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United States Coast Pilot 5

Atlantic Coast:
Gulf of Mexico, Puerto Rico, and Virgin Islands

Seventeenth Edition
July 1984

Corrected through:
Local Notices to Mariners issued by Coast Guard District Commanders, March 21, 1984.

Weekly Notice to Mariners published by Defense Mapping Agency Hydrographic/Topographic Center, No. 17, April 28, 1984.

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LIMITS OF UNITED STATES COAST PILOTS

Atlantic Coast

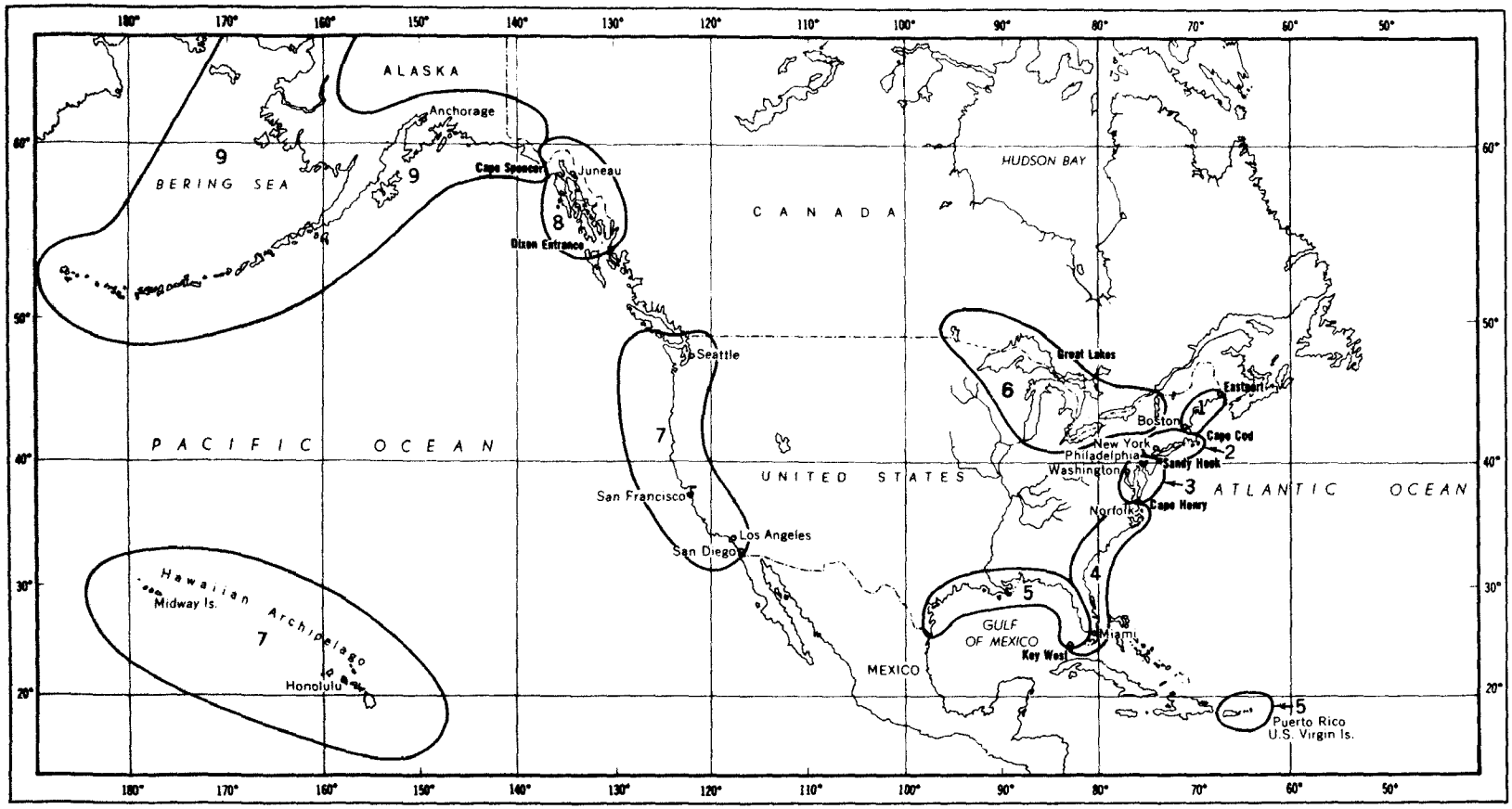
1 Eastport to Cape Cod
2 Cape Cod to Sandy Hook
3 Sandy Hook to Cape Henry
4 Cape Henry to Key West
5 Gulf of Mexico, Puerto Rico, and Virgin Islands

Pacific Coast

7 California, Oregon, Washington, and Hawaii
8 Alaska - - Dixon Entrance to Cape Spencer
9 Alaska - - Cape Spencer to Beaufort Sea

Great Lakes

6 The Lakes and their Connecting Waterways



Preface

United States Coast Pilots are published by the National Ocean Service (NOS), Charting and Geodetic Services (C&GS), pursuant to the Act of 6 August 1947 (33 U.S.C. 883a and b).

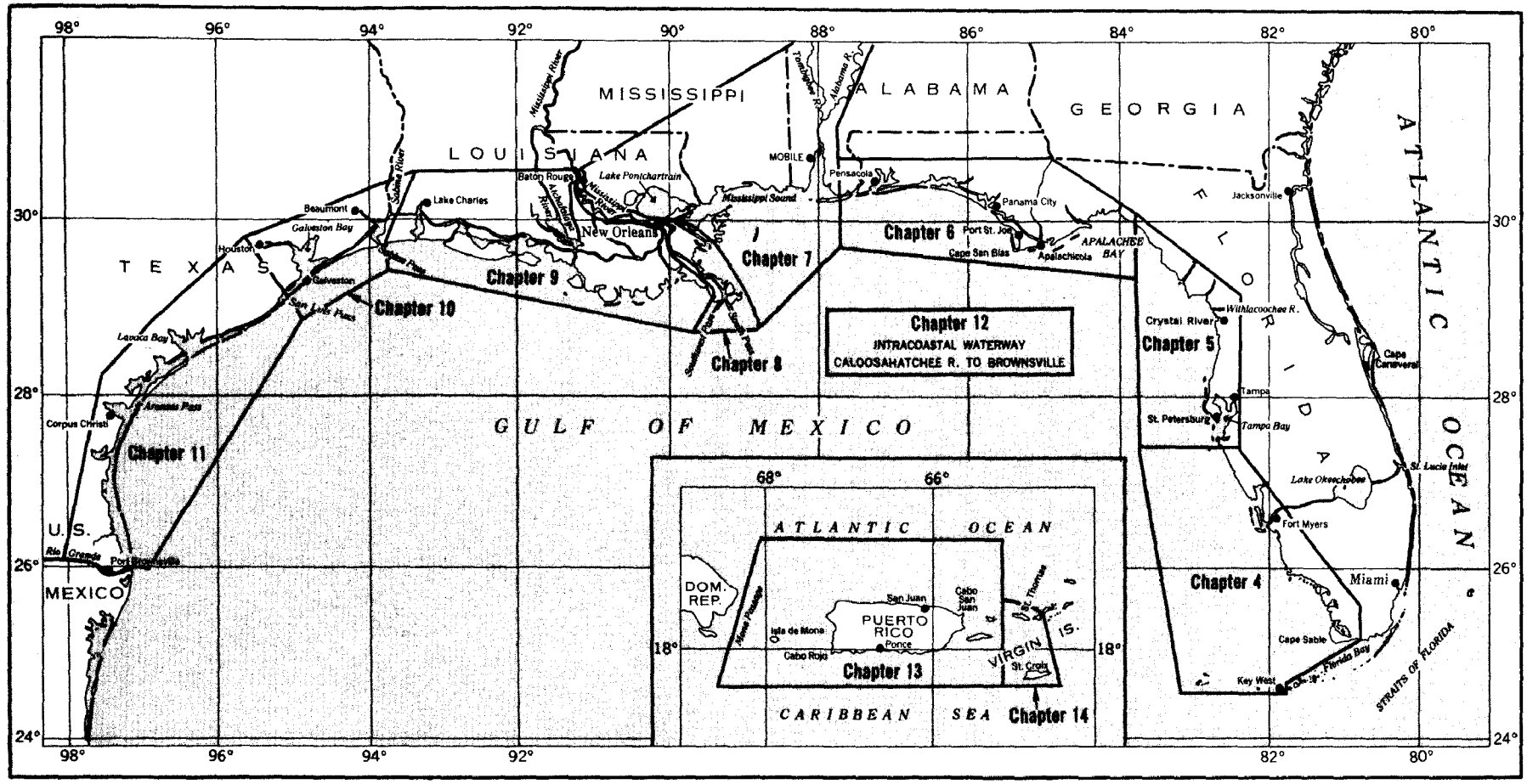
Coast Pilots supplement the navigational information shown on the nautical charts and are based upon field inspections conducted by the C&GS, information published in Notices to Mariners, and reports from NOAA survey vessels, other Government agencies, State and local governments, maritime and pilotage associations, port authorities, mariners, and others. The tables which follow the appendix are usually revised about every 5 years.

This volume of Coast Pilot 5, Atlantic Coast, Gulf of Mexico, Puerto Rico and Virgin Islands, cancels the Sixteenth (July 1983) Edition.

Caution: The Coast Pilot is corrected through the dates of Notices to Mariners shown on the title page and should not be used without reference to the Notices to Mariners issued subsequent to those dates.

Mariners and others are urged to report promptly to the National Ocean Service errors, omissions, or any conditions found to differ from or to be additional to those published in the Coast Pilot or shown on the charts in order that they may be fully investigated and proper corrections made. A Coast Pilot Report form is included in the back of this book and a Marine Information Report form is published in the Weekly Notice to Mariners for your convenience. These reports and/or suggestions for increasing the usefulness of the Coast Pilot should be sent to Director, Charting and Geodetic Services, Attention: N/CG223, National Ocean Service, NOAA, Rockville, Md. 20852.

The information published in this book has been computerized and printed by an automatic photocomposition process.



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1. GENERAL INFORMATION

UNITED STATES COAST PILOTS.–The National Ocean Service Coast Pilots are a series of nine nautical books that cover a wide variety of information important to navigators of U.S. coastal and intracoastal waters and the waters of the Great Lakes. Most of this book information cannot be shown graphically on the standard nautical charts and is not readily available elsewhere. Coast Pilot subjects include navigation regulations, outstanding landmarks, channel and anchorage peculiarities, dangers, weather, ice, freshets, routes, pilotage, and port facilities.

Caution.–The Coast Pilot is corrected through the dates of Notices to Mariners shown on the title page and should not be used without reference to the Notices to Mariners issued subsequent to those dates. Changes to the Coast Pilot that affect the safety of navigation and are reported to NOS in the interim period between new editions are published in the Local and Weekly Notices to Mariners.

Bearings.–These are true and are expressed in degrees from 000° (north) to 359°, measured clockwise. General bearings are expressed by initial letters of the points of the compass (e.g., N, NNE, NE, etc.). Adjective and adverb endings, except in chapter 2, Navigation Regulations, have been discarded. Wherever precise bearings are intended degrees are used. Light-sector bearings are toward the light.

Bridges and cables.–Vertical clearances of bridges and overhead cables are in feet above mean high water unless otherwise stated; clearances of drawbridges are for the closed position, although the open clearances are also given for vertical-lift bridges. Clearances given in the Coast Pilots are those approved for nautical charting, and are supplied by the U.S. Coast Guard (bridges) and U.S. Army Corps of Engineers (cables); they may be as-built (verified by actual inspection after completion of structures) or authorized (design values specified in permit issued prior to construction). No differentiation is made in the Coast Pilots between as-built and authorized clearances. (See charts for horizontal clearances of bridges, as these are given in the Coast Pilots only when they are less than 50 feet.) Submarine cables are rarely mentioned.

Cable ferries.–Cable ferries are guided by cables fastened to shore and sometimes propelled by a cable rig attached to the shore. Generally, the cables are suspended during crossings and dropped to the bottom when the ferries dock. Where specific operating procedures are known they are mentioned in the text. Since operating procedures vary, mariners are advised to exercise extreme caution and seek local knowledge. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Courses.–These are true and are expressed in the same manner as bearings. The directives "steer" or "make good" a course mean, without exception, to proceed from a point of origin along a track having the identical meridional angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

Currents.–Stated current velocities are the averages at strength. Velocities are in knots, which are nautical miles per hour. Directions are the true directions to which the currents set.

Depths.–Depths are in feet or fathoms, below **Chart Datum** of the chart unless otherwise stated. (See Chart Datum this chapter for further detail.) The **controlling depth** of a channel is the least depth within the limits of the channel; it restricts the safe use of the channel to drafts of less than that depth. The **centerline controlling depth** of a channel applies only to the channel centerline; lesser depths may exist in the remainder of the channel. The **midchannel controlling depth** of a channel is the controlling depth of only the middle half of the channel. **Federal project depth** is the design dredging depth of a channel constructed by the Corps of Engineers, U.S. Army; the project depth may or may not be the goal of maintenance dredging after completion of the channel, and, for this reason, project depth must not be confused with controlling depth. **Depths alongside wharves** usually have been reported by owners and/or operators of the waterfront facilities, and have not been verified by Government surveys; since these depths may be subject to change, local authorities should be consulted for the latest controlling depths.

In general, the Coast Pilots give the project depths for deep-draft ship channels maintained by the Corps of Engineers. The latest controlling depths are usually shown on the charts and published in the Notices to Mariners. For other channels, the latest controlling depths available at the time of publication are given. **In all cases, however, mariners are advised to consult with pilots, port and local authorities, and Federal and State authorities for the latest channel controlling depths.**

Under-keel clearances.–It is becoming increasingly evident that economic pressures are causing mariners to navigate through waters of barely adequate depth, with under-keel clearances being finely assessed from the charted depths, predicted tide levels, and depths recorded by echo sounders.

It cannot be too strongly emphasized that even charts based on modern surveys may not show all seabed obstructions or the shoalest depths, and actual tide levels may be appreciably lower than those predicted.

In many ships an appreciable correction must be applied to shoal soundings recorded by echo sound-

ers due to the horizontal distance between the transducers. This separation correction, which is the amount by which recorded depths therefore exceed true depths, increases with decreasing depths to a maximum equal to half the distance apart of the transducers; at this maximum the transducers are aground. Ships whose transducers are more than 6 feet apart should construct a table of true and recorded depths using the Traverse Tables. (Refer to discussion of echo soundings elsewhere in chapter 1.)

Other appreciable corrections, which must be applied by many ships, are for settlement and squat. These corrections depend on the depth of water below the keel, the hull form and speed of the ship.

Settlement causes the water level around the ship to be lower than would otherwise be the case. It will always cause echo soundings to be less than they would otherwise be. Settlement is appreciable when the depth is less than seven times the draft of the ship, and increases as the depth decreases and the speed increases.

Squat denotes a change in trim of a ship underway, relative to her trim when stopped. It usually causes the stern of a vessel to sit deeper in the water. However, it is reported that in the case of mammoth ships, squat causes the bow to sit deeper. Depending on the location of the echo sounding transducers, this may cause the recorded depth to be greater or less than it ought to be. **Caution and common sense are continuing requirements for safe navigation.**

Distances.–These are in nautical miles unless otherwise stated. A nautical mile is one minute of latitude, or approximately 2,000 yards, and is about 1.15 statute miles.

Heights.–These are in feet above the tidal datum used for that purpose on the charts, usually mean high water. However, the heights of the decks of piers and wharves are given in feet above the chart datum for depths.

Light and fog signal characteristics.–These are not described, and light sectors and visible ranges are normally not defined. (See Coast Guard Light Lists.)

Obstructions.–Wrecks and other obstructions are mentioned only if of a relatively permanent nature and in or near normal traffic routes.

Radio aids to navigation.–These are seldom described. (See Coast Guard Light Lists and Defense Mapping Agency Hydrographic/Topographic Center Radio Navigational Aids publications.)

Ranges.–These are not fully described. **"A 339° Range"** means that the rear structure bears 339° from the front structure. See Coast Guard Light Lists.

Reported information.–Information received by NOS from various sources concerning depths, dangers, currents, facilities, and other subjects, which has not been verified by Government surveys or inspections, is often included in Coast Pilots; such **unverified information** is qualified as "reported", and should be regarded with caution.

Time.–Unless otherwise stated, all times are given in local standard time in the 24-hour system. (Noon is 1200, 2:00 p.m. is 1400, and midnight is 0000.)

Winds.–Directions are the true directions from which the winds blow. Unless otherwise indicated, speeds are given in knots, which are nautical miles per hour.

NOTICES TO MARINERS

Notices to Mariners are published by Federal agencies to advise operators of vessels of marine information affecting the safety of navigation. The notices include changes in aids to navigation, depths in channels, bridge and overhead cable clearances, reported dangers, and other useful marine information. They should be used routinely for updating the latest editions of nautical charts and related publications.

Local Notice to Mariners is issued by each Coast Guard District Commander for the waters under his jurisdiction. (See appendix for Coast Guard district(s) covered by this volume.) These notices are usually published weekly and may be obtained without cost by making application to the appropriate District Commander.

Notice to Mariners, published weekly by the Defense Mapping Agency Hydrographic/Topographic Center, is prepared jointly with NOS and the Coast Guard. These notices contain selected items from the Local Notices to Mariners and other reported marine information required by oceangoing vessels operating in both **foreign** and **domestic** waters. Special items covering a variety of subjects and generally not discussed in the Coast Pilot or shown on nautical charts are published annually in Notice to Mariners 1. These items are important to the mariner and should be read for future reference. The weekly notices may be obtained by operators of oceangoing vessels, without cost, by making application to Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315.

Local Notice to Mariners, relating to the **Great Lakes** and connecting waters west of Montreal, is published weekly by the Ninth Coast Guard District. These notices contain changes in aids to navigation and other marine information affecting the safety of navigation. Application for these free notices should be made to Commander, Ninth Coast Guard District, Federal Building, Cleveland, Ohio, 44199.

Notices and reports of **improved channel depths** are also published by district offices of the Corps of Engineers, U.S. Army. (See appendix for districts covered by this volume.) Although information from these notices/reports affecting NOS charts and related publications is usually published in the Notices to Mariners, the local district engineer office should be consulted where depth information is critical.

Marine Broadcast Notices to Mariners are made by the Coast Guard through Coast Guard, Navy, and some commercial radio stations to report deficiencies and important changes in aids to navigation.

(See Radio Navigation Warnings and Weather, this chapter.)

Vessels operating within the limits of the Coast Guard districts can obtain information affecting NOS charts and related publications from the Local Notices to Mariners. Small craft using the Intracoastal Waterway and other waterways and small harbors within the United States that are not normally used by oceangoing vessels will require the Local Notices to Mariners to keep charts and related publications up-to-date. Information for oceangoing vessels can be obtained from the Notice to Mariners published by the Defense Mapping Agency Hydrographic/Topographic Center.

Notices to Mariners may be consulted at Coast Guard district offices, NOS field offices, Defense Mapping Agency Hydrographic/Topographic Center offices and depots, most local marine facilities, and sales agents handling charts and related publications.

U.S. GOVERNMENT AGENCIES PROVIDING MARITIME SERVICES

Animal and Plant Health Inspection Service, Department of Agriculture.–The Agricultural Quarantine Inspection Program and Animal Health Programs of this organization are responsible for protecting the Nation's animal population, food and fiber crops, and forests from invasion by foreign pests. They administer agricultural quarantine and restrictive orders issued under authority provided in various acts of Congress. The regulations prohibit or restrict the importation or interstate movement of live animals, meats, animal products, plants, plant products, soil, injurious insects, and associated items that may introduce or spread plant pests and animal diseases which may be new to or not widely distributed within the United States or its territories. Inspectors examine imports at ports of entry as well as the vessel, its stores, and crew or passenger baggage.

The Service also provides an inspection and certification service for exporters to assist them in meeting the quarantine requirements of foreign countries. (See appendix for a list of ports where agricultural inspectors are located and inspections conducted.)

Customs Service, Department of the Treasury.–The United States Customs Service administers certain laws relating to: entry and clearance of vessels and permits for certain vessel movements between points in the United States; prohibitions against coastwise transportation of passengers and merchandise; salvage, dredging and towing by foreign vessels; certain activities of vessels in the fishing trade; regular and special tonnage taxes on vessels; the landing and delivery of foreign merchandise (including unlading, appraisement, lighterage, drayage, warehousing, and shipment in bond); collection of customs duties, including duty on imported pleasure boats and yachts and 50% duty on foreign repairs to American vessels engaged in trade; customs treatment of sea and ship's stores while in port and the baggage of crewmen and passengers; illegally imported merchandise; and remission of penalties or forfeiture if customs or navigation laws have been violated. The Customs Service also cooperates with many other Federal agencies in the enforcement of statutes they are responsible for. Customs districts and ports of entry, including customs stations, are listed in the appendix.

The Customs Service may issue, without charge, a **cruising license,** valid for a period of up to 6 months and for designated U.S. waters, to a yacht of a foreign country which has a reciprocal agreement with the United States. A foreign yacht holding a cruising license may cruise in the designated U.S. waters and arrive at and depart from U.S. ports without entering or clearing at the customhouse, filing manifests, or obtaining or delivering permits to proceed, provided it does not engage in trade or violate the laws of the United States or visit a vessel not yet inspected by a Customs agent and does, within 24 hours of arrival at each port or place in the United States, report the fact of arrival to the nearest customhouse. Countries which have reciprocal agreements granting these privileges to United States yachts are Argentina, Australia, Bahama Islands, Bermuda, Canada, Federal Republic of Germany, Great Britain, Greece, Honduras, Jamaica, Liberia, the Netherlands, and New Zealand. Further information concerning cruising licenses may be obtained from the headquarters port for the customs district in which the license is desired. U.S. yacht owners planning cruises to foreign ports may contact the nearest customs district headquarters as to customs requirements.

Foreign-Trade Zones, Foreign–Trade Zones Board.–U.S. foreign–trade zones are enclosed areas considered outside the Customs territory of the United States. They are the U.S. version of what are known internationally as free trade zones and are located in or near U.S. Customs ports of entry. Operated as public utilities by qualified corporations, zones function under Customs supervision. Authority for establishing these facilities is granted by the Foreign–Trade Zones Board, a Federal interagency body chaired by the Secretary of Commerce, within whose Department the Board's executive secretariat is situated.

Foreign and domestic merchandise may be moved into zones for operations not otherwise prohibited by law involving storage, exhibition, assembly, manufacture, or other processing. The usual formal Customs entry procedure and payment of duties is not required on the foreign merchandise unless and until it enters Customs territory for domestic consumption, in which case the importer has a choice of paying duties either on the original foreign materials or the finished product. Quota restrictions do not normally apply to foreign goods in zones. Domestic goods moved into a zone for export are considered exported upon entering the zone for purposes of

excise tax rebates and drawback. (See appendix for addresses of Foreign-Trade Zones covered by this Coast Pilot.)

National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.-The National Ocean Service provides charts and related publications for the safe navigation of marine and air commerce, and provides basic data for engineering and scientific purposes and for other commercial and industrial needs. The principal facilities of NOS are located in Rockville, Md.; in Norfolk, Va. (Atlantic Marine Center); and in Seattle, Wash. (Pacific Marine Center). NOAA ships are based at the marine centers. These offices maintain files of charts and other publications which are available for the use of the mariners, who are invited to avail themselves of the facilities afforded. (See appendix for addresses.)

Sales agents for Charts, Coast Pilots, Tide Tables, Tidal Current Tables, Tidal Current Diagrams, and Tidal Current Charts of the National Ocean Service are located in many U.S. ports and in some foreign ports. A list of authorized sales agents and chart catalogs may be had free upon request from National Ocean Service, Distribution Branch (N/CG33). (See appendix for address.)

Nautical charts are published primarily for the use of the mariner, but serve the public interest in many other ways. They are compiled principally from NOS basic field surveys, supplemented by data from other Government organizations.

Tide Tables are issued annually by NOS in advance of the year for which they are prepared. These tables include predicted times and heights of high and low waters for every day in the year for a number of reference stations and differences for obtaining similar predictions for numerous other places. They also include other useful information such as a method of obtaining heights of tide at any time, local mean time of sunrise and sunset for various latitudes, reduction of local mean time to standard time, and time of moonrise and moonset for various ports.

Caution.-In using the Tide Tables, slack water should not be confused with high or low water. For ocean stations there is usually little difference between the time of high or low water and the beginning of ebb or flood currents; but for places in narrow channels, landlocked harbors, or on tidal rivers, the time of slack current may differ by several hours from the time of high or low water. The relation of the times of high or low water to the turning of the current depends upon a number of factors, so that no simple general rule can be given. (To obtain the times of slack water, refer to the Tidal Current Tables.)

Tidal Current Tables for the coasts of the United States are issued annually by NOS in advance of the year for which they are prepared. These tables include daily predictions of the times of slack water and the times and velocities of strength of flood and ebb currents for a number of waterways, together with differences for obtaining predictions for numerous other places. Also included is other useful information such as a method for obtaining the velocity of current at any time, duration of slack, coastal tidal currents, wind currents, combination of currents, and current diagrams. Some information on the Gulf Stream is included in the tables for the Atlantic coast.

Tidal Current Charts are published by NOS for various localities. These charts depict the direction and velocity of the current for each hour of the tidal cycle. They present a comprehensive view of the tidal current movement in the respective waterways as a whole and when used with the proper current tables or tide tables supply a means for readily determining for any time the direction and velocity of the current at various localities throughout the areas covered.

Tidal Current Diagrams, published annually by NOS, are a series of 12 monthly computer constructed diagrams used in conjunction with the Tidal Current Charts for a particular area. The diagrams present an alternate but more simplified method for calculating the speed and direction of the tidal currents in bays, estuaries, and harbors.

Coast Guard, Department of Transportation.- The Coast Guard has among its duties the enforcement of the laws of the United States on the high seas and in coastal and inland waters of the United States and its possessions; enforcement of navigation and neutrality laws and regulations; establishment and enforcement of navigational regulations upon the Inland Waters of the United States, including the establishment of a demarcation line separating the high seas from waters upon which U.S. navigational rules apply; administration of the Oil Pollution Act of 1961, as amended; establishment and administration of vessel anchorages; approval of bridge locations and clearances over navigable waters; administration of the alteration of obstructive bridges; regulation of drawbridge operations; inspection of vessels of the Merchant Marine; admeasurement of vessels; documentation of vessels; preparation and publication of merchant vessel registers; registration of stack insignia; port security; issuance of Merchant Marine licenses and documents; search and rescue operations; investigation of marine casualties and accidents, and suspension and revocation proceedings; destruction of derelicts; operation of aids to navigation; publication of Light Lists and Local Notices to Mariners; and operation of ice-breaking facilities.

The Coast Guard, with the cooperation of coast radio stations of many nations, operates the **Automated Mutual-assistance Vessel Rescue System (AMVER).** It is an international maritime mutual assistance program which provides important aid to the development and coordination of search and rescue (SAR) efforts in many offshore areas of the world. Merchant ships of all nations making offshore passages are encouraged to voluntarily send movement (sailing) reports and periodic position reports to the

AMVER Center at Coast Guard New York via selected radio stations. Information from these reports is entered into an electronic computer which generates and maintains dead reckoning positions for the vessels. Characteristics of vessels which are valuable for determining SAR capability are also entered into the computer from available sources of information.

Information concerning the predicted location and SAR characteristics of each vessel known to be within the area of interest is made available upon request to recognized SAR agencies of any nation or vessels needing assistance. Predicted locations are only disclosed for reasons related to marine safety.

Messages sent within the AMVER System are at no costs to the ship or owner. Benefits to shipping include: (1) improved chances of aid in emergencies, (2) reduced number of calls for assistance to vessels not favorably located, and (3) reduced time lost for vessels responding to calls for assistance. An AMVER participant is under no greater obligation to render assistance during an emergency than a vessel who is not participating.

All AMVER messages should be addressed to **Coast Guard New York** regardless of the station to which the message is delivered, except those sent to Canadian stations which should be addressed to **AMVER Halifax** or **AMVER Vancouver** to avoid incurring charges to the vessel for these messages.

Instructions guiding participation in the AMVER System are available in the following languages: Chinese, Danish, Dutch, English, French, German, Greek, Italian, Japanese, Korean, Polish, Norwegian, Portuguese, Russian, Spanish, and Swedish. The AMVER Users Manual is available from: Commander, Atlantic Area, U.S. Coast Guard, Governors Island, N.Y. 10004; Commander, Pacific Area, U.S. Coast Guard, Government Island, Alameda, Calif. 94501; and at U.S. Coast Guard District Offices, Marine Safety Offices, Marine Inspection Offices, and Captain of the Port Offices in major U.S. ports. Requests for instructions should state the language desired if other than English.

For AMVER participants bound for U.S. ports there is an additional benefit: AMVER participation via messages which include the necessary information is considered to meet the requirements of 33 CFR 161. (See 161.1, chapter 2, for rules and regulations.)

AMVER ReportingRequired.-U.S. Maritime Administration regulations effective August 1, 1983, state that certain U.S. flag vessels and foreign flag "War Risk" vessels must report and regularly update their voyages to the AMVER Center. This reporting is required of the following: (a) U.S. flag vessels of 1,000 gross tons or greater, operating in foreign commerce; (b) foreign flag vessels of 1,000 gross tons or greater, for which an Interim War Risk Insurance Binder has been issued under the provisions of Title XII, Merchant Marine Act, 1936.

Details of the above procedures are contained in the AMVER Users Manual. The system is also published in DMAHTC Pubs. 117A and 117B.

Search and Rescue Operation procedures are contained in the International Maritime Organization (IMO) SAR Manual (MERSAR). U.S. flag vessels may obtain a copy of MERSAR from local Coast Guard Marine Safety Offices and Marine Inspection Offices or by writing to U.S. Coast Guard (G-OSR), Washington, D.C. 20593. Other flag vessels may purchase MERSAR directly from IMO.

The Coast Guard conducts and/or coordinates **search and rescue** operations for surface vessels and aircraft that are in distress or overdue. (See Distress Signals and Communication Procedures this chapter.)

Light Lists, published by the Coast Guard, describe aids to navigation, consisting of lights, fog signals, buoys, lightships, daybeacons, and electronic aids, in United States (including Puerto Rico and U.S. Virgin Islands) and contiguous Canadian waters. Light Lists are for sale by the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, and by sales agents in the principal seaports. Mariners should refer to these publications for detailed information regarding the characteristics and visibility of lights, and the descriptions of light structures, lightships, buoys, fog signals, and electronic aids.

Documentation (issuance of certificates of registry, enrollments, and licenses), admeasurements of vessels, and administration of the various navigation laws pertaining thereto are functions of the Coast Guard. Yacht commissions are also issued, and certain undocumented vessels required to be numbered by the Federal Boat Safety Act of 1971 are numbered either by the Coast Guard or by a State having an approved numbering system (the latter is most common). Owners of vessels may obtain the necessary information from any Coast Guard District Commander, Marine Safety Office, or Marine Inspection Office. Coast Guard District Offices, Coast Guard Stations, Marine Safety Offices, Captain of the Port Offices, Marine Inspection Offices, and Documentation Offices are listed in the appendix. (Note: A Marine Safety Office performs the same functions as those of a Captain of the Port, and a Marine Inspection Office. When a function is at a different address than the Marine Safety Office, it will be listed separately in the appendix.)

Corps of Engineers, Department of the Army.-The Corps of Engineers has charge of the improvement of the rivers and harbors of the United States and of miscellaneous other civil works which include the administration of certain Federal laws enacted for the protection and preservation of navigable waters of the United States; the establishment of regulations for the use, administration, and navigation of navigable waters; the establishment of harbor lines; the removal of sunken vessels obstructing or endangering navigation; and the granting of permits for structures or operations in navigable waters, and for discharges and deposits of dredged and fill materials in these waters.

Information concerning the various ports, improvements, channel depths, navigable waters, and the condition of the Intracoastal Waterways in the areas under their jurisdiction may be obtained direct from the District Engineer offices. (See appendix for addresses.)

Restricted areas in most places are defined and regulations governing them are established by the Corps of Engineers. The regulations are enforced by the authority designated in the regulations, and the areas are shown on the large-scale charts of NOS. Copies of the regulations may be obtained at the District offices of the Corps of Engineers. The regulations also are included in the appropriate Coast Pilots.

Fishtraps.–The Corps of Engineers has general supervision of location, construction, and manner of maintenance of all traps, weirs, pounds, or other fishing structures in the navigable waters of the United States. Where State and/or local controls are sufficient to regulate these structures, including that they do not interfere with navigation, the Corps of Engineers leaves such regulation to the State or local authority. (See 33 CFR 206 (not carried in this Pilot) for applicable Federal regulations.) Construction permits issued by the Engineers specify the lights and signals required for the safety of navigation.

Fish havens, artificial reefs constructed to attract fish, can be established in U.S. coastal waters only as authorized by a Corps of Engineers permit; the permit specifies the location, extent, and depth over these "underwater junk piles".

Environmental Protection Agency (EPA).–The U.S. Environmental Protection Agency provides coordinated governmental action to assure the protection of the environment by abating and controlling pollution on a systematic basis. The ocean dumping permit program of the Environmental Protection Agency provides that except when authorized by permit, the dumping of any material into the ocean is prohibited by the "Marine Protection, Research, and Sanctuaries Act of 1972, Public Law 92-532," as amended (33 U.S.C. 1401 et seq.).

Permits for the dumping of dredged material into waters of the United States, including the territorial sea, and into ocean waters are issued by the Corps of Engineers. Permits for the dumping of fill material into waters of the United States, including the territorial sea, are also issued by the Corps of Engineers. Permits for the dumping of other material in the territorial sea and ocean waters are issued by the Environmental Protection Agency.

Corps of Engineers regulations relating to the above are contained in 33 CFR 323-324; Environmental Protection Agency regulations are in 40 CFR 220-229. (See Dump Sites this chapter.)

Persons or organizations who want to file for an application for an ocean dumping permit should write the Environmental Protection Agency Regional Office for the region in which the port of departure is located. (See appendix for addresses of regional offices and States in the EPA coastal regions.)

The letter should contain the name and address of the applicant; name and address of person or firm; the name and usual location of the conveyance to be used in the transportation and dumping of the material involved; a physical description where appropriate; and the quantity to be dumped and proposed dumping site.

Everyone who writes EPA will be sent information about a final application for a permit as soon as possible. This final application is expected to include questions about the description of the process or activity giving rise to the production of the dumping material; information on past activities of applicant or others with respect to the disposal of the type of material involved; and a description about available alternative means of disposal of the material with explanations about why an alternative is thought by the applicant to be inappropriate.

Federal Communications Commission.–The Federal Communications Commission controls non-Government radio communications in the United States, Guam, Puerto Rico, and the Virgin Islands. Commission inspectors have authority to board ships to determine whether their radio stations comply with international treaties, Federal Laws, and Commission regulations. The commission has field offices in the principal U.S. ports. (See appendix for addresses.) Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington, D.C. 20554, or from any of the field offices.

Immigration and Naturalization Service, Department of Justice.–The Immigration and Naturalization Service administers the laws relating to admission, exclusion, and deportation of aliens, the registration and fingerprinting of aliens, and the naturalization of aliens lawfully resident in the United States.

The designated ports of entry for aliens are divided into three classes. Class A is for all aliens. Class B is only for aliens who at the time of applying for admission are lawfully in possession of valid resident aliens' border-crossing identification cards or valid nonresident aliens' border-crossing identification cards or are admissible without documents under the documentary waivers contained in 8 CFR 212.1 (a). Class C is only for aliens who are arriving in the United States as crewmen as that term is defined in Section 101 (a) (10) of the Immigration and Nationality Act. The term "crewman" means a person serving in any capacity on board a vessel or aircraft. No person may enter the United States until he has been inspected by an immigration officer. A list of the offices covered by this Coast Pilot is given in the appendix.

Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC), Department of Defense.–The Defense Mapping Agency Hydrograph-

ic/Topographic Center provides hydrographic, navigational, topographic, and geodetic data, charts, maps, and related products and services to the Armed Forces, other Federal Agencies, the Merchant Marine and mariners in general. Publications include Sailing Directions (pilots), Light Lists, Table of Distances, Radio Navigational Aids, International Code of Signals, American Practical Navigator (Bowditch), and the Notice to Mariners published weekly. Sales of all DMAHTC products are handled by the Defense Mapping Agency Office of Distribution Services.

Public Health Service, Department of Health and Human Services.–The Public Health Service administers hospitalization and outpatient treatment to designated beneficiaries of the government and administers foreign quarantine procedures at U.S. ports of entry.

All vessels arriving in the United States are subject to public health inspection. Only the following vessels are subject to **routine boarding** for quarantine inspection upon arrival: (a) vessels which have been in a smallpox-infected country in the 15 days prior to arrival; (b) vessels which have been in a plague-infected country within 60 days prior to arrival; (c) vessels which have had on board during the 15 days preceeding arrival any of the following signs of **illness:**

1. Temperature of 100°F (38°C) or greater which was accompanied or followed by any one or all of the following: rash, jaundice, glandular swelling; or
2. Diarrhea severe enough to interfere with work or normal activity.
3. Death, regardless of the foregoing criteria.

Masters of vessels having illness aboard compatible with the above criteria must provide radio notification of the illness through their agent to the quarantine station at the intended U.S. port of arrival.

Vessels arriving at ports under control of the United States are subject to **sanitary inspection** to determine whether measures should be applied to prevent the introduction, transmission, or spread of communicable disease.

Specific public health laws, regulations, policies, and procedures may be obtained by contacting U. S. Quarantine Stations, U.S. Consulates or the Chief, Quarantine Branch, Bureau of Epidemiology, Center for Disease Control, Atlanta, Ga. 30333. (See appendix for addresses of U.S. Public Health Service Quarantine Stations.)

Food and Drug Administration (FDA), Public Health Service, Department of Health and Human Services.–Under the provisions of the Control of Communicable Diseases Regulations (21 CFR 1240) and Interstate Conveyance Sanitation Regulations (21 CFR 1250), vessel companies operating in interstate traffic shall obtain potable water for drinking and culinary purposes only at watering points found acceptable to the Food and Drug Administration. Water supplies used in watering point operations must also be inspected to determine compliance with applicable Interstate Conveyance Sanitation Regulations (21 CFR 1250). These regulations are based on authority contained in the Public Health Service Act (PL 78–410). Penalties for violation of any regulation prescribed under authority of the Act are provided for under section 368(a) (42 USC 271) of the Act.

FDA publishes a list of **Acceptable Vessel Watering Points** as of January 1 each year. This list is available from most FDA offices or from the Interstate Travel Sanitation Subprogram, FDA, HFF–324, 200 C Street SW., Washington, D.C. 20204. Since the acceptability of watering points may have changed since January 1, their current status must be obtained by contacting any FDA office. (See appendix for addresses.)

National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.–The National Weather Service provides marine weather forecasts and warnings for U.S. coastal waters, the Great Lakes, offshore waters, and high seas areas. Scheduled marine forecasts are issued four times daily from more than 20 **National Weather Service Forecast Offices (WSFO's)** around the country, operating 24 hours a day. Marine services are also provided by over 50 **National Weather Service Offices** with local areas of responsibility. (See appendix for Weather Service Forecast Offices and Weather Service Offices for the area covered by this Coast Pilot.)

Typically, the forecasts contain information on wind speed and direction, wave heights, visibility, weather, and a general synopsis of weather patterns affecting the region. The forecasts are supplemented with special marine warnings and statements, radar summaries, marine observations, small-craft advisories, gale warnings, storm warnings, and various categories of tropical cyclone warnings, e.g., tropical depression, tropical storm, and hurricane warnings. Specialized products such as coastal flood, seiche, and tsunami warnings, heavy surf advisories, low water statements, ice forecasts and outlooks, and lakeshore warnings and statements are issued as necessary.

The principal means of disseminating marine weather services and products in coastal areas is **NOAA Weather Radio.** This network of more than 350 stations nationwide is operated by the NWS and provides continuous broadcasts of weather information for the general public. These broadcasts repeat taped messages every 4-6 minutes. Tapes are updated periodically, usually every 2-3 hours and amended as required to include the latest information. When severe weather threatens, routine transmissions are interrupted and the broadcast is devoted to emergency warnings. (See appendix for NOAA Weather Radio Stations covered by this Coast Pilot.)

In coastal areas, the programming is tailored to the needs of the marine community. Each coastal marine forecast covers a specific area. For example,

"Cape Henlopen to Virginia Beach, out 20 miles." The broadcast range is about 40 miles from the transmitting antenna site, depending on terrain and quality of the receiver used. When transmitting antennas are on high ground, the range is somewhat greater, reaching 60 miles or more. Some receivers are equipped with a warning alert device that can be turned on by means of a tone signal controlled by the NWS office concerned. This signal is transmitted for 13 seconds preceding an announcement of a severe weather warning.

Marine weather warnings are displayed to small-craft operators and others within sight of the shore by the flags, pennants, and lights of the **Coastal Warning Display** program. This means of receiving marine warnings is the least efficient because of the limited visual range of the display and problems in hoisting and lowering the display promptly. The Coastal Warning Display program is being de-emphasized as small-boat operators and coastal residents are urged to rely instead on low-cost, portable NOAA Weather Radio receivers.

NWS marine weather products are also disseminated to marine users through the broadcast facilities of the Coast Guard, Navy, National Bureau of Standards, National Marine Fisheries Service, certain Sea Grant Universities, and commercial marine radio stations. Details on these broadcasts including times, frequencies, and broadcast content are listed in the joint NWS/Navy publication, Selected Worldwide Marine Weather Broadcasts. For marine weather services in the coastal areas, the NWS publishes a series of Marine Weather Services Charts showing locations of NOAA Weather Radio stations, Coastal Warning Display sites, telephone numbers of recorded weather messages and NWS offices, and other useful marine weather information.

Ships of all nations share equally in the effort to report weather observations. These reports enable meteorologists to create a detailed picture of wind, wave, and weather patterns over the open waters that no other data source can provide and upon which marine forecasts are based. The effectiveness and reliability of these forecasts and warnings plus other services to the marine community are strongly linked to the observations received from mariners. There is an especially urgent need for ship observations in coastal waters, and the NWS asks that these be made and transmitted whenever possible. Many storms originate and intensify in coastal areas. There may be a great difference in both wind direction and speed between the open sea, offshore waters, and on the coast itself.

Information on how ships, commericial fishermen, offshore industries, and others in the coastal zone may participate in the marine observation program is available from **National Weather Service Port Meteorological Officers (PMO's).** Port Meteorological Officers are located in major U.S. port cities and the Republic of Panama, where they visit ships in port to assist masters and mates with the weather observation program, provide instruction on the interpretation of weather charts, calibrate barometers and other meteorological instruments, and discuss marine weather communications and marine weather requirements affecting the ships' operations. (See appendix for addresses of Port Meteorological Officers in or near the area covered by this Coast Pilot.)

National Environmental Satellite, Data, and Information Service (NESDIS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce. - Among its functions, NESDIS archives, processes, and disseminates the non-real-time meteorological and oceanographic data collected by government agencies and private institutions. Marine weather observations are collected from ships at sea on a voluntary basis. About 1 million observations are received annually at NESDIS's National Climatic Center. They come from vessels representing every maritime nation. These observations, along with land data, are returned to the mariners in the form of climatological summaries and atlases for coastal and ocean areas. They are available in such NOAA publications as the **U.S. Coast Pilots, Mariners Weather Log,** and **Local Climatological Data, Annual Summary.** They also appear in the Defense Mapping Agency Hydrographic/Topographic Center's **Pilot Charts** and **Sailing Directions Planning Guides.**

DISTRESS SIGNALS AND COMMUNICATION PROCEDURES

Coast Guard search and rescue operations.–The Coast Guard conducts and/or coordinates search and rescue operations for surface vessels or aircraft that are in distress or overdue. Search and Rescue vessels and aircraft have special markings, including a wide slash of red-orange and a small slash of blue on the forward portion of the hull or fuselage. Other parts of aircraft, normally painted white, may have other areas painted red to facilitate observation. The cooperation of vessel operators with Coast Guard helicopters, fixed-wing aircraft, and vessels may mean the difference between life and death for some seaman or aviator; such cooperation is greatly facilitated by the prior knowledge on the part of vessel operators of the operational requirements of Coast Guard equipment and personnel, of the international distress signals and procedures, and of good seamanship.

International distress signals.–(1) A signal made by radiotelegraphy or by any other signalling method consisting of the group "SOS" in Morse Code.

(2) A signal sent by radiotelephony consisting of the spoken word "MAYDAY".

(3) The International Flag Code Signal of NC.

(4) A signal consisting of a square flag having above or below it a ball or anything resembling a ball.

(5) Flames on the craft (as from a burning oil barrel, etc.).

(6) A rocket parachute flare or hand flare showing a red light.

(7) Rockets or shells, throwing red stars fired one at a time at short intervals.

(8) Orange smoke, as emitted from a distress flare.

(9) Slowly and repeatedly raising and lowering arms outstretched to each side.

(10) A gun or other explosive signal fired at intervals of about 1 minute.

(11) A continuous sounding of any fog-signal apparatus.

(12) The radiotelegraph alarm signal.

(13) The radiotelephone alarm signal.

(14) Signals transmitted by emergency position-indicating radiobeacons.

(15) A piece of orange-colored canvas with either a black square and circle or other appropriate symbol (for identification from the air).

(16) A dye marker.

Radio distress procedures.–Distress calls are made on 500 kHz (SOS) for radiotelegraphy and on 2182 kHz or channel 16 (156.80 MHz) VHF-FM (MAYDAY) for radiotelephony. For less serious situations than warrant the distress procedure, the urgency signal PAN (PAHN, spoken three times), or the safety signal SECURITY (SAY-CURITAY, spoken three times), for radiotelephony, are used as appropriate. Since radiotelegraph transmissions are normally made by professional operators, and urgency and safety situations are less critical, only the distress procedures for voice radiotelephone are described. For complete information on emergency radio procedures, see 47 CFR 83 or DMAHTC Pubs. 117A or 117B. **(See appendix for a list of Coast Guard Stations which guard 2182 kHz and 156.80 MHz.)** Complete information on distress guards can be obtained from Coast Guard District Commanders.

Distress calls indicate a vessel or aircraft is threatened by grave and imminent danger and requests immediate assistance. They have absolute priority over all other transmissions. All stations which hear a distress call must immediately cease any transmission capable of interfering with the distress traffic and shall continue to listen on the frequency used for the emission of the distress call. This call shall not be addressed to a particular station, and acknowledgement of receipt shall not be given before the distress message which follows it is sent.

Radiotelephone distress communications include the following actions:

(1) The **radiotelephone alarm signal** (if available): The signal consists of two audio tones, of different pitch, transmitted alternately; its purpose is to attract the attention of persons on radio watch or to actuate automatic alarm devices. It may only be used to announce that a distress call or message is about to follow.

(2) The **distress call,** consisting of:–the distress signal MAYDAY (spoken three times);

the words THIS IS (spoken once);

the call sign or name of the vessel in distress (spoken three times).

(3) The **distress message** follows immediately and consists of:

the distress signal MAYDAY;

the call sign and name of the vessel in distress;

particulars of its position (latitude and longitude, or true bearing and distance from a known geographical position);

the nature of the distress;

the kind of assistance desired;

the number of persons aboard and the condition of any injured;

present seaworthiness of vessel;

description of the vessel (length; type; cabin; masts; power; color of hull, superstructure, trim; etc.);

any other information which might facilitate the rescue, such as display of a surface-to-air identification signal or a radar reflector;

your listening frequency and schedule;

THIS IS (call sign and name of vessel in distress). OVER.

(4) **Acknowledgement of receipt of a distress message:** If a distress message is received from a vessel which is definitely in your vicinity, immediately acknowledge receipt. If it is not in your vicinity, allow a short interval of time to elapse before acknowledging, in order to permit vessels nearer to the vessel in distress to acknowledge receipt without interference. However, in areas where reliable communications with one or more shore stations are practicable, all vessels may defer this acknowledgement for a short interval so that a shore station may acknowledge receipt first. The acknowledgement of receipt of a distress is given as follows:

the call sign or name of the vessel sending the distress (spoken three times);

the words THIS IS;

the call sign or name of acknowledging vessel (spoken three times);

The words RECEIVED MAYDAY.

After the above acknowledgement, allow a momentary interval of listening to insure that you will not interfere with another vessel better situated to render immediate assistance; if not, with the authority of the person in charge of the vessel, transmit:

the word MAYDAY;

the call sign and name of distressed vessel;

the words THIS IS;

the call sign and name of your vessel;

your position (latitude and longitude, or true bearing and distance from a known geographical position);

the speed you are proceeding towards, and the approximate time it will take to reach, the distressed vessel. OVER.

(5) **Further distress messages and other communications:** Distress communications consist of all messages relating to the immediate assistance required by the distressed vessel. Each distress communication shall be preceded by the signal MAYDAY. The vessel in distress or the station in control of distress communications may **impose silence** on any station which interferes. The procedure is:–the words SEELONCE MAYDAY (Seelonce is French for silence). Silence also may be imposed by nearby

mobile stations other than the vessel in distress or the station in control of distress communications. The mobile station which believes that silence is essential may request silence by the following procedure:–the word SEELONCE, followed by the word DISTRESS, and its own call sign.

(6) **Transmission of the distress procedure by a vessel or shore station not itself in distress:** A vessel or a shore station which learns that a vessel is in distress shall transmit a distress message in any of the following cases:

(a) When the vessel in distress is not itself able to transmit the distress message.

(b) When a vessel or a shore station considers that further help is necessary.

(c) When, although not in a position to render assistance, it has heard a distress message that has not been acknowledged.

In these cases, the transmission shall consist of:

the radiotelephone alarm signal (if available);

the words MAYDAY RELAY (spoken three times);

the words THIS IS;

the call sign and name of vessel (or shore station), spoken three times.

When a vessel transmits a distress under these conditions, it shall take all necessary steps to contact the Coast Guard or a shore station which can notify the Coast Guard.

(7) **Termination of distress:** When distress traffic has ceased, or when silence is no longer necessary on the frequency used for the distress traffic, the station in control shall transmit on that frequency a message to all stations as follows:

the distress signal MAYDAY;

the call TO ALL STATIONS, spoken three times;

the words THIS IS;

the call sign and name of the station sending the message;

the time;

the name and call sign of the vessel in distress;

the words SEELONCE FEENEE (French for silence finished).

DISTRESS ASSISTANCE AND COORDINATION PROCEDURES

Surface ship procedures for assisting distressed surface vessels.

(1) The following immediate action should be taken by each ship on receipt of a distress message:

(a) Acknowledge receipt and, if appropriate, retransmit the distress message;

(b) Immediately try to take D/F bearings during the transmission of the distress message and maintain a D/F watch on 500 kHz and/or 2182 kHz;

(c) Communicate the following information to the ship in distress:

(i) identity;

(ii) position;

(iii) speed and estimated time of arrival (ETA);

(iv) when available, true bearing of the ship in distress.

(d) Maintain a continuous listening watch on the frequency used for the distress. This will normally be:

(i) 500 kHz (radiotelegraphy) and/or

(ii) 2182 kHz (radiotelephony).

(e) Additionally, maintain watch on VHF-FM channel 16 (156.80 MHz) as necessary;

(f) Operate radar continuously;

(g) If in the vicinity of the distress, post extra lookouts.

(2) The following action should be taken when proceeding to the area of distress:

(a) Plot the position, course, speed, and ETA of other assisting ships.

(b) Know the communication equipment with which other ships are fitted. This information may be obtained from the International Telecommunication Union's List of Ship Stations.

(c) Attempt to construct an accurate "picture" of the circumstances attending the casualty. The important information needed is included under Distress Signals and Communication Procedures. Should the ship in distress fail to transmit this information, a ship proceeding to assist should request what information is needed.

(3) The following on-board preparation while proceeding to the distress area should be considered:

(a) A rope (guest warp) running from bow to quarter at the waterline on each side and secured by lizards to the ship's side to assist boats and rafts to secure alongside;

(b) A derrick rigged ready for hoisting on each side of the ship with a platform cargo sling, or rope net, secured to the runner to assist the speedy recovery of exhausted or injured survivors in the water;

(c) Heaving lines, ladders, and scramble net placed ready for use along both sides of the ship on the lowest open deck and possibly crew members suitably equipped to enter the water and assist survivors;

(d) A ship's liferaft made ready for possible use as a boarding station;

(e) Preparations to receive survivors who require medical assistance including the provision of stretchers;

(f) When own lifeboat is to be launched, any means to provide communications between it and the parent ship will prove to be of very great help;

(g) A line throwing appliance with a light line and a heavy rope, ready to be used for making connection either with the ship in distress or with survival craft.

Aircraft procedures for directing surface craft to scene of distress incident.–The following procedures performed in sequence by an aircraft mean that the aircraft is directing a surface craft toward the scene of a distress incident:

(a) Circling the surface craft at least once.

(b) Crossing the projected course of the surface craft close ahead at low altitude, rocking the wings, opening and closing the throttle, or changing the propeller pitch.

(c) Heading in the direction in which the surface craft is to be directed. The surface craft should acknowledge the signal by changing course and following the aircraft. If, for any reason, it is impossible to follow, the surface craft should hoist the international code flag NOVEMBER, or use any other signaling means available to indicate this.

The following procedures performed by an aircraft mean that the assistance of the surface craft is no longer required:

(a) Crossing the wake of the surface craft close astern at a low altitude, rocking the wings, opening and closing the throttle or changing the propeller pitch.

Since modern jet-engined aircraft cannot make the characteristic sound associated with opening and closing the throttle, or changing propeller pitch, ships should be alert to respond to the signals without the sounds, when jets or turboprop aircraft are involved.

Surface ship procedures for assisting aircraft in distress.– 1. When an aircraft transmits a distress message by radio, the first transmission is generally made on the designated air/ground enroute frequency in use at the time between the aircraft and aeronautical station. The aircraft may change to another frequency, possibly another enroute frequency or the aeronautical emergency frequencies of 121.50 MHz or 243 MHz. In an emergency, it may use any other available frequency to establish contact with any land, mobile, or direction-finding station.

2. There is liaison between Coast Radio Stations aeronautical units, and land-based search and rescue organizations. Merchant ships will ordinarily be informed of aircraft casualties at sea by broadcast messages from Coast Radio Stations, made on the international distress frequencies of 500 kHz and 2182 kHz. Ships may, however, become aware of the casualty by receiving:

(a) An SOS message from an aircraft in distress which is able to transmit on 500 kHz or a distress signal from an aircraft using radiotelephone on 2182 kHz.

(b) A radiotelegraphy distress signal on 500 kHz from a hand-operated emergency transmitter carried by some aircraft.

(c) A message from a SAR aircraft.

3. For the purpose of emergency communications with aircraft, special attention is called to the possibility of conducting direct communications on 2182 kHz, if both ship and aircraft are so equipped.

4. An aircraft in distress will use any means at its disposal to attract attention, make known its position, and obtain help, including some of the signals prescribed by the applicable Navigation Rules.

5. Aircraft usually sink quickly (e.g. within a few minutes). Every endeavor will be made to give ships an accurate position of an aircraft which desires to ditch. When given such a position, a ship should at once consult any other ships in the vicinity on the best procedure to be adopted. The ship going to the rescue should answer the station sending the broadcast and give her identity, position, and intended action.

6. If a ship should receive a distress message direct from an aircraft, she should act as indicated in the immediately preceding paragraph and also relay the message to the nearest Coast Radio Station. Moreover, a ship which has received a distress message direct from an aircraft and is going to the rescue should take a bearing on the transmission and inform the Coast Radio Station and other ships in the vicinity of the call sign of the distressed aircraft and the time at which the distress message was received, followed by the bearing and time at which the signal ceased.

7. When an aircraft decides to ditch in the vicinity of a ship, the ship should:

(a) Transmit homing bearings to the aircraft, or (if so required) transmit signals enabling the aircraft to take its own bearings.

(b) By day, make black smoke.

(c) By night, direct a searchlight vertically and turn on all deck lights. Care must be taken not to direct a searchlight toward the aircraft, which might dazzle the pilot.

8. Ditching an aircraft is difficult and dangerous. A ship which knows that an aircraft intends to ditch should be prepared to give the pilot the following information:

(a) Wind direction and force.

(b) Direction, height, and length of primary and secondary swell systems.

(c) Other pertinent weather information.

The pilot of an aircraft will choose his own ditching heading. If this is known by the ship, she should set course parallel to the ditching heading. Otherwise the ship should set course parallel to the main swell system and into the wind component, if any.

9. A land plane may break up immediately on striking the water, and liferafts may be damaged. The ship, should, therefore, have a lifeboat ready for launching, and if possible, boarding nets should be lowered from the ship and heaving lines made ready in the ship and the lifeboat. Survivors of the aircraft may have bright colored lifejackets and location aids.

10. The method of recovering survivors must be left to the judgment of the master of the ship carrying out the rescue operation.

11. It should be borne in mind that military aircraft are often fitted with ejection seat mechanisms. Normally, their aircrew will use their ejection seats, rather than ditch. Should such an aircraft ditch, rather than the aircrew bail out, and it becomes necessary to remove them from their ejection seats while still in the aircraft, care should be taken to avoid triggering off the seat mechanisms. The activating handles are invariably indicated by red and or black/yellow coloring.

12. A survivor from an aircraft casualty who is recovered may be able to give information which will assist in the rescue of other survivors. Masters are therefore asked to put the following questions to

survivors and to communicate the answers to a Coast Radio Station. They should also give the position of the rescuing ship and the time when the survivors were recovered.

(a) What was the time and date of the casualty?

(b) Did you bail out or was the aircraft ditched?

(c) If you bailed out, at what altitude?

(d) How many others did you see leave the aircraft by parachute?

(e) How many ditched with the aircraft?

(f) How many did you see leave the aircraft after ditching?

(g) How many survivors did you see in the water?

(h) What flotation gear had they?

(i) What was the total number of persons aboard the aircraft prior to the accident?

(j) What caused the emergency?

Helicopter evacuation of personnel.–Helicopter evacuation, usually performed by the Coast Guard, is a hazardous operation to the patient and to the flight crew, and should only be attempted in event of very serious illness or injury. Provide the doctor on shore with all the information you can concerning the patient, so that an intelligent evaluation can be made concerning the need for evacuation. Most rescue helicopters can proceed less than 150 miles offshore (a few new helicopters can travel 250 to 300 miles out to sea), dependent on weather conditions and other variables. If an evacuation is necessary, the vessel must be prepared to proceed within range of the helicopter, and should be familiar with the preparations which are necessary prior to and after its arrival.

When requesting helicopter assistance:

(1) Give the accurate position, time, speed, course, weather conditions, sea conditions, wind direction and velocity, type of vessel, and voice and CW frequency for your ship.

(2) If not already provided, give complete medical information including whether or not the patient is ambulatory.

(3) If you are beyond helicopter range, advise your diversion intentions so that a rendezvous point may be selected.

(4) If there are changes to any items reported earlier, advise the rescue agency immediately. Should the patient die before the arrival of the helicopter, be sure to advise those assisting you.

Preparations prior to the arrival of the helicopter:

(1) Provide continuous radio guard on 2182 kHz or specified voice frequency, if possible. The helicopter normally cannot operate CW.

(2) Select and clear the most suitable hoist area, preferably aft on the vessel with a minimum of 50 feet radius of clear deck. This must include the securing of loose gear, awnings, and antenna wires. Trice up running rigging and booms. If hoist is aft, lower the flag staff.

(3) If the hoist is to take place at night, light the pickup areas as well as possible. Be sure you do not shine any lights on the helicopter, so that the pilot is not blinded. If there are any obstructions in the vicinity, put a light on them so the pilot will be aware of their positions.

(4) Point searchlights vertically to aid the flight crew in locating the ship and turn them off when the helicopter is on the scene.

(5) Be sure to advise the helicopter of the location of the pickup area on the ship before the helicopter arrives, so that the pilot may make his approach to aft, amidships, or forward, as required.

(6) There will be a high noise level under the helicopter, so voice communications on deck are almost impossible. Arrange a set of hand signals among the crew who will assist.

Hoist operations:

(1) If possible, have the patient moved to a position as close to the hoist area as his condition will permit–**time is important.**

(2) Normally, if a litter (stretcher) is required, it will be necessary to move the patient to the special litter which will be lowered by the helicopter. Be prepared to do this as quickly as possible. Be sure the patient is strapped in, face up, and with a life jacket on (if his condition will permit).

(3) Be sure that the patient is tagged to indicate what medication, if any, was administered to him and when it was administered.

(4) Have patient's medical record and necessary papers in an envelope or package ready for transfer with the patient.

(5) Again, if the patient's condition permits, be sure he is wearing a life jacket.

(6) Change the vessel's course to permit the ship to ride as easily as possible with the wind on the bow, preferably on the port bow. Try to choose a course to keep the stack gases clear of the hoist area. Once established, maintain course and speed.

(7) Reduce speed to ease ship's motion, but maintain steerageway.

(8) If you do not have radio contact with the helicopter, when you are in all respects ready for the hoist, signal the helicopter in with a "come on" with your hand, or at night by flashlight signals.

(9) **Allow basket or stretcher to touch deck prior to handling to avoid static shock.**

(10) If a trail line is dropped by the helicopter, guide the basket or stretcher to the deck with the line; keep the line free at all times. This line will not cause shock.

(11) Place the patient in basket, sitting with his hands clear of the sides, or in the litter, as described above. Signal the helicopter hoist operator when ready for the hoist. Patient should signal by a nodding of the head if he is able. Deck personnel give thumbs up.

(12) If it is necessary to take the litter away from the hoist point, unhook the hoist cable and keep it free for the helicopter to haul in. **Do not secure cable or trail line to the vessel or attempt to move stretcher without unhooking.**

(13) When patient is strapped into the stretcher, signal the helicopter to lower the cable, attach cable to stretcher sling (bridle), then signal the hoist

operator when the patient is ready to hoist. Steady the stretcher so it will not swing or turn.

(14) If a trail line is attached to the basket or stretcher, use it to steady the patient as he is hoisted. Keep your feet clear of the line, and keep the line from becoming entangled.

Coast Guard droppable, floatable pumps.–The Coast Guard often provides vessels in distress with emergency pumps by either making parachute drops, by lowering on helicopter hoist, or by delivering by vessel. The most commonly used type of pump comes complete in a sealed aluminum drum about half the size of a 50-gallon oil drum. One single lever on top opens it up. Don't be smoking as there may be gas fumes inside the can. The pump will draw about 90 gallons per minute. There should be a waterproof flashlight on top of the pump for night use. Operating instructions are provided inside the pump container.

Preparations for being towed by Coast Guard:

(1) Clear the forecastle area as well as you can.

(2) If a line-throwing gun is used, keep everyone out of the way until line clears the boat. The Coast Guard vessel will blow a police whistle or otherwise warn you before firing.

(3) Have material ready for chafing gear.

Radar reflectors on small craft.–Operators of disabled wooden craft and persons adrift in rubber rafts or boats that are, or may consider themselves to be, the object of a search, should hoist on a halyard or otherwise place aloft as high as possible any metallic object that would assist their detection by radar. Coast Guard cutters and aircraft are radar equipped and thus are able to continue searching in darkness and during other periods of low visibility. It is advisable for coastal fishing boats, yachts, and other small craft to have efficient radar reflectors permanently installed aboard the vessel.

Filing Cruising schedules.–Small-craft operators should prepare a cruising plan before starting on extended trips and leave it ashore with a yacht club, marina, friend, or relative. It is advisable to use a checking-in procedure by telephone for each point specified in the cruising plan. Such a trip schedule is vital for determining if a boat is overdue and will assist materially in locating a missing craft in the event search and rescue operations become necessary.

Medical advice.–Free medical advice is furnished to seamen by radio through the cooperation of Governmental and commercial radio stations whose operators receive and relay messages from ships at sea to the U.S. Coast Guard and/or directly to a hospital and then radio the medical advice back to the ships. (See appendix for list of radio stations that provide this service.)

RADIO NAVIGATION WARNINGS AND WEATHER

Marine radio warnings and weather forecasts are disseminated by many sources and through several types of transmissions. Only voice radiotelephone broadcasts are described in the Coast Pilots. Radiotelegraph (CW), radioteletype, radiofacsimile, and CW broadcasts of navigational warnings and other advisories are not described, since these transmissions are normally copied only by professional radio operators. (For complete information on radio warnings and weather, see DMAHTC Pubs. 117A and 117B and the joint National Weather Service/Navy publication Selected Worldwide Marine Weather Broadcasts.)

Frequency units.–Hertz (Hz), a unit equal to one cycle per second, has been generally adopted for radio frequencies; accordingly, frequencies formerly given in the Coast Pilots in kilocycles (kc) and megacycles (mc) are now stated in **kilohertz (kHz)** and **Megahertz (MHz),** respectively.

Coast Guard radio stations.–Coast Guard radio stations provide urgent, safety, and scheduled marine information broadcasts with virtually complete coverage of the approaches and coastal waters of the United States, Puerto Rico, and the U.S. Virgin Islands.

Scheduled radiotelephone broadcasts include routine weather, small-craft advisories, storm warnings, navigation information, and other advisories on **2670 kHz** and/or a designated VHF-FM channel, following a preliminary call on **2182 kHz** and/or **VHF-FM channel 16 (156.80 MHz).** (See the appendix for a list of the stations and their broadcast frequencies and times for the area covered by this Coast Pilot.)

Urgent and safety radiotelephone broadcasts of important Notice to Mariners items, storm warnings, and other vital marine information are transmitted upon receipt, and urgent broadcasts are repeated 15 minutes later; additional broadcasts are made at the discretion of the originator. **Urgent** broadcasts are preceded by the urgent signal PAN (PAHN, spoken three times). **Both the urgent signal and message are transmitted on 2182 kHz and/or VHF-FM channel 16 (156.80 MHz). Safety** broadcasts are preceded by the safety signal SECURITY (SAY-CURITAY, spoken 3 times). **The safety signal is given on 2182 kHz and/or VHF-FM channel 16 (156.80 MHz), and the message is given on 2670 kHz and/or VHF-FM channel 22A (157.10 MHz).**

The National Weather Service operates **VHF-FM radio stations,** usually on frequencies **162.40, 162.475, or 162.55 MHz,** to provide continuous recorded weather broadcasts. These broadcasts are available to those with suitable receivers within about 40 miles of the antenna site. (See the appendix for a list of these stations in the area covered by this Coast Pilot.)

Commercial radiotelephone coast stations.–Broadcasts of coastal weather and warnings are made by some commercial radiotelephone coast stations (marine operators) on the normal transmit-

ting frequencies of the stations. Vessels with suitable receivers and desiring this service may determine the frequencies and schedules of these broadcasts from their local stations, from Selected Worldwide Marine Weather Broadcasts, or from the series of Marine Weather Services Charts published by NWS.

Local broadcast-band radio stations.–Many local radio stations in the standard AM and FM broadcast band give local marine weather forecasts from NWS on a regular schedule. These stations are listed on the series of Marine Weather Services Charts published by NWS.

Reports from ships.–The master of every U.S. ship equipped with radio transmitting apparatus, on meeting with a tropical cyclone, dangerous ice, subfreezing air temperatures with gale force winds causing severe ice accretion on superstructures, derelict, or any other direct danger to navigation, is required to cause to be transmitted a report of these dangers to ships in the vicinity and to the appropriate Government agencies.

During the West Indies hurricane season, June 1 to November 30, ships in the Gulf of Mexico, Caribbean Sea area, southern North Atlantic Ocean, and the Pacific waters W of Central America and Mexico are urged to cooperate with NWS in furnishing these special reports in order that warnings to shipping and coastal areas may be issued.

Time Signals.– The **National Bureau of Standards** broadcasts time signals continuously, day and night, from its radio stations **WWV**, near Fort Collins, Colorado, (40°49′49″N., 105°02′27″W.) on frequencies of 2.5, 5, 10, 15, and 20 MHz, and **WWVH**, Kekaha, Kauai, Hawaii (21°59′26″N., 159°46′00″W.) on frequencies 2.5, 5, 10, and 15 MHz. Services include time announcements, standard time intervals, standard audio frequencies, Omega Navigation System status reports, geophysical alerts, high seas storm information, BCD (binary coded decimal) time code, and UT1 time corrections.

Time announcements are made every minute, commencing at 15 seconds before the minute by a female voice and at 7½ seconds before the minute by a male voice, from WWVH and WWV, respectively. The time given is in Coordinated Universal Time (UTC) and referred to the time at Greenwich, England, i.e., Greenwich Mean Time.

NBS Special Publication 432 gives a detailed description of the time and frequency dissemination services of the National Bureau of Standards. Single copies may be obtained upon request from the National Bureau of Standards, Boulder, Colorado 80303. Quantities may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NAUTICAL CHARTS

Reporting chart deficiencies.–Users are requested to report all significant observed discrepancies in and desirable additions to NOS nautical charts, including depth information in privately maintained channels and basins; obstructions, wrecks, and other dangers; new landmarks or the nonexistence or relocation of charted ones; uncharted fixed private aids to navigation; and deletions or additions of small-craft facilities. All such reports should be sent to Director, Charting and Geodetic Services, Attention: N/CG22, National Ocean Service, NOAA, Rockville, Md. 20852.

Chart symbols and abbreviations.–The standard symbols and abbreviations approved for use on all regular nautical charts published by the Defense Mapping Agency Hydrographic/Topographic Center and NOS are contained in **Chart No. 1,** United States of America **Nautical Chart Symbols and Abbreviations.** This publication is available from the Defense Mapping Agency Office of Distribution Services and NOS, and their sales agents.

On certain foreign charts reproduced by the United States, and on foreign charts generally, the symbols and abbreviations used may differ from U.S. approved standards. It is, therefore, recommended that navigators who acquire and use foreign charts and reproductions procure the symbol sheet or Chart No. 1 produced by the same foreign agency.

The mariner is warned that the buoyage systems, shapes, and colors used by other countries often have a different significance than the U.S. system.

Chart Datum.–A **semidiurnal tide** has on the average two high waters (high tides) of nearly equal height and two low waters (low tides) of nearly equal height each tidal day (approximately 24.84 hours). A **mixed tide** is the same as the semidiurnal except that there is a significant difference between the heights of the two high waters and/or between the heights of the two low waters each tidal day. A **diurnal tide** has one high water and one low water each tidal day.

Prior to November 28, 1980, the following definitions were applicable: **Mean Low Water** was the arithmetic mean of the low water heights observed over a specific 19-year cycle (the National Tidal Datum Epoch). For a semidiurnal or a predominantly mixed tide, the two low waters of each tidal day were included in the mean. For a predominantly diurnal tide, the one low water of each tidal day was used in the mean. **Mean Lower Low Water** was the arithmetic mean of the lower low water (or only low water) heights of each tidal day of a predominantly mixed tide observed over a specific 19-year cycle. **Gulf Coast Low Water Datum** was Mean Low Water when the tide was classified diurnal and Mean Lower Water when the tide was classified mixed.

Chart Datum is the tidal datum for depths on NOS charts. It is Mean Low Water for the Atlantic coast of the United States, including the West Indies, and Mean Lower Low Water for the Pacific coast, including the Hawaiian Islands and Alaska. Through November 27, 1980, it was Gulf Coast Low Water Datum for the Gulf coast including the Florida Keys.

Effective November 28, 1980, the tidal datum for soundings and isobaths on all Gulf coast (including

the Florida Keys) nautical charts became Mean Lower Low Water, defined as the average of the lower (or only low water) height of each tidal day observed over the National Tidal Datum Epoch (presently, the 19-year period, 1960 through 1978). Beginning in January 1983, datum statements (legends, labels, etc.) will be changed on all affected products (nautical charts, bathymetric maps, tide tables, etc.) of NOS with the next regularly scheduled editions of these products. Shoreline, depth sounding values, etc., will not be modified as a result of this change. As such, for navigational safety purposes, there will be a period of several years when the terms "Gulf Coast Low Water Datum" and "Mean Lower Low Water" are identical and interchangeable on NOS nautical charts and publications of the Gulf of Mexico coast.

Accuracy of a nautical chart.–The value of a nautical chart depends upon the accuracy of the surveys on which it is based. The chart reflects what was found by field surveys and what has been reported to NOS Headquarters. The chart represents general conditions at the time of surveys or reports and does not necessarily portray present conditions. Significant changes may have taken place since the date of the last survey or report.

Each sounding represents an actual measure of depth and location at the time the survey was made, and each bottom characteristic represents a sampling of the surface layer of the sea bottom at the time of sampling. Areas where sand and mud prevail, especially the entrances and approaches to bays and rivers exposed to strong tidal current and heavy seas, are subject to continual change.

In coral regions and where rocks and boulders abound, it is always possible that surveys may have failed to find every obstruction. Thus, when navigating such waters, customary routes and channels should be followed and areas avoided where irregular and sudden changes in depth indicate conditions associated with pinnacle rocks, coral heads, or boulders.

Information charted as "reported" should be treated with caution in navigating the area, because the actual conditions have not been verified by government surveys.

The **date of a chart** is of vital importance to the navigator. When charted information becomes obsolete, further use of the chart for navigation may be dangerous. Announcements of new editions of nautical charts are usually published in notices to mariners. A quarterly list of the latest editions is distributed to sales agents; free copies may be obtained from the sales agents or by writing to Distribution Branch (N/CG33), National Ocean Service. (See appendix for address.)

U.S. Nautical Chart Numbering System.–This chart numbering system, adopted by the National Ocean Service and the Defense Mapping Agency Hydrographic/Topographic Center, provides for a uniform method of identifying charts published by both agencies. For charts published by NOS, a cross reference list (Nautical Chart Number Conversion Table) of new and old chart numbers can be obtained, without charge, from any of its sales agents or from Distribution Branch (N/CG33), National Ocean Service. (See appendix for address.) **The Coast Pilot reflects only the new chart numbers.** Use the new numbers when ordering charts. Nautical charts published by the Defense Mapping Agency Hydrographic/Topographic Center are identified in the Coast Pilot by an asterisk preceding the chart number.

Corrections to charts.–It is essential for navigators to keep charts corrected through information published in the notices to mariners, especially since the NOS no longer hand-corrects charts prior to distribution.

Caution in using small-scale charts.–Dangers to navigation cannot be shown with the same amount of detail on small-scale charts as on those of larger scale. Therefore, the largest scale chart of an area should always be used.

The **scales of nautical charts** range from 1:2,500 to about 1:5,000,000. Graphic scales are generally shown on charts with scales of 1:80,000 or larger, and numerical scales are given on smaller scale charts. NOS charts are classified according to scale as follows:

Sailing charts, scales 1:600,000 and smaller, are for use in fixing the mariner's position as he approaches the coast from the open ocean, or for sailing between distant coastwise ports. On such charts the shoreline and topography are generalized and only offshore soundings, and the principal lights, outer buoys, and landmarks visible at considerable distances are shown.

General charts, scales 1:150,000 to 1:600,000, are for coastwise navigation outside of outlying reefs and shoals.

Coast charts, scales 1:50,000 to 1:150,000 are for inshore navigation leading to bays and harbors of considerable width and for navigating large inland waterways.

Harbor charts, scales larger than 1:50,000, are for harbors, anchorage areas, and the smaller waterways.

Special charts, various scales, cover the Intracoastal waterways and miscellaneous small-craft areas.

Blue tint in water areas.–A blue tint is shown in water areas on many charts to accentuate shoals and other areas considered dangerous for navigation when using that particular chart. Since the danger curve varies with the intended purpose of a chart a careful inspection should be made to determine the contour depth of the blue tint areas.

Caution on bridge and cable clearances.–For bascule bridges whose spans do not open to a full vertical position, unlimited overhead clearance is not available for the entire charted horizontal clearance when the bridge is open, due to the inclination of the drawspans over the channel.

The charted clearances of overhead cables are for the lowest wires at normal high water unless otherwise stated. **Vessels with masts, stacks, booms, or**

antennas should allow sufficient clearance under power cables to avoid arcing.

Submarine cables and pipelines cross many waterways used by both large and small vessels, but all of them may not be charted. For inshore areas, they usually are buried beneath the seabed, but, for offshore areas, they may lie on the ocean floor. Warning signs are often posted to warn mariners of their existence.

The installation of submarine cables or pipelines in U.S. waters or the continental shelf of the United States is under the jurisdiction of one or more Federal agencies, depending on the nature of the installation. They are shown on the charts when the necessary information is reported to NOS and they have been recommended for charting by the cognizant agency. The chart symbols for submarine cable and pipeline areas are usually shown for inshore areas, whereas, chart symbols for submarine cable and pipeline routes may be shown for offshore areas. Submarine cables and pipelines are not described in the Coast Pilots.

In view of the serious consequences resulting from damage to submarine cables and pipelines, vessel operators should take special care when anchoring, fishing, or engaging in underwater operations near areas where these cables or pipelines may exist or have been reported to exist.

Certain cables carry high voltage, while many pipelines carry natural gas under high pressure or petroleum products. Electrocution, fire, or explosion with injury, loss of life, or a serious pollution incident could occur if they are broached.

Vessels fouling a submarine cable or pipeline should attempt to clear without undue strain. Anchors or gear that cannot be cleared should be slipped, but no attempt should be made to cut a cable or pipeline.

Artificial obstructions to navigation.–Disposal areas are designated by the Corps of Engineers for depositing dredged material where existing depths indicate that the intent is not to cause sufficient shoaling to create a danger to surface navigation. The areas are charted without blue tint, and soundings and depth curves are retained.

Dump Sites are areas established by Federal regulation (40 CFR 220–229) in which dumping of dredged and fill material and other nonbuoyant objects is allowed with the issuance of a permit. Dumping of dredged and fill material is supervised by the Corps of Engineers and all other dumping by the Environmental Protection Agency (EPA). (See Corps of Engineers and Environmental Protection Agency, this chapter, and appendix for office addresses.)

Dumping Grounds are also areas that were established by Federal regulation (33 CFR 205). However, these regulations have been revoked and the use of the areas discontinued. These areas will continue to be shown on nautical charts until such time as they are no longer considered to be a danger to navigation.

Dump Sites and Dumping Grounds are rarely mentioned in the Coast Pilot, but are shown on nautical charts. **Mariners are advised to exercise extreme caution in and in the vicinity of all dumping areas.**

Spoil areas are for the purpose of depositing dredged material, usually near and parallel to dredged channels; they are usually a hazard to navigation. Spoil areas are usually charted from survey drawings from Corps of Engineers after-dredging surveys, though they may originate from private or other Government agency surveys. Spoil areas are tinted blue on the chart and labeled, and all soundings and depth curves are omitted. Navigators of even the smallest craft should avoid crossing spoil areas.

Fish havens are established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by dumping assorted junk ranging from old trolley cars and barges to scrap building material in areas which may be of very small extent or may stretch a considerable distance along a depth curve; old automobile bodies are a commonly used material. The Corps of Engineers must issue a permit, specifying the location and depth over the reef, before such a reef may be built. However, the reefbuilders' adherence to permit specifications can be checked only with a wire drag. Fish havens are outlined and labeled on the charts and show the minimum authorized depth when known. Fish havens are tinted blue if they have a minimum authorized depth of 11 fathoms or less or if the minimum authorized depth is unknown and they are in depths greater than 11 fathoms but still considered a danger to navigation. Navigators should be cautious about passing over fish havens or anchoring in their vicinity.

Fishtrap areas are areas established by the Corps of Engineers, or State or local authority, in which traps may be built and maintained according to established regulations. The areas and regulations are in 33 CFR 206. (They are not carried in this Pilot.) The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fishtrap areas and a cautionary note are usually charted. Navigators should avoid these areas.

Local magnetic disturbances.–If measured values of magnetic variation differ from the expected (charted) values by several degrees, a magnetic disturbance note will be printed on the chart. The note will indicate the location and magnitude of the disturbance, but the indicated magnitude should not be considered as the largest possible value that may be encountered. Large disturbances are more frequently detected in the shallow waters near land masses than on the deep sea. Generally, the effect of a local magnetic disturbance diminishes rapidly with distance, but in some locations there are multiple sources of disturbances and the effects may be distributed for many miles.

Compass roses on charts.–Each compass rose shows the date, magnetic variation, and the annual change in variation. Prior to the new edition of a

nautical chart, the compass roses are reviewed. Corrections for annual change and other revisions may be made as a result of newer and more accurate information. On some general and sailing charts, the magnetic variation is shown by isogonic lines in addition to the compass roses.

The **Mercator projection** used on most nautical charts has straight-line meridians and parallels that intersect at right angles. On any particular chart the distances between meridians are equal throughout, but distances between parallels increase progressively from the Equator toward the poles, so that a straight line between any two points is a rhumb line. This unique property of the Mercator projection is one of the main reasons why it is preferred by the mariner.

Echo soundings.–Ship's echo sounders may indicate small variations from charted soundings; this may be due to the fact that various corrections (instrument corrections, settlement and squat, draft, and velocity corrections) are made to echo soundings in surveying which are not normally made in ordinary navigation, or to observational errors in reading the echo sounder. Instrument errors vary between different equipment and must be determined by calibration aboard ship. Most types of echo sounders are factory calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated velocity by as much as 5 percent, depending upon the temperature and salinity of the waters in which the vessel is operating; the highest velocities are found in warm, highly saline water, and the lowest in icy freshwater. Velocity corrections for these variations are determined and applied to echo soundings during hydrographic surveys. All echo soundings must be corrected for the vessel's draft, unless the draft correction has been set on the echo sounder.

Observational errors include misinterpreting false echos from schools of fish, seaweed, etc., but the most serious error which commonly occurs is where the depth is greater than the scale range of the instrument; a 400–fathom scale indicates 15 fathoms when the depth is 415 fathoms. Caution in navigation should be exercised when wide variations from charted depths are observed.

AIDS TO NAVIGATION

Reporting of defects in aids to navigation.–Promptly notify the nearest Coast Guard District Commander if an aid to navigation is observed to be missing, sunk, capsized, out of position, damaged, extinguished, or showing improper characteristics.

Radio messages should be prefixed "Coast Guard" and transmitted directly to any U.S. Government shore radio station for relay to the Coast Guard District Commander. If the radio call sign of the nearest U.S. Government radio shore station is not known, radiotelegraph communication may be established by the use of the general call "NCG" on the frequency of 500 kHz. Merchant ships may send messages relating to defects noted in aids to navigation through commercial facilities only when they are unable to contact a U.S. Government shore radio station. Charges for these messages will be accepted "collect" by the Coast Guard.

Lights.–The range of visibility of lights as given in the Light Lists and as shown on the charts is the **Nominal range**, which is the maximum distance at which a light may be seen in clear weather (meteorological visibility of 10 nautical miles) expressed in nautical miles. The Light Lists give the Nominal ranges for all Coast Guard lighted aids except range and directional lights. **Luminous range** is the maximum distance at which a light may be seen under the existing visibility conditions. By use of the diagram in the Light Lists, Luminous range may be determined from the known Nominal range, and the existing visibility conditions. Both the Nominal and Luminous ranges do not take into account elevation, observer's height of eye, or the curvature of the earth. **Geographic range** is a function of only the curvature of the earth and is determined solely from the heights above sea level of the light and the observer's eye; therefore, to determine the actual Geographic range for a height of eye, the Geographic range must be corrected by a distance corresponding to the height difference, the distance correction being determined from a table of "distances of visibility for various heights above sea level." (See Light List or Coast Pilot table following appendix.) The maximum distances at which lights can be seen may at times be increased by abnormal atmospheric refraction and may be greatly decreased by unfavorable weather conditions, such as fog, rain, haze, or smoke. All except the most powerful lights are easily obscured by such conditions. In some conditions of the atmosphere white lights may have a reddish hue. During weather conditions which tend to reduce visibility, colored lights are more quickly lost to sight than are white lights. Navigational lights should be used with caution because of the following conditions that may exist:

A light may be extinguished and the fact not reported to the Coast Guard for correction, or a light may be located in an isolated area where it will take time to correct.

In regions where ice conditions prevail the lantern panes of unattended lights may become covered with ice or snow, which will greatly reduce the visibility and may also cause colored lights to appear white.

Brilliant shore lights used for advertising and other purposes, particularly those in densely populated areas, make it difficult to identify a navigational light.

At short distances flashing lights may show a faint continuous light between flashes.

The distance of an observer from a light cannot be estimated by its apparent intensity. The characteristics of lights in an area should always be checked in order that powerful lights visible in the distance will not be mistaken for nearby lights showing similar

characteristics at low intensity such as those on lighted buoys.

The apparent characteristic of a complex light may change with the distance of the observer, due to color and intensity variations among the different lights of the group. The characteristic as charted and shown in the Light List may not be recognized until nearer the light.

Motion of a vessel in a heavy sea may cause a light to alternately appear and disappear, and thus give a false characteristic.

Where lights have different colored sectors, be guided by the correct bearing of the light; do not rely on being able to accurately observe the point at which the color changes. On either side of the line of demarcation of colored sectors there is always a small arc of uncertain color.

On some bearings from the light, the range of visibility of the light may be reduced by obstructions. In such cases, the obstructed arc might differ with height of eye and distance. When a light is cut off by adjoining land and the arc of visibility is given, the bearing on which the light disappears may vary with the distance of the vessel from which observed and with the height of eye. When the light is cut off by a sloping hill or point of land, the light may be seen over a wider arc by a ship far off than by one close to.

Arcs of circles drawn on charts around a light are not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation of visibility or obscuration of the light occurs.

Lights of equal candlepower but of different colors may be seen at different distances. This fact should be considered not only in predicting the distance at which a light can be seen, but also in identifying it.

Lights should not be passed close aboard, because in many cases riprap mounds are maintained to protect the structure against ice damage and scouring action.

Many prominent towers, tanks, smokestacks, buildings, and other similar structures, charted as landmarks, display flashing and/or fixed red aircraft obstruction lights. Lights shown from landmarks are charted only when they have distinctive characteristics to enable the mariner to positively identify the location of the charted structure.

Articulated lights.–An articulated light is a vertical pipe structure supported by a submerged buoyancy chamber and attached by a universal coupling to a weighted sinker on the seafloor. The light, allowed to move about by the universal coupling, is not as precise as a fixed aid. However, it has a much smaller watch circle than a conventional buoy, because the buoyancy chamber tends to force the pipe back to a vertical position when it heels over under the effects of wind, wave, or current.

Bridge lights and clearance gages.–The Coast Guard regulates marine obstruction lights and clearance gages on bridges across navigable waters. Where installed, clearance gages are generally vertical numerical scales, reading from top to bottom, and show the actual vertical clearance between the existing water level and the lowest point of the bridge over the channel; the gages are normally on the right-hand pier or abutment of the bridge, on both the upstream and downstream sides.

Bridge lights are fixed red or green, and are privately maintained; they are generally not charted or described in the text of the Coast Pilots. All bridge piers (and their protective fenders) and abutments which are in or adjacent to a navigation channel are marked on all channel sides by red lights. On each channel span of a fixed bridge, there is a range of two green lights marking the center of the channel and a red light marking both edges of the channel, except that when the margins of the channel are confined by bridge piers, the red lights on the span are omitted, since the pier lights then mark the channel edges; for multiplespan fixed bridges, the main-channel span may also be marked by three white lights in a vertical line above the green range lights.

On all types of drawbridges, one or more red lights are shown from the drawspan (higher than the pier lights) when the span is closed; when the span is open, the higher red lights are obscured and one or two green lights are shown from the drawspan, higher than the pier lights. The number and location of the red and green lights depend upon the type of drawbridge.

Bridges and their lighting, construction, maintenance, and operation are set forth in 33 CFR 114-118. Aircraft obstruction lights, prescribed by the Federal Aviation Administration, may operate at certain bridges. Drawbridge operation regulations are published in chapter 2 of the Coast Pilots.

Fog signals.–Caution should be exercised in the use of sound fog signals for navigation purposes. They should be considered solely as warning devices.

Sound travels through the air in a variable manner, even without the effects of wind, therefore, the hearing of fog signals cannot be implicitly relied upon.

Experience indicates that distances must not be judged only by the intensity of the sound; that occasionally there may be areas close to a fog signal in which it is not heard; and that fog may exist not far from a station, yet not be seen from it, so the signal may not be operating. It is not always possible to start a fog signal immediately when fog is observed.

Avoidance of collision with lightships, ocean station vessels, offshore light stations, and large navigational buoys (LNB).–Courses should invariably be set to pass these aids with sufficient clearance to avoid the possibility of collision from any cause. Errors of observation, current and wind effects, other vessels in the vicinity, and defects in steering gear may be and have been the cause of actual collisions, or imminent danger thereof, needlessly jeopardizing the safety of these facilities and their crews, and of

all navigation dependent on these important aids to navigation.

Experience shows that lightships and offshore light stations cannot be safely used as leading marks to be passed close aboard, but should always be left broad off the course, whenever sea room permits. When approaching lightships, ocean station vessels, fixed offshore light structures, and large navigational buoys (LNB) on radio bearings, the risk of collision will be avoided by ensuring that radio bearing does not remain constant.

It should be borne in mind that most lightships and large buoys are anchored to a very long scope of chain and, as a result, the radius of their swinging circle is considerable. The charted position is the location of the anchor. Furthermore under certain conditions of wind and current, they are subject to sudden and unexpected sheers which are certain to hazard a vessel attempting to pass close aboard.

During extremely heavy weather and due to their exposed locations, lightships may be carried off station without the knowledge and despite the best efforts of their crews. The mariner should, therefore, not implicitly rely on a lightship maintaining its precisely charted position during and immediately following severe storms. A lightship known to be off station will secure her light, fog signal, and radiobeacon and fly the International Code signal "LO" signifying "I am not in my correct position".

Watch (station) buoys are sometimes moored near lightships and seacoast buoys to mark the approximate station should these important aids be carried away or temporarily removed. The lightship watch buoy also gives the crew an indication of dragging.

Since these uncharted buoys are always unlighted and, in some cases, moored as much as a mile from the lightship or seacoast buoy, the danger of a closely passing vessel colliding with them is always present–particularly so during darkness or periods of reduced visibility.

Buoys.–The aids to navigation depicted on charts comprise a system consisting of fixed and floating aids with varying degrees of reliability. Therefore, prudent mariners will not rely solely on any single aid to navigation, particularly a floating aid.

The approximate position of a buoy is represented by the dot or circle associated with the buoy symbol. The approximate position is used because of practical limitations in positioning and maintaining buoys and their sinkers in precise geographical locations. These limitations include, but are not limited to, inherent imprecisions in position fixing methods, prevailing atmospheric and sea conditions, the slope of and the material making up the seabed, the fact that buoys are moored to sinkers by varying lengths of chain, and the fact that buoy body and/or sinker positions are not under continuous surveillance, but are normally checked only during periodic maintenance visits which often occur more than a year apart. The position of the buoy body can be expected to shift inside and outside of the charting symbol due to the forces of nature. The mariner is also cautioned that buoys are liable to be carried away, shifted, capsized, sunk, etc. Lighted buoys may be extinguished or sound signals may not function as a result of ice, running ice or other natural causes, collisions, or other accidents.

For the foregoing reasons, a prudent mariner must not rely completely upon the charted position or operation of floating aids to navigation, but will also utilize bearings from fixed objects and aids to navigation on shore. Further, a vessel attempting to pass close aboard always risks collision with a yawing buoy or with the obstruction the buoy marks.

Buoys may not always properly mark shoals or other obstructions due to shifting of the shoals or of the buoys. Buoys marking wrecks or other obstructions are usually placed on the seaward or channelward side and not directly over a wreck. Since buoys may be located some distance from a wreck they are intended to mark, and since sunken wrecks are not always static, extreme caution should be exercised when operating in the vicinty of such buoys.

Caution, channel markers.–Lights, daybeacons, and buoys along dredged channels do not always mark the bottom edges. Due to local conditions, aids may be located inside or outside the channel limits shown by dashed lines on a chart. The Light List tabulates the offset distances for these aids in many instances.

Aids may be moved, discontinued, or replaced by other types to facilitate dredging operations. Mariners should exercise caution when navigating areas where dredges with auxiliary equipment are working.

Temporary changes in aids are not included on the charts.

Radiobeacons.–A map showing the locations and operating details of marine radiobeacons is given in each Light List. There is included in these publications the procedure to follow for the use of radiobeacons for calibration of radio direction-finders as well as a list of special radio direction-finder calibration stations.

A vessel steering a course for a radiobeacon should observe the same precautions as when steering for a light or any other mark. If the radiobeacon is aboard a lightship, particular care should be exercised to avoid the possibility of collision, and sole reliance should never be placed on sighting the lightship or hearing its fog signal. If there are no dependable means by which the vessel's position may be fixed and the course changed well before reaching the lightship, a course should be selected that will ensure passing the lightship at a distance, rather than close aboard, and repeated bearings of the radiobeacon should show an increasing change in the same direction.

Radio bearings.–No exact data can be given as to the accuracy to be expected in radio bearings taken by a ship, since the accuracy depends to a large extent upon the skill of the ship's operator, the condition of the ship's equipment, and the accuracy of the ship's calibration curve. Mariners are urged to

obtain this information for themselves by taking frequent radio bearings, when their ship's position is accurately known, and recording the results.

Radio bearings obtained at twilight or at night, and bearings which are almost parallel to the coast, should be accepted with reservations, due to "night effect" and to the distortion of radio waves which travel overland. Bearings of aircraft ranges and standard broadcast stations should be used with particular caution due to coastal refraction and lack of calibration of their frequencies.

Conversion of radio bearings to Mercator bearings.–Radio directional bearings are the bearings of the great circles passing through the radio stations and the ship, and, unless in the plane of the Equator or a meridian, would be represented on a Mercator chart as curved lines. Obviously it is impracticable for a navigator to plot such lines on a Mercator chart, so it is necessary to apply a correction to a radio bearing to convert it into a Mercator bearing, that is, the bearing of a straight line on a Mercator chart laid off from the sending station and passing through the receiving station.

A table of corrections for the conversion of a radio bearing into a Mercator bearing follows the appendix. It is sufficiently accurate for practical purposes for distances up to 1,000 miles.

The only data required are the latitudes and longitudes of the radiobeacons and of the ship by dead reckoning. The latter is scaled from the chart, and the former is either scaled from the chart or taken from the Light List.

The table is entered with the differences of longitude in degrees between the ship and station (the nearest tabulated value being used), and opposite the middle latitude between the ship and station, the correction to be applied is read.

The sign of the correction (bearings read clockwise from N) will be as follows: In N latitude, the minus sign is used when the ship is E of the radiobeacon and the plus sign used when the ship is W of the radiobeacon. In S latitude, the plus sign is used when the ship is E of the radiobeacon, and the minus sign is used when the ship is W of the radiobeacon.

To facilitate plotting, 180 degrees should be added to or subtracted from the corrected bearing, and the result plotted from the radiobeacon.

Should the position by dead reckoning differ greatly from the true position of the ship as determined by plotting the corrected bearings, retrial should be made, using the new value as the position of the ship.

Radio bearings from other vessels.–Any vessel with a radio direction-finder can take a bearing on a vessel equipped with a radio transmitter. These bearings, however, should be used only as a check, as comparatively large errors may be introduced by local conditions surrounding the radio direction-finder unless known and accounted for. Although any radio station, for which an accurate position is definitely known, may serve as a radiobeacon for vessels equipped with a radio direction-finder, extreme caution must be exercised in their use. Stations established especially for maritime services are more reliable.

Radar transponder beacons (Racons) are low-powered radio transceivers that operate in the marine radar X-band frequencies. When activated by a vessel's radar signal, Racons provide a distinctive visible display on the vessel's radarscope from which the range and bearing to the beacon may be determined. (See Light List and DMAHTC Pub. 117A for details.)

Loran.–A list of stations and descriptive details of the Loran System are given in the Light Lists. Instructions, tables, and charts of the Loran System are published by the Defense Mapping Agency Hydrographic/Topographic Center. NOS shows loran lines on sailing, general, and coastal charts of the U.S. coasts.

Exact data cannot be given as to the accuracy to be expected in loran positions since the accuracy depends to a large extent on the skill of the operator, the condition and type of receiving equipment, and the area of operation. The accuracy of a loran fix is determined by the accuracy of the individual lines of positions used to establish the fix and by their angle of intersection.

Loran position determinations on or near the baseline extensions are subject to significant geometric errors and, therefore, should be avoided whenever possible. Loran is a long-range aid to navigation and should not normally be used in pilot waters. The use of skywaves is not recommended within 250 miles of either station.

Caution must be used in matching loran signals to ensure that the groundwave signal of the master station is not unknowingly matched with a skywave signal of a secondary station, or vice versa; or that a one-hop skywave signal from one station is not matched with a two-hop skywave signal from the other.

Omega.–Omega is a continuous radionavigation system which provides hyperbolic lines of position through phase comparisons of very low frequency (10-14 kHz range) continuous wave signals transmitted on a common frequency on a time shared basis. With eight transmitting stations located throughout the world, Omega provides worldwide, all-weather navigation coverage. Six stations make Omega available in nearly all parts of the globe, with the two other stations providing redundancy and coverage during off-air time for maintenance.

Users are cautioned that the Omega system is in an implementation stage. System changes and station off-air periods are promulgated by Notice to Mariners and radio navigational warning messages. Current information on the status of individual Omega transmitting stations is broadcast on station WWV, 16 minutes after the hour, and on station WWVH, 47 minutes after the hour. Current status reports are available by telephone (202-245-0298).

At the present time the worldwide accuracy and reliability of this system cannot be precisely determined. Therefore positioning information derived

from Omega should not be totally relied upon without reference to other positioning methods.

Uniform State Waterway Marking System.–Many bodies of water used by boatmen are located entirely within the boundaries of a State. The Uniform State Waterway Marking System (USWMS) has been developed to indicate to the small-boat operator hazards, obstructions, restricted or controlled areas, and to provide directions. Although intended primarily for waters within the State boundaries, USWMS is suited for use in all water areas, since it supplements and is generally compatible with the Coast Guard lateral system of aids to navigation. The Coast Guard is gradually using more aids bearing the USWMS geometric shapes described below.

Two categories of waterway markers are used. Regulatory markers, buoys, and signs use distinctive standard shape marks to show regulatory information. The signs are white with black letters and have a wide orange border. They signify speed zones, restricted areas, danger areas, and directions to various places. Aids to navigation on State waters use red and black buoys to mark channel limits. Red and black buoys are generally used in pairs. The boat should pass between the red buoy and its companion black buoy. If the buoys are not placed in pairs, the distinctive color of the buoy indicates the direction of dangerous water from the buoy. White buoys with red tops should be passed to the S or W, indicating that danger lies to the N or E of the buoy. White buoys with black tops should be passed to the N or E, indicating that danger lies to the S or W. Vertical red and white striped buoys indicate a boat should not pass between the buoy and the nearest shore. Danger lies inshore of the buoy.

DESTRUCTIVE WAVES.–Unusual sudden changes in water level can be caused by tsunamis or violent storms. These two types of destructive waves have become commonly known as **tidal waves,** a name which is technically incorrect as they are not the result of tide-producing forces.

Tsunamis (seismic sea waves) are setup by submarine earthquakes. Many such seismic disturbances do not produce sea waves and often those produced are small, but the occasional large waves can be very damaging to shore installations and dangerous to ships in harbors.

These waves travel great distances and can cause tremendous damage on coasts far from their source. The wave of April 1, 1946, which originated in the Aleutian Trench, demolished nearby Scotch Cap Lighthouse and caused damages of $25 million in the Hawaiian Islands 2,000 miles away. The wave of May 22-23, 1960, which originated off southern Chile, caused widespread death and destruction in islands and countries throughout the Pacific.

The speed of tsunamis varies with the depth of the water, reaching 300 to 500 knots in the deep water of the open ocean. In the open sea they cannot be detected from a ship or from the air because their length is so great, sometimes a hundred miles, as compared to their height, which is usually only a few feet. Only on certain types of shelving coasts do they build up into waves of disastrous proportions.

There is usually a series of waves with crests 10 to 40 minutes apart, and the highest may occur several hours after the first wave. Sometimes the first noticeable part of the wave is the trough which causes a recession of the water from shore, and people who have gone out to investigate this unusual exposure of the beach have been engulfed by the oncoming crest. Such an unexplained withdrawal of the sea should be considered as nature's warning of an approaching wave.

Improvements have been made in the quick determination and reporting of earthquake epicenters, but no method has yet been perfected for determining whether a sea wave will result from a given earthquake. The Pacific Tsunami Warning Center, Oahu, Hawaii, of the National Oceanic and Atmospheric Administration is headquarters of a warning system which has field reporting stations (seismic and tidal) in most countries around the Pacific. When a warning is broadcast, waterfront areas should be vacated for higher ground, and ships in the vicinity of land should head for the deep water of the open sea.

Storm surge.–A considerable rise or fall in the level of the sea along a particular coast may result from strong winds and sharp change in barometric pressure. In cases where the water level is raised, higher waves can form with greater depth and the combination can be destructive to low regions, particularly at high stages of tide. Extreme low levels can result in depths which are considerably less than those shown on nautical charts. This type of wave occurs especially in coastal regions bordering on shallow waters which are subject to tropical storms.

Seiche is a stationary vertical wave oscillation with a period varying from a few minutes to an hour or more, but somewhat less than the tidal periods. It is usually attributed to external forces such as strong winds, changes in barometric pressure, swells, or tsunamis disturbing the equilibrium of the water surface. Seiche is found both in enclosed bodies of water and superimposed upon the tides of the open ocean. When the external forces cause a short-period horizontal oscillation of the water, it is called **surge.**

The combined effect of seiche and surge sometimes makes it difficult to maintain a ship in its position alongside a pier even though the water may appear to be completely undisturbed, and heavy mooring lines have been parted repeatedly under such conditions. Pilots advise taut lines to reduce the effect of the surge.

SPECIAL SIGNALS FOR CERTAIN VESSELS

Special signals for surveying vessels.–National Ocean Service vessels while engaged in hydrographic surveying are required by Navigation Rules International-Inland, Rule 27, to exhibit:

(b)(i) three all-round lights in a vertical line

where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white;

(ii) three shapes in a vertical line where they can best be seen. The highest and lowest of these shapes shall be balls and the middle one a diamond;

(iii) when making way through the water, masthead lights, sidelights and a sternlight, in addition to the lights prescribed in subparagraph (b)(i); and

(iv) when at anchor, in addition to the lights or shapes prescribed in subparagraphs (b)(i) and (ii) the light, lights or shapes prescribed in Rule 30, Anchored Vessels and Vessels Aground.

The color of the above shapes is black.

The **wire drags** used by the NOS in sweeping for dangers to navigation may be crossed by vessels without danger of fouling at any point except between the towing launches and the large buoys near them, where the towline approaches the surface of the water. Vessels passing over the drag are requested to change course so as to cross it approximately at right angles, as a diagonal course may cause the propeller to foul the supporting buoys and attached wires. No attempt should be made to pass between the drag launches while the wire is being set out or taken in, unless it would endanger a vessel to do otherwise, because the bottom wire is slack and the floats at each 100-foot section may lift it nearly to the surface; at this time the launches usually are headed directly toward or away from each other and the operation may be clearly seen.

Warnings signals for Coast Guard vessels while handling or servicing aids to navigation are the same as those prescribed for surveying vessels. (See Special signals for surveying vessels, this chapter.)

Minesweeper signals.-U.S. vessels engaged in minesweeping operations or exercises are hampered to a considerable extent in their maneuvering powers. With a view to indicating the nature of the work on which they are engaged, these vessels will show the signals hereinafter mentioned. For the public safety, all other vessels, whether steamers or sailing craft, must endeavor to keep out of the way of vessels displaying these signals and not approach them inside the distances mentioned herein, especially remembering that it is dangerous to pass between the vessels of a pair or group sweeping together.

All vessels towing sweeps are to show: **By day,** a black ball at or near the foremast head and a black ball at each end of the fore yard. **By night,** all around green lights instead of the black balls, and in a similar manner.

Vessels or formations showing these signals are not be approached nearer than 1,640 feet (500 meters) on either beam and vessels are not to cross astern closer than 3,280 feet (1,000 meters). Under no circumstances is a vessel to pass through a formation of minesweepers. Minesweepers should be prepared to warn merchant vessels which persist in approaching too close by means of any of the appropriate signals from the International Code of Signals. In fog, mist, falling snow, heavy rainstorms, or any other condition similarily restricting visibility, whether by day or night, minesweepers while towing sweeps when in the vicinity of other vessels will sound whistle signals for a vessel towing (one prolonged blast followed by two short blasts).

The United States is increasingly using helicopters to conduct minesweeping operations and exercises. When so engaged, helicopters, like vessels, are considerably hampered in their ability to maneuver. Helicopters may function at night as well as during the day and in varying types of weather. Accordingly, surface vessels approaching helicopters engaged in minesweeping operations should take precautions similar to those described above with regard to minesweeping vessels.

Helicopters towing minesweeping gear, and surface escorts, if any, will use all practical means to warn approaching ships of the operations being conducted. Where practical, measures will be taken to mark or light the gear being towed. While towing, the helicopter's altitude varies from 49.2 to 311.6 feet (15 to 95 meters) above the water, and speeds vary from 0 to 30 knots.

Minesweeping helicopters are equipped with a rotating beacon which has a selectable red and amber mode. The amber mode is used during towing operations to notify and warn other vessels that the helicopter is towing.

Submarine emergency identification signals.-U.S. submarines are equipped with signal ejectors which may be used to launch identification signals, including emergency signals. Two general types of signals may be used: smoke floats and flares or stars. The smoke floats, which burn on the surface, produce a dense colored smoke for a period of 15 to 45 seconds. The flares or stars are propelled to a height of 300 to 400 feet from which they descend by small parachute. The flares or stars burn for about 25 seconds. The color of the smoke or flare/star has the following meaning:

Green or black is used under training exercise conditions only to indicate that a torpedo has been fired or that the firing of a torpedo has been simulated.

Yellow indicates the submarine is about to rise to periscope depth. Surface craft terminate antisubmarine counterattack and clear vicinity of submarine. Do not stop propellers.

Red indicates an emergency inside the submarine; she will try to surface immediately. Surface ships clear the area and stand by to assist. In case of repeated red signals, or if the submarine fails to surface in a reasonable time, she may be presumed disabled. Buoy the location, look for submarine buoy, and attempt to establish sonar communications. Advise U.S. Navy authorities immediately.

Submarine marker buoys consist of two spheres 3 feet in diameter with connecting structure, painted international orange. The buoy has a wire cable to the submarine, to act as a downhaul line for a rescue chamber. The buoy may be accompanied by an oil slick release to attract attention. A submarine on the bottom in distress may release this buoy. If sighted,

such a buoy should be investigated and reported immediately to U.S. Navy authorities.

The submarine may transmit the International Distress Signal (SOS) on its sonar gear independently or in conjunction to the red signal. Submarines also may use these other means of attracting attention: release of dye markers or air bubble; ejection of oil; pounding on hull.

Vessels Constrained by their Draft.–International Navigation Rules, Rule 28, states that a vessel constrained by her draft may, in addition to the lights prescribed for power-driven vessels in Rule 23, exhibit where they can best be seen three all-round red lights in a vertical line, or a cylinder.

NAVIGATION RESTRICTIONS AND REQUIREMENTS

Traffic Separation Schemes (Traffic Lanes).–To increase the safety of navigation, particularly in converging areas of high traffic density, routes incorporating traffic separation have, with the approval of the International Maritime Organization (IMO), formerly the Inter-Governmental Maritime Consultative Organization (IMCO), been established in certain areas of the world. In the interest of safe navigation, it is recommended that through traffic use these schemes, as far as circumstances permit, by day and by night and in all weather conditions.

General principles for navigation in Traffic Separation Schemes are as follows:

1. A ship navigating in or near a traffic separation scheme adopted by IMO shall in particular comply with Rule 10 of the 72 COLREGS to minimize the development of risk of collision with another ship. The other rules of the 72 COLREGS apply in all respects, and particularly the steering and sailing rules if risk of collision with another ship is deemed to exist.

2. Traffic separation schemes are intended for use by day and by night in all weather, in ice-free waters or under light ice conditions where no extraordinary maneuvers or assistance by icebreaker(s) are required.

3. Traffic separation schemes are recommended for use by all ships unless stated otherwise. Bearing in mind the need for adequate underkeel clearance, a decision to use a traffic separation scheme must take into account the charted depth, the possibility of changes in the seabed since the time of last survey, and the effects of meteorological and tidal conditions on water depths.

4. A deepwater route is an allied routing measure primarily intended for use by ships which require the use of such a route because of their draft in relation to the available depth of water in the area concerned. Through traffic to which the above consideration does not apply should, if practicable, avoid following deepwater routes. When using a deepwater route mariners should be aware of possible changes in the indicated depth of water due to meteorological or other effects.

5. Users of traffic separation schemes adopted by IMO will be guided by Rule 10 of the 1972 International Regulations for Preventing Collisions at Sea (72 COLREGS) as follows:

(a) This Rule applies to traffic separation schemes adopted by the Organization.

(b) A vessel using a traffic separation scheme shall:

(i) proceed in the appropriate traffic lane in the general direction of traffic flow for that lane;

(ii) so far as practicable keep clear of a traffic separation line or separation zone;

(iii) normally join or leave a traffic separation lane at the termination of the lane, but when joining or leaving from either side shall do so at as small an angle to the general direction of traffic flow as practicable.

(c) A vessel shall so far as practicable avoid crossing traffic lanes, but if obliged to do so, shall cross as nearly as practicable at right angles to the general direction of traffic flow.

(d) Inshore traffic zones shall not normally be used by through traffic which can safely use the appropriate traffic lane within the adjacent traffic separation scheme. However, vessels of less than 20 meters in length and sailing vessels may under all circumstances use inshore traffic zones.

(e) A vessel, other than a crossing vessel, or a vessel joining or leaving a lane shall not normally enter a separation zone or cross a separation line except:

(i) in cases of emergency to avoid immediate danger;

(ii) to engage in fishing within a separation zone.

(f) A vessel navigating in areas near the terminations of traffic separation schemes shall do so with particular caution.

(g) A vessel shall so far as practicable avoid anchoring in a traffic separation scheme or in areas near its terminations.

(h) A vessel not using a traffic separation scheme shall avoid it by as wide a margin as is practicable.

(i) A vessel engaged in fishing shall not impede the passage of any vessel following a traffic lane.

(j) A vessel of less than 20 meters in length or a sailing vessel shall not impede the safe passage of a power-driven vessel following a traffic lane.

(k) A vessel restricted in her ability to maneuver when engaged in an operation for the maintenance of safety of navigation in a traffic separation scheme is exempted from complying with Rule 10 to the extent necessary to carry out the operation.

(l) A vessel restricted in her ability to maneuver when engaged in an operation for laying, servicing or picking up of a submarine cable, within a traffic separation scheme, is exempted from complying with this Rule to the extent necessary to carry out the operation.

6. The arrows printed on charts merely indicate the general direction of traffic; ships need not set their courses strictly along the arrows.

7. The signal "YG" meaning "You appear not to be complying with the traffic separation scheme" is

provided in the International Code of Signals for appropriate use.

When approved or established, traffic separation scheme details are announced in Notice to Mariners, and later depicted on appropriate charts and included in Coast Pilots and Sailing Directions. Traffic Separation Schemes may also be covered by Federal regulations. (See 33 CFR 167, chapter 2.)

Oil Pollution.–The Oil Pollution Act, 1961, as amended, provides for **prohibited zones** throughout the world within which the discharge of oil or any oily mixture is unlawful. The prohibited zones for the United States, Puerto Rico, the U.S. Virgin Islands, and adjacent foreign territory include sea areas within 50 miles from the nearest land and the following sea areas extending more than 50 miles from the nearest land: North-West Atlantic Zone, comprising the sea areas within a line drawn from 38°47′N., 73°43′W., to 39°58′N., 68°34′W., thence to 42°05′N., 64°37′W., thence along the E coast of Canada at a distance of 100 miles from the nearest land. Canadian Western Zone (Pacific Ocean), extending for a distance of 100 miles from the nearest land along the W coast of Canada.

The law applies (with the exceptions stated below) to any seagoing vessel of any type whatsoever of American registry or nationality, including floating craft towed by another vessel making a sea voyage; this includes a **"tanker"**, defined as a type of ship in which the greater part of the cargo space is constructed or adapted for the carriage of liquid cargoes in bulk and which is not, for the time being, carrying a cargo other than oil in that part of its cargo space. The excepted categories of vessels are: tankers of under 150 gross tons, and other ships of under 500 gross tons; ships for the time being engaged in the whaling industry when actually employed on whaling operations; ships for the time being navigating the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of St. Lambert Lock at Montreal in the Province of Quebec, Canada; naval ships and ships for the time being used as naval auxiliaries.

Foreign vessels to which the International Convention for the Prevention of the Pollution of the Sea by Oil (1954, as amended) applies, while in the territorial waters of the United States, may be boarded, examined, and required to produce records as provided in Section 11 of the Oil Pollution Act of 1961, as amended. (For a complete discussion of the Oil Pollution Regulations, see 33 CFR 151.)

The Federal Water Pollution Control Act, as amended, prohibits the discharge of a harmful quantity of oil or a hazardous substance into or upon the United States navigable waters or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States including resources under the Fishery Conservation and Management Act of 1976. Discharges that do occur must be reported to the Coast Guard (National Response Center) by the most rapid available means. To assist in swift reporting of spills, a nationwide, 24-hour, toll-free telephone number has been established (1-800-424-8802). If the spiller or any other industry organization, or State or local government, does not clean up the spill, the Federal Government may. The spiller will be liable for the cleanup costs. A harmful discharge of oil has been defined as one which causes a film or sheen upon or discoloration of the surface of the water, violates applicable State water quality standards, or causes a sludge or emulsion to be deposited beneath the surface of the water. (For regulations pertaining to this Act, see 33 CFR 153.)

Other requirements for the protection of navigable waters.–U.S. laws prohibit discharge from any vessel or shore establishment of any refuse matter, other than that flowing from streets and sewers in a liquid state, into any navigable water. It is not lawful to tie up or anchor vessels or to float lografts in navigable channels in such manner as to obstruct normal navigation. When a vessel or raft is wrecked and sunk in a navigable channel it is the duty of the owner to immediately mark it with a buoy or beacon during the day and a light at night until the sunken craft is removed or abandoned.

Obligation of deck officers.–Licensed deck officers are required to acquaint themselves with the latest information published in Notice to Mariners regarding aids to navigation.

Improper use of searchlights prohibited.–No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel underway. The International Code Signal "PG2" may be made by a vessel inconvenienced by the glare of a searchlight in order to apprise the offending vessel of the fact.

Unnecessary whistling prohibited.–The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States.

Use of Radar.–Navigation Rules, International-Inland, Rule 7, states, in part that every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist. Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

This rule places an additional responsibility on vessels which are equipped and manned to use radar to do so while underway during periods of reduced visibility without in any way relieving commanding officers of the responsibility of carrying out normal precautionary measures.

Navigation Rules, International-Inland, Rules 6, 7, 8, and 19 apply to the use of radar.

Danger signal.–Navigation Rules, International-Inland, Rule 34(d), states that when vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the

intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

Narrow channels.–Navigation Rules, International-Inland, Rule 9(b) states: A vessel of less then 65.6 feet (20 meters) in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway.

Control of shipping in time of emergency or war.–In time of war or national emergency, merchant vessels of the United States and those foreign flag vessels, which are considered under effective U.S. control, will be subject to control by agencies of the United States Government. The allocation and employment of such vessels, and of domestic port facilities, equipment, and services will be performed by appropriate agencies of the War Transport Administration. The movement, routing, and diversion of merchant ships at sea will be controlled by appropriate naval commanders. The movement of merchant ships within domestic ports and dispersal anchorages will be coordinated by the U.S. Coast Guard. The commencement of naval control will be signalled by a general emergency message. (See DMAHTC Pub. 117A or 117B for emergency procedures and communication instructions.)

U.S. Fishery Conservation Zone.–The United States exercises exclusive fishery management authority over all species of fish, except tuna, within the fishery conservation zone, whose seaward boundary is 200 miles from the baseline from which the U.S. territorial sea is measured; all anadromous species which spawn in the United States throughout their migratory range beyond the fishery conservation zone, except within a foreign country's equivalent fishery zone as recognized by the United States; all U.S. Continental Shelf Fishery resources beyond the fishery conservation zone. Such resources include American lobster and species of coral, crab, abalone, conch, clam, and sponge, among others.

No foreign vessel may fish, aid, or assist vessels at sea in the performance of any activity relating to fishing including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing, within the fishery conservation zone, or fish for anadromous species of the United States or Continental Shelf Fishery resources without a permit issued in accordance with U.S. law. These permits may only be issued to vessels from countries recognizing the exclusive fishery management authority of the United States in an international agreement. The owners or operators of foreign vessels desiring to engage in fishing off U.S. coastal waters should ascertain their eligibility from their own flag state authorities. Failure to obtain a permit prior to fishing, or failure to comply with the conditions and restrictions established in the permit may subject both vessel and its owners or operators to administrative, civil, and criminal penalties. (Further details concerning foreign fishing are given in 33 CFR 611.)

Reports of foreign fishing activity within the fishery conservation zone should be made to the U.S. Coast Guard. Immediate reports are particularly desired, but later reports by any means also have value. Reports should include the activity observed, the position, and as much identifying information (name, number, homeport, type, flag, color, size, shape, etc.) about the foreign vessel as possible, and the reporting party's name and address or telephone number.

Bridge-to-Bridge Radiotelephone Communication.–Voice radio bridge-to-bridge communication between vessels is an effective aid in the prevention of collisions where there is restricted maneuvering room and/or visibility. VHF-FM radio is used for this purpose, due to its essentially line-of-sight characteristic and relative freedom from static. As VHF-FM has increasingly come into use for short-range communications in U.S. harbors and other high-traffic waters, so has the number of ships equipped with this gear increased.

The Vessel Bridge-to-Bridge Radiotelephone Regulations, effective January 1, 1973, require vessels subject to the Act while navigating to be equipped with at least one single channel transceiver capable of transmitting and receiving on VHF-FM channel 13 (156.65 MHz), the Bridge-to-Bridge Radiotelephone frequency. Vessels with multichannel equipment are required to have an additional receiver so as to be able to guard VHF-FM channel 13 (156.65 MHz),the Bridge-to-Bridge Radiotelephone frequency, in addition to VHF-FM channel 16 (156.80 MHz), the National Distress, Safety and Calling frequency required by Federal Communications Commission regulations. (See 26.01 through 26.10, chapter 2, for Vessel Bridge-to-Bridge Radiotelephone Regulations.)

In the southern Louisiana section of the Mississippi River system, due to interference and operational problems, VHF-FM channel 13 (156.650 MHz) has been replaced by channel 67 (156.375 MHz), and channel 13 may be used only to facilitate transition to and from these areas.

Channel 67 is available for navigational communication only in the Mississippi River from South Pass Lighted Bell Buoy 2 and Southwest Pass Entrance Lighted Whistle Buoy SW to mile 242.4 AHP (above Head of Passes) near Baton Rouge; and, in addition, over the full length of the Mississippi River-Gulf Outlet Canal from its entrance to the junction with the Inner Harbor Navigation Canal (Industrial Canal), and over the full length of the Inner Harbor Navigation Canal from its junction with the Mississippi River to its entry to Lake Pontchartrain.

Channel 67 is no longer available for intership commercial communication in the New Orleans

Vessel Traffic Service radio protection area. (See Pilotage, Mississippi River, chapter 8.)

Mariners are reminded that the use of bridge-to-bridge voice communications in no way alters the obligation to comply with the provisions of the Navigation Rules, International-Inland.

2. NAVIGATION REGULATIONS

This chapter contains the sections of **Code of Federal Regulations, Title 33, Navigation and Navigable Waters (33 CFR),** that are of most importance in the areas covered by Coast Pilot 5. The sections are from Part 26, Vessel Bridge-to-Bridge Radiotelephone Regulations; Part 80, COLREGS Demarcation Lines; Part 110, Anchorage Regulations; Part 117, Drawbridge Operation Regulations; Part 150, Operations, Deepwater Ports (in part); Part 160, Ports and Waterways Safety-General; Part 161, Vessel Traffic Management; Part 162, Inland Waterways Navigation Regulations; Part 164, Navigation Safety Regulations (in part); Part 165, Regulated Navigation Areas and Limited Access Areas; Part 204, Danger Zone Regulations; Part 207, Navigation Regulations; and Part 209, Administrative Procedure.

Note.–These regulations can only be amended by the enforcing agency or other authority cited in the regulations. Accordingly, requests for changes to these regulations should be directed to the appropriate agency for action. In those regulations where the enforcing agency is not cited or is unclear, recommendations for changes should be directed to the the following Federal agencies for action: U.S. Coast Guard (33 CFR 26, 80, 110, 117, 150, 160, 161, 162, 164, and 165); U.S. Army Corps of Engineers (33 CFR 204, 207, and 209).

Part 26–Vessel Bridge-to-Bridge Radiotelephone Regulations

§26.01 Purpose.

(a) The purpose of this part is to implement the provisions of the Vessel Bridge-to-Bridge Radiotelephone Act. This part–

(1) Requires the use of the vessel bridge-to-bridge radiotelephone;

(2) Provides the Coast Guard's interpretation of the meaning of important terms in the Act;

(3) Prescribes the procedures for applying for an exemption from the Act and the regulations issued under the Act and a listing of exemptions.

(b) Nothing in this part relieves any person from the obligation of complying with the rules of the road and the applicable pilot rules.

§26.02 Definitions.

For the purpose of this part and interpreting the Act–

"Secretary" means the Secretary of the Department in which the Coast Guard is operating;

"Act" means the "Vessel Bridge-to-Bridge Radiotelephone Act", 33 U.S.C. sections 1201-1208;

"Length" is measured from end to end over the deck excluding sheer;

"Power-driven vessel" means any vessel propelled by machinery; and

"Towing vessel" means any commercial vessel engaged in towing another vessel astern, alongside, or by pushing ahead.

§26.03 Radiotelephone required.

(a) Unless an exemption is granted under §26.09 and except as provided in paragraph (a)(4) of this section, section 4 of the Act provides that–

(1) Every power-driven vessel of 300 gross tons and upward while navigating;

(2) Every vessel of 100 gross tons and upward carrying one or more passengers for hire while navigating;

(3) Every towing vessel of 26 feet or over in length while navigating; and

(4) Every dredge and floating plant engaged in or near a channel or fairway in operations likely to restrict or affect navigation of other vessels: Provided, That an unmanned or intermittently manned floating plant under the control of a dredge need not be required to have separate radiotelephone capability;

Shall have a radiotelephone capable of operation from its navigational bridge, or in the case of a dredge, from its main control station, and capable of transmitting and receiving on the frequency or frequencies within the 156-162 Mega-Hertz band using the classes of emissions designated by the Federal Communications Commission, after consultation with other cognizant agencies, for the exchange of navigational information.

(b) The radiotelephone required by paragraph (a) of this section shall be carried on board the described vessels, dredges, and floating plants upon the navigable waters of the United States inside the lines established pursuant to section 2 of the Act of February 19, 1895 (28 Stat. 672), as amended.

§26.04 Use of the designated frequency.

(a) No person may use the frequency designated by the Federal Communications Commission under section 8 of the Act, 33 U.S.C. section 1207 (a), to transmit any information other than information necessary for the safe navigation of vessels or necessary tests.

(b) Each person who is required to maintain a listening watch under section 5 of the Act shall, when necessary, transmit and confirm, on the designated frequency, the intentions of his vessel and any other information necessary for the safe navigation of vessels.

(c) Nothing in these regulations may be construed as prohibiting the use of the designated frequency to communicate with shore stations to obtain or furnish information necessary for the safe navigation of vessels.

Note.–The Federal Communications Commission (FCC) has designated the frequency 156.65 MHz (Channel 13) for the use of bridge-to-bridge stations in most of the United States. However, FCC rules

designate the frequency 156.375 MHz (Channel 67) to be used instead of Channel 13 in the following areas, except to facilitate transition from these areas: The Mississippi River from South Pass Lighted Bell Buoy "2" and Southwest Pass Entrance (midchannel) Lighted Whistle Buoy SW to mile 242.4 AHP (Above Head of Passes) near Baton Rouge; and, in addition, over the full length of the Mississippi River-Gulf Outlet Canal from entrance to its junction with the Inner Harbor Navigation Canal, and over the full length of the Inner Harbor Navigation Canal from its junction with the Mississippi River to its entry to Lake Pontchartrain at the New Seabrook vehicular bridge.

§26.05 Use of radiotelephone.

Section 5 of the Act States–

(a) The radiotelephone required by this Act is for the exclusive use of the master or person in charge of the vessel, or the person designated by the master or person in charge of the vessel, or the person designated by the master or person in charge to pilot or direct the movement of the vessel, who shall maintain a listening watch on the designated frequency. Nothing contained herein shall be interpreted as precluding the use of portable radiotelephone equipment to satisfy the requirements of this Act.

§26.06 Maintenance of radiotelephone; failure of radiotelephone.

Section 6 of the Act states–

(a) Whenever radiotelephone capability is required by this Act, a vessel's radiotelephone equipment shall be maintained in effective operating condition. If the radiotelephone equipment carried aboard a vessel ceases to operate, the master shall exercise due diligence to restore it or cause it to be restored to effective operating condition at the earliest practicable time. The failure of a vessel's radiotelephone equipment shall not, in itself, constitute a violation of this Act, nor shall it obligate the master of any vessel to moor or anchor his vessel; however, the loss of radiotelephone capability shall be given consideration in the navigation of the vessel.

§26.07 English language.

No person may use the services of, and no person may serve as a person required to maintain a listening watch under section 5 of the Act, 33 U.S.C. section 1204 unless he can speak the English language.

§26.08 Exemption procedures.

(a) Any person may petition for an exemption from any provision of the Act or this part;

(b) Each petition must be submitted in writing to U.S. Coast Guard (G-W), 2100 Second Street SW, Washington, D.C. 20593, and must state–

(1) The provisions of the Act or this part from which an exemption is requested; and

(2) The reasons why marine navigation will not be adversely affected if the exemption is granted and if the exemption relates to a local communication system how that system would fully comply with the intent of the concept of the Act but would not conform in detail if the exemption is granted.

§26.09 List of exemptions.

(a) All vessels navigating on those waters governed by the navigation rules for Great Lakes and their connecting and tributary waters (33 U.S.C. 241 et seq.) are exempt from the requirements of the Vessel Bridge-to-Bridge Radiotelephone Act and this part until May 6, 1975.

(b) Each vessel navigating on the Great Lakes as defined in the Inland Navigational Rules Act of 1980 (33 U.S.C. 2001 et seq.) and to which the Vessel Bridge-to-Bridge Radiotelephone Act (33 U.S.C. 1201–1208) applies is exempt from the requirements in 33 U.S.C. 1203, 1204, and 1205 and the regulations under §§26.03, 26.04, 26.05, 26.06, and 26.07. Each of these vessels and each person to whom 33 U.S.C. 1208(a) applies must comply with Articles VII, X, XI, XII, XIII, XV, and XVI and Technical Regulations 1–7 of "The Agreement Between the United States of America and Canada for Promotion of Safety on the Great Lakes by Means of Radio, 1973."

§26.10 Penalties.

Section 9 of the Act states–

(a) Whoever, being the master or person in charge of a vessel subject to the Act, fails to enforce or comply with the Act or the regulations hereunder; or whoever, being designated by the master or person in charge of a vessel subject to the Act to pilot or direct the movement of a vessel fails to enforce or comply with the Act or the regulations hereunder–is liable to a civil penalty of not more than $500 to be assessed by the Secretary.

(b) Every vessel navigated in violation of the Act or the regulations hereunder is liable to a civil penalty of not more than $500 to be assessed by the Secretary, for which the vessel may be proceeded against in any District Court of the United States having jurisdiction.

(c) Any penalty assessed under this section may be remitted or mitigated by the Secretary, upon such terms as he may deem proper.

Part 80–COLREGS Demarcation Lines

§80.01 General basis and purpose of demarcation lines. (a) The regulations in this part establish the lines of demarcation delineating those waters upon which mariners shall comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners shall comply with the Inland Navigation Rules.

(b) The waters inside of the lines are Inland Rules waters. The waters outside the lines are COLREGS waters.

§80.738 Puerto Rico and Virgin Islands. (a) Except inside lines specifically described in this section, the 72 COLREGS shall apply on all other bays, harbors and lagoons of Puerto Rico and the U.S. Virgin Islands.

(b) A line drawn from Puerto San Juan Light to

Cabras Light across the entrance of San Juan Harbor.

§80.740 Long Key, Fla. to Cape Sable, Fla.

A line drawn from the radar dome charted on Long Key at approximate position latitude 24°49.3'N. longitude 80°49.2'W. to Long Key Light 1; thence to Arsenic Bank Light 1; thence to Arsenic Bank Light 2; thence to Sprigger Bank Light 5; thence to Schooner Bank Light 6; thence to Oxfoot Bank Light 10; thence to East Cape Light 2; thence through East Cape Daybeacon 1A to the shoreline at East Cape.

§80.745 Cape Sable, Fla. to Cape Romano, Fla. (a) A line drawn following the general trend of the mainland, highwater shoreline from Cape Sable at East Cape to Little Shark River Light 1; thence to westernmost extremity of Shark Point; thence following the general trend of the mainland, highwater shoreline crossing the entrances of Harney River, Broad Creek, Broad River, Rodgers River First Bay, Chatham River, Huston River, to the shoreline at coordinate latitude 25°41.8'N. longitude 18°17.9'W.

(b) The 72 COLREGS shall apply to the waters surrounding the Ten Thousand Islands and the bays, creeks, inlets, and rivers between Chatham Bend and Marco Island except inside lines specifically described in this part.

(c) A north-south line drawn at longitude 81°20.2'W. across the entrance to Lopez River.

(d) A line drawn across the entrance to Turner River parallel to the general trend of the shoreline.

(e) A line formed by the centerline of Highway 92 Bridge at Goodland.

§80.748 Cape Romano, Fla. to Sanibel Island, Fla. (a) A line drawn across Big Marco Pass parallel to the general trend of the seaward, highwater shoreline.

(b) A line drawn from the northwesternmost extremity of Coconut Island 000°T across Capri Pass.

(c) Lines drawn across Hurricane and Little Marco Passes parallel to the general trend of the seaward, highwater shoreline.

(d) A straight line drawn from Gordon Pass Light 4 through Daybeacon 5 to the shore.

(e) A line drawn across the seaward extremity of Doctors Pass Jetties.

(f) Lines drawn across Wiggins, Big Hickory, New, and Big Carlos Passes parallel to the general trend of the seaward highwater shoreline.

(g) A straight line drawn from Sanibel Island Light through Matanzas Pass Channel Light 2 to the shore of Estero Island.

§80.750 Sanibel Island, Fla. to St. Petersburg, Fla. (a) Lines drawn across Redfish and Captiva Passes parallel to the general trend of the seaward, highwater shorelines.

(b) A line drawn from La Costa Test Pile North Light to Port Boca Grande Light.

(c) Lines drawn across Gasparilla and Stump Passes parallel to the general trend of the seaward, highwater shorelines.

(d) A line across the seaward extremity of Venice Inlet Jetties.

(e) A line drawn across Midnight Pass parallel to the general trend of the seaward, highwater shoreline.

(f) A line drawn from Big Sarasota Pass Light 14 to the southernmost extremity of Lido Key.

(g) A line drawn across New Pass tangent to the seaward, highwater shoreline of Longboat Key.

(h) A line drawn across Longboat Pass parallel to the seaward, highwater shoreline.

(i) A line drawn from the northwesternmost extremity of Bean Point to the southeasternmost extremity of Egmont Key.

(j) A straight line drawn from Egmont Key Light through Egmont Channel Range Rear Light to the shoreline on Mullet Key.

(k) A line drawn from the northernmost extremity of Mullet Key across Bunces Pass and South Channel to Pass-a-Grille Light 8; thence to Pass-a-Grille Daybeacon 9; thence to the southwesternmost extremity of Long Key.

§80.753 St. Petersburg, Fla. to the Anclote, Fla. (a) A line drawn across Blind Pass parallel with the general trend of the seaward, highwater shoreline.

(b) Lines formed by the centerline of the highway bridges over Johns and Clearwater Passes.

(c) A line drawn across Dunedin and Hurricane Passes parallel with the general trend of the seaward, highwater shoreline.

(d) A line drawn from the northernmost extremity of Honeymoon Island to Anclote Anchorage South Entrance Light 7; thence to Anclote Keys Light; thence a straight line through Anclote River Cut B Range Rear Light to the shoreline.

§80.755 Anclote, Fla. to the Suncoast Keys, Fla. (a) Except inside lines specifically described in this section, the 72 COLREGS shall apply on the bays, bayous, creeks, marinas, and rivers from Anclote to the Suncoast Keys.

(b) A north-south line drawn at longitude 82°38.3'W. across the Chassahowitzka River Entrance.

§80.757 Suncoast Keys, Fla. to Horseshoe Point, Fla. (a) Except inside lines specifically described in this section, the 72 COLREGS shall apply on the bays, bayous, creeks, and marinas from the Suncoast Keys to Horseshoe Point.

(b) A line formed by the centerline of Highway 44 Bridge over the Salt River.

(c) A north-south line drawn through Crystal River Entrance Daybeacon 25 across the river entrance.

(d) A north-south line drawn through the Cross Florida Barge Canal Daybeacon 38 across the canal.

(e) A north-south line drawn through Withlacoochee River Daybeacon 40 across the river.

(f) A line drawn from the westernmost extremity of South Point north to the shoreline across the Waccasassa River Entrance.

(g) A line drawn from position latitude 29°16.6'N. longitude 83°06.7'W. 300° true to the shoreline of Hog Island.

(h) A north-south line drawn through Suwannee River West Pass Daybeacons 27 and 28 across the Suwannee River.

§80.760 Horsehoe Point, Fla. to Rock Islands, Fla. (a) Except inside lines specifically described provided in this section, the 72 COLREGS shall apply on the bays, bayous, creeks, marinas, and rivers from Horseshoe Point to the Rock Islands.

(b) A north-south line drawn through Steinhatchee River Light 21.

(c) A line drawn from Fenholloway River Approach Light FR east across the entrance to Fenholloway River.

§80.805 Rock Island, Fla. to Cape San Blas, Fla. (a) A south-north line drawn from the Econfina River Light to the opposite shore.

(b) A line drawn from Gamble Point Light to the southernmost extremity of Cabell Point.

(c) A line drawn from St. Marks (Range Rear) Light to St. Marks Channel Light 11; thence to the southernmost extremity of Live Oak Point; thence through Shell Point Light to the southernmost extremity of Ochlockonee Point; thence to Bald Point.

(d) A line drawn from the south shore of Southwest Cape at longitude 84°22.7'W. to Dog Island Reef East Light 1; thence to Turkey Point Light 2; thence to the easternmost extremity of Dog Island.

(e) A line drawn from the westernmost extremity of Dog Island to the easternmost extremity of St. George Island.

(f) A line drawn across the seaward extremity of the St. George Island Channel Jetties.

(g) A line drawn from the northwesternmost extremity of Sand Island to West Pass Light 7.

(h) A line drawn from the westernmost extremity of St. Vincent Island to the southeast, highwater shoreline of Indian Peninsula at longitude 85°13.5'W.

§80.810 Cape San Blas, Fla. to Perdido Bay, Fla. (a) A line drawn from St. Joseph Range A Rear Light through St. Joseph Range B Front Light to St. Joseph Point.

(b) A line drawn across the mouth of Salt Creek as an extension of the general trend of the shoreline.

(c) A line drawn from the northernmost extremity of Crooked Island 000 T. to the mainland.

(d) A line drawn from the easternmost extremity of Shell Island 120° true to the shoreline across the east entrance to St. Andrews Bay.

(e) A line drawn between the seaward end of the St. Andrews Bay Entrance Jetties.

(f) A line drawn between the seaward end of the Choctawhatchee Bay Entrance Jetties.

(g) A west-east line drawn from Fort McGee Leading Light across the Pensacola Bay Entrance.

(h) A line drawn between the seaward end of the Perdido Pass Jetties.

§80.815 Mobile Bay, Ala. to the Chandeleur Islands, La. (a) A line drawn across the inlets to Little Lagoon as an extension of the general trend of the shoreline.

(b) A line drawn from Mobile Point Light to Dauphin Island Spit Light to the eastern corner of Fort Gaines at Pelican Point.

(c) A line drawn from the westernmost extremity of Dauphin Island to the easternmost extremity of Petit Bois Island.

(d) A line drawn from Horn Island Pass Entrance Range Front Light on Petit Bois Island to the easternmost extremity of Horn Island.

(e) An east-west line (latitude 30°14.7'N.) drawn between the westernmost extremity of Horn Island to the easternmost extremity of Ship Island.

(f) A curved line drawn following the general trend of the seaward, highwater shoreline of Ship Island.

(g) A line drawn from Ship Island Light; thence to Chandeleur Light; thence in a curved line following the general trend of the seaward, highwater shorelines of the Chandeleur Islands to the island at coordinate latitude 29°31.1'N. longitude 89°05.7'W.; thence to Breton Island Light located at latitude 29°29.1'N. longitude 89°09.7'W.

§80.825 Mississippi Passes, La. (a) A line drawn from Breton Island Light to coordinate latitude 29°21.5'N. longitude 89°11.7'W.

(b) A line drawn from coordinate latitude 29°21.5'N. longitude 89°11.7'W. following the general trend of the seaward, highwater shoreline in a southeasterly direction to coordinate latitude 29°12.4'N. longitude 89°06.0'W.; thence following the general trend of the seaward, highwater shoreline in a northeasterly direction to coordinate latitude 29°13.0'N. longitude 89°01.3'W. located on the northwest bank of North Pass.

(c) A line drawn from coordinate latitude 29°13.0'N. longitude 89°01.3'W. to coordinate latitude 29°12.7'N. longitude 89°0.9'W.; thence coordinate latitude 29°10.6'N. longitude 88°59.8'W.; thence coordinate latitude 29°03.5'N. longitude 89°03.7'W.; thence Mississippi River South Pass East Jetty Light 4.

(d) A line drawn from Mississippi River South Pass East Jetty Light 4 to Mississippi River South Pass West Jetty Light; thence following the general trend of the seaward highwater shoreline in a northwesterly direction to coordinate latitude 29°03.4'N. longitude 89°13.0'W.; thence west to coordinate latitude 29°03.5'N. longitude 89°15.5'W., thence following the general trend of the seaward, highwater shoreline in a southwesterly direction to Mississippi River Southwest Pass Entrance Light.

(e) A line drawn from Mississippi River Southwest Pass Entrance Light; thence to the seaward extremity of the Southwest Pass West Jetty located at coordinate latitude 28°54.5'N. longitude 89°26.1'W.

§80.830 Mississippi Passes, La. to Point au Fer, La. (a) A line drawn from the seaward extremity of the Southwest Pass West Jetty located at coordinate latitude 28°54.5'N. longitude 89°26.1'W.; thence following the general trend of the seaward, highwater jetty and shoreline in a north, northeasterly direction to Old Tower latitude 28°58.8'N. longitude 89°23.3'W.; thence to West Bay Light; thence to

coordinate latitude 29°05.2′N. longitude 89°24.3′W.; thence a curved line following the general trend of the highwater shoreline to Point au Fer Island except as otherwise described in this section.

(b) A line drawn across the seaward extremity of the Empire Waterway (Bayou Fontanelle) entrance jetties.

(c) A line drawn from Barataria Bay Light to the Grand Isle Fishing Jetty Light.

(d) A line drawn between the seaward extremity of the Belle Pass Jetties.

(e) A line drawn from the westernmost extremity of the Timbalier Island to the easternmost extremity of Isles Dernieres.

(f) A south-north line drawn from Caillou Bay Light 13 across Caillou Boca.

(g) A line drawn 107° true from Caillou Bay Boat Landing Light across the entrances to Grand Bayou du Large and Bayou Grand Caillou.

(h) A line drawn on an axis of 103° true through Taylors Bayou Light across the entrances to Jack Stout Bayou, Taylors Bayou, Pelican Pass, and Bayou de West.

§80.835 Point au Fer, La. to Calcasieu Pass, La. (a) A line drawn from Point au Fer to Atchafalaya Channel Light 32; thence Point au Fer Reef Light; Atchafalaya Bay Pipeline Light D latitude 29°25.0′N. longitude 91°31.7′W.; thence Atchafalaya Bay Light 1 latitude 29°25.3′N. longitude 91°35.8′W. thence South Point.

(b) Lines following the general trend of the highwater shoreline drawn across the bayou canal inlet from the Gulf of Mexico between South Point and Calcasieu Pass except as otherwise described in this section.

(c) A line drawn on an axis of 130° T. through Vermilion Bay Light 2 across Southwest Pass.

(d) A line drawn across the seaward extremity of the Freshwater Bayou Canal Entrance Jetties.

(e) A line drawn from Mermentau River Channel Light 4 to Mermentau River Channel Light 5.

(f) A line drawn from the radio tower charted in approximate position latitude 29°45.7′N. longitude 93°06.3′W. 160° true across Mermentau Pass.

(g) A line drawn across the seaward extremity of the Calcasieu Pass Jetties.

§80.840 Sabine Pass, Tex. to Galveston, Tex. (a) A line drawn from the Sabine Pass East Jetty Light to the seaward end of the Sabine Pass West Jetty.

(b) Lines drawn across the small boat passes through the Sabine Pass East and West Jetties.

(c) A line formed by the centerline of the highway bridge over Rollover Pass at Gilchrist.

§80.845 Galveston, Tex. to Freeport, Tex. (a) A line drawn from Galveston North Jetty Light to Galveston South Jetty Light.

(b) A line formed by the centerline of the highway bridge over San Luis Pass.

(c) Lines formed by the centerlines of the highway bridges over the inlets to Christmas Bay (Cedar Cut) and Drum Bay.

(d) A line drawn from the seaward extremity of the Freeport North Jetty to Freeport Entrance Light 6; thence Freeport Entrance Light 7; thence the seaward extremity of Freeport South Jetty.

§80.850 Brazos River, Tex. to the Rio Grande, Tex. (a) Except as otherwise described in this section lines drawn continuing the general trend of the seaward, highwater shorelines across the inlets to Brazos River Diversion Channel, San Bernard River, Cedar Lakes, Brown Cedar Cut, Colorado River, Matagorda Bay, Cedar Bayou, Corpus Christi Bay, and Laguna Madre.

(b) A line drawn across the seaward extremity of Matagorda Ship Channel North Jetties.

(c) A line drawn from the seaward tangent of Matagorda Peninsula at Decros Point to Matagorda Daybeacon 2; thence to Matagorda Light.

(d) A line drawn across the seaward extremity of the Aransas Pass Jetties.

(e) A line drawn across the seaward extremity of the Port Mansfield Entrance Jetties.

(f) A line drawn across the seaward extremity of the Brazos Santiago Pass Jetties.

Part 110–Anchorage Regulations

§110.1 General. (a) The areas described in Subpart A of this part are designated as special anchorage areas pursuant to the authority contained in an act amending laws for preventing collisions of vessels approved April 22, 1940 (54 Stat. 150); Article 11 of section 1 of the act of June 7, 1897, as amended (30 Stat. 98; 33 U.S.C. 180), Rule 9 of section 1 of the act of February 8, 1895, as amended (28 Stat. 647; 33 U.S.C. 258), and Rule Numbered 13 of section 4233 of the Revised Statutes as amended (33 U.S.C. 322). Vessels not more than 65 feet in length, when at anchor in any special anchorage area, shall not be required to carry or exhibit the white anchor lights required by the Navigation Rules.

(b) The anchorage grounds for vessels described in Subpart B of this part are established, and the rules and regulations in relation thereto adopted, pursuant to the authority contained in section 7 of the act of March 4, 1915, as amended (38 Stat. 1053; 33 U.S.C. 471).

(c) All bearings in this part are referred to true meridian.

Subpart A–Special Anchorage Areas

§110.74 Marco Island, Marco River, Fla. Beginning at a point approximately 300 feet east of the Captains Landing Docks at latitude 25°58′04″N., longitude 81° 43′31″W.; thence 108°, 450 feet; thence 198°, 900 feet; thence 288°, 450 feet; thence 018°, 900 feet to the point of beginning.

NOTE: The area is principally for use by yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area.

§110.74a Manatee River, Bradenton, Fla. The waters of the Manatee River enclosed by a line beginning at latitude 27°31′18.6″N., longitude 82°36′49.2″W.; thence westerly to latitude 27°31′21″N., longitude 82°37′7.2″W.; thence northwesterly to latitude 27°31′22.2″N., longitude 82°37′8.4″W.; thence northeasterly to latitude 27°31′25.8″N., longitude 82°37′00″W.; thence easterly to latitude 27°31′24″N., longitude 82°36′44.4″W.; thence to the point of beginning.

§110.74b Apollo Beach, Fla. Beginning at a point approximately 300 feet south of the Tampa Sailing Squadron at latitude 27°46′50.2″N., longitude 82°25′27.8″W.; thence southeasterly to latitude 27°46′45.6″N., longitude 82°25′23.2″W.; thence southwesterly to latitude 27°46′35.8″N., longitude 82°25′34.8″W.; thence northwesterly to latitude 27°46′39.9″N., longitude 82°25′39.6″W.; thence to the point of beginning.

§110.75 Corpus Christi Bay, Tex. (a) South area. Southward of the southernmost T-head pier at the foot of Cooper Avenue and of a line bearing 156°44′, 340.6 feet, from the southerly corner of said pier to a point on the rubble breakwater; westward and northward of said breakwater; and eastward of the Corpus Christi sea wall.

Subpart B–Anchorage Grounds

§110.189a Key West Harbor, Key West, Fla.; naval explosives anchorage area (a) The anchorage ground. A circular area with its center at latitude 24°30′50.6″, longitude 81°50′31.6′ with a radius of 300 yards, for use for ammunition exceeding the prescribed limits for pierside handling.

(b) The regulations. (1) When occupied by a vessel handling explosives, no other vessel may enter the area unless authorized by the enforcing agency.

(2) Only one vessel handling explosives may anchor in the area at one time.

(3) No more than 300,000 pounds net of high explosives or equivalent may be handled in the area at any one time.

(4) The regulations in this section shall be enforced by the Commander, U.S. Naval Base, Key West, Fla., and any other agencies he may designate.

§110.190 Tortugas Harbor, in the vicinity of Garden Key, Dry Tortugas, Fla. (a) The anchorage grounds. All of Bird Key Harbor, southwest of Garden Key, bounded by the surrounding reefs and shoals and, on the northeast, by a line extending from Fort Jefferson West Channel Daybeacon 2 to Fort Jefferson West Channel Daybeacon 4, thence to Fort Jefferson West Channel Daybeacon 6, and thence to Fort Jefferson West Channel Daybeacon 8.

(b) The regulations. Except in cases of emergency involving danger to life or property, no vessel engaged in commercial fishing or shrimping shall anchor in any of the channels, harbors, or lagoons in the vicinity of Garden Key, Bush Key, or the surrounding shoals, outside of Bird Key Harbor.

§110.193 Tampa Bay, Fla. (a) The anchorage grounds–(1) Explosives anchorage east of Mullet Key. A rectangular area in Tampa Bay, approximately 4,459 yards long and 1,419 yards wide, beginning at latitude 27°38′30″, longitude 82°39′09″, and extending northeasterly to latitude 27°39′48″, longitude 82°37′15″; thence southeasterly to latitude 27°39′17″, longitude 82°36′46″; thence southwesterly to latitude 27°37′52″, longitude 82°38′38″; thence northwesterly to the point of beginning.

(2) Temporary explosives anchorage south of Interbay Peninsula. Beginning at a point bearing 107°, 1,750 yards from Cut F Range Front Light; thence to a point bearing 125°, 2,050 yards, from Cut F Range Front Light; thence to a point bearing 180°, 1,725 yards, from Cut F Range Front Light; thence to a point bearing 222°, 2,180 yards, from Cut F Range Front Light; thence to a point bearing 251°, 1,540 yards, from Cut F Range Front Light; and thence to the point of beginning.

(3) Temporary explosives anchorage off Port Tampa. A circular area with a radius of 200 yards with the point at latitude 27°50′22″, longitude 82°34′15″.

(4) Quarantine Anchorage. Southeast of the temporary explosive anchorage, beginning at a point bearing 97° true, 4,370 yards, from Cut "F" Range Front Light; thence to a point bearing 113°30′, 5,370 yards, from Cut "F" Range Front Light; thence to a point bearing 161°30′, 3,770 yards, from Cut "F" Range Front Light; thence to a point bearing 163°30′, 2,070 yards, from Cut "F" Range Front Light; thence to the point of beginning.

(5) Barge Fleeting Area, Hillsborough Bay. Located 400 feet west of Cut "D" Channel at a point beginning at latitude 27°54′34″, longitude 82°26′35″; thence northerly 1,000 feet to latitude 27°54′43″, longitude 82°26′40″; thence westerly 500 feet to latitude 27°54′41″, longitude 82°26′45″; thence southerly 1,000 feet to latitude 27°54′32″, longitude 82°26′40″; thence easterly 500 feet to the point of beginning.

NOTE: This area is reserved for transient barges only. Barges shall not occupy this anchorage for a period longer than 96 hours unless permission is obtained from the Captain of the Port for this purpose.

(b) The regulations. (1) The explosives anchorage east of Mullet Key shall be used by vessels awaiting loading or unloading at Port Tampa that have explosives actually on board and where the duration of anchorage will exceed 72 hours.

(2) The temporary explosives anchorages south of Interbay Peninsula and off Port Tampa shall be used for vessels engaged in loading explosives when the duration of the anchorage is less than 72 hours.

§110.193a St. Joseph Bay, Fla. (a) The anchorage grounds–(1) Explosives Anchorage Area 1. A rectangular area 3,000 yards long by 700 yards wide beginning at a point 1,350 yards west of U.S. Highway 98 Bridge over Gulf County Canal. The area is parallel to and 450 yards northeast of the north entrance channel to Port St. Joe, Florida.

(2) Explosives Anchorage Area 2. A circular area with a 500-yard radius around a center point located

at latitude 29°47′30″; longitude 85°21′30″, 3,100 yards southeast of FW South Channel Light and 5,250 yards south of FW North Channel Light, in St. Joseph Bay, Port St. Joe, Florida.

(b) The regulations. (1) The explosives anchorage areas shall be used as temporary anchorage for vessels engaged in loading and unloading explosives at the port of Port St. Joe, Florida, when the duration of the anchorage period is less than 96 hours.

(2) No vessel shall occupy this anchorage without obtaining a permit from the Captain of the Port.

§110.194 Mobile Bay, Ala., at entrance. (a) The anchorage grounds. The waters within a radius of 750 yards from a point located 1,000 yards true north from Fort Morgan Light.

(b) The regulations. (1) This anchorage shall be used by vessels loading or discharging high explosives. It shall also be used by vessels carrying dangerous or inflammable cargoes requiring an anchorage. It may be used for a general anchorage when not required for vessels carrying explosives or dangerous or inflammable cargoes.

(2) No vessel shall occupy this anchorage without obtaining a permit from the Captain of the Port.

§110.194a Mobile Bay, Ala., and Mississippi Sound, Miss.

(a) The anchorage grounds. (1) The waters of lower Mobile Bay, near Cedar Point, within an area bounded on the north by latitude 30°21′00″, on the east by longitude 88°05′00″, on the south by latitude 30°20′00″, and on the west by longitude 88°06′00″.

(2) The waters of Mississippi Sound, south of Biloxi, within an area bounded on the north by latitude 30°20′00″, on the east by longitude 88°54′00″, on the south by latitude 30°19′00″, and on the west by longitude 88°55′00″.

(b) The regulations. (1) The anchorages are exclusively for the use of unmanned barges, canal boats, scows, and other nondescript vessels. Such craft shall be so anchored that they will not at any time extend outside the limits of the anchorages.

(2) In emergencies or whenever maritime or commercial interests of the United States so require, the Captain of the Port is authorized to shift the position of any craft in the anchorages.

(3) Whenever in the opinion of the Captain of the Port, such action may be necessary, any or all craft in these anchorages may be required to be moored with two or more anchors.

(4) No vessel shall be navigated within the anchorages at a speed exceeding six knots.

§110.194b Mississippi Sound and Gulf of Mexico, near Petit Bois Island, Miss.

(a) The anchorage grounds–(1) Explosives Anchorage Area No. 1. A circular area with one-half mile radius with its center located at latitude 30°14′09″, longitude 88°29′13″, in the waters of Mississippi Sound north of the west end of Petit Bois Island.

(2) Explosives Anchorage Area No. 2. A circular area with a three-fourths mile radius with its center located at latitude 30°11′12″, longitude 88°30′07″, in the waters of Gulf of Mexico south of the west end of Petit Bois Island.

(b) The regulations. (1) The areas shall be used as temporary anchorages for vessels engaged in loading and unloading explosives at the Port of Pascagoula, Miss.

(2) No vessel shall occupy the areas without obtaining a permit from the Captain of the Port.

§110.195 Mississippi River below Baton Rouge, La., including South and Southwest Passes. (a) The Anchorage Grounds. Unless otherwise specified, all anchorage widths are measured from the average low water plane (ALWP).

(1) Pilottown Anchorage. An area 5.2 miles in length along the right descending bank of the river from mile 1.5 to mile 6.7 above Head of Passes, extending in width to 1,600 feet from the left descending bank of the river.

Caution: A wreck is located within the boundaries of this anchorage. Mariners are urged to use caution in this anchorage.

(2) Lower Venice Anchorage. An area 1.6 miles in length along the left descending bank of the river from mile 8.0 to mile 9.6 above Head of Passes with the west limit 1,200 feet from the ALWP of the right descending bank.

Caution: A pipeline crossing exists at mile 9.8 AHOP. Mariners are urged to use caution between mile 9.6 AHOP and mile 10.0 AHOP.

(3) Upper Venice Anchorage. An area 1.2 miles in length along the left descending bank of the river from mile 10.0 to mile 11.2 above Head of Passes with the west limit 1,200 feet from the ALWP of the right descending bank.

(4) Boothville Anchorage. An area 6.3 miles in length along the right descending bank of the river, 1,000 feet wide extending from mile 12.2 to mile 18.5 above Head of Passes.

(5) Ostrica Anchorage. An area 0.9 mile in length along the right descending bank of the river, 800 feet wide, extending from mile 23.5 to mile 24.4 above Head of Passes.

(6) Port Sulphur Anchorage. An area 2.2 miles in length along the left descending bank of the river, 800 feet wide, extending from mile 37.5 to mile 39.7 above Head of Passes.

(7) Magnolia Anchorage. An area 1.4 miles in length along the right descending bank of the river from mile 45.5 to mile 46.9 above Head of Passes. From mile 45.5 to mile 46.3 the area has a width of 1,100 feet. From mile 46.3 to mile 46.9 the area has a width of 600 feet as measured 500 feet riverward from the right descending bank.

(8) Davant Anchorage. An area 1 mile in length along the left descending bank of the river, 800 feet wide, extending from mile 53.5 to mile 54.5 above Head of Passes.

(9) Alliance Anchorage. An area 2.2 miles in length along the right descending bank of the river, 800 feet wide, extending from mile 63.6 to mile 65.8 above Head of Passes.

(10) Wills Point Anchorage. An area 1.1 miles in length along the left descending bank of the river,

800 feet wide, extending from mile 66.5 to mile 67.6 above Head of Passes.

(11) Cedar Grove Anchorage. An area 0.7 mile in length along the right descending bank of the river, 700 feet wide as measured 400 feet from the Low Water Reference Plane of the right descending bank extending from mile 69.9 to mile 70.6 above Head of Passes.

(12) Belle Chasse Anchorage. An area 2.1 miles in length along the right descending bank of the river, 1,000 feet wide, extending from mile 73.1 to mile 75.2 above Head of Passes.

(13) Lower 12 Mile Point Anchorage. An area 2.3 miles in length along the right descending bank of the river, 800 feet wide, extending from mile 78.5 to mile 80.8 above Head of Passes.

(14) Lower 9 Mile Point Anchorage. An area 2.3 miles in length along the right descending bank of the river, 800 feet wide, extending from mile 82.7 to mile 85.0 above Head of Passes.

Caution: A wreck is located within the boundaries of this anchorage. Mariners are urged to use caution in this anchorage.

(15) New Orleans General Anchorage. An area 1.6 miles in length along the right descending bank of the river extending from mile 89.3 to mile 90.9 above Head of Passes. From mile 89.3 to mile 90.5 above Head of Passes, the area has a width of 550 feet measured from the riverward edge of the Cutoff Revetment. The riverward edge of the Cutoff Revetment is 400 feet from the average low water plane. From mile 90.5 to mile 90.9 above Head of Passes, the area has width of 800 feet measured from the shore.

(16) Quarantine Anchorage. An area 0.7 mile in length along the right descending bank of the river, 800 feet wide, extending from mile 90.9 to mile 91.6 above Head of Passes.

Caution: A wreck is located within the boundaries of this anchorage. Mariners are urged to use caution in this anchorage.

(17) Kenner Bend Anchorage. An area 0.5 mile in length along the right descending bank of the river, 700 feet wide, extending from mile 115.1 to mile 115.6 above Head of Passes.

(18) Ama Anchorage. An area 1.5 miles in length along the left descending bank of the river, 700 feet wide, extending from mile 115.7 to mile 117.2 above Head of Passes.

(19) Bonnet Carre Anchorage. An area 1.5 miles in length along the left descending bank of the river, 600 feet wide, extending from mile 127.3 to mile 128.8 above Head of Passes. This area is located adjacent to the river end of the Bonnet Carre Spillway.

(20) La Place Anchorage. An area 0.3 mile in length along the left descending bank of the river, 600 feet wide, extending from mile 134.7 to mile 135.0 above Head of Passes.

(21) Reserve Anchorage. An area 0.5 mile in length along the right descending bank of the river, 800 feet wide, extending from mile 137.0 to mile 137.5 above Head of Passes.

(22) Lower Grand View Reach Anchorage. An area 0.6 mile in length along the left descending bank of the river, 700 feet wide, extending from mile 146.5 to mile 147.1 above Head of Passes.

(23) Upper Grand View Reach Anchorage. An area 1.1 miles in length along the left descending bank of the river, 700 feet wide, extending from mile 147.7 to mile 148.8 above Head of Passes.

(24) Lower Sunshine Anchorage. An area 0.9 mile in length along the left descending bank of the river, 800 feet wide, extending from mile 165.0 to mile 165.9 above Head of Passes.

(25) Upper Sunshine Anchorage. An area 0.7 mile in length along the left descending bank of the river, 800 feet wide, extending from mile 166.3 to mile 167.0 above Head of Passes.

(26) Baton Rouge General Anchorage. An area 1.5 miles in length along the right descending bank of the river, 1,400 feet wide, extending from mile 225.8 to mile 227.3 above Head of Passes.

Caution: There are two wrecks located within the boundaries of this anchorage. Mariners are urged to use caution in this anchorage.

(27) Lower Baton Rouge Anchorage. An area 0.5 mile in length near midchannel between mile 228.5 to mile 229.0 above Head of Passes with the west limit 1,100 feet off the right descending bank and having the width of 700 feet at both upper and lower limits.

(28) Middle Baton Rouge Anchorage. An area 0.2 mile in length near midchannel between mile 229.6 to mile 229.8 above Head of Passes with the west limit 1,100 feet off the right descending bank and having a width of 700 feet at both upper and lower limits.

(29) Upper Baton Rouge Anchorage. An area 0.4 mile in length near midchannel between mile 230.6 and mile 231.0 above Head of Passes with the west limit 1,100 feet off the right descending bank of the Mississippi River and having a width of 1,075 feet at its upper limit and 1,200 at its lower limit.

(b) Temporary Anchorages. (1) Temporary anchorages are nonpermanent anchorages established by the Commander, Eighth Coast Guard District to provide additional anchorage space. Establishment of temporary anchorages is based on recommendations by the Captain of the Port.

(2) Each vessel using temporary anchorages shall anchor as prescribed by the Captain of the Port.

(3) Establishment of each temporary anchorage and any requirement for the temporary anchorage will be published in the Local Notice to Mariners.

(4) Each person who has notice of any requirement prescribed for a temporary anchorage shall comply with that requirement.

(c) The Regulations. (1) Anchoring is prohibited outside of established anchorages except in cases of emergency. In an emergency, if it becomes necessary to anchor a vessel outside an established anchorage, the vessel shall be anchored so that it does not interfere with or endanger any facility or other vessel. The master or person in charge of the vessel shall notify the Captain of the Port of the

location of the emergency anchoring by the most expeditious means and shall move the vessel as soon as the emergency is over.

(2) In an emergency, if it becomes necessary to anchor a vessel in South Pass or Southwest Pass, the vessel shall be positioned as close to the left descending bank as possible.

(3) No vessel may be anchored unless it maintains a bridge watch, guards and answers Channel 16 FM (or the appropriate VTS New Orleans sector frequency), maintains an accurate position plot and can take appropriate action to ensure the safety of the vessel, structure, and other vessels.

(4) When anchoring individually, or in fleets, vessels shall be anchored with sufficient anchors, or secured with sufficient lines, to ensure their remaining in place and withstanding the actions of the winds, currents and the suction of passing vessels.

(5) No vessel may be anchored over revetted banks of the river or within any cable or pipeline area. The locations of revetted areas and cable and pipeline areas may be obtained from the District Engineer, Corps of Engineers, New Orleans, La.

(6) The intention to transfer any cargo while in an anchorage shall be reported to the Captain of the Port, giving particulars as to name of ships involved, quantity and type of cargo, and expected duration of the operation. The Captain of the Port shall be notified upon completion of operations. Cargo transfer operations are not permitted in the New Orleans General or Quarantine Anchorages. Bunkering and similar operations related to ship's stores are exempt from reporting requirements.

Note.–Activities conducted within a designated anchorage (e.g. cargo transfer, tank cleaning, stack blowing, etc.) may be restricted by other Federal, State or local regulations. Owners, or persons in charge of any vessel should consider all safety and/or environmental regulations prior to engaging in any activity within designated anchorages.

(7) Nothing in this section relieves the owner or person in charge of any vessel from the penalties for obstructing or interfering with navigation or navigational aids or for failing to comply with the navigation laws for lights, day shapes, or fog signals and any other applicable laws and regulations.

(8) Vessels carrying cargoes of particular hazard as defined in 33 CFR 126.10 or cargoes of petroleum products in bulk may not be anchored in the New Orleans General Anchorage (a)(12) or Quarantine Anchorage (a)(13) without permission from the Captain of the Port.

(9) Except when required by the United States Public Health Service for quarantine inspection, the Quarantine Anchorage, (a)(13), may be used as a general anchorage.

(10) When the Bonnet Carre Spillway is open, no vessel may be anchored in the Bonnet Carre Anchorage (a)(16).

§110.196 Sabine Pass Channel, Sabine Pass, Tex. (a) The anchorage area. The navigable waters of Sabine Pass within a trapezoidal area 1,500 feet wide and varying uniformly in length from 5,800 feet to 3,000 feet with the long side adjacent to the northeasterly edge of Sabine Pass Channel at a location opposite the town of Sabine Pass.

(b) The regulations. (1) The anchorage area is for the temporary use of vessels of all types, but especially for naval and merchant vessels awaiting weather and tidal conditions favorable to the resumption of their voyages.

(2) Except when stress of weather or adverse tides or currents make sailing impractical or hazardous, vessels shall not anchor in the anchorage area for periods exceeding 48 hours unless expressly authorized by the Captain of the Port to anchor for longer periods.

(3) Vessels shall not anchor so as to obstruct the passage of other vessels proceeding to or from available anchorage spaces.

(4) Anchors shall not be placed channelward from the anchorage area, and no portion of the hull or rigging of any anchored vessel shall extend channelward from the limits of the anchorage area.

(5) Vessels using spuds for anchors shall anchor as close to shore as practicable having due regard for the provisions in paragraph (b)(3) of this section.

(6) Fixed moorings, piles or stakes, and floats or buoys for marking anchorages or moorings in place are prohibited.

(7) Whenever the maritime or commercial interests of the United States so require, the Captain of the Port is hereby empowered to shift the position of any vessel anchored or moored within or outside of the anchorage area including any vessel which is moored or anchored so as to obstruct navigation or interfere with range lights.

§110.197 Galveston Harbor, Bolivar Roads Channel, Tex. (a) The anchorage area. The area in Bolivar Roads bounded by the north channel edge extending west from Buoy "10", latitude 29°20′48.5″, longitude 94°42′52.5″; thence to Buoy "12", latitude 29°20′43″, longituded 94°44′46.5″; thence 029° to Buoy "B", latitude 29°21′15″, longitude 94°44′27″; thence 096° to Buoy "A", latitude 29°21′05.3″, longitude 94°42′51.4″; thence 183°30′ to the point of beginning.

(b) The regulations. (1) The anchorage area is for the temporary use of vessels of all types, but especially for naval and merchant vessels awaiting weather and other conditions favorable to the resumption of their voyages.

(2) Except when stress of weather makes sailing impractical or hazardous, vessels shall not anchor in the anchorage area for periods exceeding 48 hours unless expressly authorized by the Captain of the Port to anchor for such longer periods.

(3) Vessels shall not anchor so as to obstruct the passage of other vessels proceeding to or from available anchorage spaces.

(4) Anchors shall not be placed in the channel and no portion of the hull or rigging of any anchored vessel shall extend outside the limits of the anchorage area.

(5) Vessels using spuds for anchors shall anchor

as close to shore as practicable, having due regard for the provisions in paragraph (b)(3) of this section.

(6) Fixed moorings, piles or stakes, and floats or buoys for marking anchorages or moorings in place, are prohibited.

(7) Whenever the maritime or commercial interests of the United States so require, the Captain of the Port, or his authorized representative, is hereby empowered to shift the position of any vessel anchored or moored within the anchorage area.

§110.240 San Juan Harbor, P.R. (a) The anchorage grounds–(1) Yacht, schooner and small craft Anchorage D. That part of San Antonio Channel eastward of longitude 66°05′45″.

(2) Temporary Anchorage E (general). Beginning at a point which bears 262°T., 878 yards from Isla Grande Aero Beacon; thence along a line 75°47′, 498 yards; thence along a line 134°49′, 440 yards; thence along a line 224°49′ to the northerly channel limit of Graving Dock Channel, and thence to the point of beginning.

(3) Restricted Anchorage F. Beginning at a point which bears 212°30′, 1,337.5 yards from Isla Grande Light; thence along a line 269°00′, 550 yards; thence along a line 330°00′ to the westerly channel limit of Anegado Channel; and thence along the westerly channel limit of Anegado Channel to the point of beginning.

(b) The regulations. (1) The anchorage described in paragraph (a)(1) of this section shall be reserved for the anchorage of yachts, schooners, and small craft.

(2) Vessels awaiting customs or quarantine shall use the anchorage described in paragraph (a)(2) of this section. No vessel shall remain in this anchorage more than 24 hours without a permit from the U.S. Coast Guard Captain of the Port.

(3) Restricted Anchorage F shall serve both as an additional general anchorage area in cases where the temporary anchorage is full, and as an explosives anchorage for vessels loading or unloading explosives in quantities no greater than forty (40) tons, Commercial Class "A" Explosives, when so authorized by the United States Coast Guard Captain of the Port. No vessel shall enter or anchor therein without first obtaining a permit from the United States Coast Guard Captain of the Port.

§110.245 Vieques Passage and Vieques Sound, near Vieques Island, P.R.

(a) The anchorage grounds–(1) Vieques Passage explosives anchorage and ammunition handling berth (Area 1). A circular area having a radius of 1,700 yards with its center at latitude 18°09′00″, longitude 65°32′40″.

(2) Vieques Sound explosives anchorage and ammunition handling berth (Area 2). A circular area having a radius of 2,000 yards with its center at latitude 18°11′48″, longitude 65°26′06″.

(3) Southern Vieques Passage explosives anchorage and ammunition handling berth (Area 3). A circular area having a radius of 2,000 yards with its center at latitude 18°05′51″, longitude 65°36′14″.

(b) The regulations. (1) No vessel or craft shall enter or remain in these anchorages while occupied by vessels having on board explosives or other dangerous cargo. Explosives in quantities no greater than 1,625 short tons will be handled in any area at one time.

(2) The regulations of this section shall be enforced by the Commander, Greater Antilles Section, U.S. Coast Guard Base, San Juan, Puerto Rico, and such agencies as he may designate.

§110.250 St. Thomas Harbor, Charlotte Amalie, V.I. (a) The anchorage grounds–(1) Inner harbor anchorage. Beginning at a point bearing 85°, 525 yards from the outer end of a pier at latitude 18°20′19″, longitude 64°56′26″ (approximate); thence 146°, 800 yards; thence 70°, 860 yards; thence 340°, 500 yards; and thence to the point of beginning.

(2) Outer harbor anchorage. Beginning at Scorpion Rock lighted buoy No. 1 (latitude 18°19′25.6″, longitude 64°55′41.8″); thence 180° 1,580 yards; thence 264°30′, 2,490 yards; thence due north 1,255 yards; thence due east to the southerly tip of Sprat Point, Water Island; thence to Cowell Point, Hassel Island; and thence to the point of beginning.

(3) East Gregerie Channel anchorage (general purpose). Bounded on the northeast by Hassel Island; on the southeast by the northwest boundary of the outer harbor anchorage; on the southwest by Water Island; and on the northwest by a line running from Banana Point, Water Island, 55° to Hassel Island.

(4) Small-craft anchorage. All the waters north of a line passing through the outer end of a pier at latitude 18°20′19″, longitude 64°56′26″ (Approximate) and ranging 85°.

(5) Deep-draft anchorage. A circular area having a radius of 400 yards with its center at latitude 18°19′12.2″, longitude 64°58′47.8″.

(6) Long Bay anchorage. The waters of Long Bay bounded on the north by the southerly limit line of Anchorage E, on the west by the easterly limit line of Anchorage A to a point at latitude 18°20′18″, thence to latitude 18°20′13″, longitude 64°55′21″; and thence to the shoreline at latitude 18°20′15″, longitude 64°55′13″.

(b) The regulations. (1) The outer harbor anchorage shall be used by vessels undergoing examination by quarantine, customs, immigration, and Coast Guard officers. Upon completion of these examinations vessels shall move promptly to anchorage. This anchorage shall also be used by vessels having drafts too great to permit them to use the inner harbor anchorage. No vessel shall remain more than 48 hours in this anchorage without a permit from the Harbor Master.

(2) The small-craft anchorage shall be used by small vessels undergoing examination and also by small vessels anchoring under permit from the Harbor Master.

(3) The requirements of the Navy shall predominate in the deep-draft anchorage. When occupied by naval vessels all other vessels and craft shall remain clear of the area. When the area is not required for

naval vessels, the Harbor Master may upon application made in advance assign other vessels to the area. Vessels so assigned and occupying the area shall move promptly upon notification by the Harbor Master.

(4) The harbor regulations for the Port of St. Thomas, V.I. of the United States and approaches thereto, including all waters under its jurisdiction, as adopted by the Government of the Virgin Islands, will apply to the Long Bay Anchorage.

(5) In addition, the Long Bay Anchorage is reserved for all types of small vessels, including sailing and motor pleasure craft, and such craft shall anchor in no other area except Anchorage E, in the northern portion of the harbor of Charlotte Amalie.

(6) Floats for marking anchors in place will be allowed in the Long Bay anchorage; stakes or mooring piles are prohibited.

(7) Vessels not more than 65 feet in length are not required to exhibit or carry anchor lights within the Long Bay anchorage, but must display them if emergency requires anchoring in any other part of the harbor.

(8) No vessel may anchor in any of the St. Thomas Harbor Anchorages without a permit from the Harbor Master.

(9) The U.S. Coast Guard Captain of the Port of St. Thomas, is hereby empowered, whenever the maritime or commercial interests of the United States so require, to shift the position of any vessel anchored within the Long Bay anchorage, and of any vessel which is so moored or anchored as to impede or obstruct vessel movement in the harbor, and to enforce all regulations of this section should the need arise.

§110.255 Ponce Harbor, P.R. (a) Small-craft anchorage. On the northwest of Ponce Municipal Pier and northeast of Cayitos Reef, bounded as follows: Beginning at latitude 17°58′27″, longitude 66°37′29.5″, bearing approximately 325° true, 2,200 feet from the most southwest corner of Ponce Municipal Pier; thence 273°30′ true, 1,800 feet; thence 15° true, 900 feet; thence 93°30′ true, 1,800 feet; thence 195° true, 900 feet to the point of beginning.

(b) The regulations. (1) The Commonwealth Captain of the Port may authorize use of this anchorage whenever he finds such use required in safeguarding the maritime or commercial interests.

(2) No vessel shall anchor within the area until assigned a berth by the Commonwealth Captain of the Port. Application for permission to occupy the anchorage must be submitted in advance by the master or authorized representative of the vessel.

(3) Vessels occupying the anchorage will at all times keep within the limits of the area, and shall move or shift their position promptly upon notification by the Commonwealth Captain of the Port.

(4) The anchorage is reserved for all types of small craft, including schooners, fishing vessels, yachts and pleasure craft.

(5) Floats for marking anchors in place will be allowed; stakes or mooring piles are prohibited.

Part 117–Drawbridge Operation Regulations

§117.1 General. (a) The operation of drawbridges, in the absence of specific regulations in this part, shall be as required by section 5 of the act of August 18, 1894, as amended (28 Stat. 362; 33 U.S.C. 499). It shall be the duty of persons owning, operating, and tending drawbridges built across navigable waters of the United States, to open, or cause to be opened, the draws of such bridges under such rules and regulations as in the opinion of the Commandant the public interests require. Insofar as criminal liability on the part of the bridge owner is concerned, the Commandant is of the opinion that, in the absence of Federal regulations, there is no Federal authority requiring the opening of any drawbridge to which the General Bridge Act of March 23, 1906, does not apply. With reference to the civil liability of the bridge owner, however, it has been held that the duty to take proper care of a bridge includes the duty to make proper provision for the passage of vessels through the draw. In constructing a bridge with a draw, and in undertaking to open and manage the draw so as to allow vessels to pass, the owner has recognized the right of vessels to pass through without any appeal to the national authority to protect that right. Having thus recognized the rights of commerce, and undertaken to provide accommodations for the passage of vessels, the owner is bound that the custodians of the bridge shall use ordinary diligence to avoid accidents to vessels going through the draw at customary hours, and in the customary manner, as one of the incidents of the care, management, and control of the bridge itself. The owner is responsible, therefore, for the want of ordinary care and diligence in his servants, and for the consequent damage.

(b) The Attorney General has held (Jan. 28, 1899; 22 Opin. 314) that the first part of section 5 of the 1894 act is merely declaratory of the legal duty of the owners or operators which attaches to the maintenance and operation of a drawbridge across navigable waters. "It is the duty of all persons operating such drawbridges to open or cause them to be opened in a reasonable manner and at a reasonable time, consistent with the uses for which drawbridges are constructed, for the passage of vessels. The repair of such draws and of the bridges with which they are connected is also necessary for their maintenance. It is reasonable that a sufficient time should be allowed for such repairs and if they cannot be prosecuted without closing the bridge for a number of successive days, such closing cannot be considered an unreasonable interference with navigation." "It is entirely competent for the Secretary of the Army to make rules and regulations governing this subject, but in the absence of such rules and regulations the law is as I have above stated it." (The Commandant prescribes these rules and regulations.)

(c) Notwithstanding any general or special regulation heretofore or hereafter prescribed, drawbridges across navigable waters of the United States will not be opened to navigation for certain periods determined by the proper civil defense authorities to

be in the interest of public safety during a major disaster or civil defense emergency indicated by a civil defense condition of "Air Raid Warning" (attack by enemy aircraft probable, imminent, or taking place).

(d) (Reserved).

(e) The Commandant may require the owner or operator to install and operate one or more radiotelephone stations of appropriate characteristics on a drawbridge upon finding that for navigation or safety it is essential that a means other than sound or visual signals be available to request openings of the draw.

(1) The Commandant's determination is based on such factors as location and navigational clearance of the particular bridge, character and volume of marine traffic, configuration of the navigational channel, restrictions in channel approaches, currents in the approaches to or through the drawbridge, obstructions and conditions limiting visibility, and similar conditions affecting navigation or safety through or in the vicinity of the drawbridge.

(2) Each station shall be subject to the rules and regulations of the Federal Communications Commission or the Director of Telecommunications Management as applicable governing the assignment of operating frequencies, licensing, and operation of radiotelephone stations.

(3) When the Commandant proposes that a radiotelephone station, or stations, be installed and operated on a specific drawbridge, he gives written notice of the proposed requirement to the bridge owner (or operator as appropriate) who shall have 30 days in which to submit comments or objections to the proposal. If the Commandant determines that such installation is necessary the bridge owner (or operator) shall have a reasonable time, but normally not more than 6 months, in which to effect installation and commence operation.

(4) The provisions of this section are not intended to restrict the voluntary installation and operation of radiotelephone stations on drawbridges.

§117.1a Temporary departures from regulations in this part. (a) Temporary closures of drawbridges. Notwithstanding any general or special regulation in this part, heretofore or hereafter prescribed, a specific drawbridge across navigable waters of the United States need not be open to navigation for specified periods of time when such a bridge may be undergoing repairs or maintenance work or when the public interest, health, or safety so requires.

(b) Delegation to District Commanders. The Commandant further delegates pursuant to 49 CFR 1.4 (g) to District Commanders authority to place in effect the provisions of paragraph (a) of this section with respect to drawbridges in their respective Coast Guard Districts for periods of time determined to be necessary but in no event to exceed 60 consecutive calendar days. For a specific drawbridge the District Commander having jurisdiction may suspend any drawbridge operation regulations applicable thereto and if necessary establish other operational requirements without prior notice and public procedures thereon for such actions. Where practicable, notice of the District Commander's actions taken pursuant to this section shall be disseminated in Notices to Mariners, or otherwise, for the information of all concerned.

(c) Closure for repairs or maintenance. (1) When a draw must be closed for scheduled repairs or maintenance work, approval of the District Commander should be obtained at least 10 days prior to the date of the intended closure by the owners of or the agency controlling the drawbridge. The request for approval of the proposed closure shall include a brief description of the nature of the work to be performed and the times and dates of such closure. The granting of the approval will depend upon the necessity for the closure, the reasonableness of the time(s) and date(s) requested, and the overall effect on navigation.

(2) When a draw is closed for repairs in case of emergency or damage to the structure or for vital maintenance that may not be delayed, the owners of or the agency controlling the drawbridge shall immediately inform the District Commander concerned of the closure, the reasons for the closure, and the expected completion date of the emergency repairs. Normally, the extension of any period of emergency closure to include the accomplishment of routine maintenance or for other nonemergency purposes will not be authorized.

(d) Closure for public interest, health, and safety. In situations where the public interest, health, or safety so requires, including the holding of public functions or events such as street parades and marine regattas, the District Commander may authorize the temporary closure of a drawbridge. A request for approval of a temporary closure of a drawbridge for a street parade or marine regatta or otherwise should include a brief description of the proposed event or reason why closure of the drawbridge is desired, and the time and date of such closure. The closure of a drawbridge for public interest, health, or safety will depend upon the necessity for the closure, the reasonableness of the time and date (if requested), and the overall effect on navigation.

(e) Closure of draw for emergency vehicles. When a drawtender is informed by a reliable source that an emergency vehicle is due to cross the draw, he shall take all reasonable measures necessary to have the draw closed at the time the emergency vehicle arrives at the bridge.

§117.1b Signals.

(a) Sound signals. Sound signals shall be the primary signals to be used if weather conditions will permit sound signals to be heard by the drawtender and by the vessel operator. A prolonged blast shall be of four to six seconds duration and a short blast shall be of approximately one second duration. These signals may be made by a whistle, or horn, by shouting through a megaphone, or by other similar devices producing sound that can be clearly heard. If a drawbridge does not have sound signals individually specified in this Part, the following signals shall be used:

(1) Signal to request opening of draw. One prolonged blast followed by one short blast.

(2) Acknowledging signal by the drawtender.

(i) When the draw will be opened immediately. One prolonged blast followed by one short blast, sounded not more than 30 seconds after the opening signal.

(ii) When the draw cannot be opened promptly or is open and must be closed promptly. Five short blasts, sounded in rapid succession not more than 30 seconds after the opening signal, repeated at regular intervals until acknowledged by a signal which has the same meaning from the vessel. As soon as the draw can be opened the drawtender shall sound the opening signal and open the draw for any vessel waiting to pass.

(b) Visual signals. These signals shall be used if weather, noise, or other conditions may prevent sound signals from being heard or if sound producing devices are not properly functioning. Sound signals may be used in conjunction with visual signals. If a drawbridge does not have visual signals individually specified in this Part, the following shall be used:

(1) Signal to request opening of draw. A white flag of sufficient size to be readily visible for a distance of one-half mile by day or a white or green light of sufficient intensity to be readily visible for a distance of one-half mile by night, raised and lowered vertically in full sight of the drawtender, repeated until acknowledged by the drawtender (mechanical devices or other objects using fixed or flashing lights which produce essentially the same signal, are permitted).

(2) Acknowledging signal by the drawtender.

(i) When the draw will open promptly. Same as signal to request opening, displayed not more than 30 seconds after the opening signal.

(ii) When the draw cannot open promptly or is open and must be closed promptly. A red flag of sufficient size to be readily visible for a distance of one-half mile by day or a red light of sufficient intensity to be readily visible by night, swung back and forth horizontally in full sight of the vessel not more than 30 seconds after the opening signal is observed, and repeated until acknowledged by the vessel with a signal which carries the same meaning (mechanical devices or other objects using fixed or flashing lights which produce essentially the same signal, are acceptable). As soon as the draw can open, the drawtender shall give the opening signal and open the draw for any vessels waiting to pass.

(c) Draw will not open. When the signal from the bridge indicates that the draw will not open, the vessel shall not attempt to pass the closed draw until an opening signal is received from the bridge. However, if there is sufficient room, the vessel may advance into the fender system until the draw opens.

(d) Radiotelephones. When the request for draw opening and the answering acknowledgement is given by radiotelephone, sound or visual signals need not be used. Both vessel and bride must continue to monitor the selected channel until the vessel has cleared the draw. If radiotelephone contact cannot be maintained, sound or visual signals shall be used.

(e) Contiguous drawbridges. When a vessel wishes to pass two or more drawbridges close together, the opening signal shall be given for the first bridge. After acknowledgement from the first bridge that it will open promptly, the opening signal shall be given for the second bridge and so on until all bridges that the vessel desires to pass have been given the opening signal and have acknowledged that they will open promptly.

(f) Vessels approaching a drawbridge. When two or more vessels are approaching the same drawbridge at nearly the same time from the same or opposite directions with the draw open or closed, each of these vessels shall signal independently for the opening of the draw, and the drawtender shall reply in turn to the signal of each vessel.

(g) When a vessel approaches a drawbridge in the open position, the vessel shall sound the opening signal. If no response is received, the vessel may proceed through the draw.

§117.1c Appurtenances unessential to navigation.

No vessel owner or operator shall signal a drawbridge to open for any nonstructural vessel appurtenance which is not essential to navigation, or which is easily lowered.

§117.1d Delaying opening of a draw.

No person shall unreasonably delay the opening of a draw after the signals required by §117.1b have been given.

§117.1e Process of violations.

(a) Complaints of alleged violations under this part are submitted to the District Commander of the Coast Guard District in which the drawbridge is located.

(b) Penalties for violations under this part are assessed and collected under 33 CFR 1.07.

§117.240 Navigable waters discharging into the Atlantic Ocean south of Delaware Bay (including the Lewes and Rehoboth Canal, Del.), and into the Gulf of Mexico (including coastal waterways contiguous thereto and tributaries to such waterways and the Lower Atchafalaya River, La.), except the Mississippi River and its tributaries and outlets; bridges.

(a) Corporations or persons owning or controlling a drawbridge shall provide the same with the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) and (c) (Reserved).

(d) When a vessel wishes to pass two or more bridges close together or crossing a section of the waterway less than 500 feet in length, signals as prescribed above shall be given from the vessel for opening the first bridge, followed at an interval of about five seconds by the same signals for the second bridge, and so on, thus giving, at intervals of about five seconds, separate signals for each bridge the vessel desires to pass.

(e) When two or more vessels are approaching a bridge at nearly the same time from the same or

opposite directions with the draw opened or closed, each of these vessels shall signal independently for the opening of the draw, and the drawtender shall reply as prescribed and in turn to the signal of each vessel.

(f) Where bridges are less than 500 feet apart, the signals to govern the movements of the approaching vessel shall be given from the bridge nearest the vessel. If the bridge can be opened immediately, the bridgetender shall await the reply signals from the other bridges and then give the signal circumstances require. If the nearest bridge cannot be opened immediately, the prescribed signal shall be given the approaching vessel at once to be followed as soon as possible by the signal from that bridge that the draws are about to open.

(g) The draw shall be opened with the least possible delay upon receiving the prescribed signal: Provided, That the drawspan shall not be opened when a train is approaching so closely that it cannot safely be stopped before reaching the bridge, or when a passenger or mail train is approaching within sight or hearing of the operator of the drawspan.

(h) (Reserved).

(i) Trains, wagons, and other vehicles shall not be stopped on a drawbridge for the purpose of delaying its opening, nor shall watercraft be so manipulated as to hinder or delay the operations of a drawspan, but all passage over, through, or under drawbridge shall be prompt, to prevent delay to either land or water traffic.

(j) The following provisions shall not relieve the owner of or agency controlling a drawbridge from opening the draw for the passage of vessels in accordance with paragraphs (a) through (i) of this section.

(1) A vessel shall not require the opening of the draw when such opening is needed only to provide additional clearance for appurtenances unessential to navigation of the vessel, or for appurtenances essential to navigation but which may be altered by hinging, telescoping, collapsing, or otherwise, so as to require no greater clearance than the highest fixed and essentially unalterable point of the vessel.

(2) Appurtenances unessential to navigation shall include but not be limited to fishing outriggers, radio antennae which are or can reasonably be made flexible or collapsible, television antennae, false stacks, and masts purely for ornamental purposes. Appurtenances unessential to navigation shall not include radar antennae, flying bridges, sailboat masts, piledriver leads, spud frames on hydraulic dredges, drilling derricks, derrick substructures and/or buildings, cranes on drilling or construction vessels, or other items of permanent and fixed equipment clearly necessary to the intended use of the vessel.

(3) Owners of or agencies controlling drawbridges shall report to the District Commander in charge of the locality the names of any vessels causing bridge openings considered to be in violation of this paragraph. The District Commander may at any time cause an inspection to be made of any craft so reported and is empowered to decide in each case whether or not the appurtenances are unessential to navigation. If the District Commander decides a vessel has appurtenances unessential to navigation, he shall notify the vessel owner of his decision, specifying a reasonable time for making necessary alterations. If the vessel owner is aggrieved by the decision of the District Commander, he may within 30 days after receipt of the request to perform necessary alterations appeal the decision to the Commandant in writing. If the Commandant rules that an appurtenance is unessential to navigation, the District Commander shall again specify to the vessel owner a reasonable time for making necessary alterations to the appurtenance, and after the expiration of the time specified, any operation of the vessel in such a manner as to require drawbridge openings shall be deemed in violation of the regulations of this paragraph unless the necessary alterations shall have been made.

(4) The provisions of paragraphs (j) (1), (2) and (3) of this section shall not be applicable to ocean or coastwise vessels engaged in foreign or domestic commerce.

(k) Clearance gages, of a type to be approved by the Commandant, shall be installed on the upstream and downstream sides of each drawbridge by and at the expense of the owner of or agency controlling the bridge and such gages shall be kept in good repair and legible condition.

Note.–The special regulations contained in §117.245 to §117.491, prescribed where local conditions require to govern the operation of certain bridges, supplement the general regulations contained in §117.240.

§117.245 Navigable waters discharging into the Atlantic Ocean south of and including Chesapeake Bay and into the Gulf of Mexico, except the Mississippi River and its tributaries and outlets; bridges where constant attendance of draw tenders is not required. (a) The owners of or agencies controlling certain bridges will not be required to keep draw tenders in constant attendance. The bridges to which this section applies are listed, and the special regulations applicable in each case are set forth, in paragraphs (f) to (j) inclusive, of this section. At all times not covered by the regulations in this section, and in all other respects, the regulations contained in §117.240 shall govern the operations of these bridges.

(b) Whenever a vessel unable to pass under a closed bridge desires to pass through the draw, advance notice, as specified, of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(c) Upon receipt of such advance notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owners of or agencies controlling the

bridges shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) The operating machinery of the draws shall be maintained in a serviceable condition, and the draws shall be opened and closed at intervals frequent enough to make certain the machinery is in proper order for satisfactory operation.

(f) and (g) apply to waters not discussed in this Coast Pilot.

(h) Waterways discharging into Atlantic Ocean south of Charleston.

(1) through (29) apply to waters not discussed in this Coast Pilot.

(30) Moser Channel, Seven Mile Bridge, U.S. 1 near Marathon, Monroe County, Florida. The draw of this bridge may remain closed and paragraphs (b) through (e) of this section do not apply to this bridge.

(i) Waterways discharging into Gulf of Mexico east of Mississippi River.

(i)(1), (1-a), and (2) apply to waters covered by Coast Pilot 4.

(2–a) Big Carlos Pass, Florida; State Road S-865 drawbridge. The draw shall open on signal from 8 a.m. to 7 p.m. The draw need not open from 7 p.m. to 8 a.m.

(2–b) Matlacha Pass, Florida; State Road S-78 drawbridge. The draw shall open on signal from 8 a.m. to 7 p.m. The draw need not open from 7 p.m. to 8 a.m.

(3) and (3-a) (Reserved)

(3–b) Hudson Bayou, Sarasota, Fla. The draw of the Orange Avenue bridge across Hudson Bayou may remain closed and paragraphs (a) through (e) of this section do not apply to this bridge.

(3-c) Longboat Pass bridge between Longboat Key and Anna Maria Key near Bradenton Beach, Fla. From 6 a.m. to 6 p.m. the draw shall open on signal. From 6 p.m. to 6 a.m., the draw shall open on signal if at least 3 hours notice is given.

(4) Coffee Pot Bayou, St. Petersburg, Fla. The draw need not open for the passage of vessels, and paragraphs (b) through (e) of this section shall not apply to this bridge.

(4-a) Garrison Channel, Tampa, Florida. The draw shall open on signal if at least 48 hours advance notice is given.

(4-b) Hillsborough River, Tampa, Florida.

(a) The draws of the bridges at Platt Street, mile 0.0; Brorein Street, mile 0.16; Kennedy Boulevard, mile 0.4; Cass Street, mile 0.7; and Laurel Street, mile 1.0, shall open on signal from 9 a.m. to 4 p.m., Monday through Friday and from 8 a.m. to 6 p.m., Saturday, Sunday, and Federal holidays. At all other times the draws shall open on signal if at least two hours advance notice is given.

(b) The draw of the Seaboard System Railroad (Seaboard Coast Line Railroad) bridge at Cass Street, mile 0.7, shall open on signal from 4:00 p.m. to 12:00 midnight, Monday through Friday. At all other times, the draw shall be maintained in the open position for the passage of vessels.

(c) The draws of the City of Tampa highway bridge at West Columbus Drive, mile 2.3, and the State of Florida highway bridge at West Hillsborough Avenue, mile 4.8, shall open on signal from 8:00 a.m. to 6:00 p.m. At all other times, the draws shall open on signal if at least one hour advance notice is given.

(d) Public vessels and vessels in distress. From 4 p.m. to 9 a.m., Monday through Friday, and from 6 p.m. to 8 a.m., Saturdays, Sundays and Federal holidays, the draws of the bridges listed in paragraph (a) of this section shall open on signal as soon as possible but not longer than one hour after a request by a public vessel of the United States, vessels owned or operated by the state, county, or local governments used for public safety purposes, or any vessels in distress. The opening signal from such vessels is five short blasts of a whistle, horn or other similar sound producing device, or by shouting.

(5) Little Manatee River, Fla.; Seaboard System Railroad (Seaboard Coast Line Railroad) bridge at Ruskin. The draw shall open on signal if at least three hours notice is given.

(5-a) Whitcomb Bayou, Fla. The draw shall open on signal from 9 a.m. to 6 p.m. on Saturdays and Sundays. At all other times the draw shall open on signal if at least 2 hours notice is given.

(6) Suwannee River, Fla.; Seaboard System Railroad (Atlantic Coast Line Railroad Company) bridge at Old Town. At least five days' advance notice required.

(6–a) St. Marks River, Fla.; Florida State Road Department bridge over St. Marks River on U.S. Highway 98 at Newport. At least 48 hours' advance notice to be given to State Road Department Maintenance Office, Tallahassee, Fla.

(6-b) Blackwater River, Florida. The draw of the Seaboard System Railroad (Louisville and Nashville Railroad) bridge at Milton shall open on signal from 4 a.m. to 8 p.m. From 8 p.m. to 4 a.m. the draw shall open on signal if at least 8 hours notice is given.

(6–c) Blackwater River, Fla., State Road 10 bridge at Milton. The draw shall open promptly on signal if at least 12 hours notice has been given.

(7) Flint River, Ga.; Seaboard System Railroad (Seaboard Coast Line Railroad) bridges at Bainbridge. At least 15 days advance notice required.

(8) Chattahoochee River, Alabama and Georgia. Central of Georgia bridge at Columbia, Alabama, and Seaboard System Railroad (Seaboard Coast Line Railroad) bridge near Omaha, Georgia. The draws shall open on signal if at least six hours notice is given.

(9) (Reserved).

(10) Choctawhatchee River, Fla.; State Road Department of Florida bridge on State Road No. 10 approximately 14 miles east of Freeport. At least 12 hours advance notice required.

(11) Bayou Chico, mile 0.3, Pensacola, Fla. The

draw shall open on signal but need not open for pleasure vessels from 6:00 A.M. to 8:00 A.M., 11:00 A.M. to 1:00 P.M. and 3:00 P.M. to 6:00 P.M., Monday through Friday excluding holidays, except (i) on the hour and half-hour (ii) when at least five such vessels are waiting to pass or (iii) in emergencies or severe storms. The draw when otherwise opened for other vessels may be used by pleasure vessels.

(12) Alabama River, Ala.; St. Louis-San Francisco Railway Company bridge at Yellow Bluff, near Coy. At least 48 hours' advance notice required.

(12-a) Alabama River, Ala.; U.S. Highway 31 and 82 Swing Bridge, mile 278.2 near Montgomery. The draw shall open on signal if at least 24 hours notice has been given.

(12-b) Alabama River, Ala.; Seaboard System Railroad (Louisville and Nashville Railroad) bridge, mile 293.3 near Montgomery. The draw shall open on signal if at least 24 hours notice is given.

(13) (Reserved)

(14) Coosa River, Ala.; Seaboard System Railroad (Louisville and Nashville Railroad) bridge at Gadsden. At least six hours' advance notice required.

(15) Tombigbee River, Ala.; Southern Railway Company bridge near Epes. At least 24 hours' advance notice required, to be given to the railroad company's station agent at Epes between 8:00 a.m. and 4:00 p.m. on any day except Saturdays and Sundays, either by telephone maintained on the bridge by the railroad company for the purpose or in any other manner convenient to the operator of the vessel.

(15-a) Tombigbee River, Ala.; U.S. highway drawbridge near Bellamy. The draw shall open on signal from December 1 through April 30. The draw shall open on signal from May 1 through November 30 if at least 12 hours notice is given. During periods of high water from May 1 through November 30, the draw shall open on signal.

(16) Tensaw River, Alabama. State of Alabama Highway Department bridge over the Tensaw River on U.S. Highway No. 90 near Mobile, Alabama. The draw need not be opened for the passage of vessels, and paragraphs (b) and (e), inclusive, of this section shall not apply to this bridge.

(17) Tensaw River, Ala.; Seaboard System Railroad (Louisville and Nashville Railroad) bridge, mile 15.

(i) The draw shall open on signal from 8 a.m. to 12 midnight. The draw need not open from 12 midnight to 8 a.m.

(ii) During periods of severe storms or hurricanes from the time the U.S. Weather Bureau sounds an "alert" for the area until the "all clear" is sounded drawtenders shall be constantly on duty and the draw shall open on signal for the passage of vessels.

(18) Bayou Sara, Ala.; Seaboard System Railroad (Louisville and Nashville Railroad) bridge near Satsuma. Between 6 a.m. and 10 p.m., daily, the bridge will be opened on signal for the passage of vessels. Between 10 p.m. and 6 a.m. daily, at least 4 hours' advance notice required, except during hurricane alerts for the area when a draw tender will be on duty and the bridge opened on signal for the passage of vessels. The notice posted in accordance with paragraph (d) of this section shall state exactly how the draw tender may be reached by telephone or otherwise between 10 p.m. and 6 a.m.

(19) Three Mile Creek, Ala.; State of Alabama Highway Department bridge at Mobile. Between 7:00 a.m. and 9:00 a.m. and between 4:30 p.m. and 6:30 p.m. daily the draw need not be opened for the passage of vessels. At all other times, at least 12 hours' advance notice required.

(20) Three Mile Creek, Ala. The draw shall open on signal if at least 5 days notice has been given.

(i) From November 15, 1972, through April 1, 1973, the draw need not open for the passage of vessels.

(20-a) (Reserved).

(20-b) Back Bay of Biloxi, Mile 3.0. The draw shall open on signal if at least 6 hours notice is given.

(21) West Pearl River, La.; New Orleans and Northeastern Railroad Company bridge at Pearl River Station. At least six hours' advance notice required.

(22) (Reserved).

(23) Bayou Lacombe, La; Louisiana Department of Highways bridge at Lacombe. At least 48 hours' advance notice required.

(23-a) Lake Pontchartrain, La.; Louisiana Department of Highways and Southern Railway System bridges near New Orleans. At least 48 hours advance notice required for opening the south drawspan except in case of an emergency, the drawspans shall be placed in operation not later than 12 hours after notice of the emergency and shall be kept in condition for immediate operation until the emergency is over.

(23-b) Lake Pontchartrain, La.; Greater New Orleans Expressway Commission causeway across Lake Pontchartrain, north bascule spans. At least 3 hours' advance notice required.

(24) (Reserved).

(25) Amite River, La.; State Highway 16 bridge, mile 21.4, near French Settlement, and State Highway 42 bridge, mile 32.0, at Port Vincent. At least 48 hours' advance notice required.

(26) Bayou Colyell, La.; Louisiana Department of Highways bridge near Port Vincent. At least 48 hours' advance notice required.

(j) Waterways discharging into Gulf of Mexico west of Mississippi River. (1) Bayou Plaquemine, La.; The Texas and Pacific Railway Company and the Louisiana Department of Highways bridges at Plaquemine. The draws need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(2) Bayou Terrebonne, La.; Louisiana Department of Highways drawbridge near Presquille. The draw need not open for the passage of vessels and

paragraphs (b) through (e) of this section shall not apply to this bridge.

(3) Bayou Lafourche, La.; Texas and New Orleans Railroad Co. bridge at Lafourche. At least 48 hours' advance notice required.

(4) Bayou Lafourche, La.; The State of Louisiana, Department of Highways bridge at Thibodaux and all bridges above. The draws need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(4–a) Bayou Lafourche, La.; U.S. 90 drawbridge, mile 58.2, Raceland; U.S. 90 drawbridge, S. 307, Raceland, mile 58.7; and S. 18 drawbridge, Lafourche, mile 66.1. The draws shall open on signal if at least 6 hours notice is given.

(5) Grand Bayou, La.; State of Louisiana Department of Highways bridge near Paincourtville. At least 24 hours' advance notice required.

(6) Bayou Black, La.; Morgan's Louisiana and Texas Railroad and Steamship Company bridge at Southdown. At least 24 hours' advance notice required.

(7) Bayou Black, La.; Louisiana Department of Highways bridge near Gibson, and the Terrebonne Parish Police Jury and Southdown, Incorporated, bridges (6) between Gibson and Houma. At least 24 hours' advance notice required.

(8) Little Bayou Black, La.; Texas and New Orleans Railroad Company bridge at Southdown. The draw need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive of this section shall not apply to this bridge.

(9) Bayou Grosse Tete, La.

(i) Texas and Pacific Railroad bridge, mile 14.7. The draw need not open for the passage of vessels, and paragraphs (b) through (e) of this section shall not apply to this bridge. However, the owner of or agency controlling this bridge shall restore the draw to full operation within six months of notification to take such action by the Commandant, U.S. Coast Guard.

(ii) The Louisiana Department of Highway bridge near Rosedale, mile 15.3. The draw shall open on signal if at least 48 hours notice is given.

(10) Bayou Teche, La.

(i) S–96 highway drawbridge, mile 75.2, at St. Martinville, and S–350 highway drawbridge, mile 82.0, at Parks. The draws shall open on signal if at least 24 hours notice is given.

(ii) S–31 highway drawbridge, mile 87.5, at Ruth, S–31 highway drawbridge, mile 90.5, at Breaux Bridge, and Southern Pacific Railroad drawbridge (removable span), mile 91.0, at Breaux Bridge. The draws shall open on signal if at least 48 hours notice is given.

(11) (Reserved)

(12) Stumpy Bayou, La.; Louisiana Department of Highways bridge near Weeks Island. At least 6 days' advance notice required.

(13) (Reserved).

(14) Vermilion River, La.; Louisiana Department of Highways bridge near Lafayette. At least 48 hours' advance notice required.

(15) (Reserved).

(16) Bayou Plaquemine Brule, La.;

(i) S-91 highway drawbridge at Estherwood. The draw shall open on signal if at least four hours notice is given from 5 a.m. to 9 p.m., and if at least 12 hours notice is given from 9 p.m. to 5 a.m.

(ii) Texas and New Orleans Railroad Company bridge near Midland. The draw shall open on signal if at least 24 hours notice is given.

(17) Bayou Nezpique, La.; Louisiana Department of Highways bridge near Jennings. At least 48 hours' advance notice required.

(18) Bayou Choupique, La.; Louisiana Department of Highways bridges near Calcasieu. At least 48 hours' advance notice required.

(19) Bayou Lacassine, La.; State of Louisiana, Department of Highways bridge near Hayes. At least 24 hours' advance notice required.

(20) Bayou Lacassine, La.; Texas and New Orleans Railroad Company bridge near Hayes. At least 24 hours' advance notice required.

(21) (Reserved).

(22) Bayou D'Inde, La.; railroad bridge of Defense Plant Corporation, Cities Service Refining Corporation, Agent. At least 72 hours' advance notice required.

(23) (Reserved).

(24) Houston River, La.; The Kansas City Southern Railway Company bridge near Lake Charles. At least 24 hours' advance notice required.

(25) (Reserved).

(26) Sabine River, La. and Tex.; Texas and New Orleans Railroad Company bridge near Echo, Tex., Kansas City Southern Railway Company bridge near Ruliff, Tex., and Louisiana Department of Highways bridge between Starks, La., and Deweyville, Tex. At least 24 hours' advance notice required.

(26–a) Sabine River (Old Channel) behind Orange Harbor Island, Orange, Tex. The draw shall be opened promptly on signal from 7 a.m. to 12 Midnight Monday through Friday, except holidays. At all other times, including legal holidays, 8-hours' advance notice is required.

(27) Cow Bayou, Tex.; Orange County highway bridge on Round Bunch Road and Texas Highway Department bridge at Bridge City. At least 6 hours' advance notice required.

(28) Neches River, Tex.; Gulf, Colorado and Sante Fe Railway Company bridge at Evadale. The draw need not be opened for the passage of vessels, and paragraphs (b) to (e), inclusive, of this section shall not apply to this bridge.

(29) Taylors Bayou, Tex.; Texas and New Orleans Railroad Company bridge and Texas Highway Department bridge at West Port Arthur. The draws need not be opened for the passage of vessels, and paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(30) Trinity River, Tex.; Texas and New Orleans Railroad Company bridge at Liberty, Missouri Pa-

cific Railroad Company bridges near Kenefick and at Riverside, and Gulf, Colorado and Santa Fe Railway Company bridge near Romayor. The draws need not be opened for the passage of vessels, and paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(31) Buffalo Bayou, Tex.; (i) Texas and New Orleans Railroad Company bridge at the head of Houston Turning Basin, Houston, and drawbridges upstream therefrom to, but not including the Houston Belt & Terminal Railway Company bridge near Shiloh Street, Houston. At least 24 hours' advance notice required.

(ii) Houston Belt & Terminal Railway Company bridges near Shiloh Street and at Mary Street, Houston. The draws need not be opened for the passage of vessels and paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(32) Greens Bayou, Texas: Port Terminal Railroad Association, mile 2.8. The draw shall open on signal if at least four hours notice is given and on signal for three hours thereafter if the opening is for returning downbound vessels.

(33) Clear Creek, Tex.; Texas and New Orleans Railroad Company bridge at Seabrook. The draw will be maintained in the open position for the passage of vessels except when it is necessary to close the draw for the passage of trains. A draw tender shall be in constant attendance when the draw is closed. Paragraphs (b) to (d), inclusive, of this section shall not apply to this bridge.

(34) Chocolate Bayou, Tex.; Missouri Pacific Railroad Company bridge near Liverpool. The draw is fixed in the closed position to navigation. Paragraphs (b) to (e), inclusive, of this section shall not apply to this bridge.

(35) Old Brazos River, Freeport, Texas; Missouri Pacific Railroad bridge, mile 4.4. The draw shall be maintained in the fully open to navigation position except for the crossing of trains or for maintenance.

(36) Brazos River, Tex. (i) Texas Highway Department bridge near Freeport. At least 12 hours' advance notice required.

(ii) Missouri Pacific Railroad Company bridge at Brazoria. The draw is fixed in the closed position to navigation. Paragraphs (b) to (e), inclusive, of this section shall not apply to this bridge.

(37) Colorado River, Tex.; Texas Highway Department bridge near Wadsworth. At least 24 hours' advance notice required.

(38) Lavaca River, Tex.; The draws of the Missouri Pacific Railroad bridge and the Texas FM 616 highway bridge, both at mile 11.2, at Vanderbilt, shall open on signal if at least 10 days notice is given.

Note.–In 1983, opening requests could be made by collect telephone call to 713-350-7581 for the Missouri Pacific bridge and to 512-293-3535 for the FM 616 highway bridge.

(39) Nueces Bay, Tex.; Texas Highway Department bridge between Corpus Christi and Portland. The draw need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to this bridge.

(40) San Bernard River, mile 20.7, Brazoria, Tex. The draw of the Missouri Pacific railroad bridge shall open on signal from 8 a.m. to 12 midnight. From 12 midnight to 8 a.m the draw shall open on signal if at least three hours notice is given.

(41) Arroyo Colorado, Tex.; Texas Highway Department bridge at Rio Hondo. At least 12 hours' advance notice required.

§117.462 Caloosahatchee River, Okeechobee Waterway, mile 134.5, Edison Memorial Bridge, U.S. Highway 41, Fort Myers, Lee County, Florida. (a) From 7:30 a.m. to 8:30 a.m. and 5 p.m. to 6 p.m., Monday through Friday, excluding Federal holidays except as provided for in paragraph (b) of this section, the draw need not open for passage of vessels. At all other times the draw shall open on signal.

(b) The draw shall open at any time for passage of public vessels of the United States, tugs with tows, or vessels in distress. The opening signal from these vessels is four blasts of a whistle, horn, or by shouting.

(c) The owner of or agency controlling this bridge shall post, on both sides of the bridge, signs that state the conditions of this regulation. These signs shall be of such size that they may be easily read from an approaching vessel at any time.

§117.462a Sarasota County bridges. (a) Hatchett Creek, Gulf Intracoastal Waterway, mile 56.9, State of Florida highway bridge, U.S. Highway 41, Venice, Florida. The draw shall open on signal from 6 p.m. to 7:30 a.m. From 7:30 a.m. to 6 p.m. the draw need not open except on the hour, quarter-hour, half-hour, and three-quarter hour, and except as provided in paragraph (d) of this section.

(b) Ringling Causeway, Gulf Intracoastal Waterway, mile 73.6, State of Florida highway bridge, State Road 780, Sarasota, Florida. The draw shall open on signal from 6 p.m. to 7:30 a.m. From 7:30 a.m. to 6 p.m., the draw need not open except on the hour and half-hour, and except as provided in paragraph (d) of this section.

(c) New Pass, mile 0.0, State of Florida highway bridge, State Road 789, Sarasota County, Florida. The draw shall open on signal from 6 p.m. to 7:30 a.m. From 7:30 a.m. to 6 p.m., the draw need not open except on the hour, quarter-hour, half-hour and three-quarter hour, and except as provided in paragraph (d) of this section.

(d) The draws of each bridge in this section shall open at any time for the passage of public vessels of the United States, tugs with tows, or vessels in distress. The opening signal from these vessels is four blasts of a whistle, horn, or by shouting.

§117.462b Sarasota Pass, Cortez Bridge, GIWW, mile 87.4, State Road 684, and the Anna Maria Bridge, GIWW, mile 89.2, State Road 64, Manatee County, Fla. (a) From 10 a.m. to 5 p.m., on Saturdays, Sundays, and legal holidays, the draws need not open except on the hour, quarter-hour, half-hour, and three-quarter hour, to allow any accumu-

lated vessels to pass. At all other times, the draws shall open on signal.

(b) The draws shall open at any time for the passage of public vessels of the United States, tugs with tows, and vessels in distress. The opening signal from these vessels is five short blasts of a whistle, horn, or by shouting.

(c) The owner of or agency controlling these bridges shall conspicuously post notices containing the substance of these regulations, both upstream and downstream, in such a manner they may be easily read from an approaching vessel.

§117.463 Manatee River, Fla.; U.S. Route 41 drawbridge near Bradenton. (a) The draw shall open on signal from 6 a.m. to 7 a.m. and 9 a.m. to 4 p.m.

(b) The draw need not open for the passage of vessels from 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m., however the draw shall open at 6 p.m. if any vessels are waiting to pass.

(c) From 6 p.m. to 6 a.m. the draw shall open on signal if at least three hours notice is given.

(d) The draw shall open on signal from 6 a.m. to 6 p.m. for the passage of public vessels of the United States, tugs with tows and vessels in distress. From 6 p.m. to 6 a.m. the draw shall open as soon as possible for the passage of such vessels. The opening signal from such vessels is four blasts of a whistle or horn or by shouting.

(e) During a hurricane alert issued by the National Weather Service affecting the area the draw shall open on signal.

(f) The owner of or agency controlling the bridge shall conspicuously post notices containing the substance of these regulations, both upstream and downstream, on the bridge or elsewhere, in such a manner that they may be easily read at all times from an approaching vessel. This notice shall state exactly how the authorized representative may be reached for openings of the draw.

§117.466 Gulf Intracoastal Waterway (GIWW), Pinellas County, Fla. (a) Clearwater Harbor, GIWW, mile 136.0, Clearwater Memorial Causeway, S.R. 60, Clearwater, Florida. From 9 a.m. to 6 p.m., the draw need not open except on the hour, 20 minutes past the hour, and 40 minutes past the hour to allow any accumulated vessels to pass. From 2 p.m. to 6 p.m. Saturdays, Sundays, and legal holidays, the draw need open only on the hour and half-hour to allow any accumulated vessels to pass. At all other times, the draw shall open on signal.

(b) Boca Ciega Bay, GIWW, mile 122.8, Welch Causeway bridge, S.R. 699, Madiera Beach, Florida. From 9:30 a.m. to 6 p.m., on Saturdays, Sundays, and legal holidays, the draw need not open except on the hour, 20 minutes after the hour and 40 minutes after the hour, to allow any accumulated vessels to pass. At all other times, the draw shall open on signal.

(c) Boca Ciega Bay, GIWW, mile 117.7, Corey Causeway bridge, S.R. 693, South Pasadena, Florida. From 8 a.m. to 7 p.m., Monday through Friday, and 10 a.m. to 7 p.m., Saturdays, Sundays, and legal holidays, the draw need not open except on the hour, 20 minutes after the hour, and 40 minutes after the hour, to allow any accumulated vessels to pass. At all other times, the draw shall open on signal.

(d) Boca Ciega Bay, GIWW, mile 119.0, Treasure Island Causeway bridge, Central Avenue, Treasure Island, Florida. From 3 p.m. to 6 p.m., Monday through Friday, and from 11 a.m. to 6 p.m., Saturdays, Sundays, and legal holidays, the draws need not open except on the hour, quarter-hour, half-hour, and three-quarter hour, to allow any accumulated vessels to pass. At all other times, the draw shall open on signal.

(e) Clearwater Harbor, GIWW, mile 131.8, Belleair Causeway, Pinellas County, Florida: From 12 noon to 6 p.m., on Saturdays, Sundays, and legal holidays, the draw need not open except on the hour, quarter-hour, half-hour, and three-quarter hour, to allow any accumulated vessels to pass. At all other times, the draw shall open on signal.

(f) The draws of these bridges shall open at any time for the passage of public vessels of the United States, tugs with tows, and vessels in distress. The opening signal from these vessels is five short blasts of a whistle, horn, other sound producing device, or by shouting.

(g) The owner of or agency controlling the bridges shall post notices containing the substance of these regulations both upstream and downstream, on the bridges or elsewhere, in such a manner that they can easily be read at all times from an approaching vessel.

§117.467 Clearwater Pass, Clearwater, Florida. The draw shall open on signal from 7 a.m. to 11 p.m. From 11 p.m. to 7 a.m. a delay of up to 10 minutes may be expected.

§117.480 Intracoastal Waterway, Santa Rosa Sound, Fla.; Santa Rosa Island Authority highway bridge between Gulf Breeze and Santa Rosa Island, State Road 399. (a) Except as otherwise provided in paragraphs (b), (c), and (d) of this section, it will not be necessary to open the draw span from 3 p.m. to 6 p.m., on Saturdays, Sundays, and national holidays from Memorial Day through Labor Day annually.

(b) Vessels owned or operated by the United States or commercial vessels shall be passed without delay through the draw of the bridge at any time on giving the signals prescribed in §117.240 (b) or (c).

(c) During the display or notification of small craft warnings or warnings for winds of greater force by the U.S. Weather Bureau, the bridge shall be opened for the passage of vessels giving the prescribed signals at any time.

(d) The draw of the bridge shall be opened at any time for the passage of any vessel in an emergency involving danger to life or property. Such an emergency shall be indicated by four blasts of a whistle, horn, or megaphone.

(e) The owner of or agency controlling the bridge shall keep a copy of the regulations conspicuously posted on both sides thereof, in such manner that it can be easily read.

§117.485 Escatawpa River, Miss.; Mississippi State Highway 63 drawbridge, mile 1.0. The draw need not

open for the passage of vessels from 6:00 a.m. to 6:45 a.m., 7:00 a.m. to 7:30 a.m., 3:25 p.m. to 3:45 p.m., and 4:00 p.m. to 5:00 p.m., Monday through Friday, except on national holidays. At all other times the draw shall open promptly on signal.

§117.488 Bayou La Batre, Alabama, State highway 188 bridge. The draw need not open for the passage of vessels Monday through Friday except holidays, from 7:30 a.m. to 8:30 a.m. and 3:00 p.m. to 4:30 p.m. At all other times the draw shall open promptly on signal.

§117.491 Mobile River and Chickasaw Creek, Ala.; Alabama State Highway bridge across Mobile River and Seaboard System Railroad (Louisville and Nashville Railroad Company) bridge across Chickasaw Creek at Mobile, Ala. (a) Sound signals for vessels. (1) For vessels proceeding up or down Mobile River and requiring an opening of the highway bridge only, the vessel will give a signal of three long blasts.

(2) For vessels coming down Mobile River and intending to proceed up Chickasaw Creek, requiring an opening of the railroad bridge, the vessel will give a signal of one long blast, followed after a one minute interval by three long blasts.

(3) For vessels coming up Mobile River and intending to proceed up Chickasaw Creek, requiring an opening of both bridges, the vessel will give a signal of three long blasts, a one minute interval, and one long blast followed by three long blasts.

(4) The owners of or agencies controlling the bridges shall keep a legible copy of these regulations posted conspicuously on both the upstream and downstream sides of the bridges.

§117.495 Pascagoula River at Pascagoula, Miss.; U.S. 90 Highway Bridge. The draw need not be opened for the passage of vessels from 6:15 a.m. to 7:15 a.m., 7:25 a.m. to 8 a.m., 3:15 p.m. to 4:15 p.m., and 4:30 p.m. to 5:30 p.m., Monday through Friday, except on national holidays when the draw shall open promptly on signal. At all other times the draw shall open promptly on signal.

§117.505 Old Fort Bayou, Miss. The draw of the old U.S. 90 bridge across the Old Fort Bayou, Ocean Springs, Miss., shall open on signal from 5 a.m. to 9 p.m. From 9 p.m. to 5 a.m. the draw shall open on signal if at least eight hour's notice is given to the Old Fort Bayou bridge tender. However, during periods of storm or hurricane warnings issued by the National Weather Service, the draw shall open on signal at all times.

§117.535 Inner Harbor Navigation Canal, New Orleans, La. The draws of each bridge shall be opened promptly on signal except that from 7 a.m. to 8:30 a.m., and 5 p.m. to 6:30 p.m., Monday through Friday, the draws of the New Seabrook vehicular bridge and the Danziger bridge at Chef Menteur Highway (U.S. 90) need not be opened for the passage of vessels except in an emergency.

§117.536 GIWW, Algiers Alternate Route, mile 3.8, Belle Chasse, La.

The draw shall open on signal except that from 3:30 p.m. to 5:30 p.m., Monday through Friday excluding holidays, the draw need not open for the passage of vessels.

§117.537 Gulf Intracoastal Waterway, Houma Navigation Canal, Bayou La Carpe, and Bayou Terrebonne, Houma, La.

The draws of the bridges across the Gulf Intracoastal Waterway at East Park Avenue, mile 57.6, East Main Street, mile 57.7, and Bayou Dularge, mile 59.9; the Houma Navigation Canal at State Highway 661, mile 36.0; Bayou La Carpe at State Highway 661, mile 7.5; and Bayou Terrebonne at Daigleville, mile 35.5, need not open for the passage of vessels Monday through Friday except holidays, from 7 a.m. to 8:30 a.m. and 4:30 p.m. to 6 p.m. At all other times, the draws shall open promptly on signal.

§117.538 GIWW, Harvey Canal Route, mile 2.8, Harvey, La.

The draw shall open on signal except that from 6:30 a.m. to 8:30 a.m. and from 3:45 p.m. to 5:45 p.m., Monday through Friday excluding holidays, the draw need not open for the passage of vessels.

§117.540 Bridges in Louisiana where constant attendance is not required. (a) The draws of the bridges listed below shall:

(1) Open on signal from 5 a.m. to 9 p.m.

(2) Open on signal from 9 p.m. to 5 a.m. if at least 3 hours notice is given from October 1 through January 31.

(3) Open on signal from 9 p.m. to 5 a.m. if at least 12 hours notice is given from February 1 through September 30.

Bayou Teche, mile 3.9, S-182 highway drawbridge at Calumet.

Bayou Teche, mile 11.8, S-87 highway drawbridge at Centerville.

Bayou Teche, mile 17.2, S-3069 highway drawbridge at Franklin.

Bayou Teche, mile 19.8, S-322 highway drawbridge at Sterling.

Bayou Teche, mile 22.3, S-323 highway drawbridge at Oaklawn.

Bayou Teche, mile 27.0, S-87 highway drawbridge at Baldwin.

Bayou Teche, mile 32.5, S-324 highway drawbridge at Charenton.

Bayou Teche, mile 37.0, S-670 highway drawbridge at Adeline.

Bayou Teche, mile 38.9, S-318 highway drawbridge at Sorell.

Bayou Teche, mile 41.8, S-671 highway drawbridge at Jeanerette.

Bayou Teche, mile 43.5, S–671 highway drawbridge at Jeanerette.

Bayou Teche, mile 48.7, S-320 highway drawbridge at Olivier.

Bayou Teche, mile 52.5, S–37 highway drawbridge at New Iberia.

Bayou Teche, mile 53.0, S–86 highway drawbridge at New Iberia.

Bayou Teche, mile 53.3, S–3156 highway drawbridge at New Iberia.

Bayou Teche, mile 56.7, S-344 highway drawbridge at New Iberia.

Franklin Canal, mile 4.8, Chatsworth drawbridge at Franklin.

Lower Atchafalaya River, mile 26.8, S-182 highway drawbridge at Patterson.

(b) The draws of the bridges listed below shall:

(1) Open on signal from 5 a.m. to 9 p.m.

(2) Open on signal from 9 p.m. to 5 a.m. if at least 12 hours notice is given.

West Pearl River, mile 7.9, U.S. 90 highway drawbridge near Pearlington.

Bayou Liberty, mile 2.0, S-433 highway drawbridge at Slidell.

Bayou Bonfouca, mile 7.0, S-433 highway drawbridge at Slidell.

Amite River, mile 6.0, S-22 highway drawbridge at Clio.

Houma Canal, mile 1.7, U.S. 90 highway drawbridge at Houma.

Bayou Du Large, mile 23.2, S-315 highway drawbridge, near Theriot.

Bayou Boeuf, mile 7.3, S-307 highway drawbridge at Kraemer.

Bayou des Allemands, mile 13.9, S-631 highway drawbridge at Des Allemands.

Bayou Little (Petit) Caillou, mile 25.7, S-58 highway drawbridge at Sarah.

Bayou Little (Petit) Caillou, mile 26.6, S-56 highway (Smith River) drawbridge near Montegut.

Bayou Little (Petit) Caillou, mile 29.9, S-56 highway (Duplantis) drawbridge near Bourg.

Bayou Little (Petit) Caillou, mile 33.7, S-24 highway drawbridge at Petit Caillou.

Bayou Terrebonne, mile 33.9, S-3087 highway drawbridge at Prospect.

Vermilion River, mile 22.4, S-82 highway drawbridge at Perry.

Vermilion River, mile 25.4, S-14 highway drawbridge at Abbeville.

Vermilion River, mile 26.0, S-14 highway drawbridge at Abbeville.

Vermilion River, mile 34.2, S-82 highway drawbridge, three miles south of Milton.

Vermilion River, mile 37.6, S-92 highway drawbridge at Milton.

Vermilion River, mile 41.0, S-733 highway drawbridge at Eloi Broussard.

Vermilion River, mile 44.9, S-3073 highway drawbridge at New Flanders.

Bayou Teche, mile 58.0, S-353 highway drawbridge at New Iberia.

Bayou Teche, mile 60.0, S-94 highway drawbridge at Loreauville.

Bayou Teche, mile 61.0, MoPac railroad drawbridge at Loreauville.

Bayou Teche, mile 62.5, S-344 highway drawbridge at Loreauville.

Bayou Teche, mile 69.0, S-86 highway drawbridge at Daspit.

Bayou Teche, mile 77.7, St. Martin Sugar Cooperative railroad drawbridge at Levert.

Bayou Teche, mile 2.3, S-330 highway drawbridge at Delcambre.

Superior Oil Co. Canal, mile 6.3, S-82 highway drawbridge in Cameron Parish.

Bayou Patout, mile 0.4, S-83 highway drawbridge at Weeks.

(c) GIWW, mile 243.8, west of Harvey Canal Locks. When more than 50 feet vertical clearance is required, the draw shall open on signal if at least four hours notice is given to the Louisiana Department of Highways, District Maintenance Engineer, Lake Charles, Louisiana.

(d) In all other respects, the provisions of §117.240 of this part shall govern the operations of these bridges.

§117.548 Sabine Lake, Texas, S-82 bridge. The draw shall open on signal from 5 a.m. to 9 p.m. From 9 p.m. to 5 a.m., the draw shall open on signal if at least six hours notice is given to the Maintenance Construction Supervisor or the Maintenance Foreman, Port Arthur, Texas.

§117.550 Cedar Bayou, Texas, Missouri Pacific automated drawbridge. (a) The bridge need not be manned by a regular attendant.

(b) The lift span shall be maintained at a vertical clearance of 81.4 feet above mean high water. Fixed green navigation lights shall be displayed in the center of the lift span.

(c) When a train approaches the bridge, the navigation lights shall be changed from green to red, alternating flashing red lights shall be turned on, a horn shall be sounded for 6 minutes, and at the end of 6 minutes the horn shall be stopped and the draw may be lowered and locked if the scanning equipment does not detect any object under the span. If the scanning equipment detects an obstruction, the draw shall be raised until the obstruction is cleared.

(d) After a train has cleared the bridge, the draw shall be raised to 81.4 feet above mean high water, the flashing red lights shall be stopped, and the navigation lights shall be changed from red to green.

§117.552 Clear Creek, Texas, S-146 bridge. The draw shall open on signal, except that on Saturdays, Sundays, and holidays, from 8 a.m. to 8 p.m. the draw need open only every other 10 minutes if any vessels are waiting to pass.

§117.553 Pelican Island Causeway drawbridge, Galveston, Texas. (a) The draw shall open on signal except that from 7 a.m. to 8:30 a.m., 12 noon to 1 p.m. and 4:15 p.m. to 5:15 p.m., Monday through Saturday, except national holidays, the draw need not open for the passage of vessels.

(b) The draw shall open at any time for public vessels of the United States or vessels in distress. The opening signal is four blasts of a whistle or horn or by shouting.

(c) The owner of or agency controlling this bridge shall conspicuously post notices containing the provisions of this regulation on the upstream and downstream sides of the drawbridge or elsewhere in a manner that they may be easily read at all times from an approaching vessel.

§117.554 Victoria Channel, mile 29.4 near Bloo-

mington, Tex. (a) The bridge need not be manned by a regular attendant.

(b) The lift span is normally in the down position, providing a vertical clearance of 22 feet above mean high water.

(c) Three long blasts of a horn or whistle from an approaching vessel activates navigational approach detectors, located one-half mile upstream and downstream from the bridge. If the span is inoperable, these sound signals will activate an alarm to alert bridge maintenance crews.

(d) Interruption of the approach detector beams by a vessel will cause (1) the draw to open to the fully raised position of 50 feet above mean high water for 10 minutes, (2) a navigation warning siren to sound, (3) the navigation light in the center of the lift span to change from red to green, (4) the indicator lights, located one quarter mile of each side of the bridge, to change from red to yellow. However, if a train is approaching the bridge so closely that the train may not be safely stopped, the light will remain red and the bridge will not open until the train has passed.

(e) Interruption of the detector beam, located at the end of the bridge fender system will cancel the existing time intervals and start a new 10-minute interval during which the bridge will remain open. The span will not close until the vessel clears the detector located at the opposite end of the fender system, or the 10-minute interval elapses, whichever occurs earlier.

(f) If a vessel is unable to reach the detectors located on the outer ends of the fender system before the span closes, an additional signal of three long blasts of a horn or whistle will cause the span to reopen and initiate a new 10-minute interval.

(g) If the draw is in the open position for the passage of a vessel, and a train enters an approach circuit to the bridge, the bridge will remain open for 5 minutes if the detector beam has been interrupted. If the detector beam has not been interrupted the span will close at the end of the original 10-minute opening period and will not reopen in response to the additional signal described in paragraph (f). After the train passes, the span will open on signal for any waiting vessels.)

§117.555 Mississippi River and its navigable tributaries and outlets, including the Atchafalaya River, La., above Grand Lake; bridges. (a) The owner of or the agency controlling a drawbridge crossing a navigable water of the United States shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draw.

(b) The draw shall be opened promptly when the signal for the opening of the draw is received from an approaching vessel or other water craft which cannot pass under the closed draw, excepting when an approaching train is so close that it cannot be stopped safely before reaching the bridge or an approaching passenger or mail train is within sight or hearing of the bridge operator.

(c) Trains, vehicles, vessels, or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw, but all passage over the drawspan or through the draw opening shall be in a manner to expedite both land and water traffic.

(d) (Reserved).

(e) A vessel approaching to pass two or more bridges less than 800 feet apart shall signal the first and give the same signals for the second bridge after an interval of about 10 seconds, and so on, thus giving at intervals of about 10 seconds separate signals for each bridge to be passed. The operator of each bridge shall reply.

(f) When two or more vessels are approaching to pass a drawbridge from opposite directions, the person in charge of each vessel shall signal for the opening of the draw. The vessel running with the current shall have the right of way. At slack tide the vessel running in ebb current direction shall have right of way. The bridge operator shall reply.

(g) When vessels are approaching a bridge span or a draw from the same direction, each vessel shall signal independently for the opening of the draw and shall be navigated in accordance with the pilot rule applicable to the waterway governing such vessels.

(h) Special supplemental regulations may be prescribed to provide for closed or open periods when land or water traffic predominates and to provide for intermittent attendance of bridge operators on bridges across streams where water traffic is minor or at times nonexistent. Owners of or the agency controlling bridges for which such special supplemental regulations are prescribed will be required to keep a copy thereof posted in a conspicuous place on both the upstream and downstream sides of the bridges.

Note.–The special regulations contained in **§117.560,** prescribed where local conditions require to govern the operation of certain bridges, supplement the general regulations contained in **§117.555.**

§117.560 Mississippi River and its tributaries and outlets; bridges where constant attendance of draw tenders is not required. (a) The owners of or agencies controlling certain bridges will not be required to keep draw tenders in constant attendance. The bridges to which this section applies are listed, and the special regulations applicable in each case are set forth in paragraphs (f) and (g) of this section.

(b) Whenever a vessel unable to pass under a closed bridge desires to pass through the draw, advance notice, as specified, of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(c) Upon receipt of such advance notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owners of or agencies controlling the bridges shall keep conspicuously posted on both the upstream and downstream sides thereof, in such

manner that it can easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) The operating machinery of the draws shall be maintained in a serviceable condition, and the draws shall be opened and closed at intervals frequent enough to make certain that the machinery is in proper order for satisfactory operation.

(f) and (g) These bridges are not mentioned specifically in Coast Pilot 5.

Part 150.–Operations, Deepwater Ports (in part). For a complete description of this Part, see 33 CFR 150.

Subpart C-Vessel Navigation

§150.301 Applicability.

This subpart prescribes rules that–

(a) Apply to the navigation of all vessels at or near a deepwater port; and

(b) Describe vessel activities permitted and prohibited in a deepwater port safety zone.

Note: Appendix A to this part describes the designated boundaries of U.S. deepwater port safety zones and shipping safety fairways leading to those ports. Included within the safety zones are specific areas to be avoided, anchorages, and other ships' routing measures associated with particular safety zones.

§150.303 Definitions.

"Support vessel" means a tug, linehandling boat, crewboat, workboat, supply vessel, bunkering vessel, barge, or other similar vessel working for a licensee in connection with the operation of a deepwater port or cleared by a licensee to service a tanker calling at a deepwater port.

"Tanker" means a vessel that calls at a deepwater port to load or unload oil at a single point mooring (SPM).

§150.305 Ships' routing measures.

No licensee may operate a deepwater port unless the port has such ships' routing measures as prescribed or approved by the Coast Guard to provide for safe navigation at or near the deepwater port.

§150.307 Radar surveillance.

The Vessel Traffic Supervisor shall maintain radar surveillance of the safety zone whenever–

(a) A tanker is proceeding to the safety zone after submitting the report required in §150.335; or

(b) A tanker or support vessel is underway in the safety zone; or

(c) A vessel other than a tanker or support vessel is about to enter or is underway in the safety zone.

§150.309 Advisories to tankers.

(a) The Vessel Traffic Supervisor shall advise the master of each tanker underway in the safety zone of the tanker's position by range and bearing from the pumping platform complex (PPC) at intervals not to exceed 10 minutes.

(b) Whenever the Vessel Traffic Supervisor determines that a vessel may potentially interfere with the movement of a tanker in the safety zone, the Vessel Traffic Supervisor shall keep the master of the tanker informed of the position and estimated course and speed of the vessel as necessary to assist the tanker in navigation within the safety zone.

(c) Whenever a tanker enters the safety zone, the Vessel Traffic Supervisor shall advise the tanker of the position of each other vessel moored, anchored, or underway in the safety zone.

§150.311 Radio listening watch.

Whenever a tanker is in the safety zone, the Vessel Traffic Supervisor and the master of the tanker shall each continuously monitor the radio frequency designated in the Operation Manuals for use by tankers and support vessels underway at the port, except when transmitting on that frequency.

§150.313 Clearances for tankers.

(a) The Vessel Traffic Supervisor may not clear a tanker to enter the safety zone unless–

(1) Each other tanker underway in the safety zone is at least 5 miles from the tanker requesting clearance to enter the safety zone; and

(2) A Mooring Master is on board or ready to board at a position in the designated safety fairway that will permit completion of boarding before the tanker enters the safety zone.

(b) The Vessel Traffic Supervisor may not clear a tanker to moor at a SPM unless–

(1) There is a SPM berth available and the Vessel Traffic Supervisor has assigned that berth to the tanker;

(2) The visibility in the safety zone is at least two miles;

(3) All operating conditions prescribed in the Operation Manuals for mooring to a SPM have been met; and

(4) A Mooring Master and an Assistant Mooring Master are on board.

(c) The Vessel Traffic Supervisor may not clear a tanker to depart from a SPM unless the visibility in the safety zone is at least two miles and a Mooring Master is on board.

(d) No tanker may enter the safety zone or moor at or depart from a SPM, unless the master of the tanker has obtained clearance from the Vessel Traffic Supervisor, except as permitted by paragraph (e) of this section.

(e) A tanker may, in an emergency, for the protection of life or property, depart from a SPM without clearance from the Vessel Traffic Supervisor if the master advises the Vessel Traffic Supervisor of the circumstances, by radio, at the earliest possible moment.

§150.315 Clearances for support vessels.

(a) The Vessel Traffic Supervisor shall direct support vessel movements within the safety zone.

(b) The Vessel Traffic Supervisor may clear support vessels to enter or depart the safety zone at any point.

§150.317 Clearances for other vessels.

(a) When requested by the master of a vessel other than a tanker or support vessel, the Vessel Traffic Supervisor shall furnish information con-

cerning other vessels underway or moored in the safety zone.

(b) If the Vessel Traffic Supervisor determines that a vessel other than a tanker or support vessel may be standing into danger with respect to any vessel or part of the deepwater port installation in the safety zone, the Vessel Traffic Supervisor shall attempt to inform the master of that vessel by radio or other means.

(c) Except in situations involving force majeure, the Vessel Traffic Supervisor shall not clear a vessel other than a tanker or support vessel to enter the safety zone of a deepwater port for any purpose that would interfere with the purpose of the deepwater port; endanger the safety of life, property, or the environment; or otherwise be prohibited by regulation.

§150.333 Advance notice of arrival.

(a) The master of a tanker bound for a deepwater port shall report the following information to the Captain of the Port and the Vessel Traffic Supervisor of the port at least 24 hours before entering the safety zone at the port:

(1) The name, gross tonnage, and draft of the tanker.

(2) The type and amount of cargo on board.

(3) Any conditions on the vessel that may impair the navigation of the vessel, such as fire, malfunctioning propulsion machinery or steering equipment, or limitations on navigational or radiotelephone capabilities because of equipment or material malfunction.

(4) Any leaks, structural damage, or machinery malfunctions that may impair cargo transfer operations or cause a discharge of oil.

(5) The estimated time of arrival at the deepwater port safety zone.

(b) If the information reported in paragraph (a)(3), (a)(4), or (a)(5) of this section changes at any time before entering the safety zone, or while the tanker is in the safety zone, the master of the tanker shall report the changes to the Captain of the Port and Vessel Traffic Supervisor as soon as possible.

§150.335 Report before entering safety zone.

The master of a tanker bound for a deepwater port shall notify the Vessel Traffic Supervisor of the port when the tanker is 20 miles from the entrance to the safety zone.

§150.337 Navigation of tankers in the safety zone.

(a) A tanker must not enter or depart a safety zone except via a designated safety fairway, unless under force majeure.

(b) A tanker must not anchor in the safety zone except in a designated anchorage area unless under force majeure.

(c) Atanker underway in a safety zone must keep at least 5 miles behind any other tanker underway ahead of it in the safety zone.

(d) A tanker must not operate, anchor, or be moored in any area of the safety zone in which the net underkeel clearance would be less than 5 feet.

§150.338 Navigation of support vessels in the safety zone.

(a) A support vessel must not enter or move within the safety zone unless the movement is cleared by the Vessel Traffic Supervisor.

(b) A support vessel must not anchor in the safety zone, except in an anchorage area or for support vessel maintenance operations cleared by the Vessel Traffic Supervisor.

§150.339 Navigation of other vessels in the safety zone.

Vessels other than tankers or support vessels should not enter the safety zone of a deepwater port unless clearance has been obtained from the Vessel Traffic Supervisor.

§150.341 Mooring Master.

A tanker must not be underway in the safety zone unless a Mooring Master is on board.

Note: The Mooring Master advises the master of the tanker on operational and ship control matters that are peculiar to the specific deepwater port, such as navigational aids, depth and current characteristics of the maneuvering area, mooring equipment and procedures, and the port's vessel traffic control procedures.

§150.342 Assistant Mooring Master.

A tanker must not moor at an SPM unless an Assistant Mooring Master is on board.

Note: The Assistant Mooring Master is stationed on the forecastle of the tanker during mooring operations to assist the Mooring Master by reporting position approach data relative to the SPM and to advise the tanker personnel in handling of mooring equipment peculiar to the deepwater port.

§150.345 Regulated vessel activities.

(a) Vessel activities permitted and prohibited at deepwater ports, controls on those activities, and the specific safety zone areas in which the controls apply are listed in Table 150.345(a).

(b) A deepwater port licensee shall obtain the permission of the Captain of the Port having jurisdiction over that licensee's port before allowing any vessel activity at the port which is not listed in Table 150.345(a) or otherwise provided for in this subpart.

TABLE 150.345(a)

Regulated Vessel Activities at Deepwater Ports

Regulated Vessel Activities	*"Areas to be avoided" around each PPC and SPM*[1]	*Safety Zone* *Anchorage Area*	*Remaining portion of safety zone*
Tankers calling at Port	C	C	C
Support Vessel Movements	C	C	C
Transit by Vessels Other Than Tankers or Support Vessels	N	P	P
Mooring to SPM by Vessels Other Than Tankers or Support Vessels	F		

Anchoring by Vessels Other Than Tankers or Support Vessels	N	F or P	N
Fishing, including Bottom Trawl (Shrimping)	N	P	P
Mobile Drilling Operations or Erection of Structures[2]	N	N	N
Lightering/Transshipment[3]	N	N	N

1. The radius of areas to be avoided around each PPC is 600 meters and around each SPM is 500 meters.
2. Not part of Port Installation.
3. No person may transfer oil at a deepwater port by lighterage, except in bunkering operations, unless authorized by the Captain of the Port. (33 CFR 150.423(e).)

NOTE: The person in charge of any vessel planning to enter a safety zone should contact the port Vessel Traffic Supervisor on Channel 10 VHF-FM before entry and comply with that person's instructions.

KEY TO REGULATED ACTIVITIES
F-FORCE MAJEURE
N-NOT PERMITTED
C-TANKERS CALLING AT PORT AND SUPPORT VESSEL MOVEMENTS: PERMITTED WHEN CLEARED BY VESSEL TRAFFIC SUPERVISOR.
P-VESSELS OTHER THAN TANKERS OR SUPPORT VESSELS: PERMITTED WHEN NOT IN IMMEDIATE AREA OF TANKERS, CLEARANCE BY VESSEL TRAFFIC SUPERVISOR REQUIRED. COMMUNICATIONS WITH VESSEL TRAFFIC SUPERVISOR REQUIRED. FOR TRANSITING FOREIGN FLAG VESSELS, THE REQUIREMENT FOR CLEARANCE TO ENTER THE SAFETY ZONE IS ADVISORY IN NATURE.

Appendix A-Deepwater Port Safety Zone and Shipping Safety Fairway Boundaries

I. Purpose. This appendix contains a general description of the deepwater port safety zone and shipping safety fairways designated and developed during the license application review process for each deepwater port that has been authorized for construction and operation off the United States' coastline. Annexes show, to the nearest second of latitude and longitude, the geographical boundaries of each resultant safety zone and shipping fairway.

The regulations in Subpart C of this part concerning vessel navigation and activities permitted and prohibited at U.S. deepwater ports apply only in the safety zone areas and adjacent waters, and supplement the International Regulations for Preventing Collisions at Sea.

II. Authority. Section 10(d) of the Deepwater Port Act of 1974 (88 Stat. 2138 (33 U.S.C. 1509(d)) and Section 4(c) of the Ports and Waterways Safety Act, as amended, (33 U.S.C. 1223(c)); 49 CFR 1.46.

III. General. Deepwater port safety zones are established to promote safety of life and property, marine environmental protection and navigational safety at any deepwater port and adjacent waters. In a deepwater port safety zone no installations, structures, or uses that are incompatible with port operations are permitted. The configuration of each designated safety zone is depicted on current editions of the navigational charts that cover the deepwater port area.

IV. Modifications. Safety zone and shipping safety fairway boundaries are subject to modification as experience is gained in U.S. deepwater port operations. Modifications will be made only after due notification and consideration of the views of interested persons.

Annex A-LOOP, Inc. Deepwater Port, Gulf of Mexico

(a) Deepwater Port Safety Zone:

(1) Starting at: 28°55′23″N., 90°00′37″W.

(2) A rhumb line to: 28°53′50″N., 90°04′07″W.

(3) Then an arc with a 4,465 meter radius centered at the port pumping platform complex (PPC), 28°53′06″N., 90°01′30″W.

(4) To a point: 28°51′08″N., 89°59′55″W.

(5) Then a rhumb line to: 28°48′36″N., 89°55′00″W.

(6) Then a rhumb line to: 28°52′04″N., 89°52′42″W.

(7) Then a rhumb line to: 28°54′05″N., 89°56′38″W.

(8) Then a rhumb line to: 28°52′21″N., 89°57′47″W.

(9) Then a rhumb line to: 28°52′51″N., 89°58′46″W.

(10) Then an arc with a 4,465 meter radius centered again at the port, PPC, 28°53′06″N., 90°01′30″W.

(11) To the point of starting, 28°55′23″N., 90°00′37″W.

(b) Areas to be Avoided. The seven areas within the safety zone to be avoided are as follows:

(1) The area encompassed within a circle having a 600 meter radius around the port PPC and centered at: 28°53′06″N., 90°01′30″W.

(2) The six areas encompassed within a circle having a 500 meter radius around each single point mooring (SPM) at the port and centered at: 28°54′12″N., 90°00′37″W.; 28°53′16″N., 89°59′59″W.; 28°52′15″N., 90°00′19″W.; 28°51′45″N., 90°01′25″W.; 28°52′08″N., 90°02′33″W.; 28°53′07″N., 90°03′02″W.

(c) Anchorage Area. The area within the safety zone enclosed by rhumb lines joining points at: 28°52′21″N., 89°57′47″W.; 28°54′05″N., 89°56′38″W.; 28°52′04″N., 89°52′42″W.; 28°50′20″N., 89°53′51″W.; 28°52′21″N., 89°57′47″W.

(d) Shipping Safety Fairway to Safety Zone. The two mile wide areas enclosed by rhumb lines joining points at:

(1) North of Gulf Safety Fairway. 28°48′36″N., 89°55′00″W.; 28°48′14″N., 89°54′17″W.; 28°45′47″N., 89°54′19″W.; 28°36′06″N., 89°55′44″W.; 28°18′30″N., 89°55′15″W.; 28°20′58″N., 89°53′03″W.; 28°36′09″N., 89°53′28″W.; 28°49′07″N., 89°51′30″W.; 28°50′20″N., 89°53′51″W.

(2) South of Gulf Safety Fairway. 28°15′20″N.,

89°55′10″W.; 27°46′29″N., 89°54′23″W.; 27°46′32″N., 89°52′08″W.; 28°17′48″N., 89°52′58″W.

Part 160–Ports and Waterways Safety-General

Subpart A–General

§160.1 Purpose.

Part 160 contains regulations implementing the Ports and Waterways Safety Act (33 U.S.C. 1221) and related statutes.

§160.3 Definitions.

(a) For the purposes of this part:

(1) "Commandant" means the Commandant of the United States Coast Guard.

(2) "District Commander" means the officer of the Coast Guard designated by the Commandant to command a Coast Guard District described in 33 CFR 3.

(3) "Captain of the Port" means the Coast Guard officer commanding a Captain of the Port zone described in 33 CFR 3.

(4) "Person" means an individual, firm, corporation, association, partnership, or governmental entity.

(5) "State" means each of the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Trust Territories of the Pacific Islands, the Commonwealth of the Northern Marianas Islands, and any other commonwealth, territory, or possession of the United States.

(6) "Vessel" means every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water.

(7) "Vehicle" means every type of conveyance capable of being used as a means of transportation on land.

§160.5 Delegations.

(a) District Commanders and Captains of the Ports are delegated the authority to establish safety zones.

(b) Under the provisions of 33 CFR 6.04-1 and 6.04-6, District Commanders and Captains of the Ports have been delegated authority to establish security zones.

(c) Under the provisions 33 CFR §1.05-1, District Commanders have been delegated authority to establish regulated navigation areas.

(d) Under the direction of the Captain of the Port Honolulu, the Commander, Marianas Section, may exercise the authority of a Captain of the Port within the waters surrounding Guam, and the Commonwealth of Marianas, all of which are in the Honolulu Captain of the Port Zone.

§160.7 Appeals.

(a) Any person directly affected by a safety zone or an order or direction issued under this subchapter (33 CFR Subchapter P) may request reconsideration by the official who issued it or in whose name it was issued. This request may be made orally or in writing, and the decision of the official receiving the request may be rendered orally or in writing.

(b) Any person directly affected by the establishment of a safety zone or by an order or direction issued by, or on behalf of, a Captain of the Port may appeal to the District Commander through the Captain of the Port. The appeal must be in writing, except as allowed under paragraph (d) of this section, and shall contain complete supporting documentation and evidence which the appellant wishes to have considered. Upon receipt of the appeal, the District Commander may direct a representative to gather and submit documentation or other evidence which would be necessary or helpful to a resolution of the appeal. A copy of this documentation and evidence is made available to the appellant. The appellant is afforded five working days from the date of receipt to submit rebuttal materials. Following submission of all materials, the District Commander issues a ruling, in writing, on the appeal. Prior to issuing the ruling, the District Commander may, as a matter of discretion, allow oral presentation on the issues.

(c) Any person directly affected by the establishment of a safety zone or by an order or direction issued by a District Commander, or who receives an unfavorable ruling on an appeal taken under paragraph (b) of this section, may appeal through the District Commander to the Chief, Office of Marine Environment and Systems, U.S. Coast Guard, Washington, D.C. 20593. The appeal must be in writing, except as allowed under paragraph (d) of this section. The District Commander forwards the appeal, all the documents and evidence which formed the record upon which the order or direction was issued or the ruling under paragraph (b) of this section was made, and any comments which might be relevant, to the Chief, Office of Marine Environment and Systems. A copy of this documentation and evidence is made available to the appellant. The appellant is afforded five working days from the date of receipt to submit materials to the Chief, Office of Marine Environment and Systems. The decision of the Chief, Office of Marine Environment and Systems is based upon the materials submitted, without oral argument or presentation. The decision of the Chief, Office of Marine Environment and Systems is issued in writing and constitutes final agency action.

(d) If the delay in presenting a written appeal would have significant adverse impact on the appellant, the appeal under paragraphs (b) and (c) of this section may initially be presented orally. If an initial presentation of the appeal is made orally, the appellant must submit the appeal in writing within five days of the oral presentation to the Coast Guard official to whom the presentation was made. The written appeal must contain, at a minimum, the basis for the appeal and a summary of the material presented orally. If requested, the official to whom the appeal is directed may stay the effect of the action while the ruling is being appealed.

Subpart B–Control of Vessel and Facility Operations.

§160.101 Purpose.

This subpart describes the authority exercised by District Commanders and Captains of the Ports to insure the safety of vessels and waterfront facilities, and the protection of the navigable waters and the resources therein. The controls described in this subpart are directed to specific situations and hazards.

§160.103 Applicability.

(a) This subpart applies to any-

(1) Vessel on the navigable waters of the United States, except as provided in paragraphs (b) and (c) of this section;

(2) Bridge or other structure on or in the navigable waters of the United States; and

(3) Land structure or shore area immediately adjacent to the navigable waters of the United States.

(b) This subpart does not apply to any vessel on the Saint Lawrence Seaway.

(c) Except pursuant to international treaty, convention, or agreement, to which the United States is a party, this subpart does not apply to any foreign vessel that is not destined for, or departing from, a port or place subject to the jurisdiction of the United States and that is in-

(1) Innocent passage through the territorial sea of the United States;

(2) Transit through the navigable waters of the United States which form a part of an international strait.

§160.105 Compliance with orders.

Each person who has notice of the terms of an order issued under this subpart must comply with that order.

§160.107 Denial of entry.

Each District Commander or Captain of the Port, subject to recognized principles of international law, may deny entry into the navigable waters of the United States or to any port or place under the jurisdiction of the United States, and within the district or zone of that District Commander or Captain of the Port, to any vessel not in compliance with the provisions of the Port and Tanker Safety Act (33 U.S.C. 1221-1232) or the regulations issued thereunder.

§160.109 Waterfront facility safety.

(a) To prevent damage to, or destruction of, any bridge or other structure on or in the navigable waters of the United States, or any land structure or shore area immediately adjacent to those waters, and to protect the navigable waters and the resources therein from harm resulting from vessel or structure damage, destruction, or loss, each District Commander or Captain of the Port may-

(1) Direct the handling, loading, unloading, storage, stowage, and movement (including the emergency removal, control, and disposition) of explosives or other dangerous articles and substances, including oil or hazardous material as those terms are defined in Section 4417a of the Revised Statutes, as amended, (46 U.S.C. 391a) on any structure on or in the navigable waters of the United States, or any land structure or shore area immediately adjacent to those waters; and

(2) Conduct examinations to assure compliance with the safety equipment requirements for structures.

§160.111 Special orders applying to vessel operations.

Each District Commander or Captain of the Port may order a vessel to operate or anchor in the manner directed when–

(a) The District Commander or Captain of the Port has reasonable cause to believe that the vessel is not in compliance with any regulation, law or treaty;

(b) The District Commander or Captain of the Port determines that the vessel does not satisfy the conditions for vessel operation and cargo transfers specified in §160.113; or

(c) The District Commander or Captain of the Port has determined that such order is justified in the interest of safety by reason of weather, visibility, sea conditions, temporary port congestion, other temporary hazardous circumstances, or the condition of the vessel.

§160.113 Prohibition of vessel operation and cargo transfers.

(a) Each District Commander or Captain of the Port may prohibit any vessel subject to the provisions of section 4417a of the Revised Statutes (46 U.S.C. 391a) from operating in the navigable waters of the United States, or from transferring cargo or residue in any port or place under the jurisdiction of the United States, and within the district or zone of that District Commander or Captain of the Port, if the District Commander or the Captain of the Port determines that the vessel's history of accidents, pollution incidents, or serious repair problems creates reason to believe that the vessel may be unsafe or pose a threat to the marine environment.

(b) The authority to issue orders prohibiting operation of the vessels or transfer of cargo or residue under paragraph (a) of this section also applies if the vessel:

(1) Fails to comply with any applicable regulation;

(2) Discharges oil or hazardous material in violation of any law or treaty of the United States;

(3) Does not comply with applicable vessel traffic service requirements;

(4) While underway, does not have at least one licensed deck officer on the navigation bridge who is capable of communicating in the English language.

(c) When a vessel has been prohibited from operating in the navigable waters of the United States under paragraphs (a) or (b) of this section, the District Commander or Captain of the Port may allow provisional entry into the navigable waters of the United States, or into any port or place under the jurisdiction of the United States and within the district or zone of that District Commander or Captain of the Port, if the owner or operator of such vessel proves to the satisfaction of the District

Commander or Captain of the Port, that the vessel is not unsafe or does not pose a threat to the marine environment, and that such entry is necessary for the safety of the vessel or the persons on board.

(d) A vessel which has been prohibited from operating in the navigable waters of the United States, or from transferring cargo or residue in a port or place under the jurisdiction of the United States under the provisions of paragraph (a) or (b)(1), (2), or (3) of this section, may be allowed provisional entry if the owner or operator proves, to the satisfaction of the District Commander or Captain of the Port that has jurisdiction, that the vessel is no longer unsafe or a threat to the environment, and that the condition which gave rise to the prohibition no longer exists.

§160.115 Withholding of clearance.

(a) Each District Commander or Captain of the Port may request the Secretary of the Treasury, or the authorized representative thereof, to withhold or revoke the clearance required by 46 U.S.C. 91 of any vessel, the owner or operator of which is subject to any penalties under 33 U.S.C. 1232.

Subpart C–Notifications of Arrivals, Departures, Hazardous Conditions, and Certain Dangerous Cargoes

§160.201 Applicability and exceptions to applicability.

(a) This subpart prescribes notification requirements for U.S. and foreign vessels bound for or departing from ports or places in the United States.

(b) This subpart does not apply to boats under the Federal Boat Safety Act of 1971 (46 U.S.C. 1451, et seq.) and, except §160.215, does not apply to passenger and supply vessels when they are employed in the exploration for or in the exploitation of oil, gas, or mineral resources on the continental shelf.

(c) Sections 160.207 and 160.209 do not apply to the following:

(1) Each vessel of less than 1,600 gross tons.

(2) Each vessel operating exclusively within a Captain of the Port zone.

(3) Each vessel operating upon a route that is described in a schedule that is submitted to the Captain of the Port for each port or place of destination listed in the schedule at least 24 hours in advance of the first date and time of arrival listed on the schedule and contains:

(i) Name, country of registry, and call sign or official number of the vessel;

(ii) Each port or place of destination; and

(iii) Dates and times of arrivals and departures at those ports or places.

(4) Each vessel arriving at a port or place under force majeure.

(5) Each vessel entering a port of call in the United States in compliance with the Automated Mutual Assistance Vessel Rescue System (AMVER).

(6) Each vessel entering a port of call in the United States in compliance with the U.S. Flag Merchant Vessel Locator Filing System (USMER).

(7) Each barge.

(8) Each public vessel.

(9) United States or Canadian flag vessels, except tank vessels or vessels carrying certain dangerous cargo, which operate solely on the Great Lakes.

(d) Sections 160.207, 160.211, and 160.213 apply to each vessel upon the waters of the Mississippi River between its mouth and mile 235, Lower Mississippi River, above Head of Passes. Sections 160.207, 160.211, and 160.213 do not apply to each vessel upon the waters of the Mississippi River between its sources and mile 235, above Head of Passes, and all the tributaries emptying thereinto and their tributaries, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway, and the Red River of the North.

§160.203 Definitions.

As used in this subpart:

"Agent" means any person, partnership, firm, company or corporation engaged by the owner or charterer of a vessel to act in their behalf in matters concerning the vessel.

"Carried in bulk" means a commodity that is loaded or carried on board a vessel without containers or labels and received and handled without mark or count.

"Certain dangerous cargo" includes any of the following:

(a) Class A explosives, as defined in 46 CFR 146.20–7 and 49 CFR 173.53.

(b) Oxidizing materials or blasting agents for which a permit is required under 49 CFR 176.415.

(c) Large quantity radioactive material, as defined in 49 CFR 173.389(b), or Fissile Class III shipments of fissile radioactive material, as defined in 49 CFR 173.389 (a)(3).

(d) Each cargo under Table 1 of 46 CFR Part 153 when carried in bulk.

(e) Any of the following when carried in bulk:

Acetaldehyde
Ammonia, anhydrous
Butadiene
Butane
Butene
Butylene Oxide
Chlorine
Ethane
Ethylene
Ethylene Oxide
Methane
Methyl Acetylene, Propadiene Mixture, Stabilized
Methyl Bromide
Methyl Chloride
Phosphorous, elemental
Propane
Propylene
Sulfur Dioxide
Vinyl Chloride

"Great Lakes" means Lakes Superior, Michigan, Huron, Erie, and Ontario, their connecting and tributary waters, the Saint Lawrence River as far east as Saint Regis, and adjacent port areas.

"Hazardous conditions" means any condition that could adversely affect the safety of any vessel, bridge, structure, or shore area or the environmental quality of any port, harbor, or navigable water of the United States. This condition could include but is not limited to, fire, explosion, grounding, leakage, damage, illness of a person on board, or a manning shortage.

"Port or place of departure" means any port or place in which a vessel is anchored or moored.

"Port or place of destination" means any port or place to which a vessel is bound to anchor or moor.

"Public vessel" means a vessel owned by and being used in the public service of the United States. This definition does not include a vessel owned by the United States and engaged in a trade or commercial service or a vessel under contract or charter to the United States.

§160.205 Waivers.

The Captain of the Port may waive, within that Captain of the Port's designated zone, any of the requirements of this subpart for any vessel or class of vessels upon finding that the vessel, route, area of operations, conditions of the voyage, or other circumstances are such that application of this subpart is unnecessary or impractical for purposes of safety, environmental protection, or national security.

§160.207 Notice of arrival: Vessels bound for ports or places in the United States.

(a) The owner, master, agent or person in charge of a vessel on a voyage of 24 hours or more shall report under paragraph (c) of this section at least 24 hours before entering the port or place of destination.

(b) The owner, master, agent, or person in charge of a vessel on a voyage of less than 24 hours shall report under paragraph (c) of this section before departing the port or place of departure.

(c) The Captain of the Port of the port or place of destination in the United States must be notified of–

(1) The name and country of registry of the vessel;

(2) The name of the port or place of departure;

(3) The name of the port or place of destination; and

(4) The estimated time of arrival at the port or place.

If the estimated time of arrival changes by more than six hours from the latest reported time, the Captain of the Port must be notified of the correction as soon as the change is known.

§160.209 Notice of arrival: Vessels bound from the high seas for ports or places on the Great Lakes.

In addition to complying with the requirements of §160.207, the owner, master, agent, or person in charge of a vessel bound from the high seas for any port or place of destination on the Great Lakes shall notify the Commander, Ninth Coast Guard District, at least 24 hours before arriving at the Snell Locks, Massena, New York of–

(a) The name and country of registry of the vessel; and

(b) The estimated time of arrival at the Snell Locks, Massena, New York.

§160.211 Notice of arrival: Vessels carrying certain dangerous cargo.

(a) The owner, master, agent, or person in charge of a vessel, except a barge, bound for a port or place in the United States carrying a certain dangerous cargo shall notify the Captain of the Port of the port or place of destination at least 24 hours before entering that port or place of–

(1) The name and country of registry of the vessel;

(2) The location of the vessel at the time of the report;

(3) The name of each certain dangerous cargo carried;

(4) The amount of each certain dangerous cargo carried;

(5) The stowage location of each certain dangerous cargo;

(6) The operational condition of the equipment under 33 CFR 164.35;

(7) The name of the port or place of destination; and

(8) The estimated time of arrival at that port or place. If the estimated time of arrival changes by more than six hours from the latest reported time, the Captain of the Port must be notified of the correction as soon as the change is known.

(b) The owner, master, agent, or person in charge of a barge bound for a port or place in the United States carrying certain dangerous cargo shall report the information required in paragraph (a)(1) through (a)(8) of this section to the Captain of the Port of the port or place of destination at least 4 hours before entering that port or place.

§160.213 Notice of departure: Vessels carrying certain dangerous cargo.

(a) The owner, master, agent, or person in charge of a vessel, except a barge, departing from a port or place in the United States for any other port or place and carrying a certain dangerous cargo shall notify the Captain of the Port of the port or place of departure at least 24 hours before departing, unless this notification was made within 2 hours after the vessel's arrival of:

(1) The name and country of registry of the vessel;

(2) The name of each certain dangerous cargo carried;

(3) The amount of each certain dangerous cargo carried;

(4) The stowage location of each certain dangerous cargo carried;

(5) The operational condition of the equipment under 33 CFR 164.35;

(6) The name of the port or place of departure; and

(7) The estimated time of departure from the port or place.

If the estimated time of departure changes by more than six hours from the latest reported time,

the Captain of the Port must be notified of the correction as soon as the change is known.

(b) The owner, master, agent, or person in charge of a barge departing from a port or place in the United States for any other port or place and carrying a certain dangerous cargo shall report the information required in paragraph (a)(1) through (a)(7) of this section to the Captain of the Port of the port or place of departure at least 4 hours before departing unless this report was made within 2 hours after the barge's arrival.

§160.215 Notice of hazardous conditions.

Whenever there is a hazardous condition on board a vessel, the owner, master, agent, or person in charge shall immediately notify the Captain of the Port of the port or place of destination and the Captain of the Port of the port or place in which the vessel is located of the hazardous condition.

Part 161–Vessel Traffic Management

Subpart A–(Reserved)

Subpart B–Vessel Traffic Services

New Orleans Vessel Traffic Service

§161.401 Purpose and applicability. (a) Sections 161.401 and 161.402 prescribe rules for vessel operation in the New Orleans Vessel Traffic Service Area (VTS Area) to prevent collisions and groundings and to protect the navigable waters of the VTS Area from environmental harm resulting from collisions and groundings.

§161.402 Vessel operation. (a) Mississippi River below Baton Rouge, La., including South and Southwest Passes-

(1) Supervision. The use, administration and navigation of the waterways to which this paragraph applies shall be under the supervision of the District Commander, Eight Coast Guard District.

(2) Speed; high-water precautions. When passing another vessel (in motion, anchored, or tied up), a wharf or other structure, work under construction, plant engaged in river and harbor improvement, levees withstanding flood waters, buildings partially or wholly submerged by high water, or any other structure liable to damage by collision, suction or wave action, vessels shall give as much leeway as circumstances permit and reduce their speed sufficiently to preclude causing damages to the vessel or structure being passed. Since this subparagraph pertains directly to the manner in which vessels are operated, masters of vessels shall be held responsible for strict observance and full compliance therewith. During high river stages, floods, or other emergencies, the District Commander may prescribe by navigation bulletins or other means the limiting speed on land miles per hour deemed necessary for the public safety for the entire section or any part of the waterways covered by this paragraph and such limiting speed shall be strictly observed.

(3) Towing. Towing in any formation by a vessel with insufficient power to permit ready maneuverability and safe handling is prohibited.

(b) Movement of vessels in vicinity of Algiers Point, New Orleans Harbor-

(1) Control lights. When the Mississippi River reaches 8 feet on the Carrollton Gage on a rising stage, and until the gage reads 9 feet on a falling stage, the movement of all tugs with tows and all ships, whether under their own power or in tow, but excluding tugs or towboats without tows or river craft of comparable size and maneuverability operating under their own power, in the vicinity of Algiers Point shall be governed by red and green lights designated and located as follows: Governor Nicholls Light located on the left descending bank on the wharf shed at the upstream end of Esplanada Avenue Wharf, New Orleans, approximately 94.3 miles above Head of Passes; and Gretna Light located on the right descending bank on top of the levee at the foot of Ocean Avenue, Gretna, approximately 96.6 miles above Head of Passes. Governor Nicholls Light has lights visible from both upstream and downstream, and Gretna Light has lights visible from upstream, all indicating by proper color the direction of traffic around Algiers Point. From downstream, Gretna Light always shows green. All lights are visible throughout the entire width of the river and flash once every second. A green light displayed ahead of a vessel (in the direction of travel) indicates that Algiers Point is clear and the vessel may proceed. A red light displayed ahead of a vessel (in the direction of travel) indicates that Algiers Point is not clear and the vessel shall not proceed. Absence of lights shall be considered a danger signal and no attempt shall be made to navigate through the restricted area.

(2) Ascending vessels. Ascending vessels shall not proceed farther up the river than a line connecting the upper end of Atlantic Street Discharge Light (on right descending bank) with the lower end of Desire Street Wharf (on left descending bank) when a red light is displayed. Vessels waiting for a change of signal shall keep clear of descending vessels.

(3) Descending vessels. (i) Descending vessels shall not proceed farther down the river than a line connecting the lower end of Julia Street Wharf (on left descending bank) with the vertical flagpole at Eastern Associated Terminals (on right descending bank) when a red light is displayed. Vessels shall round to and be headed upstream before they reach that line, if the signal remains against the vessel. Vessels waiting for a change of signal shall keep clear of ascending vessels.

(ii) Vessels destined to a wharf above the lower end of Julia Street Wharf shall signal the Gretna towerman three long blasts and one short blast of a whistle or horn to indicate that the vessel is not bound below the Julia Street Wharf.

(iii) The master, pilot, or authorized representative of any vessel scheduled to depart from a wharf between Governor Nicholls Light and Louisiana Avenue, bound downstream around Algiers Point, shall communicate with the Governor Nicholls Light towerman by telephone to determine whether the channel at Algiers Point is clear before depar-

ture. When the point is clear, vessels shall then proceed promptly so that other traffic will not be unnecessarily delayed.

NOTE.– Telephone numbers of both signal towers will be published in navigation bulletins in advance of each operating period.

(4) Minor changes. The District Commander is authorized to waive operation or suspension of the lights whenever prospective river stages make it appear that the operation or suspension will be required for only a brief period of time or when river stages will rise or fall below the critical stage which is established for operation or suspension by only a few tenths on the Carrollton Gage.

(5) Underpowered vessels. When the Carrollton Gage reads 12 feet or higher, any vessel which is considered by the master or pilot as being underpowered or a poor handler shall not navigate around Algiers Point without the assistance of a tug or tugs.

(6) Towing. When the Carrollton Gage reads 12 feet or higher, towing on a hawser in a downstream direction between Julia Street and Desire Street is prohibited except by special permission of the District Commander.

(c) Navigation of South and Southwest Passes.

(1) No vessel, except small craft and towboats and tugs without tows, shall enter either South Pass or Southwest Pass from the Gulf until after any descending vessel which has approached within two and one-half (2½) miles of the outer end of the jetties and visible to the ascending vessel shall have passed to sea.

(2) No vessel having a speed of less than ten mph shall enter South Pass from the Gulf when the stage of the Mississippi River exceeds 15 feet on the Carrollton Gage at New Orleans. This paragraph does not apply when Southwest Pass is closed to navigation.

(3) No vessel, except small craft and towboats and tugs without tows, ascending South Pass shall pass Franks Crossing Light until after a descending vessel shall have passed Depot Point Light.

(4) No vessel, except small craft and towboats and tugs without tows, shall enter the channel at the head of South Pass until after an ascending vessel which has reached Franks Crossing Light shall have passed through into the river.

(5) When navigating South Pass during periods of darkness no tow shall consist of more than one towed vessel other than small craft, and during daylight hours no tow shall consist of more than two towed vessels other than small craft. Tows may be in any formation. When towing on a hawser, the hawser shall be as short as practicable to provide full control at all times.

(6) When towing in Southwest Pass during periods of darkness no tow shall consist of more than two towed vessels other than small craft, and during daylight hours no tow shall consist of more than three towed vessels other than small craft.

Berwick Bay Vessel Traffic Service

GENERAL RULES

§161.701 Purpose and applicability.

(a) Sections 161.701 through 161.783 prescribe rules for vessel operations in the Berwick Bay (Morgan City, Louisiana) Vessel Traffic Service (VTS) Area to prevent collisions, rammings, and groundings and to protect the navigable waters of the VTS Area from environmental harm resulting from collisions, rammings, and groundings.

(b) The General Rules in §§161.701 through 161.717, except the requirement in §161.709 to have a VTS operating manual, apply to the operations of all vessels.

(c) The requirements in §161.709 to have a VTS operating manual, the Communications Rules in §§161.721 through 161.729, and the Reporting Rules in §§161.735 through 161.749 apply to the operation of all vessels subject to the Vessel Bridge-to-Bridge Radiotelephone Regulations in 33 CFR 26.

(d) In addition to the vessels under paragraph (c) of this section, §161.725 on use of English language in reports, §161.735 on means of reporting, §161.739 on initial reports, and §161.749 on deviations from the reported route apply to the operation of–

(1) Recreational vessels less than 300 gross tons intending to transit under the lift span of the Southern Pacific Railroad (SPRR) bridge; and

(2) Commercial vessels not subject to the Vessel Bridge-to-bridge Radiotelephone Regulations in 33 CFR 26.

§161.703 Definitions.

As used in §§161.701 through 161.783:

"Available horsepower" means the total horsepower output of all operating propulsion equipment on all vessels engaged in a single towing operation.

"Cargo of particular hazard" means cargo consisting of commodity listed in 33 CFR 126.10.

"Integrated tow" means a tow consisting of specially designed barges that fit to each other and to the towing vessel as one unit.

"Master" means licensed master or operator or, on vessels not required to have a licensed master or operator, the person in command of the vessel.

"Overall length" means the combined length in feet of the towing vessel or vessels and the tow.

"Person" includes an individual, firm, corporation, association, partnership, or government entity.

"SPRR bridge" means the Southern Pacific Railroad bridge across Berwick Bay between the cities of Berwick and Morgan City, Louisiana.

"Vessel Traffic Center" or "VTC" means the shore based facility that operates the Berwick Bay Vessel Traffic Service or the Commanding Officer of the facility, or that person's authorized representative, depending upon the context in which the term is used.

"Vessel Traffic Service Area" or VTS Area" means the area described in §161.781.

§161.705 Vessel operations in the VTS Area.

Except under §161.715 (authorized deviations) and §161.717 (emergencies), no person may cause or authorize the operation of a vessel in the VTS Area contrary to the rules in §§161.701 through 161.783.

§161.707 Laws and regulations not affected.

Nothing in §§161.701 through 161.783 is intended to relieve any person from complying with–

(a) The Inland Navigational Rules Act of 1980 (33 U.S.C. 2001 through 2072);

(b) The technical annexes to the Inland Navigational Rules (Parts 84 through 88 of this chapter);

(c) Vessel Bridge-to-bridge Radiotelephone Regulations (Part 26 of this chapter);

(d) Subtitle II of Title 46, United States Code, "Shipping"; and

(e) Any other law or regulation.

§161.709 VTS Operating Manual.

The master of a vessel shall ensure that a copy of the current edition of the Berwick Bay Vessel Traffic Service Operating Manual is available on board the vessel when it is in the VTS Area.

Note.–"Berwick Bay VTS Operating Manual" includes the VTS regulations and navigation information. The manual is available from the Commander, Eighth Coast Guard District (m), Hale Boggs Federal Building, 500 Camp Street, New Orleans, Louisiana 70130 or from the Commanding Officer, Berwick Bay Vessel Traffic Service, 800 David Dr., Rm. 255, Morgan City, Louisiana 70380.

§161.711 VTC directions.

(a) During conditions of vessel congestion, adverse weather, reduced visibility, or other hazardous circumstances in the VTS Area, the VTC may issue directions to control and supervise traffic and may specify times when vessels may enter, move within or through, or depart from ports, harbors, or other waters in the VTS Area.

(b) Whenever the VTC determines that a vessel in the VTS Area is navigating in an unsafe manner or with improperly functioning equipment, the VTC may direct the vessel's movement or direct it to anchor or moor.

(c) The master of a vessel in the VTS Area shall comply with each direction issued to the vessel under this section.

§161.713 Obstructing navigable channels.

Mooring in, anchoring in, or otherwise obstructing a navigable channel in any way is prohibited without first obtaining permission to do so from the VTC.

§161.715 Authorization to deviate from these rules.

The Captain of the Port, New Orleans, may, upon written request, issue an authorization to deviate from any rule in §§161.701 through 161.783 if that officer finds that the proposed operation can be done safely. A request for an authorization must state the need for the deviation and describe the proposed operation.

§161.717 Emergencies.

In an emergency, any master may deviate from any rule in §§161.701 through 161.783 to the extent necessary to avoid endangering persons, property or the marine environment.

COMMUNICATIONS RULES

§161.721 Radiotelephone listening watch.

The master of a vessel required to make the reports under §§161.739 through 161.749 only by radiotelephone shall ensure that a continuous listening watch is maintained on the frequency designated in the current edition of the Berwick Bay VTS Operating Manual, except when transmitting on that frequency.

§161.723 Radiotelephone reports.

Each report under §§161.739 through 161.749 made by radiotelephone must be made on the frequency designated in the current edition of the Berwick Bay VTS Operating Manual.

§161.725 English language.

Each report required by §§161.701 through 161.783 must be made in the English language.

§161.729 Radiotelephone equipment failure.

(a) Whenever a vessel's radiotelephone equipment fails, compliance with the following is not required:

(1) Section 161.721 on maintaining a listening watch.

(2) Sections 161.739 through 161.749 on reporting, unless those reports can be made by other reasonable means.

(b) Whenever a vessel's radiotelephone equipment fails, permission to proceed must first be obtained from the VTC if the vessel is:

(1) Intending to transit the lift span of the SPRR bridge.

(2) Getting underway from within the VTS Area; or

(3) Transiting any portion of the Intracoastal Waterway between Mile 93 West of Harvey Lock (WHL) and Mile 99 WHL.

(c) The master of a vessel shall ensure that the radiotelephone equipment is restored to operating condition as soon as possible.

REPORTING RULES

§161.735 Means of reporting.

(a) Reports under §§161.739 through 161.749 must be made only by radiotelephone, except as provided under paragraph (b) of this section.

(b) Vessels not subject to the Vessel Bridge-to-Bridge Radiotelephone regulations in 33 CFR 26 may make initial reports under §161.739 and deviation reports under §161.749 by radiotelephone, telephone ((504) 385-2462), or other reasonable means.

§161.739 Initial report.

When a vessel enters or begins to navigate in the VTS Area, the master of the vessel shall report the following information to the VTC:

(a) Name of the vessel.

(b) Type of vessel (towing, fishing, supply, etc.).

(c) Location of the vessel.

(d) Route within the VTS Area.

(e) Any cargo of particular hazard that is on board the vessel or any vessel being towed.

(f) Any impairment to the operation of the vessel as described in §161.747.

(g) If towing is involved, available horsepower and overall length of the vessels.

§161.743 Movement reports.

(a) When a vessel passes a reporting point in §161.783, other than when entering or leaving the VTS Area, the master of the vessel shall report the following information to the VTC:

(1) Name of the vessel.

(2) Name of the reporting point.

(3) If towing is involved, any revision to the available horsepower and overall length information given in the initial report under §161.739(g).

(b) A movement report is required at the Berwick Reporting Point only for vessels passing through the lock.

§161.745 Final report.

When a vessel anchors in, moors in, or departs from the VTS Area, the master shall report to the VTC the name of the vessel and place of anchoring, mooring, or departure.

§161.747 Report of equipment impairment.

The master of a vessel in the VTS Area shall report to the VTC as soon as possible–

(a) Any condition on the vessel that may impair its safe navigation, such as fire or a defect in propulsion machinery, steering equipment, radar, or gyrocompass;

(b) Any tow that the towing vessel is unable to control or can control only with difficulty;

(c) When involved in a collision, ramming, or grounding; and

(d) Any radiotelephone equipment failure.

§161.749 Deviation report.

(a) Except in an emergency, the master of a vessel in the VTS Area shall report each deviation from the route reported in the initial report under §161.739(d) before making the deviation.

(b) Whenever a vessel in the VTS Area deviates, because of an emergency, from the route reported in the initial report under §161.739(d) or from any provision in §§161.701 through 161.783, the master of the vessel shall report the deviations to the VTC as soon as possible.

HIGH WATER TOWING LIMITATIONS

§161.761 Applicability.

The high water towing limitations (§§161.761 through 161.770) apply to the operation of vessels with tows intending to transit under the lift span of the SPRR bridge, or through the navigational openings of either of the two U.S. 90 highway bridges to the north of the SPRR bridge, when those limitations are in effect.

§161.762 Precautionary notices.

(a) Whenever the Morgan City River Gauge reads 2.5 feet above mean sea level and the Coast Guard Captain of the Port, New Orleans, or that person's authorized representative, anticipates that the water level will rise to 3 or more feet above mean sea level, the VTC issues precautionary notices that the high water towing limitations may soon go into effect.

(b) Precautionary notices are–

(1) Announced during Coast Guard Marine Information Broadcasts;

(2) Published in Coast Guard Local Notices to Mariners;

(3) Announced by the VTC in response to initial reports; and

(4) Available by calling the VTC at (504) 385-2462 or on the frequency designated in the current edition of the Berwick Bay VTS Operating Manual.

(c) Precautionary notices are given throughout the period during which the conditions in paragraph (a) of this section exist.

(d) During the period when the water level falls below 3 feet above mean sea level on the Morgan City River Gauge but remains at or about 2.5 feet, precautionary notices are issued only if the Coast Guard Captain of the Port, New Orleans, of that person's authorized representative, anticipates that the decrease in the level below 3 feet is only temporary.

§161.764 When limitations are in effect.

(a) The high water towing limitations are in effect when two vertically arranged red balls by day and two vertically arranged flashing white lights by night are displayed on top of the SPRR bridge.

(b) The VTC posts the visual displays under paragraph (a) of this section when the Morgan City River Gauge reads 3 or more feet above mean seal level.

(c) The VTC discontinues the visual displays under paragraph (a) of this section when the Morgan City River Gauge reads less than 3 feet above mean sea level.

§161.765 Notice of when limitations are in effect.

(a) In addition to the notice provided by the visual displays under §161.764(a), notice of when limitations are in effect is–

(1) Announced during Coast Guard Marine Information Broadcasts;

(2) Published in Coast Guard Local Notices to Mariners;

(3) Announced by the VTC in response to initial reports; and

(4) Available by calling the VTC at (504) 385-2462 or on the frequency designated in the current edition of the Berwick Bay VTS Operating Manual.

(b) The notices under paragraph (a) of this section are given throughout the period when the limitations are in effect.

§161.767 General limitations.

The following general rules apply to all towing operations:

(a) Towing on a hawser in either direction is prohibited, with the exception of one self-propelled vessel towing one other vessel in a northbound direction.

(b) Barges and towing vessels must be arranged in tandem with the exception of one vessel towing one other vessel alongside.

(c) The variation in draft and beam of the barges that make up an integrated tow must not exceed 10% of the draft of the barge drawing the most water and 10% of the beam of the widest barge.

(d) All tows carrying any cargo of particular hazard must have at least 1,000 available horsepower.

§161.768 Southbound limitations.

In addition to the general limitations in §161.767, the following rules apply to southbound towing operations:

(a) A towing vessel or vessels and tow which are integrated must not exceed an overall length of 1,180 feet.

(b) A towing vessel or vessels and tow which are not integrated must not exceed an overall length of 300 feet.

§161.769 Northbound limitations.

In addition to the general limitations in §161.767, the following rules apply to northbound towing operations:

(a) A towing vessel or vessels and tow which are integrated must not exceed an overall length of 1,180 feet.

(b) A towing vessel or vessels and tow which are not integrated must not consist of more than two barges.

§161.770 Extreme high water limitations.

In addition to the general limitations in §161.767, when the Morgan City River Gauge reads 4.5 or more feet above mean sea level, the following rules apply to all towing operations:

(a) Between sunrise and sunset:

(1) A towing vessel or vessels and tow greater than 600 feet but no greater than 1,180 feet in overall length must have at least 3,000 available horsepower.

(2) A towing vessel or vessels and tow greater than 400 feet but no greater than 600 feet in overall length must have at least 1,200 available horsepower.

(3) A towing vessel or vessels and tow no greater than 400 feet in overall length and carrying no cargo of particular hazard must have at least 600 available horsepower.

(4) A single barge tow carrying no cargo of particular hazard must have at least 400 available horsepower.

(b) Between sunset and sunrise:

(1) A multiple barge tow must be no greater than 400 feet in overall length and must have at least 1,200 available horsepower.

(2) A single barge tow carrying no cargo of particular hazard must have at least 600 available horsepower.

DESCRIPTIONS AND GEOGRAPHIC COORDINATES

§161.781 VTS Area.

The VTS Area consists of the following segments of waterways:

(a) The Intracoastal Waterway Morgan City to Port Allen Alternate Route from Mile 0 to Mile 5.

(b) The Intracoastal Waterway from Mile 93 West of Harvey Lock (WHL) to Mile 99 WHL.

(c) The Atchafalaya River Route from Mile 113 to Mile 122.

(d) From Bayou Boeuf (Intracoastal Waterway Mile 94.5 West of Harvey Lock) south one statute mile along Bayou Shaffer.

(e) From Berwick Lock northwest one statute mile along the Lower Atchafalaya River.

§161.783 Reporting points.

The reporting points are as follows:

Stouts Point Light as Atchafalaya River Route (A.R.) Mile 113.0;

Southern tip of Long Island at Morgan City-Port Allen Alternate Route (M.P.) Mile 5.0;

Stouts Pass at A.R. Mile 115.0;

Light 18 at M.P. Mile 3.0;

Bayou Teche at 1 mile above Berwick Lock on Lower Atchafalaya River (Bayou Teche);

Berwick Lock near Berwick Bay on Lower Atchafalaya River (Report only if transiting the lock);

Conrads Point at M.P. Mile 1.5;

20 Grand Point at Intracoastal Waterway (ICW) Mile 95.5W;

Shaffer Junction, ICW Mile 94.5W at junction with Bayou Shaffer;

Bayou Shaffer at 1 mile south of junction with Bayou Boeuf;

Bayou Boeuf Lock at ICW Mile 93.0W;

Overhead cable at A.R. Mile 119.0 (ICW Mile 96.5W);

Floodway Gas Processing Plant at ICW Mile 99.0W;

Atchafalaya River at A.R. Mile 122.0

Part 162 Inland Waterways Navigation Regulations

§162.65 All waterways tributary to the Atlantic Ocean south of Chesapeake Bay and all waterways tributary to the Gulf of Mexico east and south of St. Marks, Fla. (a) Description. This section applies to the following:

(1) Waterways. All navigable waters of the United States, natural or artificial, including bays, lakes, sounds, rivers, creeks, intracoastal waterways, as well as canals and channels of all types, which are tributary to or connected by other waterways with the Atlantic Ocean south of Chesapeake Bay or with the Gulf of Mexico east and south of St. Marks, Florida.

(2) United States property. All river and harbor lands owned by the United States in or along the waterways described in paragraph (a)(1) of this section, including lock sites and all structures thereon, other sites for Government structures and for the accommodation and use of employees of the United States, and rights of way and spoil disposal areas to the extent of Federal interest therein.

(3) Vessels and rafts. The term "vessel" as used in this section includes all floating things moved over these waterways other than rafts.

(b) Waterways-(1) Fairway. A clear channel shall at all times be left open to permit free and unobstructed navigation by all types of vessels and rafts that normally use the various waterways or sections thereof. The District Commander may specify the width of the fairway required in the various waterways under his charge.

(2) Stoppage in waterway, anchorage or mooring. (i) No vessels or rafts shall anchor or moor in any of the land cuts or other narrow parts of the waterway, except in case of an emergency. Whenever it becomes necessary for a vessel or raft to stop in any

such portions of the waterway it shall be securely fastened to one bank and as close to the bank as possible. This shall be done only at such a place and under such conditions as will not obstruct or prevent the passage of other vessels or craft. Stoppages shall be only for such periods as may be necessary.

(ii) No vessel or raft will be allowed to use any portion of the fairway as a mooring place except temporarily as authorized above without the written permission from the District Commander.

(iii) When tied up, all vessels must be moored by bow and stern lines. Rafts and tows shall be secured at sufficiently close intervals to insure their not being drawn away from the bank by winds, currents or the suction of passing vessels. Tow lines shall be shortened so that the different parts of the tow shall be as close together as possible. In narrow sections, no vessel or raft shall be tied abreast of another.

(iv) Lights shall be displayed in accordance with provisions of the Inland Rules and the Pilot Rules for Inland Waters.

(v) No vessel, even if fastened to the bank as prescribed in paragraph (b)(2)(i) of this section, shall be left without a sufficient crew to care for it properly.

(vi) Vessels will not be permitted to load or unload in any of the land cuts except as a regular established landing or wharf without written permission secured in advance from the District Commander.

(vii) No vessel, regardless of size, shall anchor in a dredged channel or narrow portion of a waterway for the purpose of fishing, if navigation is obstructed, thereby.

(viii) Except in cases of emergency the dropping of anchors, weights, or other ground tackle, within areas occupied by submarine cable or pipe crossings is prohibited. Such crossings will ordinarily be marked by signboards on each bank of the shore or indicated on coast charts.

(3) Speed. (i) Vessels shall proceed at a speed which will not endanger other vessels or structures and will not interfere with any work in progress incident to maintaining, improving, surveying or marking the channel.

(ii) Official signs indicating limiting speeds through critical portions of the waterways shall be strictly obeyed.

(iii) Vessels approaching and passing through a bridge shall so govern their speed as to insure passage through the bridge without damage to the bridge or its fenders.

(iv) A vessel being overtaken by another shall slacken speed sufficiently to permit the passage to be effected with safety to both vessels.

(4) Assembly and handling of tows.

(i) All vessels drawing tows and equipped with rudders shall use two tow lines or a bridle and shorten them to the greatest possible extent so as to have full control at all times. The various parts of a tow shall be securely assembled with the individual units connected by lines as short as practicable. If necessary, as in the case of lengthy or cumbersome tows or tows in restricted channels, the District Commander may require that tows be broken up and may require the installation of a rudder, drag or other approved steering device on the tow in order to avoid obstructing navigation or damaging the property of others, including aids to navigation maintained by the United States or under its authorization, by collision or otherwise.

(ii) No tow shall be drawn by a vessel that has insufficient power or crew to permit ready maneuverability and safe handling.

(iii) Tows desiring to pass a bridge shall approach the opening along the axis of the channel so as to pass through without danger of striking the bridge or its fenders. No vessel or tow shall navigate through a drawbridge until the movable span is fully opened.

(iv) In the event that it is evident to the master of a towing vessel that a tow cannot be safely handled through a bridge, it will be brought to anchor and the towed vessels will be taken through the bridge in small units, or singly if necessary, or the tow will wait until navigation conditions have improved to such an extent that the tow can pass through the bridge without damage.

(5) Projections from vessels. No vessel carrying a deck load which overhangs or projects over the side of said vessel, or whose rigging projects over the side of the vessel so as to endanger passing vessels, wharves or other property, will enter or pass through any of the narrow parts of the waterway.

(6) Meeting and passing. Vessels, on meeting or overtaking, shall give the proper signals and pass in accordance with the Inland Rules and the Pilot Rules for Inland Waters. Rafts shall give to vessels the side demanded by proper signal. All vessels approaching dredges, or other plant engaged on improvements to a waterway, shall give the signal for passing and slow down sufficiently to stop if so ordered or if no answering signal is received. On receiving the answering signal, they shall then proceed to pass at a speed sufficiently slow to insure safe navigation.

NOTE. The Corps of Engineers also has regulations dealing with this section in 33 CFR 207.

§162.75 All waterways tributary to the Gulf of Mexico (except the Mississippi River, its tributaries, South and Southwest Passes and Atchafalaya River) from St. Marks, Fla., to the Rio Grande. (a) The regulations in this section shall apply to:

(1) Waterways. All navigable waters of the U.S. tributary to or connected by other waterways with the Gulf of Mexico between St. Marks, Fla., and the Rio Grande, Tex. (both inclusive), and the Gulf Intracoastal Waterway; except the Mississippi River, its tributaries, South and Southwest Passes, and the Atchafalaya River above its junction with the Morgan City-Port Allen Route.

(2) Bridges, wharves, and other structures. All bridges, wharves, and other structures in or over these waterways.

(3) Vessels. The term "vessels" as used in this section includes all floating craft other than rafts.

(b) Waterways:

(1) A clear channel shall at all times be left open to permit free and unobstructed navigation by all types of vessels and tows normally using the various waterways covered by the regulations of this section.

(2) Fairway: The District Commander may specify the width of the fairway required in the various waterways under his charge.

(3) Anchoring or mooring:

(i) Vessels or tows shall not anchor or moor in any of the land cuts or other narrow parts of the waterway except in an emergency, or with permission of the District Commander. Whenever it becomes necessary for a vessel or tow to stop in any such portions of the waterway, it shall be securely fastened to one bank and as close to the bank as possible. This shall be done only at such a place and under such conditions as will not obstruct or prevent the passage of other vessels or tows. Stoppages shall be only for such periods as may be necessary.

(ii) When tied up individually, all vessels and tows shall be moored by bow and stern lines. Tows shall be secured at sufficiently frequent intervals to insure their not being drawn away from the bank by winds, currents, or the suction of passing vessels. Lines shall be shortened so that the various barges in a tow will be as close together as possible.

(iii) Lights shall be displayed in accordance with provisions of the Inland Rules and the Pilot Rules for Inland Waters.

(iv) Whenever any vessel or tow is moored to the bank (paragraph (b)(3)(i) of this section) at least one crew member shall always remain on board to see that proper signals are displayed and that the vessel or tow is properly moored at all times.

(v) No vessel, regardless of size, shall anchor in a dredged channel or narrow portion of a waterway for the purpose of fishing if navigation is obstructed thereby:

(4) Speed: Speeding in narrow sections is prohibited. Official signs indicating limited speeds shall be obeyed. Vessels shall reduce speed sufficiently to prevent damage when passing other vessels or structures in or along the waterway.

(5) Size, assembly, and handling of tows:

(i) On waterways 150 feet wide or less, tows which are longer than 1,180 feet, including the towing vessel, but excluding the length of the hawser, or wider than one-half of the bottom width of the channel or 55 feet, whichever is less, will not be allowed, except when the District Commander has given special permission or the waterway has been exempted from these restrictions by the District Commander. Before entering any narrow section of the Gulf Intracoastal Waterway, tows in excess of one-half the channel width, or 55 feet, will be required to stand by until tows which are less than one-half the channel width or 55 feet wide have cleared the channel. When passing is necessary in narrow channels, overwidth tows shall yield to the maximum. Separate permission must be received from the District Commander for each overlength or overwidth movement. In addition, the following exceptions are allowed:

(ii) Gulf Intracoastal Waterway-Between mile 6.2 EHL (Inner Harbor Navigation Canal Lock) and mile 33.6 EHL tows of 78 feet in width will be allowed.

(iii) Gulf Intercoastal Waterway-Between mile 33.6 EHL and the Mobile Bay Ship Channel, tows of 108 feet in width will be allowed if under 750 feet in length including the towboat but excluding the length of the hawser.

(iv) Gulf Intracoastal Waterway-Mobile Bay Ship Channel to St. Marks, Fla., for tows made up of empty barges on the off or shallow side, a width of 75 feet will be allowed.

(v) All vessels pulling tows not equipped with rudders in restricted channels and land cuts shall use two towlines, or a bridle on one towline, shortened as much as safety of the towing vessel permits, so as to have maximum control at all times. The various parts of a tow shall be securely assembled with the individual units connected by lines as short as practicable. In open water, the towlines and fastenings between barges may be lengthened so as to accommdate the wave surge. In the case of lengthy or cumbersome tows, or tows in restricted channels, the District Commander may require that tows be broken up, and may require the installation of a rudder or other approved steering device on the tow in order to avoid obstructing navigation or damaging the property of others. Pushing barges with towing vessel astern, towing barges with towing vessel alongside, or pushing and pulling barges with units of the tow made up both ahead and astern of the towing vessel are permissible provided that adequate power is employed to keep the tows under full control at all times. No tow shall be drawn by a vessel that has insufficient power or crew to permit ready maneuverability and safe handling.

(vi) All tows navigating the Pass Manchac bridges in Louisiana are limited to no more than two barges, not to exceed a combined tow length of 400 feet (excluding the towboat). Vessel operators for tows exceeding these limits must request and receive permission from the COTP New Orleans prior to navigating the bridges. Requests should be made by telephoning the COTP at 504-589-7101. Any decision made by the COTP is final agency action.

(6) Projections from vessels: Vessels or tows carrying a deck load which overhangs or projects over the side, or whose rigging projects over the side, so as to endanger passing vessels, wharves, or other property, shall not enter or pass through any of the narrow parts of the waterway without prior approval of the District Commander.

(7) Meeting and passing: Passing vessels shall give the proper signals and pass in accordance with the International Rules, the Inland Rules and the Pilot Rules for Inland Waters, where applicable. At certain intersections where strong currents may be encountered, sailing directions may be issued through navigation bulletins or signs posted on each side of the intersections.

NOTE. The Corps of Engineers also has regulations dealing with this section in 33 CFR 207.

§162.80 Mississippi River below mouth of Ohio River, including South and Southwest Passes. (a) Mooring on Mississippi River between Miles 314.5 AHP and 340.0 AHP.

(1) No vessel or craft shall moor along either bank of the Mississippi River between Miles 314.5 AHP and Mile 340.0 AHP except in case of an emergency, pursuant to an approved navigation permit, or as authorized by the District Commander. Vessels may be moored any place outside the navigation channel in this reach in case of an emergency and then for only the minimum time required to terminate the emergency. When so moored, all vessels shall be securely tied with bow and stern lines of sufficient strength and fastenings to withstand currents, winds, wave action, suction from passing vessels or any other forces which might cause the vessels to break their moorings. When vessels are so moored, a guard shall be on board at all times to insure that proper signals are displayed and that the vessels are securely and adequately moored.

(2) Vessels may be moored any time at facilities constructed in accordance with an approved navigation permit or as authorized by the District Commander. When so moored, each vessel shall have sufficient fastenings to prevent the vessels from breaking loose by wind, current, wave action, suction from passing vessels or any other forces which might cause the vessels to break their mooring. Number of vessels in one fleet and the width of the fleet of vessels tied abreast shall not extend into the fairway or be greater than allowed under the permit.

(3) Mariners should report immediately by radio or fastest available means to the lockmaster at Old River Lock or to any Government patrol or survey boat in the vicinity any emergency mooring or vessels drifting uncontrolled within the area described in paragraph (a)(1) of this section. It is the responsibility and duty of the master of a towing vessel releasing or mooring a vessel in this reach of the Mississippi River to report such action immediately.

(b) Mooring on Mississippi River below Baton Rouge, La., including South and Southwest Passes.

(1) When tied up individually or in fleets, vessels shall be moored with sufficient lines and shore fastenings to insure their remaining in place and withstanding the action of winds, currents and the suction of passing vessels.

NOTE. The Corps of Engineers also has regulations dealing with this section in 33 CFR 207.

§162.260 Channel leading to San Juan Harbor, P.R.; use, administration, and navigation. (a) Steamers passing dredge engaged in improving the channel shall not have a speed greater than 4 miles an hour, and the propelling machinery shall be stopped when crossing the lines to the dredge anchors.

(b) Vessels using the channel shall pass the dredge on the side designated from the dredge by the signals prescribed in paragraph (c) of this section.

(c) Dredge shall display the red flag by day and four white lights hung in a vertical line by night to indicate the passing side.

(d) Vessels shall not anchor on the ranges of stakes or other marks placed for the guidance of the dredge, nor in such a manner as to obstruct the channel for passing vessels.

(e) Vessels shall not run over or disturb stake, lanterns, or other marks placed for the guidance of the dredge.

(f) Dredges working in the prosecution of the work shall not obstruct the channel unnecessarily.

(g) The dredge will slack lines running across the channel from the dredge on the passing side, for passing vessels, when notified by signal, with whistle or horn.

(h) The position of anchors of the dredge shall be marked by buoys plainly visible to passing vessels.

§162.270 Restricted areas in vicinity of Maritime Administration Reserve Fleets. (a) The regulations in this section shall govern the use and navigation of waters in the vicinity of the following National Defense Reserve Fleets of the Maritime Administration, Department of Transportation:

(1) (Reserved)

(2) James River Reserve Fleet, Fort Eustis, Virginia.

(3) (Reserved)

(4) (Reserved)

(5) Beaumont Reserve Fleet, Neches River near Beaumont, Texas.

(6) Suisun Bay Reserve Fleet near Benicia, California.

(b) No vessels or other watercraft, except those owned or controlled by the United States Government, shall cruise or anchor between Reserve Fleet units within 500 feet of the end vessels in each Reserve Fleet unit, or within 500 feet of the extreme units of the fleets, unless specific permission to do so has first been granted in each case by the enforcing agency.

(c) The regulations in this section shall be enforced by the respective Fleet Superintendents and such agencies as they may designate.

Part 164–Navigation Safety Regulations (in part). For a complete description of this part see 33 CFR 164.

§164.01 Applicability.

(a) This part (except for §164.38 and §164.39) applies to each self-propelled vessel of 1600 or more gross tons (except foreign vessels described in §164.02) when it is operating in the navigable waters of the United States except the St. Lawrence Seaway.

§164.02 Applicability exception for foreign vessels. (See 33 CFR 164.)

§164.03 Incorporation by reference. (See 33 CFR 164.)

§164.11 Navigation underway: General.

The owner, master, or person in charge of each vessel underway shall ensure that:

(a) The wheelhouse is constantly manned by persons who–

(1) Direct and control the movement of the vessel; and

(2) Fix the vessel's position;

(b) Each person performing a duty described in paragraph (a) of this section is competent to perform that duty;

(c) The position of the vessel at each fix is plotted on a chart of the area and the person directing the movement of the vessel is informed of the vessel's position;

(d) Electronic and other navigational equipment, external fixed aids to navigation, geographic reference points, and hydrographic contours are used when fixing the vessel's position;

(e) Buoys alone are not used to fix the vessel's position;

Note: Buoys are aids to navigation placed in approximate positions to alert the mariner to hazards to navigation or to indicate the orientation of a channel. Buoys may not maintain an exact position because strong or varying currents, heavy seas, ice, and collisions with vessels can move or sink them or set them adrift. Although buoys may corroborate a position fixed by other means, buoys cannot be used to fix a position: however, if no other aids are available, buoys alone may be used to establish an estimated position.

(f) The danger of each closing visual or each closing radar contact is evaluated and the person directing the movement of the vessel knows the evaluation;

(g) Rudder orders are executed as given;

(h) Engine speed and direction orders are executed as given;

(i) Magnetic variation and deviation and gyrocompass errors are known and correctly applied by the person directing the movement of the vessel;

(j) A person whom he has determined is competent to steer the vessel is in the wheelhouse at all times (See also 46 U.S.C. 672, which requires an able seaman at the wheel on U.S. vessels of 100 gross tons or more in narrow or crowded waters or during low visibility.);

(k) If a pilot other than a member of the vessel's crew is employed, the pilot is informed of the draft, maneuvering characteristics, and peculiarities of the vessel and of any abnormal circumstances on the vessel that may affect its safe navigation.

(l) Current velocity and direction for the area to be transited are known by the person directing the movement of the vessel;

(m) Predicted set and drift are known by the person directing movement of the vessel;

(n) Tidal state for the area to be transited is known by the person directing movement of the vessel;

(o) The vessel's anchors are ready for letting go;

(p) The person directing the movement of the vessel sets the vessel's speed with consideration for–

(1) The prevailing visibility and weather conditions;

(2) The proximity of the vessel to fixed shore and marine structures;

(3) The tendency of the vessel underway to squat and suffer impairment of maneuverability when there is small underkeel clearance;

(4) The comparative proportions of the vessel and the channel;

(5) The density of marine traffic;

(6) The damage that might be caused by the vessel's wake;

(7) The strength and direction of the current; and

(8) Any local vessel speed limit;

(q) The tests required by §164.25 are made and recorded in the vessel's log; and

(r) The equipment required by this part is maintained in operable condition.

§164.19 Requirements for vessels at anchor.

The master or person in charge of each vessel that is anchored shall ensure that–

(a) A proper anchor watch is maintained;

(b) Procedures are followed to detect a dragging anchor; and

(c) Whenever weather, tide, or current conditions are likely to cause the vessel's anchor to drag, action is taken to ensure the safety of the vessel, structures, and other vessels, such as being ready to veer chain, let go a second anchor, or get underway using the vessel's own propulsion or tug assistance.

§164.25 Tests before entering or getting underway.

(a) Except as provided in paragraphs (b) and (c) of this section no person may cause a vessel to enter into or get underway on the navigable waters of the United States unless no more than 12 hours before entering or getting underway, the following equipment has been tested:

(1) Primary and secondary steering gear.

(2) All internal vessel control communications and vessel control alarms.

(3) Standby or emergency generator, for as long as necessary to show proper functioning, including steady state temperature and pressure readings.

(4) Storage batteries for emergency lighting and power systems in vessel control and propulsion machinery spaces.

(5) Main propulsion machinery, ahead and astern.

(b) Vessels navigating on the Great Lakes and their connecting and tributary waters, having once completed the test requirements of this sub-part, are considered to remain in compliance until arriving at the next port of call on the Great Lakes.

(c) Vessels entering the Great Lakes from the St. Lawrence Seaway are considered to be in compliance with this sub-part if the required tests are conducted preparatory to or during the passage of the St. Lawrence Seaway or within one hour of passing Wolfe Island.

§164.30 Charts, publications, and equipment: General.

No person may operate or cause the operation of a vessel unless the vessel has the marine charts,

publications, and equipment as required by §§164.33 through 164.41 of this part.

§164.33 Charts and publications.

(a) Each vessel must have the following:

(1) Marine charts of the area to be transited, published by the National Ocean Service, U.S. Army Corps of Engineers, or a river authority that–

(i) Are of a large enough scale and have enough detail to make safe navigation of the area possible; and

(ii) Are currently corrected.

(2) For the area to be transited, a currently corrected copy of, or applicable currently corrected extract from, each of the following publications:

(i) U.S. Coast Pilot.

(ii) Coast Guard Light List.

(3) For the area to be transited, the current edition of, or applicable current extract from:

(i) Tide tables published by the National Ocean Service.

(ii) Tidal current tables published by the National Ocean Service, or river current publication issued by the U.S. Army Corps of Engineers, or a river authority.

(b) As an alternative to the requirements for paragraph (a) of this section, a marine chart or publication, or applicable extract, published by a foreign government may be substituted for a U.S. chart and publication required by this section. The chart must be of large enough scale and have enough detail to make safe navigation of the area possible, and must be currently corrected. The publication, or applicable extract, must singly or in combination contain similar information to the U.S. Government publication to make safe navigation of the area possible. The publication, or applicable extract must be currently corrected, with the exceptions of tide and tidal current tables, which must be the current editions.

(c) As used in this section, "currently corrected" means corrected with changes contained in all Notices to Mariners published by Defense Mapping Agency Hydrographic/Topographic Center, or an equivalent foreign government publication, reasonably available to the vessel, and that is applicable to the vessel's transit.

§164.35 Equipment: All vessels.

Each vessel must have the following:

(a) A marine radar system for surface navigation.

(b) An illuminated magnetic steering compass, mounted in a binnacle, that can be read at the vessel's main steering stand.

(c) A current magnetic compass deviation table or graph or compass comparison record for the steering compass, in the wheelhouse.

(d) A gyrocompass.

(e) An illuminated repeater for the gyrocompass required by paragraph (d) of this section that is at the main steering stand, unless that gyrocompass is illuminated and is at the main steering stand.

(f) An illuminated rudder angle indicator in the wheelhouse.

(g) The following maneuvering information prominently displayed on a fact sheet in the wheelhouse:

(1) For full and half speed, a turning circle diagram to port and starboard that shows the time and the distance of advance and transfer required to alter the course 90 degrees with maximum rudder angle and constant power settings.

(2) The time and distance to stop the vessel from full and half speed while maintaining approximately the initial heading with minimum application of rudder.

(3) For each vessel with a fixed propeller, a table of shaft revolutions per minute for a representative range of speeds.

(4) For each vessel with a controllable pitch propeller, a table of control settings for a representative range of speeds.

(5) For each vessel that is fitted with an auxiliary device to assist in maneuvering, such as a bow thruster, a table of vessel speeds at which the auxiliary device is effective in maneuvering the vessel.

(6) The maneuvering information for the normal load and normal ballast condition for–

(i) Calm weather-wind 10 knots or less, calm sea;

(ii) No current;

(iii) Deep water conditions-water depth twice the vessel's draft or greater; and

(iv) Clean hull.

(7) At the bottom of the fact sheet, the following statement:

Warning.

The response of the (name of the vessel) may be different from that listed above if any of the following conditions, upon which the maneuvering information is based, are varied:

(1) Calm weather-wind 10 knots or less, calm sea;

(2) No current;

(3) Water depth twice the vessel's draft or greater;

(4) Clean hull; and

(5) Intermediate drafts or unusual trim.

(h) An echo depth sounding device.

(i) A device that can continuously record the depth readings of the vessel's echo depth sounding device, except when operating on the Great Lakes and their connecting and tributary waters.

(j) Equipment on the bridge for plotting relative motion.

§164.37 Equipment: Vessels of 10,000 gross tons or more.

(a) Each vessel of 10,000 gross tons or more must have, in addition to the radar system under §164.35(a), a second marine radar system that operates independently of the first.

Note: Independent operation means two completely separate systems, from separate branch power supply circuits or distribution panels to antennas, so that failure of any component of one system will not render the other system inoperative.

(b) On each tanker of 10,000 gross tons or more that is subject to Section 5 of the Port and Tanker Safety Act of 1978 (46 U.S.C. 391a), the dual radar

system required by this part must have a short range capability and a long range capability; and each radar must have true north features consisting of a display that is stabilized in azimuth.

§164.38 Automatic radar plotting aids (ARPA). (See 33 CFR 164.)

§164.39 Steering gear: Tank vessels. (See 33 CFR 164.)

§164.41 Electronic position fixing devices.

(a) Each vessel calling at a port in the continental United States, including Alaska south of Cape Prince of Wales, except each vessel owned or bareboat chartered and operated by the United States, or by a state or its political subdivision, or by a foreign nation, and not engaged in commerce, must have one of the following:

(1) A Type I or II LORAN C receiver as defined in Section 1.2(e), meeting Part 2 (Minimum Performance Standards) of the Radio Technical Commission for Marine Services (RTCM) Paper 12-78/DO-100 dated December 20, 1977, entitled "Minimum Performance Standards (MPS) Marine Loran-C Receiving Equipment". Each receiver installed on or after June 1, 1982, must have a label with the information required under paragraph (b) of this section. If the receiver is installed before June 1, 1982, the receiver must have the label with the information required under paragraph (b) by June 1, 1985.

(2) A satellite navigation receiver with:

(i) Automatic acquisition of satellite signals after initial operator settings have been entered; and

(ii) Position updates derived from satellite information during each usable satellite pass.

(3) A system that is found by the Commandant to meet the intent of the statements of availability, coverage, and accuracy for the U.S. Coastal Confluence Zone (CCZ) contained in the U.S. "Federal Radionavigation Plan" (Report No. DOD-NO 4650.4-P, I or No. DOT-TSC-RSPA-80-16, I). A person desiring a finding by the Commandant under this subparagraph must submit a written application describing the device to: Commandant (G-WWM), U.S. Coast Guard, Washington, D.C. 20593. After reviewing the application, the Commandant may request additional information to establish whether or not the device meets the intent of the Federal Radionavigation Plan.

Note.–The Federal Radionavigation Plan is available from the National Technical Information Service, Springfield, Va. 22161, with the following Government Accession Numbers:

Vol 1, ADA 116468
Vol 2, ADA 116469
Vol 3, ADA 116470
Vol 4, ADA 116471

(b) Each label required under paragraph (a)(1) of this section must show the following:

(1) The name and address of the manufacturer.

(2) The following statement by the manufacturer: This receiver was designed and manufactured to meet Part 2 (Minimum Performance Standards) of the RTCM MPS for Marine Loran-C Receiving Equipment.

§164.51 Deviations from rules: Emergency.

Except for the requirements of §164.53(b), in an emergency, any person may deviate from any rule in this part to the extent necessary to avoid endangering persons, property, or the environment.

§164.53 Deviations from rules and reporting: Nonoperating equipment.

(a) If during a voyage any equipment required by this part stops operating properly, the person directing the movement of the vessel may complete the voyage subject to the requirements in 33 CFR 160.

(b) If the vessel's radar, radio navigation receivers, gyrocompass, echo depth sounding device, or primary steering gear stops operating properly, the person directing the movement of the vessel must report or cause to be reported that it is not operating properly to the nearest Captain of the Port, District Commander, or, if participating in a Vessel Traffic Service, to the Vessel Traffic Center, as soon as possible.

§164.55 Deviations from rules: Continuing operation or period of time.

The Captain of the Port, upon written application, may authorize a deviation from any rule in this part if he determines that the deviation does not impair the safe navigation of the vessel under anticipated conditions and will not result in a violation of the rules for preventing collisions at sea. The authorization may be issued for vessels operating in the waters under the jurisdiction of the Captain of the Port for any continuing operation or period of time the Captain of the Port specifies.

§164.61 Marine casualty reporting and record retention.

When a vessel is involved in a marine casualty as defined in 46 CFR 4.03-1, the master or person in charge of the vessel shall–

(a) Ensure compliance with 46 CFR 4.05, "Notice of Marine Casualty and Voyage Records," and

(b) Ensure that the voyage records required by 46 CFR 4.05-15 are retained for–

(1) 30 days after the casualty if the vessel remains in the navigable waters of the United States; or

(2) 30 days after the return of the vessel to a United States port if the vessel departs the navigable waters of the United States within 30 days after the marine casualty.

Part 165–Regulated Navigation Areas and Limited Access Areas

Subpart A–General

§165.1 Purpose of part.

The purpose of this part is to–

(a) Prescribe procedures for establishing different types of limited or controlled access areas and regulated navigation areas;

(b) Prescribe general regulations for different types of limited or controlled access areas and regulated navigation areas;

(c) Prescribe specific requirements for established areas; and

(d) List specific areas and their boundaries.

§165.5 Establishment procedures.

(a) A safety zone, security zone, or regulated navigation area may be established on the initiative of any authorized Coast Guard official.

(b) Any person may request that a safety zone, security zone, or regulated navigation area be established. Except as provided in paragraph (c) of this section, each request must be submitted in writing to either the Captain of the Port or District Commander having jurisdiction over the location as described in 33 CFR 3, and include the following:

(1) The name of the person submitting the request;

(2) The location and boundaries of the safety zone, security zone, or regulated navigation area;

(3) The date, time, and duration that the safety zone, security zone, or regulated navigation area should be established;

(4) A description of the activities planned for the safety zone, security zone, or regulated navigation area;

(5) The nature of the restrictions or conditions desired; and

(6) The reason why the safety zone, security zone, or regulated navigation area is necessary.

(Requests for safety zones, security zones, and regulated navigation areas are approved by the Office of Management and Budget under control numbers 2115-0076, 2115-0219, and 2115-0087.)

(c) Safety Zones and Security Zones. If, for good cause, the request for a safety zone or security zone is made less than 5 working days before the zone is to be established, the request may be made orally, but it must be followed by a written request within 24 hours.

§165.7 Notification.

(a) The establishment of these limited access areas and regulated navigation areas is considered rulemaking. The procedures used to notify persons of the establishment of these areas vary depending upon the circumstances and emergency conditions. Notification may be made by marine broadcasts, local notice to mariners, local news media, distribution in leaflet form, and on-scene oral notice, as well as publication in the Federal Register.

(b) Notification normally contains the physical boundaries of the area, the reasons for the rule, its estimated duration, and the method of obtaining authorization to enter the area, if applicable, and special navigational rules, if applicable.

(c) Notification of the termination of the rule is usually made in the same form as the notification of its establishment.

Subpart B–Regulated Navigation Areas

§165.10 Regulated navigation area.

A regulated navigation area is a water area within a defined boundary for which regulations for vessels navigating within the area have been established under this part.

§165.11 Vessel operating requirements (regulations).

Each District Commander may control vessel traffic in an area which is determined to have hazardous conditions, by issuing regulations–

(a) Specifying times of vessel entry, movement, or departure to, from, within, or through ports, harbors, or other waters;

(b) Establishing vessel size, speed, draft limitations, and operating conditions; and

(c) Restricting vessel operation, in a hazardous area or under hazardous conditions, to vessels which have particular operating characteristics or capabilities which are considered necessary for safe operation under the circumstances.

§165.13 General regulations.

(a) The master of a vessel in a regulated navigation area shall operate the vessel in accordance with the regulations contained in Subpart F.

(b) No person may cause or authorize the operation of a vessel in a regulated navigation area contrary to the regulations in this Part.

Subpart C–Safety Zones

§165.20 Safety zones.

A Safety Zone is a water area, shore area, or water and shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. It may be stationary and described by fixed limits or it may be described as a zone around a vessel in motion.

§165.23 General regulations.

Unless otherwise provided in this part–

(a) No person may enter a safety zone unless authorized by the COTP or the District Commander;

(b) No person may bring or cause to be brought into a safety zone any vehicle, vessel, or object unless authorized by the COTP or the District Commander;

(c) No person may remain in a safety zone or allow any vehicle, vessel, or object to remain in a safety zone unless authorized by the COTP or the District Commander; and

(d) Each person in a safety zone who has notice of a lawful order or direction shall obey the order or direction of the COTP or District Commander issued to carry out the purposes of this subpart.

Subpart D–Security Zones

§165.30 Security zones.

(a) A security zone is an area of land, water, or land and water which is so designated by the Captain of the Port or District Commander for such time as is necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States.

(b) The purpose of a security zone is to safeguard from destruction, loss, or injury from sabotage or other subversive acts, accidents, or other causes of a similar nature–

(1) Vessels,
(2) Harbors,
(3) Ports and
(4) Waterfront facilities–in the United States and all territory and water, continental or insular, that is subject to the jurisdiction of the United States.

§165.33 General regulations.

Unless otherwise provided in the special regulations in Subpart F of this part–

(a) No person or vessel may enter or remain in a security zone without the permission of the Captain of the Port;

(b) Each person and vessel in a security zone shall obey any direction or order of the Captain of the Port;

(c) The Captain of the Port may take possession and control of any vessel in the security zone;

(d) The Captain of the Port may remove any person, vessel, article, or thing from a security zone;

(e) No person may board, or take or place any article or thing on board, any vessel in a security zone without the permission of the Captain of the Port; and

(f) No person may take or place any article or thing upon any waterfront facility in a security zone without the permission of the Captain of the Port.

Subpart E–Restricted Waterfront Areas

§165.40 Restricted Waterfront Areas.

The Commandant, may direct the COTP to prevent access to waterfront facilities, and port and harbor areas, including vessels and harbor craft therein. This section may apply to persons who do not possess the credentials outlined in 33 CFR 125.09 when certain shipping activities are conducted that are outlined in 33 CFR 125.15.

Subpart F–Specific Regulated Navigation Areas and Limited Access Areas

§165.801 Mississippi River Gulf Outlet. (a) The area enclosed by the following boundary is a Safety Zone-The Mississippi River Gulf Outlet from Lighted Buoy 1 (LLNR 2014) northwesterly to its junction with the Gulf Intracoastal Waterway and then westerly to, and including, the Inner Harbor Navigation Canal and easterly to and including the Michoud Canal.

(b) Vessels, including tows, over 600 feet in length, or over 80 feet in beam, or with a draft in excess of 30 feet, and intending to transit that portion of the Safety Zone from its seaward entrance at Lighted Buoy 2 (LLNR 2015) to the jetty at Light 62 (LLNR 2068) must receive permission to enter or move within the Safety Zone. Vessels meeting this criteria will not meet or overtake each other in this seaward portion of the Safety Zone unless the pilots and/or operators of both vessels consider such passage to be safe and agree to it. Such an agreement must be reported beforehand to the VTS.

(c) All inbound vessels meeting the criteria of paragraph (b) of this section shall notify New Orleans Vessel Traffic Service (VTS) two hours prior to intended entry into the Safety Zone (in order to be scheduled), and immediately prior to entry (in order to obtain permission to enter), and upon passing MRGO Lighted Bell Buoy 2, and MRGO Lighted Bell Buoy 20 (LLNR 2031), MRGO Light 62, MRGO Light 94 (LLNR 2082.50) and MRGO Light 114 (LLNR 2092).

Notification shall be made on Channel 12 VHF-FM. Notification prior to intended entry which cannot be accomplished on Channel 12 VHF-FM due to extreme range, shall be made by telephone to the VTS at (504) 589-2772 or 589-2773 by the vessel's agent or via the marine operator.

(d) All outbound vessels meeting the criteria of paragraph (b) of this section shall notify VTS two hours prior to intended movement within the Safety Zone (in order to be scheduled), and immediately prior to movement (in order to obtain permission to move), and immediately after heading fair in the outbound direction, and as the vessel passes the junction of the MRGO and Gulf Intracoastal Waterway (Mile 60.0 MRGO), MRGO Light 114, MRGO Light 94, and MRGO Light 62, and MRGO Lighted Bell Buoy 20 and MRGO Lighted Bell Buoy 2. Notification two hours prior to movement shall be made by telephone to the VTS at (504) 589-2772 or 589-2773. Other notification shall be made on channel 12 VHF-FM. Channel 11 VHF-FM may be used in lieu of Channel 12 by vessels above the Paris Road Bridge (mile 60.9 MRGO).

(e) Movement within this Safety Zone is normally unrestricted for vessels that do not meet the criteria of paragraph (b) of this section. The Captain of the Port may require other vessels within this defined zone to comply with the general regulations governing safety zones as contained in 33 CFR 165.20 whenever necessary for the protection of vessels, structures and water and shore areas.

§165.802 Lower Mississippi River vicinity of Old River Control Structure-safety zone.

(a) The area enclosed by the following boundary is a safety zone-A line beginning at Black Hawk Light at Mile 316.1 AHOP LMR; thence to the Northwest end of the Overbank Structure; thence South along the Old River Control Structure to the Southeast end of the Low Sill Structure; thence Northeast to the Old River Control Structure Light at Mile 314.5 AHOP LMR; thence along a line to Black Hawk Point Light.

(b) Any vessel desiring to enter this safety zone must first obtain permission from the Captain of the Port, New Orleans, Louisiana. The operator of the Corps of Engineers' picket boat on scene is delegated the authority to permit entry into this Safety Zone.

§165.803 Mississippi River-regulated navigation area.

The following is a regulated navigation area-The waters of the Mississippi River between miles 88 and 127 above Head of Passes.

(a) Definitions. As used in this section:

(1) "Breakaway" means a barge that is adrift and is not under the control of a towing vessel.

(2) "COTP" means the Captain of the Port, New Orleans.

(3) "Fleet" includes one or more tiers.

(4) "Fleeting facility" means the geographic area along or near a river bank at which a barge mooring service, either for hire or not for hire, is established.

(5) "Mooring barge" or "spar barge" means a barge moored to mooring devices and to which other barges may be moored.

(6) "Mooring device" includes a deadman, anchor, pile or other reliable holding apparatus.

(7) "Person in charge" includes any owner, agent, pilot, master, officer, operator, crewmember, supervisor, dispatcher or other person navigating, controlling, directing or otherwise responsible for the movement, action, securing, or security of any vessel, barge, tier, fleet or fleeting facility subject to the regulations in this section.

(8) "Tier" means barges moored interdependently in rows or groups.

(b) Waivers:

(1) The COTP may, upon written request, except as allowed in paragraph (3) of this subsection, waive any regulation in this section if it is found that the proposed operation can be conducted safely under the terms of that waiver.

(2) Each written request for a waiver must state the need for the waiver and describe the proposed operation.

(3) Under unusual circumstances due to time constraints, the person in charge may orally request an immediate waiver from the COTP. The written request for a waiver must be submitted within five working days after the oral request.

(4) The COTP may, at any time, terminate any waiver issued under this subsection.

(c) Emergencies. In an emergency, a person may depart from any regulation in this section to the extent necessary to avoid immediate danger to persons, property or the environment.

(d) Mooring: general.

(1) No person may secure a barge to trees or to other vegetation.

(2) No person may allow a barge to be moored with unraveled or frayed lines or other defective or worn mooring.

(3) No person may moor barges side to side unless they are secured to each other from fittings as close to each corner of abutting sides as practicable.

(4) No person may moor barges end to end unless they are secured to each other from fittings as close to each corner of abutting ends as practicable.

(e) Mooring to a mooring device.

(1) A barge may be moored to mooring devices if the upstream end of that barge is secured to at least one mooring device and the downstream end is secured to at least one other mooring device.

(2) Barges moored in tiers may be shifted to mooring devices if the shoreward barge at the upstream end of the tier is secured to at least one mooring device, and the shoreward barge at the downstream end of the tier is secured to at least one other mooring device.

(3) Each wire rope used between the upstream end of a barge and a mooring device must have at least a diameter of 1¼ inch. Chain or line used between the upstream end of a barge and a mooring device must be at least equivalent in strength to 1¼ inch diameter wire rope.

(4) Each wire rope used between the downstream end of a barge and a mooring device must have at least a diameter of ⅞ inch. Chain or line used between the downstream end of a barge and a mooring device must be of at least equivalent strength of ⅞ inch diameter wire rope.

(f) Moorings: barge-to-barge; barge-to-vessel; barge-to-wharf or pier. The person in charge shall ensure that a barge moored to another barge, a mooring or spar barge, a vessel, a wharf, or a pier, is secured as near as practicable to each abutting corner of the barge being moored by–

(1) Three parts of wire rope of at least ⅞ inch diameter with an eye at each end of the rope passed around the timberhead, caval, or button;

(2) A mooring of natural or synthetic fiber rope that has at least 75 percent of the breaking strength of three parts of ⅞ inch diameter wire rope; or

(3) Fixed rigging that is at least equivalent to three parts of ⅞ inch diameter wire rope.

(g) Mooring: person in charge.

(1) The person in charge of a barge, tier, fleet or fleeting facility shall ensure that the barge, tier, fleet or fleeting facility meets the requirements in paragraphs (d) and (e) of this section.

(2) The person in charge shall ensure that all mooring devices, wires, chains, lines and connecting gear are of sufficient strength and in sufficient number to withstand forces that may be exerted on them by moored barges.

(h) Fleeting facility: inspection of moorings.

(1) The person in charge of a fleeting facility shall assign a person to inspect moorings in accordance with the requirements in paragraph (h)(2) of this section.

(2) The person assigned to inspect moorings shall inspect:

(i) At least twice each day during periods that are six hours or more apart, each mooring wire, chain, line and connecting gear between mooring devices and each wire, line and connecting equipment used to moor each barge; and

(ii) After a towboat adds barges to, withdraws barges from, or moves barges at a fleeting facility, each mooring wire, line, and connecting equipment of each barge within each tier affected by that operation.

(3) The person who inspects moorings shall take immediate action to correct each deficiency.

(i) Fleeting facility: records. The person in charge of a fleeting facility shall maintain, and make available to the Coast Guard, records containing the following information:

(1) The time of commencement and termination of each inspection required in paragraph (h)(2) of this section.

(2) The name of each person who makes the

inspection required in paragraph (h)(2) of this section.

(3) The identification of each barge entering and departing the fleeting facility, along with the following information:

(i) Date and time of entry and departure; and

(ii) The names of any hazardous cargo which the barge is carrying.

(4) The identification of each towboat that moves a barge into, within or out of the fleeting facility.

Note.–The requirements in paragraph (i)(3) of this section for the listing of hazardous cargo refers to cargoes regulated by Subchapters D and O of Chapter I, Title 46, Code of Federal Regulations. The recordkeeping requirement for barge/fleeting facilities (Regulated Navigation Area) is approved under Office of Management and Budget control number 2115-0087.

(j) Fleeting facility: surveillance.

(1) The person in charge of a fleeting facility shall assign a person to be in continuous surveillance and to observe the barges in the fleeting facility. Joint use of this person by adjacent facilities may be considered upon submission of a detailed proposal for a waiver to the COTP.

(2) The person who observes the barges shall:

(i) Inspect for movements that are unusual for properly secured barges; and

(ii) Take immediate action to correct each deficiency.

(k) Fleeting facility: person in charge. The person in charge of a fleeting facility shall ensure that each deficiency found under the requirements of paragraphs (h) or (j) of this section is corrected.

(l) Securing breakaways. The person in charge shall take immediate action to:

(1) Secure each breakaway; and

(2) Report each breakaway as soon as possible to the COTP by telephone, radio or other means of rapid communication.

(m) High water.

(1) This subsection applies to barges on the Mississippi River between miles 88 and 127 above Head of Passes when:

(i) The Carrollton gage stands 12 feet or more; or

(ii) The Carrollton gage stands 10 feet, the U.S. Army Corps of Engineers forecasts the Mississippi River is rising to 12 feet, and the District Commander determines these circumstances to be especially hazardous and issues orders directing that paragraph (m)(2) and (3) of this section are in effect.

(2) During high water, the person in charge of a fleeting facility shall ensure compliance with the following requirements:

(i) Each fleet consisting of eight or more barges must be attended by at least one radar-equipped towboat for each 100 barges or less. Joint use of this towboat by adjacent facilities may be considered upon submission of a detailed proposal for a waiver.

(ii) Each fleet must have two or more towboats in attendance when:

(A) Barges are withdrawn from or moved within the fleet and the fleet at the start of the operation contains eight or more barges; or

(B) Barges are added to the fleet and the number of barges being added plus the fleet at the start of the operation total eight or more.

(iii) Each towboat required in paragraphs (m)(2)(i) and (2)(ii) of this section must be:

(A) Capable of safely withdrawing, moving or adding each barge in the fleet;

(B) Immediately operational;

(C) Radio-equipped;

(D) Within 500 yards of the barges; and

(iv) The person in charge of each towboat required in paragraphs (m)(2)(i) and (2)(ii) of this section shall maintain:

(A) A continuous guard on the frequency specified by current Federal Communications Commission regulations found in Part 83 of Title 47, Code of Federal Regulations; and

(B) When moored, a continuous watch on the barges in the fleeting facility.

(v) During periods when visibility is less than 200 yards, the person in charge of each towboat required in paragraph (m)(2)(i) of this subsection shall maintain, when moored, a continuous radar surveillance of the barges moored in the fleeting facility.

(3) During high water when visibility is reduced to less than 200 yards:

(i) Tows may not be assembled or disassembled;

(ii) No barge may be added to, withdrawn from or moved within a fleet except:

(A) A single barge may be added to or withdrawn from the channelward or downstream end of the fleet; and

(B) Barges made up in a tow may depart a fleet from the channelward or downstream end of the fleet; and

(iii) No person in charge of a tow arriving in this regulated navigation area may moor unless the COTP is notified prior to arrival in the regulated navigation area.

§165.804 Snake Island, Texas City, Texas; mooring and fleeting of vessels-safety zone.

(a) The following is a safety zone:

(1) The west and northwest shores of Snake Island;

(2) The Turning Basin west of Snake Island;

(3) The area of Texas City Channel from the north end of the Turning Basin to a line drawn 000° true from the northwesternmost point of Snake Island.

(b) Special Regulations. All vessels are prohibited from mooring, anchoring, or otherwise stopping in the safety zone, except in case of an emergency.

(c) Barges are prohibited from fleeting or grounding in the zone.

(d) In an emergency, vessels shall advise the Captain of the Port, Galveston, of the nature of the emergency via the most rapid means available.

§165.805 Calcasieu Channel and Industrial Canal, Calcasieu River, Lake Charles, La. (a) The waters within the following boundaries are a safety zone: The area extending 150 feet out into the Industrial

Canal, Calcasieu River, Lake Charles, La., along the shoreline of the Trunkline LNG Company's waterfront property, from position 30°06′31.9″N., 93°18′22.8″W. to the end of the turning basin and to include an area 50 feet out from any LNG ships while moored to the Trunkline LNG facility.

(b) The waters within the following boundaries are a safety zone while a non-gasfree LNG vessel is transiting within the Calcasieu River ship channel and between buoy "CC" and the Trunkline LNG facility: The area 2 miles ahead, 1 mile astern, and to either side of an LNG vessel to the width of the ship channel. Meeting, crossing, or overtaking situations are not permitted within the safety zone unless specifically authorized by the USCG Captain of the Port.

(c) Notice to transiting LNG vessels will be provided by Broadcast and/or Local Notice to Mariners.

Part 166–Shipping Safety Fairways

Subpart A–General

§166.100 Purpose. The purpose of these regulations is to establish and designate shipping safety fairways and fairway anchorages to provide unobstructed approaches for vessels using U.S. ports.

§166.105 Definitions. (a) "Shipping safety fairway" or "fairway" means a lane or corridor in which no artificial island or fixed structure, whether temporary or permanent, will be permitted. Temporary underwater obstacles may be permitted under certain conditions described for specific areas in Subpart B. Aids to navigation approved by the U.S. Coast Guard may be established in a fairway.

(b) "Fairway anchorage" means an anchorage area contiguous to and associated with a fairway, in which fixed structures may be permitted within certain spacing limitations, as described for specific areas in Subpart B.

§166.110 Modification of areas. Fairways and fairway anchorages are subject to modification in accordance with 33 U.S.C. 1223(c); 92 Stat. 1473.

Subpart B–Designations of Fairways and Fairway Anchorages

§166.200 Areas in the Gulf of Mexico. (a) Purpose. Fairways and anchorage areas as described in this section are established to control the erection of structures therein to provide safe approaches through oil fields in the Gulf of Mexico to entrances to the major ports along the Gulf Coast.

(b) Special Conditions for Fairways in the Gulf of Mexico. Temporary anchors and attendant cables or chains attached to floating or semisubmersible drilling rigs outside a fairway may be placed within a fairway described in this section for the Gulf of Mexico, provided the following conditions are met:

(1) Anchors installed within fairways to stabilize semisubmersible drilling rigs shall be allowed to remain 120 days. This period may be extended by the Army Corps of Engineers, as provided by 33 CFR 209.135(b).

(2) Drilling rigs must be outside of any fairway boundary to whatever distance is necessary to ensure that the minimum depth of water over an anchor line within a fairway is 125 feet.

(3) No anchor buoys or floats or related rigging will be allowed on the surface of the water or to a depth of at least 125 feet from the surface, within a fairway.

(4) Aids to Navigation or danger markings must be installed as required by 33 CFR Subchapter C.

(c) Special Conditions for Fairway Anchorages in the Gulf of Mexico. Structures may be placed within an area designated as a fairway anchorage, but the number of structures will be limited by spacing as follows:

(1) The center of a structure to be erected shall not be less than two (2) nautical miles from the center of any existing structure.

(2) In a drilling or production complex, associated structures connected by walkways shall be considered one structure for purposes of spacing, and shall be as close together as practicable having due consideration for the safety factors involved.

(3) A vessel fixed in place by moorings and used in conjunction with the associated structures of a drilling or production complex, shall be considered an attendant vessel and the extent of the complex shall include the vessel and its moorings.

(4) When a drilling or production complex extends more than five hundred (500) yards from the center, a new structure shall not be erected closer than two (2) nautical miles from the outer limit of the complex.

(5) An underwater completion installation in an anchorage area shall be considered a structure and shall be marked with a lighted buoy approved by the United States Coast Guard under 33 CFR Part 66.01.

Note:Where the areas have already been charted, coordinates have been omitted and reference made to the chart(s) showing the fairways and anchorages.

(d) Designated Areas.

(1) Brazos Santiago Pass Safety Fairway. See charts 11300 and 11301.

(2) Brazos Santiago Pass Anchorage Areas. See charts 11300 and 11301.

(3) Port Mansfield Safety Fairway. See chart 11300.

(4) Aransas Pass Safety Fairway. See charts 11300, 11313, and 11307.

(5) Aransas Pass Anchorage Areas. See charts 11300, 11313, and 11307.

(6) Matagorda Entrance Safety Fairway. See charts 11300, and 11316.

(7) Matagorda Entrance Anchorage Areas. See charts 11300, and 11316.

(8) Freeport Harbor Safety Fairway. See charts 11300 and 11321.

(9) Freeport Harbor Anchorage Areas. See charts 11300 and 11321.

(10) Galveston Entrance Safety Fairways. See charts 11340 and 11323.

(11) Galveston Entrance Anchorage Areas. See charts 11340 and 11323.

(12) Sabine Pass Safety Fairway. See charts 11340 and 11341.

(13) Sabine Pass Anchorage Area. See charts 11340 and 11341.

(14) Coastwise Safety Fairway. (i) Brazos Santiago Pass to Aransas Pass. See charts 11300, 11301, and 11307.

(ii) Aransas Pass to Calcasieu Pass. See charts 11300, 11340, 11313, 11316, 11323, 11332, 11344.

(15) Calcasieu Pass Safety Fairway. See charts 11340, 11344, and 11341.

(16) Calcasieu Pass Anchorage Area. See charts 11340, 11344, and 11341.

(17) (Reserved).

(18) Freshwater Bayou Safety Fairway. See charts 11340 and 11349.

(19) Southwest Pass Safety Fairway. See charts 11340 and 11349.

(20) Atchafalaya Pass Safety Fairway. See charts 11340 and 11351.

(21) Bayou Grand Caillou Safety Fairway. See charts 11340 and 11356.

(22) Cat Island Pass Safety Fairway. See charts 11340, and 11357.

(23) Belle Pass Safety Fairway. See charts 11340 and 11357.

(24) Barataria Pass Safety Fairway. See charts 11340 and 11358.

(25) Grand Bayou Pass Safety Fairway. See charts 11340 and 11358.

(26) Empire to the Gulf Safety Fairway. See charts 11340 and 11358.

(27) Gulf Safety Fairway. Aransas Pass Safety Fairway to Southwest Pass Safety Fairway. See charts 11300 and 11340.

(28) Southwest Pass (Mississippi River) Safety Fairway. (i) Southwest Pass (Mississippi River) to Gulf Safety Fairway. See charts 11340 and 11361.

(ii) Southwest Pass (Mississippi River) to Sea Safety Fairway. See charts 11340, 11360, and 11361.

(iii) Southwest Pass (Mississippi River) to South Pass (Mississippi River) Safety Fairway. See charts 11360 and 11361.

(29) Southwest Pass (Mississippi River) Anchorage. See charts 11360 and 11361.

(30) South Pass (Mississippi River) Safety Fairways. (i) South Pass to Sea Safety Fairway. See charts 11360 and 11361.

(ii) South Pass (Mississippi River) to Mississippi River-Gulf Outlet Channel Safety Fairway. See charts 11360 and 11361.

(31) South Pass (Mississippi River) Anchorage. See charts 11360 and 11361.

(32) Mississippi River-Gulf Outlet Safety Fairway. (i) See charts 11360 and 11363.

(ii) Mississippi River-Gulf Outlet Channel to Mobile Ship Channel Safety Fairway. See chart 11360.

(33) Mississippi River-Gulf Outlet Anchorage. See charts 11360 and 11363.

(34) Gulfport Safety Fairway. See charts 11360 and 11373.

(35) Biloxi Safety Fairway. See charts 11360 and 11373.

(36) Ship Island Pass to Horn Island Pass Safety Fairway. See charts 11360 and 11373.

(37) Pascagoula Safety Fairway. See charts 11360 and 11373.

(38) Horn Island Pass to Mobile Ship Channel Safety Fairway. See charts 11360, 11373, and 11376.

(39) Mobile Safety Fairway. (i) Mobile Ship Channel. See charts 11360 and 11376.

(ii) Mobile Ship Channel to Sea Safety Fairway. See charts 11360 and 11376.

(iii) Mobile to Pensacola Safety Fairway. See charts 11360, 11340, and 11382.

(40) Mobile Anchorage. See chart 11360.

(41) Pensacola Safety Fairway. See charts 11360 and 11382.

(42) Pensacola Anchorage. See charts 11360 and 11382.

(43) Pensacola to Panama City Safety Fairway. See charts 11360, 11389, and 11382.

(44) Panama City Safety Fairways. See charts 11360 and 11389.

(45) Panama City Anchorage. See charts 11360 and 11389.

(46) Port St. Joe Fairway to Panama City Safety Fairway. See charts 11360 and 11389.

(47) Port St. Joe Anchorage. See charts 11360 and 11389.

(48) Tampa Safety Fairways. See charts 11412, 11420, and 11400.

(49) Tampa Anchorages. See charts 11412, 11400, and 11420.

(50) Charlotte Safety Fairway. See charts 11426 and 11420.

(51) Charlotte Anchorage. See charts 11426 and 11420.

Part 167–Offshore Traffic Separation Schemes

Subpart A–General

§167.1 Purpose.

The purpose of the regulations in this part is to establish and designate traffic separation schemes and precautionary areas to provide access routes for vessels proceeding to and from U.S. ports.

§167.5 Definitions.

(a) "Traffic separation scheme" (TSS) means a designated routing measure which is aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes. The elements of a TSS include traffic lanes, a separation zone or line, and, in many cases, precautionary areas.

(b) "Traffic lane" means an area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones, may constitute a boundary.

(c) "Separation zone or line" means a zone or line separating the traffic lanes in which ships are proceeding in opposite or nearly opposite directions; or separating a traffic lane from the adjacent sea area; or separating traffic lanes designated for partic-

ular classes of ships proceeding in the same direction.

(d) "Precautionary area" means a routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.

§167.10 Operating rules.

The operator of a vessel in a TSS shall comply with Rule 10 of the International Regulations for Preventing Collisions at Sea, 1972, as amended.

§167.15 Modification of schemes.

(a) A traffic separation scheme or precautionary area described in this Part may be permanently amended in accordance with 33 U.S.C. 1223 (92 Stat. 1473), and with international agreements.

(b) A traffic separation scheme or precautionary area in this Part may be temporarily adjusted by the Commandant of the Coast Guard in an emergency, or to accommodate operations which would create an undue hazard for vessels using the scheme or which would contravene Rule 10 of the International Regulations for Preventing Collisions at Sea, 1972. Adjustment may be in the form of a temporary traffic lane shift, a temporary suspension of a section of the scheme, a temporary precautionary area overlaying a lane, or other appropriate measure. Adjustments will only be made where, in the judgment of the Coast Guard, there is no reasonable alternative means of conducting an operation and navigation safety will not be jeopardized by the adjustment. Notice of adjustments will be made in the appropriate Notice to Mariners and in the Federal Register. Requests by members of the public for temporary adjustments to traffic separation schemes must be submitted 150 days prior to the time the adjustment is desired. Such Requests, describing the interference that would otherwise occur to a TSS, should be submitted to the District Commander of the Coast Guard District in which the TSS is located.

Subpart B–Description of Traffic Separation Schemes and Precautionary Areas

§167.100 Galveston Bay Approach Traffic Separation Scheme and Precautionary Areas.

(a) An inshore precautionary area bounded by a line connecting the following geographical positions:

(1) 29°18.10′N., 94°39.20′W.
(2) 29°16.10′N., 94°37.00′W.
(3) 28°18.00′N., 94°34.90′W.
(4) 29°19.40′N., 94°37.10′W.
(5) 29°19.80′N., 94°38.10′W.

(b) A traffic separation zone bounded by a line connecting the following geographical positions:

(6) 29°17.15′N., 94°35.80′W.
(7) 29°09.20′N., 94°26.23′W.
(8) 29°09.05′N., 94°26.36′W.
(9) 29°17.04′N., 94°35.93′W.

(c) A traffic lane for inbound (northwesterly heading) traffic is established between the separation zone and a line connecting the following geographical positions:

(3) 29°18.00′N., 94°34.90′W.
(10) 29°11.20′N., 94°24.00′W.

(d) A traffic lane for outbound (southeasterly heading) traffic is established between the separation zone and line connecting the following geographical positions:

(2) 29°16.10′N., 94°37.00′W.
(11) 29°07.70′N., 94°27.80′W.

(e) An offshore precautionary area bounded by a line connecting the following geographical positions:

(11) 29°07.70′N., 94°27.80′W.
(12) 29°06.40′N., 94°26.20′W.
(13) 29°06.40′N., 94°23.90′W.
(14) 29°09.10′N., 94°20.60′W.
(10) 29°11.20′N., 94°24.00′W.

Note.–A pilot boarding area is located near the center of the inshore precautionary area. Due to heavy vessel traffic, mariners are advised not to anchor or linger in this precautionary area except to pick up or disembark a pilot.

Part 204–Danger Zone Regulations

§204.95 Straits of Florida and Florida Bay in vicinity of Key West, Fla.; operational training area, aerial gunnery range, and bombing and strafing target areas, Naval Air Station, Key West, Fla. (a) The danger zones.– (1) Operational training area. Waters of the Straits of Florida and Gulf of Mexico southwest, west and northwest of Key West bounded as follows: Beginning at latitude 25°45′00″, longitude 82°07′00″; thence southeast to latitude 24°49′00″, longitude 81°55′00″; thence southwest to latitude 24°37′30″, longitude 82°00′30″; thence westerly to latitude 24°37′30″, longitude 82°06′00″; thence southerly to latitude 24°28′30″, longitude 82°06′00″; thence southerly to latitude 24°25′00″, longitude 82°06′30″; thence easterly to latitude 24°25′00″, longitude 81°57′00″ thence southwesterly to latitude 23°30′00″, longitude 82°19′00″; thence westerly to latitude 23°30′00″, longitude 82°46′00″; thence northwesterly to latitude 23°52′30″, longitude 83°11′00″; thence northerly to latitude 24°25′00″, longitude 83°11′00″; thence easterly to latitude 24°25′00″, longitude 83°08′00″; thence clockwise along the arc of a circle with a radius of 92 miles centered at latitude 24°35′00″, longitude 81°41′15″ to latitude 25°45′05″, longitude 82°23′30″; thence east to point of beginning.

(2) Bombing and strafing target areas.

(i) A circular area immediately west of Marquesas Keys with a radius of two nautical miles having its center at latitude 24°33.4′ and longitude 82°10.9′, not to include land area and area within Marquesas Keys. The target located within this area, a grounded LSIL will be used for bombing and aircraft rocket exercises.

(ii) A circular area located directly west of Marquesas Keys with a radius of three statute miles having its center at latitude 24°35.6′ and longitude 82°11.6′, not to include land area within Marquesas

Keys. The targets located within this area, pile-mounted platforms, will be used as high altitude horizontal bombing range utilizing live ordnance up to and including 1,800 pounds of high explosives. In general, these explosives will be of an air-burst type, above 1,500 feet.

(iii) A circular area located west of Marquesas Keys with a radius of two nautical miles having its center at latitude 24°34′30″ and longitude 82°14′00″.

(b) The regulations. (1) In advance of scheduled air or surface operations which, in the opinion of the enforcing agency, may be dangerous to watercraft, appropriate warnings will be issued to navigation interests through official government and civilian channels or in such other manner as the District Engineer, Corps of Engineers, Jacksonville, Florida, may direct. Such warnings will specify the location, type, time, and duration of operations, and give such other pertinent information as may be required in the interests of safety.

(2) Watercraft shall not be prohibited from passing through the operational training area except when the operations being conducted are of such nature that the exclusion of watercraft is required in the interest of safety or for accomplishment of the mission, or is considered important to the national security.

(3) When the warning to navigation interests states that bombing and strafing operations will take place over the designated target areas or that other operations hazardous to watercraft are proposed to be conducted in a specifically described portion of the overall area, all watercraft will be excluded from the target area or otherwise described zone of operations and no vessel shall enter or remain therein during the period operations are in progress.

(4) Aircraft and naval vessels conducting operations in any part of the operational training area will exercise caution in order not to endanger watercraft. Operations which may be dangerous to watercraft will not be conducted without first ascertaining that the zone of operations is clear. Any vessel in the zone of operations will be warned to leave and upon being so warned the vessel shall leave immediately.

(5) The regulations in this section shall be enforced by the Commandant, Sixth Naval District, Charleston, S.C., and such agencies as he may designate.

§204.100 Tampa Bay south of MacDill Air Force Base, Fla.; small arms firing range and aircraft jettison, United States Air Force, MacDill Air Force Base. (a) The danger zone. Shoreward of a line beginning at latitude 27°49′27.38″, longitude 82°29′35.83″; thence to latitude 27°49′20.14″, longitude 82°29′42.78″; thence to latitude 27°48′44.82″, longitude 82°31′10.0″; thence to latitude 27°49′09.35″, longitude 82°32′24.56″; thence to latitude 27°49′38.62″, longitude 82°33′02.44″; and thence to a point on the shore line of MacDill Air Force Base at latitude 27°50′28.57″, longitude 82°32′15.0″. The area will be marked by suitable boundary signs or buoys.

(b) The regulations. (1) Vessels and other watercraft are prohibited from entering the danger zone at all times.

(2) Advance notice will be given of the date on which the first firing practice shall begin. At intervals of not more than three months thereafter, notice will be sent out that firing practice is continuing. Such notices will appear in local newspapers and in "Notice to Mariners."

(3) The regulations in the section shall be enforced by the proper Air Force Authority at MacDill Air Force Base.

§204.111 Gulf of Mexico south of Apalachee Bay, Fla.; Air Force rocket firing range. (a) The danger zone. An area about 45 statute miles wide and 60 statute miles long, approximately parallel to and about 30 miles off the west coast of Florida, south of Apalachee Bay. The area is bounded as follows: Beginning at latitude 29°42′30″, longitude 84°40′00″; thence east along latitude 29°42′30″ to longitude 84°00′00″; thence southeast to latitude 28°56′00″, longitude 83°31′00″; thence southwest to latitude 28°37′00″, longitude 84°11′00″; thence northwest to latitude 29°17′30″, longitude 84°40′00″; thence northwest to latitude 29°32′00″, longitude 85°00′00″; thence northeast along a line three miles off the meanderings of the shore to the point of beginning.

(b) The regulations. (1) The fact that aerial rocket firing will be conducted over the danger zone will be advertised to the public through the usual media for the dissemination of information. Inasmuch as such firing is likely to be conducted during the day or night throughout the year without regard to season, such advertising of firing will be repeated at intervals not exceeding three months and at more frequent intervals when in the opinion of the enforcing agency, repetition is necessary in the interest of public safety.

(2) Prior to the conduct of rocket firing, the area will be patrolled by surface patrol boat and/or patrol aircraft to insure that no watercraft are within the danger zone and to warn any such watercraft seen in the vicinity that rocket firing is about to take place in the area. When aircraft is used to patrol the area, low flight of the aircraft across the bow will be used as a signal or warning.

(3) Any such watercraft shall, upon being so warned, immediately leave the area, and, until the conclusion of the firing, shall remain at such a distance that it will be safe from the fallout resulting from such rocket firing.

(4) The regulations in this section shall not deny access to or egress from harbors contiguous to the danger zone in the case of regular passenger or cargo carrying vessels proceeding to or from such harbors. In the case of the presence of any such vessel in the danger zone the officer in charge shall cause the cessation or postponement of fire until the vessel shall have cleared that part of the area in which it might be endangered by the fallout. The vessel shall proceed on its normal course and shall not delay its progress unnecessarily. Masters are requested to avoid the danger zone whenever possi-

ble so that interference with firing training may be minimized.

(c) The regulations in this section shall be enforced by the Commander, Moody Air Force Base, Valdosta, Georgia, and such agencies as he may designate.

§204.112 Gulf of Mexico, south of St. George Island, Fla.; test firing range. (a) The danger zone. A fanshaped area bounded as follows:

NW corner (29°35′15″N., 85°03′12″W.)
SW corner (29°31′18″N., 85°07′31″W.)
SE corner (29°30′18″N., 84°59′18″W.)
NE corner (29°35′09″N., 85°01′53″W.)

The seaward end of the area is an arc with a 10,500 meter radius with its center located on the south shore line of St. George Island 1,500 feet east of Cape St. George Light.

(b) The regulations. (1) The area shall be used from sunrise to sunset daily Mondays through Fridays for test firing helicopter armament.

(2) During firing, the entire area plus 5 miles beyond in all directions shall be kept under surveillance by one control helicopter equipped with FM and UHF communications to the Safety Office at range control to insure cease fire if an aircraft or surface vessel is observed approaching the area.

(3) The regulations in this section shall be enforced by the Commanding Officer, U.S. Army Aviation Test Board, Fort Rucker, Ala., and such agencies as he may designate.

§204.113 Gulf of Mexico and Apalachicola Bay south of Apalachicola, Florida, Drone Recovery Area, Tyndall Air Force Base, Florida. (a) The restricted area. A rectangular area excluding St. George Island with the eastern boundary of the area west of the channel through St. George Island within the following co-ordinates: Beginning at a point designated as the northeast corner latitude 29°38′20″N., longitude 84°58′30″W.; thence southeast to latitude 29°35′23″N., longitude 84°56′54″W.; thence southwest to latitude 29°34′15″N., longitude 85°00′35″W.; thence northwest to latitude 29°37′10″N., longitude 85°02′00″W.; thence northeast to point of beginning.

(b) The regulations. (1) The area will be used twice daily and during usage will be restricted to navigation for a period of one hour. It may be used freely at all other times.

(2) Patrol boats and aircraft will warn navigation out of the area before each testing period.

(3) The regulations in this section shall be enforced by the Commander, Headquarters 4756th Air Defense Wing (Weapons) U.S. Air Force, Tyndall Air Force Base, Florida, and such other agencies as he may designate.

§204.114 Gulf of Mexico south and west of Apalachicola, San Blas, and St. Joseph Bays; air-to-air firing practice range, Tyndall Air Force Base, Fla. (a) The danger zone. Beginning at latitude 29°40′00″, longitude 85°21′30″, in the vicinity of Cape San Blas; thence southeasterly to latitude 29°23′00″, longitude 84°39′00″; thence southwesterly to latitude 28°39′00″, longitude 84°49′00″; thence northwesterly to latitude 29°43′00″, longitude 85°53′00″; thence northeasterly to latitude 29° 56′30″, longitude 85°38′30″; and thence southeasterly to the point of beginning.

(b) The regulations. (1) Air-to-air firing practice will ordinarily take place in the area during the hours of daylight, seven days per week. During periods of firing, passage through the area will not be denied to cargo-carrying or passenger-carrying vessels or tows proceeding on established routes. In case any such vessel is within the danger area, the officer in charge of firing practice operations will cause the cessation or postponement of fire until the vessel has cleared that part of the area within range of the weapons being used. The vessel shall proceed on its normal course and not delay its progress.

(2) Other vessels will be warned to leave the danger area during firing practice by surface patrol boat and/or patrol aircraft. When aircraft is used to patrol the area, low flight of the aircraft across the bow will be used as a signal or warning. Upon being so warned such vessels shall clear the area immediately.

(3) The area will be open to all vessels whenever firing practice is not being conducted.

(4) The regulations in this section shall be enforced by the Commanding Officer, Tyndall Air Force Base, Florida, and such agencies as he may designate.

§204.120 Gulf of Mexico, southeast of St. Andrew Bay East Entrance, Small Arms Firing Range, Tyndall Air Force Base, Fla. (a)– The Danger Zones–(1) Area No. 1. The waters of the Gulf of Mexico, southeast of St. Andrew Bay East Entrance within a rectangular area beginning at a point on shore at latitude 30°04′32″, longitude 85°37′07″; thence to latitude 30°03′03″, longitude 85°38′42″; thence to latitude 30°02′14″, longitude 85°37′15″; thence to a point on shore at latitude 30°04′13″, longitude 85°36′47″; thence along the shoreline to the point of beginning.

(2) Area No. 2. The waters of the Gulf of Mexico and St. Andrew Sound within an area described as follows, but excluding Crooked Island: Beginning at a point on shore at latitude 30°02′56″, longitude 85°34′35″; thence to latitude 30°02′18″, longitude 85°36′18″; thence to latitude 30°01′24″, longitude 85°35′40″; thence to latitude 30°00′45″, longitude 85°34′41″; thence to a point on shore at latitude 30°02′10″, longitude 85°33′42″; thence along the shore line to the point of beginning.

(b) The regulations. (1) No vessel or other craft shall enter or remain in the areas during periods of firing. Area No. 1 will be used for firing practice between 6:30 a.m. and 5:00 p.m., as scheduled, Monday through Friday, with possibly some sporadic firings on Saturdays and Sundays. A 10′ x 18′ red flag will be displayed on a pole at the shoreline whenever firing is in progress.

(2) Area No. 2 will be operated on a sporadic schedule, with firings likely each day including Saturdays, Sundays, and holidays, between the hours of 6:00 a.m. and 5:00 p.m. A 10′ x 18′ red flag

will be displayed on a pole at the shore line whenever firing is in progress.

(3) The regulations in this section shall be enforced by the Commanding Officer, Tyndall Air Force Base, Florida, and such agencies as he may designate.

§204.126 Gulf of Mexico, south of Panama City, Florida; underwater experimental areas, U.S. Navy Mine Defense Laboratory, Panama City, Florida. (a) The prohibited areas. (1) A circular area with a radius of 300 yards around existing research platform No. 1 located at latitude 30°00′34″, longitude 85°54′12″.

(2) A circular area with a radius of 300 yards around existing research platform No. 2 located at latitude 30°07′14″, longitude 85°46′30″.

(b) The regulations. The areas will be buoyed and marked by the U.S. Coast Guard and will be prohibited to navigation at all times.

§204.130 Choctawhatchee Bay, Aerial Gunnery Ranges, Air Proving Ground Center, Air Research and Development Command, Eglin Air Force Base, Fla. (a) The danger zones. (1) Aerial gunnery range in west part of Choctawhatchee Bay. The waters of Choctawhatchee Bay within an area described as follows: Beginning at a point on the west shore at latitude 30°28′30″, longitude 86°30′00″; thence southeasterly to latitude 30°25′30″, longitude 86°21′30″; thence southwesterly to a point on the south shore at latitude 30°23′30″, longitude 86°23′00″; thence northwesterly to a point on the south shore at latitude 30°24′00″, longitude 86°25′00″; and thence northwesterly to the point of beginning; excluding that part of the area included within the aerial gunnery range along the north shore of Choctawhatchee Bay (described in paragraph (a)(2) of this section).

(2) Aerial gunnery range along north shore of Choctawhatchee Bay. The waters of Choctawhatchee Bay within an area described as follows: Beginning at a point in the waters of Choctawhatchee Bay at latitude 30°26′00″, longitude 86°25′30″; thence north to the shore at longitude 86°25′30″; thence southeasterly and northeasterly along the shore to longitude 86°15′00″; thence south to latitude 30°26′29″, longitude 86°15′00″; thence southwesterly to latitude 30°26′12″, longitude 86°20′35″; thence north to latitude 30°26′57″, longitude 86°20′35″; thence southwesterly to the point of beginning.

(b) The regulations–(1) Aerial gunnery ranges. (i) The aerial gunnery range in the west part of Choctawhatchee Bay (described in paragraph (a)(1) of this section) may be used by watercraft except during periods when firing is conducted. During these periods, firing will be controlled by observation posts, and watercraft will be warned by patrol boats. During periods of firing, traverse of this area shall not be denied to regular cargo-carrying or passenger-carrying vessels or tows proceeding on established routes. In case any such vessel is within the area, the officer in charge of gunnery operations will cause the cessation or postponement of fire until the vessel has cleared that part of the area within the range of the weapons being used. The vessel shall proceed on its normal course and shall not delay its progress.

(ii) No vessel or other craft shall enter or remain within the aerial gunnery range along the north shore of Choctawhatchee Bay (described in paragraph (a)(2) of this section) at any time.

(2) Enforcing Agency. The regulations in this section shall be enforced by the Commander, Air Proving Ground Center, Eglin AFB, and such agencies as he may designate.

§204.134 The Narrows and Gulf of Mexico adjacent to Santa Rosa Island, Air Force Proving Ground Command, Eglin Air Force Base, Florida. (a) The restricted area. The waters of The Narrows and the Gulf of Mexico easterly of the periphery of a circular area 5 nautical miles in radius, centered at latitude 30°23′10.074″, longitude 86°48′25.433″ (USC&GS Station Tuck 3), within the segment of a circle, 3 nautical miles in radius, centered at latitude 30°24′00″, longitude 86°41′47″.

(b) The regulations. (1) The area will be used intermittently during daylight hours. During periods of use the area will be prohibited to navigation.

(2) The regulations in this section shall be enforced by the Commander, Air Force Proving Ground Command, Eglin Air Force Base, Florida, and such agencies as he may designate.

§204.135 Gulf of Mexico, south from Choctawhatchee Bay; guided missiles test operations area, Headquarters Air Proving Ground Command, United States Air Force, Eglin Air Force Base, Florida. (a) The danger zone. The waters of the Gulf of Mexico south from Choctawhatchee Bay within an area described as follows: Beginning at a point five nautical miles southeasterly from USC&GS Station Tuck 3, at latitude 30°23′10.074″, longitude 86°48′25.433″, 3 nautical miles offshore of Santa Rosa Island; thence easterly three nautical miles offshore and parallel to shore, to a point south of Apalachicola Bay, Florida, latitude 29°32′00″, longitude 85°00′00″; thence southeasterly to latitude 29°17′30″, longitude 84°40′00″; thence southwesterly to latitude 28°40′00″, longitude 84°49′00″; thence southeasterly to latitude 28°10′00″, longitude 84°30′00″; thence 270° true to longitude 86°48′00″; thence due north along longitude 86°48′00″ to the intersection of the line with a circle of five nautical miles radius centered on USC&GS Station Tuck 3, at latitude 30°23′10.074″, longitude 86°48′25.433″, thence northeasterly along the arc of the circle to the point of beginning.

(b) The regulations. (1) The area will be used intermittently during daylight hours for a week or 10 days at a time. Firing will take place once or twice a day for periods ordinarily of not more than one hour. Advance notice of such firings will be published in local newspapers and in such other manners as the District Engineer, Corps of Engineers, Mobile, Alabama, may direct.

(2) During periods of firing, passage through the area will not be denied to cargo-carrying or passen-

ger-carrying vessels or tows proceeding on established routes. In case any such vessel is within the danger area, the officer in charge of firing operations will cause the cessation or postponement of fire until the vessel shall have cleared the portion of the danger area involved. The entire area involved will be under constant observation of both surface patrol vessels and air patrol planes prior to and during periods of firing and notice will be given to vessels and tows of intention to fire by buzzing low over the vessel, upon which signal vessels and tows shall proceed on their established course promptly and clear the area as soon as possible.

(3) Other vessels will be warned to leave the immediate danger area during firing periods by surface patrol craft. Upon being so warned such vessels shall clear the area immediately. Such period normally will not exceed two hours.

(4) The regulations in this section shall be enforced by the Commanding Officer, Air Force Proving Ground Command, Eglin Field, Florida, and such agencies as he may designate.

§204.136 Waters of Santa Rosa Sound and Gulf of Mexico adjacent to Santa Rosa Island, Air Force Proving Ground Command, Eglin Air Force Base, Florida. (a) The danger zones–(1) Prohibited area. Waters of Santa Rosa Sound and Gulf of Mexico within a circle one nautical mile in radius, centered at latitude 30°23′10.074″, longitude 86°48′25.433″ (USC&GS Station Tuck 3). The portion of the area in Santa Rosa Sound includes the Gulf Intracoastal Waterway between miles 209.6 and 211.4 from Harvey Lock, Louisiana.

(2) Restricted area. The waters of Santa Rosa Sound and Gulf of Mexico surrounding the prohibited area described in paragraph (a)(1) of this section, within a circle five nautical miles in radius centered at latitude 30°23′10.074″, longitude 86°48′25.433″ (USC&GS Station Tuck 3). The portion of the area in Santa Rosa Sound includes the Gulf Intracoastal Waterway between miles 204.6 and 216.4 from Harvey Lock, Louisiana.

(b) The regulations. (1) Experimental test operations will be conducted by the United States Air Force within the prohibited area on an intermittent basis. Such test operations shall not exceed one hour, and shall not occur more than twice weekly.

(2) No vessel or other watercraft shall enter the prohibited area, except to navigate the Gulf Intracoastal Waterway. Such vessels and other watercraft shall confine their movements to the waters within the limits of the Intracoastal Waterway and shall make the passage as promptly as possible under normal vessel speed.

(3) During periods when experimental test operations are underway no vessels or other watercraft shall enter or navigate the waters of the restricted area.

(4) Warning signs will be erected on the shore lines of Santa Rosa Sound and the Gulf of Mexico to mark the limits of the respective areas.

(5) The regulations in this section shall be enforced by the Commander, Headquarters Air Proving Ground Command, Eglin Air Force Base, Florida, and such agencies as he may designate.

§204.228 Atlantic Ocean off north coast of Puerto Rico; practice firing areas, United States Army Forces Antilles. (a) The danger zones–(1) Westerly small-arms range. The waters within the sector of a circle bounded by radii of 10,000 yards bearing 279° and 315° respectively, from latitude 18°28′31″, longitude 66°25′37″, and the included arc.

NOTE: All bearings in this section are referred to true meridian.

(2) Camp Tortuguero artillery range. The waters within the quadrant of a circle bounded by radii of 20,000 yards bearing 315° and 45°, respectively, from latitude 18°28′31″, longitude 66°25′37″, and the included arc.

(3) Easterly small-arms range. The waters within the sector of a circle bounded by radii of 7,210 yards bearing 45° and 70°, respectively, from a point on the southeast boundary of the artillery range 2,790 yards from its southerly end, and the included arc.

NOTE: The outer boundaries of the danger zones will not be marked, but signs will be posted along shore to warn against trespassing in the firing areas.

(b) The regulations. (1) The danger zones shall be open to navigation at all times except when practice firing is being conducted. When practice firing is being conducted no vessel or other craft except those engaged in towing targets or patrolling the areas shall enter or remain within the danger zones: Provided, That any vessel propelled by mechanical power at a speed greater than five knots may proceed through the Camp Tortuguero artillery range at any time to and from points beyond, but not from one point to another in, the danger zone, between latitudes 18°31′ and 18°32′, at its regular rate of speed without stopping or altering its course, except when notified to the contrary.

(2) The fact that practice firing is to take place over the designated area will be advertised to the public through the usual media for the dissemination of such information. Factual information as to the dates, time, and characteristics of the firing will be advertised in advance of each session of firing but in no case less than one week nor more than four weeks before such firing is scheduled to take place.

(3) Prior to conducting each practice firing, the entire danger zone will be patrolled by aircraft or surface vessels to insure that no watercraft are within the danger zone. Any watercraft in the vicinity will be warned that practice firing is about to take place. Any such watercraft shall, upon being so warned, leave the danger zone immediately and shall not return until such practice shall have been terminated and notification to that effect shall have been given by the patrol craft, except that vessels proceeding on a regular course through the area will be allowed to proceed out of the area without warning, and firing will not commence until such vessels are clear of the area.

(4) This section shall be enforced by the Commanding General, United States Army Forces Antilles, and such agencies as he may designate.

§204.230 Atlantic Ocean and Vieques Sound, in vicinity of Culebra Island, bombing and gunnery target area. (a) The danger zone. From Punta Resaca on the north coast of Culebra at latitude 18°20'12", longitude 65°17'29" to latitude 18°25'07", longitude 65°12'07"; thence to latitude 18°26'31", longitude 65°16'45"; thence to latitude 18°23'00", longitude 65°24'30"; thence to the charted position of nun buoy "2" at latitude 18°20'19", longitude 65°24'51"; thence to latitude 18°18'47", longitude 65°24'35"; thence to latitude 18°15'30", longitude 65°21'30"; thence to a point on the southeast coast of Cayo de Luis Pena at latitude 18°17'51", longitude 65°19'41"; and thence to Punta Tamarindo on the west coast of Culebra at latitude 18°19'12", longitude 65°19'22".

(b) The regulations. (1) The danger zone is subject to use as a target area for bombing and gunnery practice. It will be open to navigation at all times except when firing is being conducted. At such times no surface vessels, except those patrolling the area, shall enter or remain within the danger area. Prior to conducting each firing or dropping of ordnance the danger area will be patrolled to insure that no watercraft are within the danger area. Any watercraft in the vicinity will be warned that practice firing is about to take place and advised to vacate the area.

(2) The regulations in this section shall be enforced by the Commander, Caribbean Sea Frontier, San Juan, Puerto Rico, and such agencies as he may designate.

§204.234 Caribbean Sea and Vieques Sound in vicinity of Eastern Vieques, bombing and gunnery target area. (a) The danger zone. From Punta Conejo on the south coast of Vieques at latitude 18°06'30", longitude 65°22'33"; thence to latitude 18°03'00", longitude 65°21'00"; thence to latitude 18°03'00", longitude 65°15'30"; thence to latitude 18°11'30", longitude 65°14'30"; thence to latitude 18°12'00", longitude 65°20'00"; and thence to Cabellos Colorados on the north coast of Vieques at latitude 18°09'49", longitude 65°23'27".

(b) Regulations. (1) It will be open to navigation at all times except when firing is being conducted. At such times no surface vessels, except those patrolling the area, shall enter or remain within the danger area. Prior to conducting each firing or dropping of ordnance the danger area will be patrolled to insure that no watercraft are within the danger area. Any watercraft in the vicinity will be warned that practice firing is about to take place and advised to vacate the area.

(2) The regulations will be enforced by the Commander, U.S. Naval Forces Caribbean, U.S. Naval Station, Roosevelt Roads, Puerto Rico, and such agencies and subordinate commands as he/she may designate.

Part 207–Navigation Regulations

§207.160 All waterways tributary to the Atlantic Ocean south of Chesapeake Bay and all waterways tributary to the Gulf of Mexico east and south of St. Marks, Fla.; use, administration, and navigation. (a) Description. This section applies to the following:

(1) Waterways. All navigable waters of the United States, natural or artificial, including bays, lakes, sounds, rivers, creeks, intracoastal waterways, as well as canals and channels of all types, which are tributary to or connected by other waterways with the Atlantic Ocean south of Chesapeake Bay or with the Gulf of Mexico east and south of St. Marks, Florida.

(2) Locks. All Government owned or operated locks and hurricane gate chambers and appurtenant structures in any of the waterways described in paragraph (a)(1) of this section.

(3) United States property. All river and harbor lands owned by the United States in or along the waterways described in paragraph (a)(1) of this section, including lock sites and all structures thereon, other sites for Government structures and for the accommodation and use of employees of the United States, and rights of way and spoil disposal areas to the extent of Federal interest therein.

(4) Vessels and rafts. The term "vessel" as used in this section includes all floating things moved over these waterways other than rafts.

(b) Authority of District Engineers. The use, administration, and navigation of these waterways, Federal locks and hurricane gate chambers shall be under the direction of the officers of the Corps of Engineers, United States Army, detailed in charge of the respective sections, and their authorized assistants. The cities in which the U.S. District Engineers are located are as follows:

U.S. District Engineer, Norfolk, Virginia.

U.S. District Engineer, Wilmington, North Carolina.

U.S. District Engineer, Charleston, South Carolina.

U.S. District Engineer, Savannah, Georgia.

U.S. District Engineer, Jacksonville, Florida.

(c) Commercial statistics. (1) As required by section 11 of the River and Harbor Act of September 22, 1922 (42 Stat. 1043; 33 U.S.C. 555), owners, agents, masters and clerks of vessels plying upon the waterways described in paragraph (a)(1) of this section shall submit a report on such activities for statistical purposes which must contain the following information.

(i) Name of vessel.

(ii) Name and address of owner or operator.

(iii) Type of vessel–steam, motor, sail, barge, or other type.

(iv) Net registered tonnage–if not registered, approximate net tonnage.

(v) Maximum draft at time of passage.

(vi) Number of passengers.

(vii) Cargo–by commodities, expressed in short tons, or other units by which such commodities are customarily measured, giving origin and destination.

(2) All persons rafting and towing logs shall submit a report of their activities containing such

information as may be called for by the District Engineer concerned.

(3) The report should be presented to the lockmaster of the federally operated locks for each trip made. Where no federally operated lock is passed, they shall be mailed promptly to the District Engineer. On written request, persons or corporations making frequent use of these waterways may be granted permission to submit monthly statements in lieu of reports by trips. Reports may be submitted on forms furnished free of charge by the District Engineer.

(d) Bridges. (For regulations governing the operation of bridges, see 33 CFR 117.1, 117.240 and 117.245.)

(e) Locks-(1) Authority of Lockmasters

(i) Locks Staffed with Government Personnel. The provisions of this subparagraph apply to all waterways in this Section except for the segment of the Atlantic Intracoastal Waterway identified in (e)(1)(ii). The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He/she shall see that all laws, rules and regulations for the use of the lock and lock area are duly complied with, to which end he/she is authorized to give all necessary orders and directions in accordance therewith, both to employees of the Government and to any and every person within the limits of the lock and lock area, whether navigating the lock or not. No one shall cause any movement of any vessel, boat, or other floating thing in the lock or approaches except by or under the direction of the lockmaster or his/her assistants.

(ii) Locks Staffed with Contract Personnel. The provisions of this subparagraph apply to the segment of the Atlantic Intracoastal Waterway comprising the Albemarle and Chesapeake Canal and the Dismal Swamp Canal including Great Bridge Lock, Chesapeake, Virginia; Deep Creek Lock, Chesapeake, Virginia; and South Mills Lock, North Carolina. Contract personnel shall give all necessary orders and directions for operation of the locks. No one shall cause any movement of any vessel, boat or other floating thing in the locks or approaches except by or under the direction of the contract lock operator. All duties and responsibilities of the lockmaster set forth in this Section shall be performed by the contract lock operator except that the responsibility for enforcing all laws, rules and regulations shall be vested in a government employee designated by the Norfolk District Engineer. The District Engineer will notify waterway users and the general public through appropriate notices and media concerning the location and identify of the designated government employee.

(2) Signals. Vessels desiring lockage in either direction shall give notice to the lockmaster at not more than three-quarters of a mile nor less than one-quarter of a mile from the lock, by two long and two short blasts of a whistle. When the lock is available, a green light, semaphore or flag will be displayed; when not available, a red light, semaphore or flag will be displayed. No vessel or rafts shall approach within 300 feet of any lock entrance unless signalled to do so by the lockmaster.

(3) Precedence at locks. (i) The vessel arriving first at a lock shall be first to lock through; but precedence shall be given to vessels belonging to the United States and to commercial vessels in the order named. Arrival posts or markers may be established ashore above or below the locks. Vessels arriving at or opposite such posts or markers will be considered as having arrived at the locks within the meaning of this paragraph.

(ii) The lockage of pleasure boats, house boats or like craft shall be expedited by locking them through with commercial craft (other than barges carrying petroleum products or highly hazardous materials) in order to utilize the capacity of the lock to its maximum. If, after the arrival of such craft, no separate or combined lockage can be accomplished within a reasonable time not to exceed the time required for three other lockages, then separate lockage shall be made.

(4) Entrance to and exit from locks. No vessel or raft shall enter or leave the locks before being signalled to do so. While waiting their turns, vessels or rafts must not obstruct traffic and must remain at a safe distance from the lock. They shall take position in rear of any vessels or rafts that may precede them, and there arrange the tow for locking in sections if necessary. Masters and pilots of vessels or in charge of rafts shall cause no undue delay in entering or leaving the lock, and will be held to a strict accountability that the approaches are not at any time unnecessarily obstructed by parts of a tow awaiting lockage or already passed through. They shall provide sufficient men to move through the lock promptly without damage to the structures. Vessels or tows that fail to enter the locks with reasonable promptness after being signalled to do so will lose their turn.

(5) Lockage of vessels. (i) Vessels must enter and leave the locks carefully at slow speed, must be provided with suitable lines and fenders, must always use fenders to protect the walls and gates, and when locking at night must be provided with suitable lights and use them as directed.

(ii) Vessels which do not draw at least six inches less than the depth on miter sills or breast walls, or which have projections or sharp corners liable to damage gates or walls, shall not enter a lock or approaches.

(iii) No vessel having chains or lines either hanging over the sides or ends, or dragging on the bottom, for steering or other purposes, will be permitted to pass a lock or dam.

(iv) Power vessels must accompany tows through the locks when so directed by the lockmaster.

(v) No vessel whose cargo projects beyond its sides will be admitted to lockage.

(vi) Vessels in a sinking condition shall not enter a lock or approaches.

(vii) The passing of coal from flats or barges to steamers while in locks is prohibited.

(viii) Where special regulations for safeguarding human life and property are desirable for special situations, the same may be indicated by printed signs, and in such cases such signs will have the same force as other regulations in this section.

(ix) The lockmaster may refuse to lock vessels which, in his judgment, fail to comply with this paragraph.

(6) Lockage of rafts. Rafts shall be locked through in sections as directed by the lockmaster. No raft will be locked that is not constructed in accordance with the requirements stated in paragraph (g) of this section. The party in charge of a raft desiring lockage shall register with the lockmaster immediately upon arriving at the lock and receive instructions for locking.

(7) Number of lockages. Tows or rafts locking in sections will generally be allowed only two consecutive lockages if one or more single vessels are waiting for lockage, but may be allowed more in special cases. If tows or rafts are waiting above and below a lock for lockage, sections will be locked both ways alternately whenever practicable. When there are two or more tows or rafts awaiting lockage in the same direction, no part of one shall pass the lock until the whole of the one preceding it shall have passed.

(8) Mooring. (i) Vessels and rafts when in the lock shall be moored where directed by the lockmaster by bow, stern and spring lines to the snubbing posts or hooks provided for that purpose, and lines shall not be let go until signal is given for vessel or raft to leave. Tying boats to the lock ladders is prohibited.

(ii) The mooring of vessels or rafts near the approaches to locks except while waiting for lockage, or at other places in the pools where such mooring interferes with general navigation of the waterway is prohibited.

(9) Maneuvering locks. The lock gates, valves, and accessories will be moved only under the direction of the lockmaster; but if required, all vessels and rafts using the locks must furnish ample help on the lock walls for handling lines and maneuvering the various parts of the lock under the direction of the lockmaster.

(f) (Reserved)

(g) Rafts, logging. (1) Rafts will be permitted to navigate a waterway only if properly and securely assembled. The passage of "bag" or "sack" rafts, "dog" rafts, or of loose logs over any portion of a waterway, is prohibited. Each section of a raft will be secured within itself in such a manner as to prevent the sinking of any log, and so fastened or tied with chains or wire rope that it cannot be separated or bag out so as to materially change its shape. All dogs, chains and other means used in assembling rafts shall be in good condition and of ample size and strength to accomplish their purposes.

(2) No section of a raft will be permitted to be towed over any portion of a waterway unless the logs float sufficiently high in the water to make it evident that the section will not sink en route.

(3) Frequent inspections will be made by the person in charge of each raft to insure that all fastenings remain secure, and when any one is found to have loosened, it shall be repaired at once. Should any log or section be lost from a raft, the fact must be promptly reported to the District Engineer, giving as definitely as possible the exact point at which the loss occurred. In all cases the owner of the lost log or section will take steps immediately to remove the same from the waterway.

(4) The length and width of rafts shall not exceed such maximum dimensions as may be prescribed by the District Engineer.

(5) All rafts shall carry sufficient men to enable them to be managed properly, and to keep them from being an obstruction to other craft using the waterway. To permit safe passage in a narrow channel rafts will, if necessary, stop and tie up alongside the bank. Care must be exercised both in towing and mooring rafts to avoid the possibility of damage to aids to navigation maintained by the United States or under its authorization.

(6) When rafts are left for any reason with no one in attendance, they must be securely tied at each end and at as many intermediate points as may be necessary to keep the timbers from bagging into the stream, and must be moored so as to conform to the shape of the bank. Rafts moored to the bank shall have lights at 500-foot intervals along their entire length. Rafts must not be moored at prominent projections of the bank, or at critical sections.

(7) Logs may be stored in certain tributary streams provided a clear channel at least one-half the width of the channel be left clear for navigation along the tributary. Such storage spaces must be protected by booms and, if necessary to maintain an open channel, piling should also be used. Authority for placing these booms and piling must be obtained by written permit from the District Engineer.

(8) The building, assembling, or breaking up of a raft in a waterway will be permitted only upon special authority obtained from the District Engineer, and under such conditions as he may prescribe.

(h) Dumping of refuse or oil in waterway, obstructions. Attention is invited to the provisions of sections 13 and 20 of the River and Harbor Act of March 3, 1899 (30 Stat. 1152, 1154; 33 U.S.C. 407, 415), and of sections 2, 3, and 4 of the Oil Pollution Act of June 7, 1924 (43 Stat. 604, 605; 33 U.S.C. 432-434), which prohibit the depositing of any refuse matter in these waterways or along their banks where liable to be washed into the waters; authorize the immediate removal or destruction of any sunken vessel, craft, raft, or other similar obstruction, which stops or endangers navigation; and prohibit the discharge of oil from vessels into the coastal navigable waters of the United States.

(i) Damage. Masters and owners of vessels using the waterways are responsible for any damage caused by their operations to canal revetments, lock piers and walls, bridges, hurricane gate chambers,

spillways, or approaches thereto, or other Government structures, and for displacing or damaging of buoys, stakes, spars, range lights or other aids to navigation. Should any part of a revetment, lock, bridge, hurricane gate chamber, spillway or approach thereto, be damaged, they shall report the fact, and furnish a clear statement of how the damage occurred, to the nearest Government lockmaster or bridge tender, and by mail to the District Engineer, U.S. Engineer Office, in local charge of the waterway in which the damage occurred. Should any aid to navigation be damaged, they shall report that fact immediately to the nearest Coast Guard Officer in Charge Marine Inspection.

(j) Trespass on property of the United States. Trespass on waterway property or injury to the banks, locks, bridges, piers, fences, trees, houses, shops or any other property of the United States pertaining to the waterway, is strictly prohibited. No business, trading or landing of freight or baggage will be allowed on or over Government piers, bridges, or lock walls.

(k) Copies of regulations. Copies of the regulations in this section will be furnished free of charge upon application to the nearest District Engineer.

§207.173 Key West Harbor at U.S. Naval Base, Key West, Fla.; naval restricted area. (a) The areas: (1) All waters within 100 yards of the Harry S. Truman Annex beginning at a point on the shore at latitude 24°32′45.3″N., longitude 81°47′51″W.; thence to a point 100 yards due south of the south end of Whitehead Street at latitude 24°32′42.3″N., longitude 81°47′51″W., and extending westerly paralleling the south shoreline of Harry S. Truman Annex to latitude 24°32′37.6″N., longitude 81°48′32″W., and thence to the shore at latitude 24°32′41″N., longitude 81°48′31″W. (Area 1).

(2) All waters within 100 yards of the Coast Guard Station and the westerly end of Trumbo Point Annex beginning at the shore at latitude 24°33′47.6″N., longitude 81°47′55.6″W.; thence westerly to latitude 24°33′48″N., longitude 81°48′00.9″W.; thence southerly to latitude 24°33′45.8″N., longitude 81°48′00.9″W., thence westerly to latitude 24°33′47″N., longitude 81°48′12″W.; thence northerly to latitude 24°34′00.6″N., longitude 81°48′10.6″W.; thence easterly to the bulkhead which forms the easterly end of slip between the Coast Guard Station and Pier D-3 at latitude 24°33′59.2″N., longitude 81°47′59.1″W. (Area 2).

(3) All waters within 100 yards of Fleming Key (Area 3).

(4) All waters within 100 yards of a portion of the north shore of Trumbo Point Annex beginning at the shore at latitude 24°33′58″N., longitude 81°47′41.5″W.; thence northeasterly to latitude 24°34′00.9″N., longitude 81°47′37.7″W.; thence southeasterly to latitude 24°33′57.6″N., longitude 81°47′20″W.; thence southerly to the shore at latitude 24°33′54.7″N., and longitude 81°47′20.9″W. (Area 4).

(5) All waters within 100 yards of a portion of the southwest shore of the Naval Air Station and Boca Chica Key between a point at latitude 24°33′24″N., and longitude 81°42′30″W., and a point at latitude 24°33′54″N., and longitude 81°42′56″W. (Area 5).

(b) The regulations: (1) Entering or crossing any of the restricted areas described in paragraph (a) of this section is prohibited except as follows: Privately owned vessels properly registered and bearing identification in accordance with Federal and/or State laws and regulations, and at night showing lights required by Federal laws and Coast Guard regulations or, if no constant lights are required, then a bright white light showing all around the horizon, may transit the following portion of the restricted areas:

(i) The channel about 75 yards in width extending from the northwest corner of a pier formerly identified as "Pier D-3 of Trumbo Point Annex" eastward beneath the Fleming Key Bridge along the north shore of Trumbo Point Annex.

(ii) A channel 150 feet in width which extends easterly from the main ship channel into Key West Bight, the northerly edge of which passes 25 feet south of the Trumbo Point Annex piers on the north side of the bight. While legitimate access of privately owned vessels to facilities of Key West Bight is unimpeded, it is prohibited to moor, anchor, or fish within 50 feet of any U.S. Government owned pier or craft.

(2) Stopping or landing by other than Government owned vessels and certain specifically authorized private craft in any of the restricted areas described in paragraph 4(a) of this section is prohibited.

(3) Vessels using the restricted channel areas described in paragraph (b)(1)(i) and (ii) of this section shall proceed at speeds commensurate with minimum wake.

(4) The regulations in this section shall be enforced by the Commanding Officer, Naval Air Station, Key West, Florida, and such agencies as he may designate.

§207.175a Carlson's Landing Dam navigation lock, Withlacoochee River, Fla.; use, administration and navigation. (a) The owner of or agency controlling the lock shall not be required to operate the navigation lock except from 7 a.m. to 12 noon, and from 1 p.m. to 7 p.m., during the period of February 15 through October 15 each year; and from 8 a.m. to 12 noon, and from 1 p.m. to 6 p.m., during the remaining months of each year. During the above hours and periods the lock shall be opened upon demand for the passage of vessels.

(b) The owner of or agency controlling the lock shall place signs, of such size and description as may be designated by the District Engineer, U.S. Army Engineer District, Jacksonville, Fla., at each side of the lock indicating the nature of the regulations in this section.

§207.175b Weekley Bayou, an arm of Boggy Bayou, Fla., at Eglin Air Force Base; restricted area. (a) The area. All waters of Weekley Bayou west of a line drawn between latitude 30°28′57″, longitude

86°29′03″, and latitude 30°28′58″, longitude 86°29′06″, said line crossing the Bayou approximately 225 yards above its mouth.

(b) The regulations. (1) No vessel shall enter the area without the permission of the Commander, Eglin Air Force Base, Florida, or his authorized representative.

(2) The regulations in this section shall be enforced by the Commander, Eglin Air Force Base, Florida, or such agencies as he may designate.

§207.175c Ben's Lake, a tributary of Choctawhatchee Bay, Fla., at Eglin Air Force Base; restricted area. (a) The area. All waters of Ben's Lake including the channel connecting it with Choctawhatchee Bay.

(b) The regulations. (1) No vessel shall enter the area or navigate therein without the permission of the Commander, Eglin Air Force Base, Florida, or his authorized representative.

(2) These regulations shall be enforced by the Commander, Eglin Air Force Base, Florida, or such agencies as he may designate.

§207.175d Alligator Bayou, a tributary of St. Andrew Bay, Florida; restricted area. (a) The area. All waters of Alligator Bayou from a line connecting points of latitude 30°10′21″, longitude 85°45′07″ and latitude 30°10′16″, longitude 85°45′04″ to State Road 392.

(b) The regulation. (1) No vessel shall enter the area or navigate therein without permission of the Commanding Officer, Naval Ship Research and Development Laboratory, Panama City, Fla., or his authorized representative.

(2) The regulation of this section shall be enforced by the Commanding Officer, Naval Ship Research and Development Laboratory, Panama City, Fla., or such agencies as he may designate.

§207.175e Gulf of Mexico and St Andrew Sound, south of East Bay, Florida, Tyndall Drone Launch Corridor, Tyndall Air Force Base, Florida, Restricted Area. (a) The area. The waters of the Gulf of Mexico and St. Andrew Sound within an area described as follows, including Crooked Island: Beginning at a point on shore at latitude 30°01′30″, longitude 85°32′30″, thence to latitude 30°00′58″, longitude 85°33′38″, thence to latitude 29°56′38″, longitude 85°33′38″, thence to latitude 29°55′15″, longitude 85°31′21″, thence to a point on shore at latitude 30°00′58″, longitude 85°31′21″, thence northwest to the point of beginning. This area will be referred to as the "Tyndall Drone Launch Corridor."

(b) The regulations. (1) Military usage of areas is Monday through Friday between the hours of 7 a.m. and 5 p.m.

(2) Vessels are allowed to enter and remain in this area provided they have operational communication equipment capable of monitoring VHF Marine frequency Channel 16 (156.80 MHz). In the event the Marine radio equipment is not installed on the vessel, CB equipment with Channel 13 (27.115 MHz) will be used as an alternate means of communications. Warnings will be broadcast by the Air Force on Channel 16 (156.80 MHz) and Channel 13 (27.115 MHz) using the following sequence:

(i) Announcement 90 minutes prior to drone launch.

(ii) Announcement 60 minutes prior to drone launch.

(iii) Announcement of drone launch or drone cancelled, and the expected time of the drone launch. Upon receipt of the drone warning on either Channel 16 (156.80 MHz) or Channel 13 (27.115 MHz), vessels will take the necessary action to vacate the drone launch corridor not later than 60 minutes prior to expected drone launch.

(3) Vessels are authorized direct movement without stopping through this area at any time unless warned by helicopter or patrol boat.

(4) The area will be patrolled by helicopter/vessels during periods of hazardous military activity. Verbal warnings or instructions issued by these craft will be strictly adhered to.

(5) The regulations in this section shall be enforced by the Commanding Officer, Tyndall Air Force Base, Florida, and such agencies as he may designate.

§207.176 Pensacola Bay, Fla.; seaplane restricted area. (a) The area. Beginning at latitude 30°22′28″, longitude 87°16′00″; thence to latitude 30°21′02″, longitude 87°14′20″; thence to latitude 30°20′02″, longitude 87°15′16″; thence to latitude 30°20′11″; longitude 87°17′58″; and thence to 272° true to the shore.

(b) The regulations. (1) This area is established as a naval seaplane landing area.

(2) Vessels and small craft, except crash boats, plane rearming boats, and similar craft ordered into the area on specific missions in connection with the servicing of planes or patrol of the area, are prohibited from entering or being in the area at any time.

(3) The regulations in this section shall be enforced by the Chief of Naval Air Basic Training, U.S. Naval Air Station, Pensacola, Fla., and such agencies as he may designate.

§207.180 All waterways tributary to the Gulf of Mexico (except the Mississippi River, its tributaries, South and Southwest Passes and the Atchafalaya River) from St. Marks, Fla., to the Rio Grande; use, administration, and navigation. (a) The regulations in this section shall apply to:

(1) Waterways. All navigable waters of the U.S. tributary to or connected by other waterways with the Gulf of Mexico between St. Marks, Fla., and the Rio Grande Tex. (both inclusive), and the Gulf Intracoastal Waterway; except the Mississippi River, its tributaries, South and Southwest Passes, and the Atchafalaya River above its junction with the Morgan City-Port Allen Route.

(2) Locks and floodgates. All locks, floodgates, and appurtenant structures in the waterways described in paragraph (a)(1) of this section.

(3) Bridges, wharves, and other structures. All bridges, wharves, and other structures in or over these waterways.

(4) Vessels. The term "vessels" as used in this section includes all floating craft other than rafts.

(5) Rafts. The term "raft" as used in this section includes any and all types of assemblages of floating logs or timber fastened together for support or conveyance.

(b) Authority of District Engineers: The use, administration, and navigation of the waterways and structures to which this section applies shall be under the direction of the officers of the Corps of Engineers, U.S. Army, in charge of the respective districts, and their authorized assistants. The location of these Engineer Districts, and the limits of their jurisdiction, are as follows:

(1) U.S. District Engineer, Mobile, Ala. The St. Marks River, Fla., to and including the Pearl River, Mississippi and Louisiana; and the Gulf Intracoastal Waterway from Apalachee Bay, Fla., to mile 36.4 east of Harvey Lock.

(2) U.S. District Engineer, New Orleans, La. From Pearl River, Mississippi and Louisiana, to Sabine River, Louisiana and Texas; and the Gulf Intracoastal Waterway from mile 36.4 east of Harvey Lock, to mile 266 west of Harvey Lock.

(3) U.S. District Engineer, Galveston, Tex. The Sabine River, Louisiana and Texas, to the Rio Grande, Tex.; and the Gulf Intracoastal Waterway from mile 266 west of Harvey Lock, to Brownsville, Tex.

(c) Commercial statistics: Owners, agents, masters, or clerks of vessels using the waterways to which this section applies shall submit a report on vessel movements and the cargo carried. The report is required by section 11 of the River and Harbor Act of September 22, 1922 (42 Stat. 1043; 33 U.S.C. 555). The required information may be submitted on ENG Forms 3925 and 3925B. These forms will be furnished free of charge to the operators by any of the U.S. Engineer Districts listed in paragraph (b) of this section. If the operators choose not to submit the required information on these forms, they should contact the District Engineers to determine the information required.

(d) Locks and floodgates:

(1) The term "lock" as used in this section shall include locks, floodgates, and appurtenant structures, and the area designated as the lock area including the lock approach channels.

(2) Authority of lockmasters: The term "lockmaster" as used in this section means the official in charge of operating a lock or floodgate. The lockmaster is responsible for the immediate management and control of the lock and lock area and for the enforcement of all laws, rules, and regulations for the use of the lock. He is authorized to give all necessary and appropriate orders and instructions to every person in the lock area, whether navigating the lock or not; and no one shall cause any movement of any vessel within the lock area unless instructed to do so by the lockmaster or his duly authorized assistants. The lockmaster may refuse passage through the lock to any vessel which, in his judgment, fails to comply with the regulations of this section.

(3) Sound signals: Vessels desiring passage through a lock shall notify the lockmaster by three long and distinct blasts of a horn, whistle, or calls through a megaphone, when within a reasonable distance from the lock. When the lock is ready for entrance, the lockmaster shall reply with three long blasts of a horn, whistle, or calls through a megaphone. When the lock is not ready for entrance, the lockmaster shall reply by four or more short, distinct blasts of a horn, whistle, or calls through a megaphone (danger signal). Permission to leave the lock shall be indicated by the lockmaster by one long blast.

(4) Visual signals: Signal lights and discs shall be displayed at all locks as follows:

(i) From sunset to sunrise: One green light shall indicate the lock is open to approaching navigation; one red light shall indicate the lock is closed to approaching navigation.

(ii) From sunrise to sunset: Large discs, identical in color and number to the light signals prescribed in paragraph (d)(4)(i) of this section will be displayed from a mast on or near the lock wall.

(5) Radiophone: Locks will monitor continuously VHF-Channel 14 ("Safety and Calling" Channel) and/or AM-2738 kHz for initial communication with vessels. Upon arrival at a lock, a vessel equipped with a radiophone will immediately advise the lock by radio of its arrival so that the vessel may be placed on proper turn. Information transmitted or received in these communications shall in no way affect the requirements for use of sound signals or display of visual signals, as provided in paragraphs (d)(3) and (4) of this section.

(6) Precedence at locks: The order of precedence for locking is:

(i) U.S. Government vessels, passenger vessels, commercial vessels, rafts, and pleasure craft.

(ii) The vessel arriving first at a lock will be locked through first. When vessels approach simultaneously from opposite directions, the vessel approaching at the same elevation as the water in the lock chamber will be locked through first. In order to achieve the most efficient utilization of the lock, the lockmaster is authorized to depart from the normal order of locking precedence, stated in paragraph (d)(6)(i) of this section, as in his judgment is warranted.

(iii) The lockage of pleasure boats, houseboats, or like craft may be expedited by locking them through with commercial craft (other than vessels carrying dangerous cargoes, as described in 46 CFR Part 146). If, after the arrival of such craft, no combined lockage can be made within reasonable time, not to exceed three other lockages, then separate lockage shall be made.

(7) Entrance to and exits from locks: No vessel or tow shall enter or exit from a lock before being signaled to do so. While awaiting turn, vessels or tows must not obstruct navigation and must remain at a safe distance from the lock, taking position to

the rear of any vessel or tows that precede them; and rearranging the tow for locking in sections, if necessary. Masters and pilots of vessels or tows shall enter or exit from a lock with reasonable promptness after receiving the proper signal. Appropriate action will be taken to insure that the lock approaches are not obstructed by sections of a tow either awaiting lockage or already locked through. Masters of vessels shall provide sufficient men to assist in the locking operation when deemed necessary by the lockmaster. Care shall be taken to insure prompt and safe passage of the vessel without damage to the structure.

(8) Lockage and passage of vessels: Vessels or tows shall enter and exit from locks under sufficient control to prevent damage to the lock, gates, guide walls, fenders, or other parts of the structure. Vessels shall be equipped with and use suitable fenders and adequate lines to protect the lock and to insure safe mooring during the locking operation. Vessels shall not meet or pass anywhere between the gate walls or fender system or in the approaches to locks.

(9) Vessels prohibited from locks: The following vessels shall not be permitted to enter locks or approach channels:

(i) Vessels in a sinking condition.

(ii) Vessels leaking or spilling cargo.

(iii) Vessels not having a draft of at least three (3) inches less than the depth over the sills or breast walls.

(iv) Vessels having projection or cargo loaded in such a manner that is liable to damage the structure.

(v) Vessels having chains, links, or drags either hanging over the sides or ends or dragging on the bottom for steering or other purposes.

(vi) Vessels containing flammable or dangerous cargo must have the hatch covers in place and securely fastened.

(10) Number of lockages: Tows locking in sections will generally be allowed only two consecutive lockages if other vessels are waiting for lockage unless otherwise decided by the lockmaster. If other tows are waiting above and below a lock, lockages will be made both ways alternately whenever practicable.

(11) Mooring in locks:

(i) When in a lock, vessels and tows shall be moored where directed by the lockmaster by bow, stern, and spring lines to the snubbing posts or hooks provided for that purpose, and lines shall not be let go until the signal is given for the vessel to exit. Tying to the lock ladders is prohibited.

(ii) Mooring near the approaches to locks is prohibited except when the vessels or tows are awaiting lockage.

(12) Lock operating personnel: Vessels and tows using the locks may be required to furnish personnel to assist in locking through; however, the operation of the structure is the responsibility of the lockmaster, and personnel assisting in the lockage of the vessels and tows will follow the direction of the appropriate official on duty at the lock. No gates, valves or other accessories or controls will be operated unless under his direction.

(13) Waterway traffic data: To meet requirements for current data on waterway traffic and the trend of such traffic, all vessels transiting locks shall furnish such information as prescribed by the District Engineer. ENG Form 3102 for submitting this data can be obtained at any Federally operated lock.

(14) Lockage of rafts: Rafts shall be locked through as directed by the lockmaster. No raft will be locked that is not constructed in accordance with the requirements stated in paragraph (f) of this section. The person in charge of a raft desiring lockage shall register with the lockmaster immediately upon arriving at the lock and receive instructions for locking.

(e) Waterways:

(1)–(4) (Reserved)

(5) (i) (Reserved)

(ii) Algiers Canal between the Mississippi River and Bayou Barataria, La., and on Harvey Canal, Gulf Intracoastal Waterway, mile 0 to mile 6 WHL, tows 74 feet in width will be allowed. Tows in excess of 55 feet wide desiring to move over Algiers Canal or Harvey Canal will obtain clearance from the lockmaster at Algiers Lock or Harvey Lock, respectively, before entering the canal. Overwidth tows will report clearing Algiers or Harvey Canal to the respective lockmaster and will rearrange tows to conform to prescribed dimensions immediately upon leaving the canal. The lockmaster will withhold permission for additional tows over 55 feet wide until all previously authorized tows moving in the opposite direction have cleared the waterway.

(iii)–(vi) (Reserved)

(vii) Vessels or tows shall not navigate through a drawbridge until the movable span is fully opened.

(6) Projections from vessels: Vessels or tows carrying a deck load which overhangs or projects over the side, or whose rigging projects over the side, so as to endanger passing vessels, wharves, or other property, shall not enter or pass through any of the narrow parts of the waterway without prior approval of the District Engineer.

(7) Meeting and passing: Passing vessels shall give the proper signals and pass in accordance with the Federal Rules of the Road. At certain intersections where strong currents may be encountered, sailing directions may be issued through navigation bulletins or signs posted on each side of the intersection.

(f) Rafts: The navigation regulations in this paragraph shall apply fully to the movement of rafts.

(1) Rafts will be permitted to navigate a waterway only if properly and securely assembled. Each raft shall be so secured as to prevent the loss or sinking of logs.

(2) All rafts shall carry sufficient men to enable them to be managed properly. It will be the responsibility of the owner to remove logs from the waterway that have broken loose from the raft.

(3) Building, assembling, or breaking up of a raft within a waterway may be permitted; however, the work must be done in an area that will not restrict

the use of the waterway by other users. The work area must be cleared of loose logs so that they will not enter the waterway and become a hazard to navigation.

(g) Damage: Should any damage be done to a revetment, lock, floodgates, bridge, or other federally owned or operated structure, the master of the vessel shall report the accident to the nearest lockmaster or bridgetender as soon as possible after the accident. Damage to aids to navigation and to nonfederally owned bridges must be reported to the Commander, Eighth Coast Guard District, New Orleans, La.

(h) Marine accidents: Masters, mates, pilots, owners, or other persons using the waterways covered by this section shall report to the District Engineer at the earliest possible date any accident on the waterway which causes any vessel to become an obstruction to navigation. The information to be furnished the District Engineer shall include the name of the vessel, its location, and the name and address of the owner. The owner of a sunken vessel shall properly mark the vessel as soon as practicable after sinking.

(i) Trespass on U.S. property:

(1) Trespass on or injury to waterway property of the United States is prohibited. No business, trading, or landing of freight, will be allowed on Government property without permission of the District Engineer.

(2) The District Engineer may establish policy pertaining to mooring, exchanging crews, loading and unloading supplies, and making emergency repairs in the vicinity of locks so long as navigation is not impeded thereby.

(j) Liability: The regulations of this section will not affect the liability of the owners and operators of vessels for any damage caused by their operations to the waterway or to the structures therein.

§207.184 Sabine River at Orange, Texas; restricted area in vicinity of the Naval and Marine Corps Reserve Center. (a) The area: The berthing area of the Naval and Marine Corps Reserve Center and the waters adjacent thereto from the mean high tide shoreline to a line drawn parallel to, and 100 feet channelward from lines connecting the pierhead of Pier 10 and from a line drawn parallel to, and 200 feet upstream from, Pier 10 to a line drawn parallel to, and 100 feet downstream from Pier 10.

(b) The regulations. (1) No vessel or other craft except vessels of the United States Government or vessels duly authorized by the Commanding Officer, Naval and Marine Corps Reserve Center, Orange, Texas, shall navigate, anchor, or moor in the restricted area.

(2) The regulations of this section shall be enforced by the Commanding Officer, Naval and Marine Corps Reserve Center, Orange, Texas, and such agencies as he may designate.

§207.185 Taylors Bayou, Tex., Beaumont Navigation District Lock; use, administration and navigation. (a) Between March 15 and September 15 each year, pleasure boats, houseboats, and other craft not employed for commercial purposes, will be locked through only at 6:00 and 11:45 a.m., and 6:30 p.m., except in cases of emergency; but whenever a lockage is made for a commercial boat, other craft may likewise pass through if there is room in the lock. At all other times lockages shall be made in accordance with §207.180.

(b) The lock tender or one in charge of the lock shall be the judge as to whether the boat presenting itself for lockage is a commercial or pleasure boat.

§207.187 Gulf Intracoastal Waterway, Tex.; special floodgate, lock and navigation regulations. (a) Application. The regulations in this section shall apply to the operation of the Brazos River Floodgates and the Colorado River Locks at Mile 400.8 and Mile 441.5, respectively, west of Harvey Lock, La., on the Gulf Intracoastal Waterway, and navigation of the tributary Colorado River Channel in the vicinity of said locks.

(b) Definitions. The term "current" means the velocity of flow of water in the river. It is expressed in statute miles per hour. The term "head differential" means the difference measured in feet between the water level in the river and that in the waterway when the floodgates or lock gates are closed. The term "Lockmaster" means the official in charge of the floodgates or locks.

(c) Operation of floodgates and locks–(1) Unlimited passage. The floodgates and locks shall be opened for the passage of single vessels and towboats with single or multiple barges when the current in the river is less than 2 miles per hour and the head differential is less than 0.7 foot. When the head differential is less than 0.7 foot, the Colorado River Locks shall normally be operated as floodgates, using only the riverside gates of each lock.

(2) Limited passage. When the current in either river exceeds 2 miles per hour or the head differential at the Brazos River Floodgates is between the limits of 0.7 foot and 1.8 feet, both inclusive, or the head differential at the Colorado River locks is 0.7 foot or greater, passage shall be afforded only for single vessels or towboats with single loaded barges or two empty barges. When two barges are rigidly assembled abreast of each other and the combined width of both together is 55 feet or less, they shall be considered as one barge. Each section of an integrated barge shall be considered as one barge, except when it is necessary to attach a rake section to a single box section to facilitate passage, the two sections shall be considered as one barge. It shall be the responsibility of the master, pilot or other person in charge of a vessel to determine whether a safe passage can be effected, give due consideration to the vessel's power and maneuverability, and the prevailing current velocity, head differential, weather and visibility. If conditions are not favorable, passage shall be delayed until conditions improve and a safe crossing is assured.

(3) Gate closures. The Brazos River Floodgates shall be closed to navigation when the head differential exceeds 1.8 feet. The Colorado River Locks

shall be closed to navigation when the current in the river exceeds a critical velocity as determined by the District Engineer, U.S. Army Engineer District, Galveston, Tex. The Brazos River Floodgates or the Colorado River Locks shall be closed to navigation when in the opinion of said District Engineer it is required for the protection of life and property, or it is to the advantage of the Government to permit uninterrupted emergency or maintenance operations, including dredging.

(4) Mooring facilities. Mooring facilities located on both banks of the Gulf Intracoastal Waterway on the approaches to the floodgates and locks are for the mooring of vessels when the floodgates or locks are closed to navigation or tows are limited to single barges. Vessels awaiting passage shall be moored parallel to the bank and as close to the bank as possible. Barges shall be moored fore and aft with two lines, each to a separate mooring facility. Beaching of vessels in lieu of mooring them is prohibited. The mooring facilities are numbered and vessels making fast to them shall notify the Lockmaster giving the number of each facility being used.

(5) (Reserved).

(6) Communication–(i) Radio. The floodgates and locks are equipped with short wave radio equipment transmitting and receiving on VHF-FM Channels 12, 13, 14, and 16. Call letters for the floodgates are WUI 411 and for the locks are WUI 412.

(ii) Telephone. The floodgates and locks are equipped with telephone facilities. The floodgates may be reached by phoning Freeport, Tex., 713-233-1251; the locks may be reached by phoning Matagorda, Tex., 713-863-7842.

(7) Arrival posts. Arrival posts 10 feet high and 10 inches in diameter have been established on the approaches to the locks and floodgates. They are painted with alternate horizontal bands of red and white 3 inches wide. Arrival at the floodgates or locks shall be determined as provided in paragraph (d)(4) of §207.180.

(d) Navigation of the Colorado River Channel–(1) Traffic signals. (i) Light and sound signals directed both upstream and downstream on the Colorado River are mounted on top of a galvanized skeleton steel tower 85 feet high located on the northeast point of land at the Gulf Intracoastal Waterway crossing of the river. They will be operated from the control house of the East Lock of the Colorado River Locks to direct the interchange of traffic in the Colorado River and the Gulf Intracoastal waterway.

(ii) Vessels navigating the Colorado River and desiring passage either upstream or downstream through the crossing, or into the crossing and through a lock into the Gulf Intracoastal Waterway, shall give notice to the Lockmaster by two long and distinct blasts of a whistle or horn when within a distance of not more than one-half mile nor less than one-fourth mile from the Gulf Intracoastal Waterway crossing. When the locks and the crossing are clear of vessels, the Lockmaster shall reply by two long and distinct blasts of a whistle or horn and display a green light from the signal tower indicating that the vessel in the river may proceed across the crossing or into the main stem of the Gulf Intracoastal Waterway either eastbound or westbound. When there are vessels in the river crossing or in the locks, the Lockmaster shall reply by four or more short blasts of a whistle or horn (danger signal) and display a red light from the signal tower indicating the vessel in the river shall wait at least a quarter of a mile from the crossing for clearance. When the locks and crossing are clear of vessels, the lockmaster shall indicate to the waiting vessel by two long and distinct blasts of a whistle or horn and display of a green light from the signal tower indicating that the vessel may proceed across the crossing or into the main stem of the Gulf Intracoastal Waterway either eastbound or westbound. During periods when the red light may be obscured by fog, mist, or rain, an audible signal consisting of a long blast followed by a short blast of a whistle or horn, repeated every 30 seconds, shall be sounded from the signal tower as an adjunct to the red light.

(2) Signs. Large signs with silver reflective background and stop sign red letters are erected one-fourth mile upstream and downstream from the Gulf Intracoastal Waterway on the Colorado River. The legend states "DO NOT PROCEED BEYOND THIS POINT WHEN SIGNAL TOWER LIGHT IS RED." These signs must be obeyed.

Note.–The foregoing regulations are supplementary to the regulations in §207.180.

§207.188 Corpus Christi Bay, Tex.; seaplane restricted area, U.S. Naval Air Station, Corpus Christi. (a) The area. The waters of Corpus Christi Bay within the area described as follows: Beginning at a point on the south shore of Corpus Christi Bay at the "North Gate" of the U.S. Naval Air Station at longitude 97°17′15.0″W.; thence through points at:

27°42′34.9″N., 97°17′09.6″W.
27°41′46.8″N., 97°14′23.8″W.
27°41′15.1″N., 97°14′35.4″W.
27°41′27.0″N., 97°15′16.7″W.

27°40′41.6″N., 97°15′33.3″W.; thence to a point on shore at latitude 27°40′44.9″N.; thence along the shore to the point of beginning.

(b) The regulations: (1) No vessel or watercraft shall enter or remain in the area at any time, day or night, except with express written approval of the enforcing agency, or as a result of force majeure.

(2) The regulations in this section shall be enforced by the Chief of Naval Air Training, U.S. Naval Air Station, Corpus Christi, Tex., and such agencies as he may designate.

§207.200 Mississippi River below mouth of Ohio River, including South and Southwest Passes; use, administration, and navigation. (a) Mississippi River bank protection works provided by United States. Except in case of great emergency, no vessel or craft shall anchor over revetted banks of the river, and no floating plant other than launches and similar small craft shall land against banks protected by revetment except at regular commercial landings. In all cases,

every precaution to avoid damage to the revetment works shall be exercised. The construction of log rafts along mattressed or paved banks or the tying up and landing of log rafts against such banks shall be performed in such a manner as to cause no damage to the mattress work or bank paving. Generally, mattress work extends out into the river 600 feet from the low water line. Information as to the location of revetted areas may be obtained from, and will be published from time to time by, the District Engineers, Corps of Engineers, New Orleans, Louisiana, Vicksburg, Mississippi, and Memphis, Tennessee, and the President, Mississippi River Commission, Vicksburg, Mississippi.

(b) Mississippi River below Baton Rouge, La., including South and Southwest Passes-(1) Supervision. The use, administration, and navigation of the waterways to which this paragraph applies shall be under the supervision of the District Engineer, Corps of Engineers, New Orleans, Louisiana.

(2)-(3) (Reserved)

(4) Cable and pipeline crossings. Any cable or pipeline crossing or extending into the waterways shall be marked by large signs with 12-inch black letters on a white background readable from the waterway side, placed on each side of the river near the point where the cable or pipeline enters the water, and at a sufficient height to be readable above any obstructions normally to be expected at the locality such as weeds or moored vessels.

(5) Marine accidents. Masters, mates, pilots, owners, or other persons using the waterway to which this paragraph applies shall notify the District Engineer by the most expeditious means available of all marine accidents, such as fire, collision, sinking, or stranding, where there is possible obstruction of the channel or interference with navigation or where damage to Government property is involved, furnishing a clear statement as to the name, address, and ownership of the vessel or vessels involved, the time and place, and the action taken. In all cases, the owner of the sunken vessel shall take immediate steps properly to mark the wreck.

§207.815 Vieques Passage and Atlantic Ocean, off east coast of Puerto Rico and coast of Vieques Island; naval restricted areas. (a) The restricted areas. (1) A strip 1,500 yards wide, off the naval reservation shoreline along the east coast of Puerto Rico extending from Point Figuera south to Point Puerca, and thence west to Point Cascajo and the mouth of the Daguada River.

(2) A strip 1,500 yards wide, off the naval reservation shoreline along the west end of Vieques Island extending from Caballo Point on the north shore, west around the breakwater to Point Arenas, and thence south and east to a point on the shoreline one mile east of the site of the abandoned central at Playa Grande.

(3) A strip 1,500 yards wide, off the south coast of Vieques Island extending from the entrance to Port Mosquito east to Conejo Point.

(4) An area inclosed by an arc with a radius of 3,000 yards centered on Cabras Island Lighthouse and extending from Point Puerca to Point Cascajo.

(b) The regulations. No vessel shall enter or remain within the restricted areas at any time unless on official business, except that fishing vessels are permitted to anchor in Playa Blanca, passing through the restricted area described in paragraph (a)(1) of this section to and from anchorage on as near a north-south course as sailing conditions permit. Under no conditions will fishing be permitted in the restricted areas.

§207.817 Caribbean Sea, at St. Croix, V.I.; restricted areas. (a) The areas-(1) Area "A". A triangular area bounded by the following coordinates:

17°44′42″N., 64°54′18″W.
17°43′06″N., 64°54′18″W.
17°44′30″N., 64°53′30″W.

(2) Area "B". A rectangular area bounded by the following coordinates:

17°41′42″N., 64°54′00″W.
17°41′42″N., 64°54′18″W.
17°41′18″N., 64°54′00″W.
17°41′18″N., 64°54′18″W.

(b) The regulations. (1) Anchoring in the restricted areas is prohibited with the exception of U.S. Government owned vessels and private vessels that have been specifically authorized to do so by the Commanding Officer, Atlantic Fleet Range Support Facility.

(2) The regulations in this paragraph shall be enforced by the Commanding Officer, Atlantic Fleet Range Support Facility, Roosevelt Roads, P.R., and such agencies as he may designate.

Part 209-Administrative Procedure

§209.135 Shipping safety fairways and anchorage areas, Gulf of Mexico

Permits. (a) Department of the Army permits are required pursuant to law (30 Stat. 1151; 33 U.S.C. 403) and (92 Stat. 635; 43 U.S.C. 1333(e)) for work or structures in the Gulf of Mexico in coastal waters and the waters covering the Outer Continental Shelf. The Department of the Army will grant no permits for the erection of structures in the area designated as fairways, since structures located therein would constitute obstructions to navigation. Exception: The temporary placement of anchors may be allowed by these regulations.

(b) The Department of the Army may permit temporary anchors and attendant cables or chains for floating or semisubmersible drilling rigs to be placed within a fairway provided the following conditions are met.

(1) The installation of anchors to stabilize semisubmersible drilling rigs within fairways must be temporary and shall be allowed to remain only 120 days. This period may be extended by the district engineer provided reasonable cause for such extension can be shown and the extension is otherwise justified.

(2) Drilling rigs must be at least 500 feet from any fairway boundary or whatever distance necessary to

insure that minimum clearance over an anchor line within a fairway will be 125 feet.

(3) No anchor buoys or floats or related rigging will be allowed on the surface of the water or to a depth of 125 feet from the surface, within the fairway.

(4) Drilling rigs may not be placed closer than 2 nautical miles of any other drilling rig situated along a fairway boundary, and not closer than 3 nautical miles to any drilling rig located on the opposite side of the fairway.

(5) The permittee must notify the District Engineer, U.S. Geological Survey, Bureau of Land Management, U.S. Coast Guard, National Oceanic and Atmospheric Administration and the U.S. Navy Hydrographic Office of the approximate dates (commencement and completion) the anchors will be in place to insure maximum notification to mariners.

(6) Navigation aids or danger markings must be installed as required by the U.S. Coast Guard.

(c) The Department of the Army may grant permits for the erection of structures within an area designated as an anchorage area, but the number of structures will be limited by spacing, as follows: The center of a structure to be erected shall be not less than two (2) nautical miles from the center of any existing structure. In a drilling or production complex, associated structures shall be as close together as practicable having due consideration for the safety factors involved. A complex of associated structures, when connected by walkways, shall be considered one structure for the purpose of spacing. A vessel fixed in place by moorings and used in conjunction with the associated structures of a drilling or production complex, shall be considered an attendant vessel and its extent shall include its moorings. When a drilling or production complex includes an attendant vessel and the complex extends more than five hundred (500) yards from the center of the complex, a structure to be erected shall be not closer than two (2) nautical miles from the near outer limit of the complex. An underwater completion installation in an anchorage area shall be considered a structure and shall be marked with a lighted buoy as approved by the United States Coast Guard.

3. GULF OF MEXICO

The **Gulf of Mexico** coast of the United States, from Key West, Fla., to the Rio Grande, is low and mostly sandy, presenting no marked natural features to the mariner approaching from seaward; shoal water generally extends well offshore. The principal points and harbor entrances are marked by lights, which are the chief guides for approaching or standing along the coast.

From the S shore of the Florida mainland, the **Florida Keys** and **Florida Reefs** extend for about 134 miles in the SW curve to Sand Key Light, and about 58 miles in a W direction to Loggerhead Key. These keys and reefs are of sand, shell, and coral formation. The reefs have frequent shoal patches. The keys are generally low and covered with mangrove. Together, they form the N boundary of the **Straits of Florida.** Toward the W end are several openings between the keys offering passage from the straits into the Gulf.

The SW extremity of the Florida mainland is part of the Everglades National Park and Big Cypress Swamp. Much of these areas are under water throughout the year and are nearly all covered during the rainy summer season. Fronting the swampy areas are the Ten Thousand Islands, a group of low mangrove-covered islands divided by tidal channels. N of the Ten Thousand Islands the coast is low, sandy, and generally backed by pine forests and **Hammocks.** These hammocks are a jungle of tropical trees, mostly hardwood, which appear as an impenetrable green wall.

From Cape Romano to Anclote Keys the coast becomes a barrier beach of low islands separated by inlets, most of which are small and cannot be distinguished from offshore. Between Anclote Keys and St. James Island, the W side of Apalachee Bay, the coast is low and marshy for 1 to 2 miles inland then backed by pine forests. The shoreline is broken by a number of unimportant rivers and creeks.

W of St. James Island to the South Pass of the Mississippi River, the coast is mostly a barrier beach of low, wooded, sand islands. The general drift of these islands is to the W which causes an encroachment upon the channels between them. Hurricanes and heavy gales will sometimes change the shape of these islands and in some cases they have washed away leaving only shoals.

The boundary between Florida and Alabama follows the Perdido River. The Alabama-Mississippi boundary follows a marked line cutting across the E end of Petit Bois Island, through Grande Batture Islands. Pearl River, from its most E junction with Lake Borgne, forms the boundary between Mississippi and Louisiana.

Westward of the Delta to Galveston Entrance, the coast is a wide fringe of flat and generally treeless coastal marsh containing close growths of sedge, grass, and rushes with several deep indentations or bays separated from the Gulf by chains of long narrow islands and many shallow salt water lakes and lagoons. The islands and marshes are fringed with barrier beaches, mostly of fine sand, which rise to a crest with groves of trees on the inner slopes. Sand and shell ridges, sometimes several feet above the general level, are found throughout the marshes. These ridges, called **Chenieres** because of the oak groves usually found growing on them, are former barrier beaches; good examples are Grande Chenier and Pecan Island. In addition to the cheniere, three other marsh features are defined. Small solitary hills are called either **Islands** or **Mounds** depending on their height above the level of the surrounding marsh. Islands are greater than 25 feet while mounds are less. A **Bayou** is a drainage stream for a swamp area or an auxiliary outlet for a river. They flow either to the Gulf of Mexico or a large lake, rarely into a river or other bayou. The depth of water is nearly always sufficient for river-craft navigation. The current, except after a heavy rainfall, is very sluggish, but often may be reversed by a change in the direction of the wind. The highest land is found immediately adjacent to the bayous in the form of natural levees; as a rule, the larger the bayou the higher its levee.

Sabine Pass, Lake, and River form the boundary between Louisiana and Texas.

From Galveston Entrance to the mouth of the Rio Grande the coast is a barrier beach of long narrow islands and peninsulas, which are generally low and sandy, with but few distinguishing marks, enclosing a chain of shallow bays or lagoons, some of considerable size. The passes between the islands, except where improvements have been made by constructing jetties and dredging, are narrow and cannot be distinguished from offshore.

Dump Sites and **Dumping Grounds.**–These areas are rarely mentioned in the Coast Pilot, but are shown on the nautical charts. (See Dump Sites and Dumping Grounds, chapter 1, and charts for limits.)

Aids to navigation.–Lights, radiobeacons, and buoys are the principal guides to mark the approaches to the important harbors. Many of the light stations have fog signals and radiobeacons, particularly those in the vicinity of the larger ports. Many of the coastal and harbor buoys are equipped with radar reflectors, which greatly increase the range at which the buoys may be detected on the radarscope. Most of the critical dangers are marked. (See the Light List for a complete description of navigational aids.)

Loran.–Loran C provides the mariner with good navigation coverage in the Gulf of Mexico.

Radar is an important aid to navigation in this area, particularly in detecting other traffic, offshore

oil platforms, and in the prevention of collisions during frequent periods of low visibility. The coast is generally low and does not present a good radar target, but many of the coastal buoys are equipped with radar reflectors.

COLREGS Demarcation Lines.–Lines have been established to delineate those waters upon which mariners must comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners must comply with the Inland Navigational Rules Act of 1980 (Inland Rules). The waters inside of the lines are **Inland Rules Waters,** and the waters outside of the lines are **COLREGS Waters.** (See **Part 80,** chapter 2, for specific lines of demarcation.)

Ports and Waterways Safety.–(See **Part 160,** chapter 2, for regulations governing vessel operations and requirements for notification of arrivals, departures, hazardous conditions, and certain dangerous cargoes to the Captain of the Port.)

Harbor entrances.–The entrances to most of the harbors along the Gulf Coast are obstructed by shifting sandbars. The more important entrances have been improved by dredging and in some cases by construction of jetties. On many of the bars the buoys are moved from time to time to mark the shifting channels. The best time to enter most of the harbors is on a rising tide.

The tidal currents have considerable velocity in most of the harbor entrances and their direction is affected by the force and direction of the wind. In S gales the sea breaks on some of the bars.

Shipping Safety Fairways.–A system of shipping safety fairways has been established along the Gulf Coast to provide safe lanes for shipping that are free of oil well structures. Vessels should approach the harbor entrances and proceed coastwise between the ports within these fairways, but should exercise due caution at all times as the lanes are unmarked. (See 166.100 through 166.200, chapter 2, for references to the charts showing the limits of the fairways, and the regulations governing them.)

Anchorages.–**Fairway anchorages** have been established off the entrances to some of the ports; these areas are generally free of oil well structures. (See 166.100 through 166.200, chapter 2, for references to the charts showing the limits of the anchorages, and regulations governing them.) Other anchorages have been established along the Gulf Coast, bays, sounds, and rivers. (See Part 110, chapter 2, for limits and regulations.)

Vessel Traffic Services (VTS) have been established in the Mississippi River and Mississippi River-Gulf Outlet Canal (New Orleans VTS), Berwick Bay, Calcasieu Ship Channel (Lake Charles VTS), and in the Houston-Galveston Bay area (Houston-Galveston VTS). The services have been established to prevent collisions and groundings and to protect the navigable waters from environmental harm.

The Vessel Traffic Services for the New Orleans area, Berwick Bay, and the Houston-Galveston Bay area provide for Vessel Traffic Centers (VTC) that may regulate the routing and movement of vessels by radar surveillance, movement reports of vessels, VHF-FM radio communications, and specific reporting points. The Services consist of precautionary areas and reporting points.

The Lake Charles Vessel Traffic Service consists of reporting points and special conditions to be observed within the VTS area.

New Orleans, Lake Charles, and Houston-Galveston Vessel Traffic Services are voluntary and Berwick Bay Vessel Traffic Service is mandatory. (See chapters 8, 9, and 10 for details of the Vessel Traffic Services.)

Houston-Galveston Vessel Traffic Service is voluntary and Berwick Bay Vessel Traffic Service is mandatory. (See chapters 9 and 10, respectively, for details of the Berwick Bay and Houston-Galveston Vessel Traffic Services.)

Tropical waters.–The most remarkable feature is the exceeding clearness of the sea water, enabling the bottom to be seen from aloft at considerable depths and at some distance. The navigation of the banks is consequently conducted almost entirely by the eye, but care must be taken not to run with the sun ahead of the vessel as that prevents the banks from being seen.

The charts indicate clearly the positions of the many shoal heads; but considerable experience is required in identifying the patches by the color of the water. Small clouds, moving slowly and known to the pilots as flyers, are apt to deceive the inexperienced, their reflection on the surface of the sea over the clear white sandy bottom having every appearance of rocky shoals. It is prudent to avoid a dark spot.

Bank Blink is a phenomenon in tropical waters described as a bright reflected light hanging over the clear white sandbanks, serving to point them out from a considerable distance. From experience, it has been found to be untrustworthy, however, and should not be depended on in place of a lookout aloft. Soundings, the reckoning, and especially the latitude, should be unremittingly checked.

Dangers.–**Danger zones** and **Restricted areas,** extending as much as 100 miles offshore, are located in the Gulf of Mexico from Key West to the Rio Grande. (See Parts 162, 204, and 207, chapter 2, for limits and regulations.)

Fish havens, some marked by privately maintained buoys, are numerous along the outside coast of the Gulf of Mexico. Navigators should be cautious about passing over fish havens or anchoring in their vicinity.

Wrecks.–Numerous wrecks, submerged and showing above water, in the bays, sounds, rivers, and along the outer coast of the Gulf of Mexico are obstructions to navigation. A careful check should be made of the chart to insure that dangerous wrecks are not along the routes selected.

Oil well structures.–Numerous submerged wells, and oil well structures (platforms), including appurtenances thereto, such as mooring piles, anchor and mooring buoys, pipes, and stakes, exist in the Gulf of Mexico off the coasts of Mississippi, Louisiana, and

Texas. The heaviest concentration of these obstructions, however, is found between the Mississippi River Delta and Galveston Bay, extending as much as 70 miles offshore.

In general, the oil well structures (platforms) in the Gulf are marked at night as follows:

Structures outside the 5-fathom curve show quick flashing white lights visible from all directions at a distance of at least 5 miles; more than one light may be displayed. Fog signals are sounded from the structures when visibility is less than 5 miles; signal consists of a horn sounding one 2-second blast every 20 seconds.

Structures between the 2-fathom and 5-fathom curves show quick flashing white lights visible from all directions at a distance of at least 3 miles. Fog signals are sounded from the structures when visibility is less than 3 miles.

Structures along the coast in less than 2 fathoms and within the bays and sounds show either quick flashing white or red lights visible from all directions at a distance of at least 1 mile. Normally these structures are not equipped with fog signals.

Structures on or adjacent to the edges of navigable channels and fairways, regardless of location, may be required to display lights and fog signals for the safety of navigation.

Associated structures within 100 yards of the main structures, regardless of location, are not normally lighted, but are marked with red or white retro-reflective material. Mariners are cautioned that uncharted submerged pipelines and cables may exist in the vicinity of these structures, or between such structures and the shore.

During construction of a well or during drilling operations and until such time as the platform is capable of supporting the required aids, fixed white lights on the attending vessel or drilling rig may be shown in lieu of the required quick flashing white lights on the structure. The attending vessel's foghorn may also be used as a substitute.

Submerged wells may or may not be marked depending on their location and depth of water over them.

All obstruction lights and fog signals used to mark the various structures are operated as privately maintained aids to navigation. The detailed regulations for the marking of offshore structures are contained in 33 CFR 67.

Information concerning the establishment, change, or discontinuance of offshore oil well structures and their appurtenances are published in Notice to Mariners with the exception of those inside the outer shoreline.

All structures in the Gulf of Mexico are shown on the latest issues of the 1:80,000 and/or larger scale nautical charts covering the area. A warning note in lieu of the individual obstructions is shown on charts 11352 and 11345. Charts 11360, 11340, and 11300 show oil well structures only when offshore of the indicated purple limits of the 1:80,000 scale charts.

Mariners are advised to use the Shipping Safety Fairways which have been established in the Gulf of Mexico. These fairways provide shipping lanes free of oil drilling structures. Although the use of these fairways is not mandatory, mariners should take advantage of the safer passageways made available.

A list of offshore oil well structures and submerged wells in the Gulf of Mexico that have been completed and their existence known is published annually as a Special Local Notice to Mariners by the Eighth Coast Guard District. Mariners desiring to receive issues of this publication should write to the District Commander, Eighth Coast Guard District, requesting to be placed on their mailing list. (See appendix for address.)

Information concerning seismographic operations is not published in Notice to Mariners unless such operations will create a menace to navigation in waters used by general navigation. Where seismographic operations are being conducted, casings (pipes), buoys, stakes, and detectors are installed. Pipes are marked with flags by day and fixed red lights by night; buoys are colored international orange and white horizontal bands; and stakes are marked with flags.

Pipelaying barges.–With the increased number of pipeline laying operations, operators of all types of vessels should be aware of the dangers of passing close aboard, close ahead, or close astern of a jetbarge or pipelaying barge. Pipelaying barges and jetbarges usually move at 0.5 knot or less and have anchors which extend out about 3,500 to 5,000 feet in all directions and which may be marked by lighted anchor buoys. The exposed pipeline behind the pipelaying barge and the area in the vicinity of anchors are hazardous to navigation and should be avoided. The pipeline and anchor cables also represent a submerged hazard to navigation. It is suggested, if safe navigation permits, for all types of vessels to pass well ahead of the pipelaying barge or well astern of the jetbarge. The pipelaying barge, jetbarge, and attending vessels may be contacted on VHF-FM channel 16 (156.80 MHz) for passage instructions.

Drawbridges.–Within the area of this Coast Pilot, the general and/or special regulations and the opening signals for drawbridges are given in 117.1b, 117.240, 117.245, and 117.462 through 117.560, chapter 2. Where these regulations apply, reference to them is made in the Coast Pilot under the name of the bridge or the waterway over which the bridge crosses. The special regulations, which are prescribed for a number of specific bridges, may restrict the hours of operation at certain bridges. Other bridges may be allowed to remain unattended, either entirely or during certain time periods. Such bridges may not be required to open at all or may open only during specified periods, and a specified minimum advance notice may be required to be given to the authorized representative of the bridge owner to have the bridge opened. The exact procedure for contacting this representative must generally be posted on signs at the bridge. Additional information

that applies to all drawbridges is given in 117.1, 117.1a, 117.1c, 117.1d, and 117.1e, chapter 2.

Routes.-On the E side of the Gulf of Mexico, for a distance of possibly 100 miles outside the 100-fathom curve, SE currents prevail and velocities as high as 2.5 knots have been reported. The Gulf Stream investigations indicated that the strongest current into the Straits of Florida is found near the 1,000-fathom curve W of Dry Tortugas, and that velocities of 1.5 to 2 knots are frequent in that locality. Approaching Dry Tortugas from the Gulf should, therefore, be regarded as a difficult run, as a vessel will overrun her log, and observations are the principal guide; currents may be expected at all times, but variations occur both in direction and velocity, due to the season of the year and the winds. Approaching the passage W of Rebecca Shoal from N, a number of vessels have stranded on New Ground, indicating an E set.

Junction point for deep-draft vessels bound to or from Gulf Coast ports is **Straits of Florida** (24°25'N., 83°00'W.), which is 14 miles SSW of Dry Tortugas Light.

From the Straits of Florida to Cape Hatteras vessels follow the Gulf Stream, pass about 14 miles S of Rebecca Shoal Light, then follow Florida Reefs about 8 miles off and pass Fowey Rocks Light at a distance of 10 to 12 miles and Jupiter Inlet Light 15 miles. The velocity of the current varies greatly in different localities and is also subject to sudden changes, due to wind, differences in barometric pressure, and the like, so that no fixed hourly rate of drift can be given. Frequently high velocities will be carried between certain points and suddenly dropping off between others. The position should, therefore, be checked whenever possible by bearings. The ship speed plus supposed rate of current should not be assumed to fix the position. The greatest velocity will be found between Carysfort Reef and Jupiter Inlet, ranging from 2 to 4.5 knots.

During the winter months when northers are frequent, it is well for westbound vessels to keep a little N of the **295°** course from Dry Tortugas to Heald Bank Lighted Whistle Buoy, but go S of it in passing. In either direction, verify position as often as possible, because of the varying conditions of the current. For 300 miles before reaching Heald Bank, westbound craft frequently overrun, especially during the winter months, and eastbound vessels overrun the last 300 miles before reaching Dry Tortugas. Depend upon soundings westbound, but upon observations eastbound.

Currents along the course from Dry Tortugas to Galveston are subject to great variability. However, observations have shown that a 0.5 knot SE current may be expected for 200 miles after leaving Dry Tortugas. For the next 100 miles the current generally sets E at 0.5 knot. For the next 200 miles the set is about NNE at 0.2 knot. For nearly 200 miles before reaching Galveston the set is approximately WNW at 0.2 knot. It is emphasized that this approximates the long-term mean current pattern and that it may not be experienced on any particular voyage. (See Loop Current, this chapter.) Winds and storms frequently modify conditions, and their effects must be taken into account.

Inside Navigation.-Navigation on the waterways covered by this volume requires a knowledge of the channel conditions and other factors restricting navigation. General items of interest to the vessel operator are indicated in the paragraphs that follow; details are given in the text.

Special regulations governing the use, administration, and navigation of floodgates and locks of the Intracoastal Waterway are given in 207.185 and 207.187, chapter 2.

Bends or Curves.-In the Intracoastal and adjoining waterways there are many sharp bends which are dangerous to vessels meeting or passing. On approaching a bend, a vessel should reduce speed sufficiently to be able to stop within half the distance to a ship coming from the opposite direction. Under no circumstances should a vessel attempt to overtake and pass another at a bend. Even with sufficient view of the channel ahead and after proper exchange and understanding of signals, the overtaken vessel may suddenly sheer from current action. This is even more pronounced with larger vessels and tows.

Crosscurrents.-Where two streams cross, the current will have a greater velocity in the deeper channel. This is noticeable along the Intracoastal Waterway where it follows a dredged canal cutting across a winding stream. Crosscurrents will also be noticed where either an inlet from the ocean or a drainage canal or a river enter the waterway.

Crosscurrents are especially strong along the Intracoastal Waterway in San Carlos Bay, The Rigolets-New Orleans Cut, Chef Menteur Pass, Vermilion River Cutoff, and Brazos and Colorado Rivers.

Spoil banks.-Nature quickly covers her scars. This is true of the spoil banks made by dredging. When awash, these banks are often covered by grass, bushes, and sometimes fairly large trees.

Water hyacinth is a floating freshwater plant which infests numerous streams tributary to the South Atlantic and Gulf Coasts. It has bright green leaves and a purple flower. It propagates from seeds and suckers, spreads quickly in most localities, and may cause complete suspension of navigation if not removed. The hyacinths form in mats or jams and float around driven by the wind or current. In open water these mats often resemble small islands. At times some of the bays and tributaries may be changed in appearance due to hyacinth jams. Where the water is apt to be brackish, an attempt can be made to force a boat through the mat. In doing so, however, care should be taken that any logs that might be floating in the weeds are not struck with force enough to damage the hull. Snakes may also be found on the hyacinth mats. The work of removing this growth is undertaken by the various Corps of

Engineers districts and the State of Florida by the processes of spraying, cutting, and the use of booms.

Mangrove.–Three distinct types of mangrove are found in the S section of this area. Yellow or white mangrove is found principally on the sand flats in front of the fast land. Red mangrove is rooted in water most of the time. Black mangrove grows on sand ridges and higher ground which cover only at very high water or storm tides. The black mangrove sometimes grows to a height of 50 to 60 feet. Along the coast from Cape Sable to Everglades City, most mangroves grow from 25 to 50 feet high with some stands of red mangroves reaching above 60 feet. Along the coast of Florida Bay, the red and black mangroves generally do not exceed a height of about 26 feet.

Stumps and sunken logs.–Reports are frequently made that vessels have struck shoals or rocks in rivers which have later proved to be stumps or sunken logs. Mariners are warned against navigating too close to the banks of streams where submerged stumps are known or may be expected to exist.

Hurricane moorings.–On receiving advisory notice of a tropical disturbance small boats should seek shelter in a small winding stream whose banks are lined with trees, preferably cedar or mangrove. Moor with bow and stern lines fastened to the lower branches; if possible snug up with good chafing gear. The knees of the trees will act as fenders and the branches, having more give than the trunks, will ease the shocks of the heavy gusts. If the banks are lined only with small trees or large shrubs, use clumps of them within each hawser loop. Keep clear of any tall pines as they generally have shallow roots and are more apt to be blown down.

Manatees.–The West Indian Manatee is a marine mammal protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. These acts make it illegal to harass, hunt, capture, or kill any marine mammal. The manatee is a large slow-moving herbivorous animal that resembles a blunt-nosed, stubby-flippered seal. These animals mainly inhabit the waters of Florida, although they have been sighted from S Virginia around the Gulf coast to Texas. They are quite docile and have no natural enemies, but are an endangered species, mostly because collisions with boat propellors cause a large number of deaths each year. In the winter, manatees move from the cooler waters of the Atlantic Ocean and the Gulf of Mexico and congregate, sometimes in large numbers, in warmer freshwater rivers and streams and near the cooling water discharge outlets of powerplants. It is during these high concentration periods that most manatee deaths occur.

The Florida Manatee Sanctuary Act has been established to regulate motorboat speeds and operations in critical areas of manatee concentration between November 15 and March 31 (in Withlacoochee River between March 1 and September 30). The **regulated zones** are marked by large reflective signs. In these zones, boat operators must reduce their speed to "slow" or "idle," and no person shall intentionally or negligently annoy, molest, harass, disturb, collide with, injure, or harm manatees. Copies of the regulations are available from the Florida Department of Natural Resources, Division of Law Enforcement, Commonwealth Bldg., 3900 Commonwealth Blvd., Tallahassee, Fla. 32303. **Regulated zones** within the area covered by this Coast Pilot are in Faka Union Bay, River, and Canal; in Withlacoochee River; in the approach to the river from the main channel through Hillsborough Bay; in the Homosassa River; and in Kings Bay on the Crystal River. **Caution zones,** advisory in nature and without the force of law, have also been established in areas where manatees are known to gather.

Tides.–Periodic tides in the Gulf of Mexico usually are small and may, therefore, be greatly modified and sometimes obliterated by fluctuations in the water surface due to winds or other meteorological conditions.

At Key West the mean range of tide is 1.3 feet. Extreme variations in the level from 1.5 feet below the plane of reference to 4 feet above may occur in this locality.

Along the W coast of the peninsula of Florida from Cape Sable to Apalachee Bay, the mean range varies from 0.5 to 3.6 feet. Extreme tides from 3 feet below to 6 feet above the plane of reference have been observed on this coast.

Along the N shore of the Gulf of Mexico from St. George Sound to the Rio Grande the tide is generally diurnal and the range is less than 3 feet, but fluctuations due to the wind from 3.5 feet below to 4 feet above the plane of reference are not uncommon. During the severe storms that occasionally visit this region, high waters from 10 to 12 feet above the plane of reference have been reported at Galveston, Texas, and 12.7 feet has been observed at Port O'Connor, Texas.

The periodic or astronomical tide, small at the mouth of the Mississippi River, gradually diminishes as it ascends the river until it finally becomes completely masked by the larger fluctuations resulting from meteorological conditions. At New Orleans the diurnal range of the tide during low-river stages averages about 0.8 foot. There is no periodic tide at high-river stages. There is, however, a large fluctuation in the level due to the condition of the river. The mean annual fluctuation at New Orleans is about 14 feet, the water being highest in the spring months and lowest during the autumn and early part of the winter. An extreme fluctuation of 21 feet in the river level at this city has been reported. (See the Tide Tables for more detailed information on tides in the Gulf of Mexico.)

Currents.–Under normal conditions, at all seasons of the year, the great volume of water passing N through Yucatan Channel into the Gulf of Mexico spreads out in various directions. Surface flows set: W across Campeche Bank, the Gulf of Campeche, and the Sigsbee Deep; NW toward Galveston and Port Arthur; NNW toward the Mississippi Passes; and E into the Straits of Florida.

A straight line drawn from Buenavista Key, Western Cuba, to the Mississippi Passes forms an approximate boundary between movements having different directions. W of this line the drift is generally N or W, while E of it the drift is E or SE toward the Straits of Florida.

There are N flows along the W side of the Gulf between Tampico and Corpus Christi in the vicinity of the 100-fathom and 1,000-fathom curves, N of the Sigsbee Deep between the 2,000-fathom and the 100-fathom curves, and along the W coast of Florida.

In general, the surface circulation is the same at all seasons. There is, however, some seasonal change in velocity, the flow being generally stronger in spring and summer than in the autumn and winter.

The current near the Florida Keys is variable and uncertain.

Tidal currents are generally weak in the open Gulf, but they are strong at times near shore, in the vicinities of shoals, and in the entrances to harbors. (See the Tidal Current Tables for more detailed information.)

The **Gulf Stream System** is the most famous of the principal ocean currents. The name was first used by Benjamin Franklin in 1769. In general, as the swift current of the Gulf Stream issues into the sea through Straits of Florida, its waters are characterized by a deep blue color, high salinity, high temperature in the upper stratum, and absence of phosphorescence. Except near shoals where waves may stir up bottom sediments, Gulf Stream water is very clear, enabling visual penetration to unusually great depths. At its junction with coastal seawater, the edges may frequently be recognized in moderate weather by ripples, as well as by the difference in color. Northward, in the cooler regions, the evaporation from its surface, when the temperature of the air is lower than that of the water, is apparent as "sea smoke." In addition, the stream may carry with it some **Gulf weed** (Sargassum), which is olive brown, branched seaweed with berrylike air vessels.

The upstream extent of the Gulf Stream System can be traced to the Yucatan Strait where a well-established current enters the Gulf of Mexico. The current in the Gulf of Mexico is called the **Loop Current.** The position of the Loop Current is quite variable, but there is some evidence of a cyclical pattern of about 290 days. The Loop Current begins with a short flow pattern protruding into the Gulf of Mexico, then it slowly builds up, gradually increasing its N protrusion into the Gulf and reaching as far N as 28°N before shedding a large warm eddy. The remaining Loop Current has a shortened flow path and begins the process anew. The large detached warm eddy will drift W to SW into the western Gulf of Mexico where it will eventually dissipate. The warm eddy has a clockwise flow with a maximum current close inside its periphery of 0.5 to 1.5 knots.

After entering the Straits of florida between Cuba and the Florida Keys, the Gulf Stream System's path becomes much more stable. The major variation of the current from off Key West to off Little Bahama Bank appears to be a meandering of the axis of the current within the narrow confines of the Straits. The current within the Straits and slightly to the N is frequently referred to as the **Florida Current.**

Shortly after emerging from the Straits of Florida, the Gulf Stream is joined by the **Antilles Current,** which flows NW along the open ocean side of the West Indies. The Antilles Current, like the Gulf Stream, carries warm, highly saline waters of clear indigo blue. The union of the two currents gives rise to a broad and deep current possessing about the same characteristics as the Florida Current except that the velocity is somewhat reduced. The Gulf Stream from the Florida Straits flows N, then NE, paralleling the general trend of the 100-fathom contour up to Cape Hatteras. From 32°N to Cape Hatteras the stream shows some lateral meandering which does not generally exceed one stream width, or about 40 miles.

Beyond Cape Hatteras the Gulf Stream is forced E away from the coast and into much deeper water. As it moves into progressively deeper water, the stream is subject to increased meandering which can have as large a N-S extent as 270 miles. The wavelike meanders of the stream propagate E at speeds of about 3 to 5 miles per day. These meanders occasionally shed detached current rings or eddies which are found N and S of the stream and which are respectively warmer and cooler than the surrounding waters. Eddies are generally formed E of 65°W.

Warm eddies average about 50 to 80 miles in diameter and are found N of the stream between it and the continental shelf. Warm eddies rotate in a clockwise direction with a maximum flow of about 1.6 knots located about halfway from the center of the eddy. Warm eddies generally move about 1.6 miles per day W after formation in the region between the stream and the continental shelf to about 70°W. From 70°W the eddies generally move SW along the continental shelf and eventually are absorbed into the stream near Cape Hatteras. Many warm eddies are absorbed by the stream well before they reach Cape Hatteras. About five to eight warm eddies are formed each year and average about a 1 year life cycle. Cold eddies average about 110 miles in diameter and are found S of the stream in the Sargasso water region. Cold eddies rotate in a counterclockwise direction with a maximum flow of about 1.6 knots located halfway from the center. Cold eddies tend to move about 1.6 miles per day SW after formation and are eventually absorbed back into the Gulf Stream. About eight cold eddies are formed each year and average about a 2 year life cycle.

E of the Grand Banks of Newfoundland, the whole surface is slowly driven E and NE by the prevailing W winds to the coastal waters of northwestern Europe. For distinction, this broad and variable wind-driven surface movement is sometimes referred to as the **North Atlantic Drift.**

On its W or inner side, the Gulf Stream is separated from the coastal waters by a zone of

rapidly falling temperature, to which the term **north wall** (**west wall** from Georgia S) has been applied. The abrupt change in the temperature of the waters separated by the north wall (west wall) is frequently very striking and is a definite indication of the edge of the stream. It is most clearly marked N of Cape Hatteras but extends, more or less well defined, from the Straits of Florida to the Grand Banks of Newfoundland. In the vicinity of the Grand Banks, the north wall represents the dividing line between the warm current of the Gulf Stream and the cold waters of the **Labrador Current,** which according to observations, turns sharply, between 42°-43°N and 51°-52°W, and flows E, parallel to the Gulf Stream.

Throughout the whole stretch from the Florida Keys to past Cape Hatteras the stream flows with considerable velocity. Characteristic average surface speed is on the order of 2.5 knots, increasing to about 4.5 knots off Cape Florida where the cross sectional area of the channel is least. These values are for the axis of the stream where the current is a maximum, the speed of the stream decreasing gradually from the axis as the edges of the stream are approached. The axis of the stream is estimated to be about 13.5 miles seaward of the north wall. Both the speed and position of the axis of the stream fluctuate from day to day, hence description of both position and speed are averages.

Crossing the stream at Jupiter or Fowey Rocks, an average allowance of 2.5 knots in a N direction should be made for the current.

Crossing the stream from Habana, a fair allowance for the average current between 100-fathom curves is 1 knot in an ENE direction.

A vessel bound from Cape Hatteras to Habana, or the Gulf ports, crosses the stream off Cape Hatteras. A fair allowance to make in crossing the stream is 1 to 1.5 knots in a NE direction for a distance of 40 miles from the 100-fathom curve.

Earlier systematic observations on the Gulf Stream dealt with the temperature of the water rather than its motion and the axis was taken to be along the line of highest temperature obtained. Later the axis was taken to mark the line of greatest velocity. Ordinarily it is assumed that these two axes coincide, but this is by no means certain. The thermometer, although it indicates the limits of the stream in a general way, is therefore only an approximate guide to the velocity of the currents.

The lateral boundaries of the current within the Straits of Florida are fairly well fixed, but as the stream crosses 32°N its E boundary becomes somewhat vague. On the W side the limits can be defined approximately since the waters of the stream differ in color, temperature, salinity, and flow from the inshore coastal waters. On the E, however, the Antilles Current combines with the Gulf Stream so that its waters here merge gradually with the waters of the open Atlantic. Observations of the National Ocean Survey indicate that, in general, the average position of the inner edge of the Gulf Stream from the Straits of Florida to Cape Hatteras lies inside the 100-fathom curve.

At the W end of the Straits of Florida the limits of the Gulf Stream are not well defined. Between Fowey Rocks and Jupiter Inlet the inner edge lies very close to the shoreline.

Along the Florida Reefs between Alligator Reef and Dry Tortugas the distance of the N edge of the Gulf Stream from the edge of the reefs gradually increases toward the W. Off Alligator Reef it is quite close inshore, while off Rebecca Shoal and Dry Tortugas it is possibly 15 to 20 miles S of the 100-fathom curve. The location of the Florida Current S of the Lower Keys is often found displaced unusually far S when there is a deep intrusion of the Loop Current N into the Gulf of Mexico, and it is found closer than usual to the Lower Keys after the Loop Current has shed a warm eddy and assumed a more southerly position in the Gulf of Mexico. Between the reefs and the N edge of the Gulf Stream the currents are ordinarily tidal and are subject at all times to considerable modification by local winds and barometric conditions. This neutral zone varies in both length and breadth; it may extend along the reefs a greater or lesser distance than stated, and its width varies as the N edge of the Gulf Stream approaches or recedes from the reefs.

Location of the Gulf Stream.–The approximate position of the axis of the Gulf Stream for various regions is shown on the following NOS charts: 11013, Straits of Florida; 411, South Carolina to Cuba; 11460, Cape Canaveral to Key West; 11420, Alligator Reef to Habana. Chart 11009 shows the axis and the position of the inner edge of the Gulf Stream from Cape Hatteras to Straits of Florida.

Up-to-date information on the location, width, and maximum surface temperature of the Gulf Stream System is available in a variety of ways. Such information is broadcast by NOAA Weather Radio stations from Key West, Florida, to Cape Hatteras, North Carolina. The times of these broadcasts and their formats vary from station to station, but in general, all give the distance to the inshore edge of the Stream with reference to a navigational light or buoy, the width of the Stream when that is known, and the maximum temperature. This information is derived largely from infrared satellite imagery, and it is unfortunately not available during the warmer summer months S of about Jupiter Inlet. (See appendix for a list of NOAA Weather Radio stations.)

For ships in port or with telecopy equipment, an analysis of the Gulf Stream System from the central Gulf of Mexico to Cape Hatteras which includes an estimated location of the maximum current is prepared on Mondays, Wednesdays, and Fridays by the NOAA Satellite Field Services Station in Miami, Florida. These analyses are available to anyone with a telecopy receiver compatible with a Xerox Model 410 automatic telecopier by simply telephoning (305) 661-0738.

Wind-driven currents are very complicated. Their velocities and directions depend upon a number of factors such as the velocity, direction, and duration of the wind, the proximity of the coast, and the

direction of the coastline. Generally in the Northern Hemisphere the wind-driven current sets somewhat to the right of the wind but in coastal waters there are many exceptions to this general rule, the current often setting to the left of the wind, due to the tendency of the current to follow the direction of the coastline or to other local conditions.

The velocity of the wind current relative to that of the wind also varies with the locality. Wind-current information is given in the Tidal Current Tables.

Weather.–Climatological tables for coastal localities and meteorological tables for the coastal ocean area covered in this volume follow the appendix. National Weather Service offices and radio stations that transmit weather information are listed in the appendix.

Storm warning display locations are listed on the NOS charts and shown on the Marine Weather Services Charts, which contain additional important information and are available from National Ocean Service, Distribution Branch (N/CG33). (See appendix for address.)

This section presents a seasonal picture of the weather that can be expected to affect shipping in the Gulf of Mexico and the NW Caribbean. Detailed local weather is discussed in the appropriate chapters.

While navigating the Gulf of Mexico presents few weather hazards, the ones that occur can be treacherous. Winter storms and cold fronts can generate gales and rough seas. Sea fog, frequent from December through April, can plague the mariner in open and coastal waters. During summer and fall, there is the threat from hurricanes.

During winter, the region is subjected alternately to maritime tropical and continental polar air masses. While the Gulf lies S of the primary winter storm tracks, one will occasionally stray through the region. When cold fronts push through and stall over the Gulf, they may trigger the formation of winter storms. These systems often parallel the N Gulf coast or move inland producing persistent low stratus clouds and rain ahead of their centers. About one-half of the 30 to 40 cold fronts that penetrate the Gulf each year bring strong N winds and whip up rough seas; these are known as **"northers"**. The cold air behind the fronts can cause sudden and sometimes large drops in temperature. These cold air masses lower the sea surface temperatures, which aids in the formation of dense advection fog that occurs when warm southerlies blow across these cool waters. This fog is most prevalent along the N Gulf coast from January through April.

By May, the semipermanent, subtropical **Atlantic High (Bermuda High)**, which extends westward across the Gulf of Mexico, strengthens and tends to block storms and fronts from the N. Spring is one of the most trouble-free seasons in the Gulf. Easterly moving systems are infrequent until early summer when the threat of easterly waves and tropical cyclones looms over the region.

The summer wind flow around the Bermuda High is generally from the E through S, and this is reinforced along much of the coast by the afternoon sea breeze. These prevailing winds provide a source of moist tropical air that results in frequent shower activity along the coast, particularly during the afternoon and evening. Many of these showers develop into thunderstorms, which may drift offshore at night. Infrequently, W through N winds bring hot, dry weather to the Gulf coast.

Easterly wave and tropical cyclone activity increases during August and reaches a peak in September. The principal paths of tropical cyclones moving into the Gulf are from the Straits of Florida and the Yucatan Channel. More than one-half of the tropical storms reach hurricane strength, threatening ships at sea as well as coastal installations. This threat remains through November.

During autumn, the Bermuda High begins to weaken and retreat eastward, opening the way for cold fronts and an occasional winter storm. This increases the frequency of gales and rough seas. However, there are still many days of fine sailing weather. Locally, along the coast, radiation fog forms on clear, calm nights but disperses quickly with the rising sun or if the wind picks up.

Puerto Rico and the Virgin Islands lie directly in the path of easterly trade winds throughout the year. Surrounded by warm tropical waters, the islands have fairly uniform year-round weather with small annual and diurnal temperature changes and slight wet and dry seasons. In winter, the trades are occasionally interrupted by weak cold fronts from N which generate shifting winds and provide some rain during the normally dry winter season. From May through November, easterly waves, which are migratory, unorganized masses of clouds and showers, occasionally move through the region. Sometimes they organize into tropical storms or hurricanes, which are a threat to the mariner and marine coastal facilities. Normally in summer, rain falls as brief showers or thunderstorms, the result of warm, moist air being forced aloft by mountainous or hilly terrain.

Extratropical Cyclones and Northers.–From October through April, cold continental air masses invade the Gulf of Mexico some 30 to 40 times. These cold outbreaks may become unstable as they spread across the warm water. Squalls containing thick clouds and heavy showers may develop, and local winds may reach 50 knots or more. Initially these fronts may be accompanied by gale force winds. About 15 to 20 of them are considered by mariners to be true "northers", with winds exceeding 20 knots. Ship observations indicate that winds exceed 20 knots 5 to 15 percent of the time in the N Gulf region. Close to the N coast, rough seas are less likely than farther S because of the limited fetch. Northers usually last 1 to 2 days but can persist for 4 days. The passage of these fronts often results in sudden, large temperature drops, particularly close to the coast.

These fronts often stall over the Gulf of Mexico.

The contrast between the cold continental air to N and warm tropical air to S may result in the formation of an atmospheric wave along the front. Depending upon supporting environmental conditions, the wave may develop into a low pressure system. These lows often move NE or ENE and sometimes develop into major winter storms off the Atlantic coast. N Gulf waters are considered a region of cyclogenesis from December through March, and the waters off the central coast of Texas are particularly active. February is usually the most active month. These low pressure systems spread dense low clouds and rain ahead of their centers and draw in cold air in their wakes.

Lows and northers are mainly responsible for the strong winds and rough seas that hamper navigation from fall through spring. Wave heights of 10 feet or more are encountered up to 8 percent of the time while winds of 28 knots or more blow up to 6 percent of the time. January and February are the worst months and conditions are roughest off the coasts of Mississippi, Louisiana, and Texas. Gale-force winds (speeds of 34 knots or more) are encountered up to 2 percent of the time.

Tropical Cycolone–To the meteorologist, the tropical cyclone is a warm-core low-pressure system that develops over the warm waters of the tropical oceans with a counterclockwise rotary circulation in the northern hemisphere. When maximum sustained windspeeds exceed 63 knots, it is called a **Hurricane** in the North Atlantic. To the mariner, the tropical cyclone is a storm to be avoided, a relatively small, unpredictable system capable of generating 200-knot winds, 40-foot seas, and 20-foot storm surges. Aboard today's ships, the wind itself is usually not the greatest problem. However, in open water a ship is at the mercy of the combination of wind and wave. The sides of a ship tend to act as a sail. Under certain conditions this sail effect may be critical. In hurricanes, the combination of this sail effect, the wave action, stress on the vessel, and ship's handling can cause a vessel to capsize. The more the mariner knows about tropical cyclones, their habits, and the areas in which they may be encountered, the better are his chances of survival.

Rarely does the mariner who has experienced a fully developed tropical cyclone (hurricane) at sea wish to encounter a second one. He has learned the wisdom of avoiding them if possible. The uninitiated may be misled by the deceptively small size of a tropical cyclone as it appears on a weather map, and by the fine weather experienced only a few hundred miles from the reported center of such a storm. The rapidity with which the weather can deteriorate with approach of the storm, and the violence of the hurricane, are difficult to visualize if they have not been experienced.

As a tropical cyclone moves out of the tropics to higher latitudes, it normally loses energy slowly, expanding in area until it gradually dissipates or acquires the characteristics of extratropical cyclones. At any stage, a tropical cyclone normally loses energy at a much faster rate if it moves over land. As a general rule, tropical cyclones of the North Atlantic Region move with the prevailing winds of the area. In small hurricanes the diameter of the area of destructive winds may not exceed 25 miles while in some of the greatest storms the diameter may be as much as 400 to 500 miles.

At the center is a comparative calm known as the "eye of the storm." The diameter of this "eye" varies with individual storms and may be as little as 7 miles but is rarely more than 30 miles. The average is 15 to 20 miles. This center is the region of low atmospheric pressure around which winds blow in a more or less circular course, spiraling inward in a counterclockwise direction. Winds at the outer edge of the storm area are light to moderate and gusty, and often increase toward the center to speeds too high for instrument recording. Although the air movement near the center of the hurricane is usually light and fitful, the seas in this area are in most cases very heavy and confused, rendered so by the violent shifting winds which surround it. Furthermore, after the center has passed a vessel, she may expect a sharp renewal of the gales, with winds from a more or less opposite direction. The hurricane may affect an area covering tens of thousands of square miles.

In the North Atlantic, tropical cyclones form over a wide range of ocean between the Cape Verde Islands and the Windward Islands, over the W Caribbean Sea and the Gulf of Mexico. In an average year nine or ten tropical cyclones come to life and about six of these reach hurricane intensity. Early and late season tropical cyclones tend to form in the W Caribbean or E Gulf of Mexico and move in a NW through NE direction. In both June and November an average of two tropical cyclones develop every three years; one of these usually reaches hurricane strength. By July, activity spreads E to the Windward Islands and four tropical cyclones can be expected every five years. Storms have a tendency to move into the Gulf of Mexico or along the E coast of the United States. During August and the first half of September, the breeding grounds lie between the West Indies and Africa, while during the latter part of September they extend into the Caribbean and Gulf of Mexico. During this 2-month period about seven tropical cyclones come to life, with about four reaching hurricane strength. Early August tracks are similar to those of July, while later in the month storms move in a more W direction in the lower latitudes and either continue into the S Gulf of Mexico or recurve over Puerto Rico. This is also true for many late September storms while earlier in the month many move WNW to the N of Puerto Rico and either through the Straits of Florida into the Gulf of Mexico or NE into the mid-Atlantic. October activity decreases to August levels while development is concentrated in the W Caribbean and just E of the West Indies. October storms frequently move into the Gulf of Mexico from the SE.

Locating and tracking tropical cyclones.–By means of radio, the National Weather Service collects weather observations daily from land stations, ships

at sea, and aircraft. When a tropical cyclone is located, usually in its early formative stage, it is followed closely. In the North Atlantic, U.S. Air Force and NOAA aircraft make frequent flights to the vicinity of such storms to provide information needed for tracking the tropical cyclone and determining its intensity. Long-range shore radar stations follow the movement of the storm's precipitation area when it is in range.

All tropical cyclones in the Atlantic Ocean are routinely and continuously monitored by satellite. In areas far removed from the United States and the West Indies, satellite observations are the primary and often the only means of tracking tropical cyclones, other than ship reports. Satellite imagery, in addition to other means of observation such as aircraft reconnaissance, also provides estimates of the strength of the maximum sustained winds and minimum central pressure in tropical cyclones. Bulletins are broadcast to ships several times daily, giving information on each storm's location, intensity, and movement. As a further aid, the mariner may obtain weather reports by radio directly from other ships in the vicinity of a tropical cyclone.

Signs of approach.–While National Hurricane Center warnings provide information for locating and avoiding a tropical cyclone, it is important to know the sequence of events leading to its passage.

An early indication of the approach of such a storm is the presence of a long swell. In the absence of a tropical cyclone, the crests of swell in the deep waters of the Atlantic pass at the rate of perhaps eight per minute. Swell generated by a tropical cyclone is about twice as long, the crests passing at the rate of perhaps four per minute. The swell may be observed several days before the arrival of the storm.

When the storm center is 500 to 1,000 miles away, the barometer usually rises a little and exhibits a slight pumping action. Skies are relatively clear and cumulus clouds, if present at all, are few in number and their vertical development appears suppressed. Snow-white, fibrous "mare's tails" (cirrus) appear when the storm is about 300 to 600 miles away. Usually these seem to converge more or less in the direction from which the storm is approaching.

Shortly after the cirrus appears, but sometimes before, the barometer starts a long, slow fall. At first the fall is so gradual that it appears only to alter somewhat the normal daily cycle (two maximums and two minimums in the tropics). As the rate of fall increases, the daily pattern is completely lost in the more or less steady fall.

The cirrus becomes more confused and tangled, and then gradually gives way to a continuous veil of cirrostratus. Below this veil, altostratus forms, and then stratocumulus. These clouds gradually become more dense, and as they do so, the weather becomes unsettled. A fine, mist-like rain begins to fall, interrupted from time to time by showers. The barometer has fallen perhaps 0.1 inch (3 mb).

As the fall becomes more rapid, the wind increases in gustiness, and its speed becomes greater, reaching perhaps 22 to 40 knots (Beaufort 6-8). On the horizon appears a dark wall of heavy cumulonimbus, the **bar** of the storm. Portions of this heavy cloud become detached from time to time and drift across the sky, accompanied by rain squalls and wind of increasing speed. Between squalls, the cirrostratus can be seen through breaks in the stratocumulus.

As the bar approaches, the barometer falls more rapidly and wind speed increases. The seas, which have been gradually mounting, become tempestuous and, squall lines, one after the other, sweep past in ever-increasing number and intensity.

With the arrival of the bar, the day becomes very dark, squalls become virtually continuous and the barometer falls precipitously, with a rapid increase in the wind speed. The center may still be 100 to 200 miles away in a hurricane. As the center of the storm comes closer, the ever-stronger wind shrieks through the rigging and about the superstructure of the vessel. As the center approaches, rain falls in torrents. The wind's fury increases. The seas become mountainous. The tops of huge waves are blown off to mingle with the rain and fill the air with water. Objects at a short distance are not visible. Even the largest and most seaworthy vessels become virtually unmanageable, and may sustain heavy damage. Less sturdy vessels do not survive. Navigation virtually stops as safety of the vessel becomes the prime consideration. The awesome fury of this condition can only be experienced. Words are inadequate to describe it.

If the eye of the storm, which may be from 5 to 30 miles across, passes over the vessel, the winds suddenly drop to a breeze as the wall of the eye passes. The rain stops and skies clear to permit the sun to shine through the thin cloud cover. Visibility improves and confused, mountainous seas approach from all sides. The barometer reaches its lowest point. As the wall on the opposite side of the eye arrives, the full fury of the wind strikes as suddenly as it ceased, but from the opposite direction. The sequence of conditions that occurred during approach of the storm is reversed, and pass more quickly, as the various parts of the storm are not as wide in the rear as on the forward side of the storm.

Locating the center of a tropical cyclone.–If intelligent action is to be taken to avoid the full fury of a tropical cyclone, early determination of its location and direction of travel relative to the vessel is essential. The bulletins and forecasts are an excellent general guide, but they are not infallible and may be sufficiently in error to induce a mariner in a critical position to alter course so as to unwittingly increase the danger of the vessel. Often it is possible, using only those observations made aboard ship, to obtain a sufficiently close approximation to enable the vessel to maneuver to the best advantage.

As previously stated, the presence of an exceptionally long swell is usually the first visible indication of the existence of a tropical cyclone. In deep water it approaches from the general direction of origin (the position of the storm center when the

swell was generated). However, in shoaling water this is a less reliable indication, because the direction is changed by refraction, the crests being more nearly parallel to the bottom contours.

When the cirrus clouds appear, their point of convergence provides an indication of the direction of the storm center. If the storm is to pass well to one side of the observer, the point of convergence shifts slowly in the direction of the storm movement. If the storm center will pass near the observer, this point remains steady. When the bar becomes visible, it appears to rest upon the horizon for several hours. The darkest part of this cloud is in the direction of the storm center. If the storm is to pass to one side, the bar appears to drift slowly along the horizon. If the storm is heading directly toward the observer, the position of the bar remains fixed. Once within the area of the dense, low clouds, one should observe their direction of movement, which is almost exactly along the isobars, with the center of the storm being 90° from the direction of cloud movement (left of direction of movement in the Northern Hemisphere).

The winds are probably the best guide to the direction of the center of a tropical cyclone. The circulation is cyclonic, but because of the steep pressure gradient near the center, the winds there blow with greater violence and are more nearly circular than in extratropical cyclones.

According to Buys Ballot's law, an observer who faces into the wind has the center of the low pressure on his right (Northern Hemisphere) and somewhat behind him. If the wind followed circular isobars exactly, the center would be exactly eight points, or 90°, from dead ahead when facing into the wind. However, the track of the wind is usually inclined somewhat toward the center, so that the angle dead ahead varies between perhaps 8 and 12 points (90° to 135°). The inclination varies in different parts of the same storm. It is least in front of the storm, and greatest in the rear, since the actual wind is the vector sum of that due to the pressure gradient and the motion of the storm along the track. A good average is perhaps 10 points in front, and 11 or 12 points in the rear. These values apply when the storm center is still several hundred miles away. Closer to the center, the wind blows more nearly along the isobars, the inclination being reduced by one or two points at the wall of the eye. Since wind direction usually shifts temporarily during a squall, its direction at this time should not be used for determining the position of the center.

When the center is within radar range, it might be located by this equipment. However, since the radar return is predominately from the rain, results can be deceptive, and other indications should not be neglected.

Distance from the storm center is more difficult to determine than direction. Radar is perhaps the best guide. The rate of fall of the barometer is of some help; this is only a rough indication, however, for the rate of fall may be quite erratic and will vary somewhat with the depth of the low at the center, the speed of the storm center along its track, and the stage in the life cycle of the storm.

Hurricane avoidance.–Most mariners feel that ocean-going ships should leave ports which are threatened by a hurricane. Despite this natural caution, ships continue to be damaged by tropical cyclones both in port or after leaving port. This can be blamed largely on the relative unpredictability of storm movement. In making a decision to leave or stay, the mariner must take into account the local climatology of tropical cyclones, the local predictability of their movement, the speed of movement, and the suitability of the port. The Gulf of Mexico coast displays a balance of these factors. However, the reduced flexibility in evasion options created by the shape of the Gulf biases the leave/stay decision in favor of an early departure. This effectively reduces the predictability of the threat at the time of decision. The large range of storm speeds affecting the section of the coast from New Orleans to Pensacola encourages an even earlier departure. These are considered "high risk" ports. Local factors in the Gulf of Mexico further diminish the security of many ports. For example, the strong impact of storm surge along much of the Gulf coast in places leads to closure of ports due to sudden silting of their long dredged approach channels. Detailed information on the vulnerability of North Atlantic ports to hurricanes may be found in the "Hurricane Havens Handbook for the North Atlantic Ocean" published by Commanding Officer, Naval Environmental Prediction Research Facility, Monterey, Calif. 93940. Additional local information may be found in the individual chapters of this book.

The safest procedure with respect to tropical cyclones is to avoid them. If action is taken sufficiently early, this is simply a matter of setting a course that will take the vessel well to one side of the probable track of the storm, and then continuing to plot the position of the storm center, as given in the weather bulletins, revising the course as needed.

However, such action is not always possible. If one finds himself within the storm area, the proper action to take depends in part upon his position relative to the storm center and its direction of travel. It is customary to divide the circular area of the storm into two parts. In the Northern Hemisphere, that part to the **right** of the storm track (facing in the direction toward which the storm is moving) is called the **dangerous semicircle.** It is considered dangerous because (1) the actual wind **speed** is greater than that due to the pressure gradient alone, since it is augmented by the forward motion of the storm, and (2) the **direction** of the wind and sea is such as to carry a vessel into the path of the storm (in the forward part of the semicircle). The part to the **left** of the storm track is called the **navigable semicircle.** In this part, the wind is decreased by the forward motion of the storm, and the wind blows vessels away from the storm track (in the forward part). Because of the greater wind speed in the dangerous semicircle, the seas are higher there than in the navigable semicircle.

A plot of successive positions of the storm center should indicate the semicircle in which a vessel is located. However, if this is based upon weather bulletins, it is not a reliable guide because of the lag between the observations upon which the bulletin is based and the time of reception of the bulletin, with the ever present possibility of a change in the direction of motion of the storm. The use of radar eliminates this lag, but the return is not always a true indication of the center. Perhaps the most reliable guide is the wind. Within the cyclonic circulation, a **veering wind** (one changing direction to the right in the Northern Hemisphere and to the left in the Southern Hemisphere) indicates a position in the dangerous semicircle, and a **backing wind** (one changing in a direction opposite to a veering wind) indicates a position in the navigable semicircle. However, if a vessel is underway, its motion should be considered. If it is outrunning the storm or pulling rapidly toward one side (which is not difficult during the early stages of a storm, when its speed is low), the opposite effect occurs. This should usually be accompanied by a rise in atmospheric pressure, but if motion of the vessel is nearly along an isobar, this may not be a reliable indication. If in doubt, the safest action is usually to stop long enough to determine definitely the semicircle. The loss in valuable time may be more than offset by the minimizing of the possibility of taking the wrong action and increasing the danger to the vessel. If the wind direction remains steady (for a vessel which has stopped), with increasing speed and falling barometer, the vessel is in or near the path of the storm. If it remains steady with decreasing speed and rising barometer, the vessel is on the storm track, behind the center.

The first action to take if one finds himself within the cyclonic circulation is to determine the position of his vessel with respect to the storm center. **While the vessel can still make considerable way through the water, a course should be selected to take it as far as possible from the center.** If the vessel can move faster than the storm, it is a relatively simple matter to outrun the storm if sea room permits. But when the storm is faster the solution is not as simple. In this case, the vessel, if ahead of the storm, will approach nearer to the center. The problem is to select a course that will produce the greatest possible minimum distance. This is best determined by means of a relative movement plot.

As a general rule, for a vessel in the Northern Hemisphere, safety lies in placing the wind on the starboard bow in the dangerous semicircle and on the starboard quarter in the navigable semicircle. If on the storm track ahead of the storm, the wind should be put about 2 points on the starboard quarter until the vessel is well within the navigable semicircle, and the rule for that semicircle then followed. With a faster than average vessel, the wind can be brought a little farther aft in each case. However, as the speed of the storm increases along its track, the wind should be brought farther forward. If land interferes with what would otherwise be the best maneuver, the solution should be altered to fit the circumstances. If the speed of the vessel is greater than that of the storm, it is possible for the vessel, if behind the storm, to overtake it. In this case, the only action usually needed is to slow enough to let the storm pull ahead.

In all cases, one should be alert to changes in the direction of movement of the storm center, particularly in the area where the track normally curves toward the pole. If the storm maintains its direction and speed, the ship's course should be maintained as the wind shifts.

If it becomes necessary for a vessel to heave to, the characteristics of the vessel should be considered. A power vessel is concerned primarily with damage by direct action of the sea. A good general rule is to heave to with head to the sea in the dangerous semicircle or stern to the sea in the navigable semicircle. This will result in greatest amount of headway away from the storm center, and least amount of leeway toward it. If a vessel handles better with the sea astern or on the quarter, it may be placed in this position in the navigable semicircle or in the rear half of the dangerous semicircle, but never in the forward half of the dangerous semicircle. It has been reported that when the wind reaches hurricane speed and the seas become confused, some ships ride out the storm best if the engines are stopped, and the vessel is permitted to seek its own position. In this way, it is said, the ship rides with the storm instead of fighting against it.

In a sailing vessel, while attempting to avoid a storm center, one should steer courses as near as possible to those prescribed above for power vessels. However, if it becomes necessary for such a vessel to heave to, the wind is of greater concern than the sea. A good general rule always is to heave to on whichever tack permits the shifting wind to draw aft. In the Northern Hemisphere this is the starboard tack in the danger semicircle and the port tack in the navigable semicircle.

Practical rules.–When there are indications of a hurricane, vessels should remain in port or seek one if possible. Changes in barometer and wind should be carefully observed and recorded, and every precaution should be taken to avert damage by striking light spars, strengthening moorings, and if a steamer, preparing steam to assist the moorings. In the ports of the southern states, hurricanes are generally accompanied by very high tides, and vessels may be endangered by overriding the wharf where moored if the position is at all exposed.

Vessels in the Straits of Florida may not have sea room to maneuver so as to avoid the storm track, and should try to make a harbor, or to stand out of the straits to obtain sea room. Vessels unable to reach a port and having sea room to maneuver usually observe the previously discussed general rules for avoiding the storm center, which, for power-driven vessels, are summarized as follows:

Right or dangerous semicircle.–Bring the wind on the starboard bow (045° relative), hold course and

make as much way as possible. If obliged to heave to, do so with head to the sea.

Left or navigable semicircle.–Bring the wind on the starboard quarter (135° relative), hold course and make as much way as possible. If obliged to heave to, do so with stern to the sea.

On storm track, ahead of center.–Bring wind two points on the starboard quarter (157½° relative), hold course and make as much way as possible. When well within the navigable semicircle, maneuver as indicated above.

On storm track, behind center.–Avoid the center by the best practicable course, keeping in mind the tendency of tropical cyclones to curve N and E.

Coastal effects.–The high winds of a hurricane inflict widespread damage when such a storm leaves the ocean and crosses land. Aids to navigation may be blown out of position or destroyed. Craft in harbors, unless they are properly secured, drag anchor or are blown against obstructions. Ashore, trees are blown over, houses are damaged, power lines are blown down, etc. The greatest damage usually occurs in the dangerous semicircle a short distance from the center, where the strongest winds occur. As the storm continues on across land, its fury subsides faster than it would if it had remained over water.

Along the coast, particularly, greater damage may be inflicted by water than by the wind. There are at least four sources of water damage. First, the unusually high seas generated by the storm winds pound against shore installations and craft in their way. Second, the continued blowing of the wind toward land causes the water level to increase perhaps 3 to 10 feet above its normal level. This **Storm tide,** which may begin when the storm center is 500 miles or even farther from the shore, gradually increases until the storm passes. The highest storm tides are caused by a slow-moving hurricane of larger diameter, because both of these effects result in greater duration of wind in the same direction. The effect is greatest in a partly enclosed body of water, such as the Gulf of Mexico, where the concave coastline does not readily permit the escape of water. It is least on small islands, which present little obstruction to the flow of water. Third, the furious winds which blow around the wall of the eye often create a ridge of water called a **Storm surge,** which strikes the coast and often inflicts heavy damage. The effect is similar to that of a **Tsunami (seismic sea wave)** caused by an earthquake in the ocean floor. Both of these waves are popularly called **Tidal waves.** Storm surges of 20 feet or more have occurred. About 3 or 4 feet of this is due to the decrease of atmosphere pressure, and the rest to winds. Like the damage caused by wind, that due to high seas, the storm tide, and the storm surge is greatest in the dangerous semicircle, near the center. The fourth source of water damage is the heavy rain that accompanies a tropical cyclone. This causes floods that add to the damage caused in other ways.

When proceeding along a shore recently visited by a hurricane, a navigator should remember that time is required to restore aids to navigation which have blown out of position or have been destroyed. In some instances the aid may remain but its light, sound apparatus, or radiobeacon may be inoperative. Landmarks may have been damaged or destroyed.

Cargo Care and Dew Point.–The temperature at which condensation to water droplets occurs is called the dew point. When the dew point is above freezing, condensation will be in the form of water; below freezing dew points, when reached, will result in the formation of ice crystals deposited upon cold surfaces. Knowledge of the dew point along with the cargo temperature and moisture content is vital for hold ventilation decisions.

The relatively high humidities and temperatures encountered in this subtropical region make protection of cargoes from sweat an important consideration. Critical conditions are most likely to occur when cargoes are loaded under conditions of high temperatures, which are prevalent from spring through autumn.

When free air has a dew point temperature higher than the temperature of the surface with which it comes in contact, the air is often cooled sufficiently below its dew point to release moisture. When this happens aboard ship, condensation will take place on relatively cool cargo or on the ship's structure within the hold where it later drips onto the cargo. Thus, if cargo is stowed in a cool climate and the vessel sails into warmer waters, ventilation of the hold with outside air will likely lead to sweat damage in any cargo sensitive to moisture. Under such conditions external ventilation should, as a rule, be closed off entirely, unless the cargo generates internal heat, that hazard being greater than sweat damage. In the opposite case, when a vessel is loaded during a warm period, and moves into cooler weather, vulnerable cargo should be ventilated.

A safe rule for ventilation directed toward moisture control may be stated as follows: Whenever accurate measurements show the outside air has a dew point below the dew point of the air surrounding the cargo to be protected, such outside air is capable of removing moisture from the hold and the ventilation process can be safely started. Whenever the reverse is true, and the outside dew point is higher than the dew point temperature around the cargo, then ventilation will increase the moisture content of the hold and may readily result in sweating within the ship. The above does not take into account possible fumes or gases in the compartment; in such cases discretion must be used.

Principal ports.–The principal deep-draft commercial ports within the area of this Coast Pilot are: Port St. Joe, Panama City, Pensacola, Tampa, Mobile, Pascagoula, New Orleans, Baton Rouge, Lake Charles, Orange, Freeport, Port Lavaca-Point Comfort, Port Arthur, Beaumont, Galveston, Texas City, Houston, Corpus Christi, Port Brownsville, and Port Isabel. (See chapters 13 and 14, respectively, for the principal deep-draft commercial ports of Puerto Rico and U.S. Virgin Islands.)

Other ports are Key West, Port Boca Grande, Sarasota, St. Petersburg, St. Marks, and Carrabelle.

Pilotage, with a few minor exceptions, is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot properly licensed by the Federal Government for the waters which the vessel travels.

Arrangements for pilots are generally made in advance by the ships' agents. Pilots serving the larger ports maintain a 24-hour radio watch, while those at the smaller ports maintain a radio watch only when vessels are expected. Detailed information on pilotage procedures is given in the text for the ports concerned.

Towage.–Tugs are available at all major ports; they can usually be obtained for the smaller ports on advance notice if none are available locally. Arrangements for tugs should be made in advance through ships' agents or the pilots. (See the text for the ports concerned as to the availability of tugs.)

Vessel Arrival Inspections.–Vessels subject to U.S. quarantine, customs, immigration, and agricultural quarantine inspections generally make arrangements in advance through ships' agents. Government officials conducting such inspections are stationed in most major ports. Mariners arriving at ports where officials are not stationed, should contact the nearest activity providing that service. (See appendix for addresses.) Unless otherwise directed, officials usually board vessels at their berths. **Note:** U.S. Public Health quarantine matters for ports in Puerto Rico and the U.S. Virgin Islands are handled by the U.S. Quarantine Station, San Juan, P.R.

Harbormasters where appointed are mentioned in the text. They usually have charge of the anchorage and berthage of vessels.

Supplies.–General supplies, including fuel oil, diesel oil and fuel, gasoline, water, and marine supplies are available at the principal ports. Similar items but in more limited quantities can be obtained at many places mentioned under descriptions of the different ports.

Repairs-salvage.–Hull and engines of medium to large vessels can be repaired at Tampa, Mobile, New Orleans, Port Arthur, Beaumont, Orange, Galveston, and Houston. Smaller vessels can be handled at numerous other ports. Extensive above-the-waterline hull and engine repairs can be made at Pensacola, Pascagoula, and Lake Charles. Minor repairs can be made at Freeport and Port Brownsville. Marine railways are available, and repairs to smaller craft can be made at many other places on the Gulf Coast, as listed under the descriptions of the different ports.

Deep-sea salvage equipment is available at Key West, Tampa, Mobile, New Orleans, Port Arthur, Beaumont, and Galveston.

Small-craft facilities.–There are numerous places where fuel, supplies, repairs, slips for dockage, and launching ramps are available for small craft. For isolated places and small cities, the Coast Pilot describes the more important of these facilities; for large port areas, where individual facilities are too numerous to mention, the information given is more general. Additional information may be obtained from the series of small-craft charts published for many places, and from various local small-craft guides.

A vessel of less than 65.6 feet (20 meters) in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway. (Navigation Rules, International-Inland Rule 9(b).

Standard time.–Port St. Joe, Fla., and the areas E of it observe eastern standard time (e.s.t.), which is 5 hours slow of Greenwich mean time. Example: when it is 1000 at Greenwich, it is 0500 at Tampa, Fla. The area from Port St. Joe to the Rio Grande uses central standard time (c.s.t.), which is 6 hours slow of Greenwich mean time. Example: when it is 1000 at Greenwich, it is 0400 at Corpus Christi, Texas. Puerto Rico and the U.S. Virgin Islands observe Atlantic standard time (A.s.t.), which is 4 hours slow of Greenwich mean time. Example: when it is 1000 at Greenwich, it is 0600 at San Juan, Puerto Rico, and Charlotte Amalie, U.S. Virgin Islands.

Daylight saving time.–In all States covered by this Coast Pilot clocks are advanced one hour on the last Sunday in April and are set back to standard time on the last Sunday in October. Puerto Rico and the U.S. Virgin Islands do not observe daylight saving time.

Legal public holidays.–New Year's Day, January 1; Washington's Birthday, third Monday in February; Memorial Day, last Monday in May; Independence Day, July 4; Labor Day, first Monday in September; Columbus Day, second Monday in October; Veterans Day, November 11; Thanksgiving Day, fourth Thursday in November; and Christmas Day, December 25. The national holidays are observed by employees of the Federal Government and the District of Columbia, and may not be observed by all the areas in every case.

In addition, the following holidays are also observed in the area covered by this Coast Pilot:

Three Kings' Day, January 6: Puerto Rico and Virgin Islands.

Battle of New Orleans, January 8: Louisiana.

De Hostos' Birthday, January 11: Puerto Rico.

Robert E. Lee's Birthday, January 19: Florida and Louisiana. (Third Friday in January in Mississippi and Alabama.)

Arbor Day, Third Friday in January: Florida.

Franklin D. Roosevelt's Birthday, January 30: Virgin Islands.

Lincoln's Birthday, February 12: Virgin Islands.

Washington's Birthday, February 22: Louisiana and Virgin Islands.

Texas Independence Day, March 2: Texas.

Emancipation Day, March 22: Puerto Rico.

Mardi Gras (Shrove Tuesday): Alabama, Florida, and Louisiana.

Transfer Day, March 31: Virgin Islands.

Holy Thursday: Virgin Islands.

Good Friday: Florida, Louisiana, Puerto Rico, and Virgin Islands.

Easter Monday: Virgin Islands.

Pascua Florida Day, April 2: Florida.

Thomas Jefferson's Birthday, April 13: Alabama.

Jose de Diego's Birthday, April 16: Puerto Rico

San Jacinto Day, April 21: Texas.

Whit Monday: Virgin Islands.

Confederate Memorial Day, April 26: Florida. (Last Monday in April in Alabama and Mississippi.)

Memorial Day, May 30: Louisiana and Virgin Islands.

Confederate Memorial Day, June 3: Louisiana.

Jefferson Davis' Birthday, June 3: Florida and Texas, (First Monday in June in Alabama and Mississippi.)

Organic Act Day, June: Virgin Islands.

Munoz Rivera's Birthday, July 17: Puerto Rico.

Constitution Day, July 25: Puerto Rico.

Supplication Day, July 25: Virgin Islands.

Dr. Jose C. Barbosa's Birthday, July 27: Puerto Rico.

Huey P. Long's Birthday, August 30: Louisiana.

Columbus Day, October 12: Louisiana, Puerto Rico and Virgin Islands.

Thanksgiving Day, October 25: Virgin Islands.

Liberty Day, November 1: Virgin Islands.

Discovery Day, November 19: Puerto Rico.

Second Christmas Day, December 26: Virgin Islands.

4. KEY WEST TO TAMPA BAY

This chapter describes the W coast of Florida from Key West to Tampa Bay, and the ports of Key West, Naples, Fort Myers, Port Boca Grande, Venice, and Sarasota, and many of the smaller ports and landings. Also described are the Ten Thousand Islands, Big Marco Pass, Gordon Pass, Estero Island, Matanzas Pass, San Carlos Bay, Caloosahatchee River, Sanibel Island, Charlotte Harbor, Peace River, Myakka River, Gasparilla Sound, Gasparilla Island, New Pass, Venice Inlet, Big Sarasota Pass, Lido Key, Longboat Key, Longboat Pass, and Anna Maria Key.

The section of the Intracoastal Waterway from Caloosahatchee River, Fla., to Tampa Bay passing through the waters described in this chapter and places along its route is discussed in chapter 12.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.740 through 80.750, chapter 2.

Chart 11420.–The coast, for nearly 115 miles, from Key West to San Carlos Bay is low, sandy, and generally wooded. Innumerable small islands and keys, interlaced by many small rivers and bayous, make up Everglades National Park and the Ten Thousand Islands. From San Carlos Bay N to Tampa Bay the coast is made up of nearly straight sandy beaches of the barrier islands.

The **Florida Keys** comprise a chain of low islands along the SW coast of the Florida Peninsula extending W in a wide arc to the Dry Tortugas. The keys are mostly of coral formation and are generally covered with dense mangrove, though some have stands of pine and a few have coconut groves.

On the straits side of the keys, and at an average distance of 5 miles, are the **Florida Reefs,** a dangerous line of shoals which extend along the entire length of the chain. The reefs are particularly hazardous because they do not break in smooth weather and few of them are exposed. The water shoals abruptly between the reefs and along their outer edges.

When approaching the reefs from seaward, their proximity usually is indicated by a change in color of the water from deep blue to light green or by the bank blink, described in chapter 3. However, too much reliance should not be placed on such indications. Lights and daybeacons facilitate navigation along the reefs in clear weather, but soundings should be resorted to in thick weather. Depths of 50 fathoms indicate a distance of 2 to 3 miles from the reefs, and great caution should be used in approaching closer. Fogs are infrequent in this area.

The water always becomes milky following windy weather. The usual color is bluish green on the reefs, while the rock patches are dark, shading through brown to yellow as they approach the surface. Sand patches are bright green. Grass patches at depths of 10 to 15 feet have the appearance of rocks. With the sun astern, the line marking deep water and the edges of reefs is surprisingly clear from a position aloft.

Weather.–Along the coast from Key West to Tampa Bay, the major weather hazards include tropical cyclones, thunderstorms, and cold fronts. Tropical cyclones, which can occur in any month, are mainly a threat in June, August, September, and October. Thirteen hurricanes have crossed the coastline between Key West and Tampa Bay in the past 100 years. The chance of a tropical cyclone encounter decreases along the W coast, N to Fort Myers and Tampa Bay. Thunderstorms develop on about 60 to 80 days annually along this section of the coast. They are least likely near Key West and most likely in the Tampa Bay area. While they can occur at anytime, they are most likely from June through September, during the late afternoon and evening hours; at sea they frequently occur at night. During the summer months, thunderstorms are observed on about 10 to 20 days per month. From fall through spring, cold fronts occasionally reach these waters generating strong, gusty winds which kick up rough seas. While gales are infrequent, winds of 28 knots or more occur about 1 to 2 percent of the time off Key West and 2 to 3 percent of the time off Fort Myers. Wave heights of 10 feet or more are encountered 1 to 3 percent of the time in the S compared to 3 to 5 percent off Fort Myers. Visibilities are usually good, particularly off Key West. Farther N, they drop below 2 miles about 1 percent of the time from December through April. Along the coast, a shallow ground fog may form, but this usually dissipates with the rising sun.

Charts 11447, 11441, 11445.–Key West Harbor is 134 miles and 151 miles SW of Miami Harbor via the inside and coastwise routes, respectively. The harbor proper is in front of the city of Key West, protected on the E side by the island and on the other sides by submerged reefs and sand flats. The harbor is entered through breaks in the reef by four principal channels with depths of about 13 to 33 feet, and several minor channels.

Key West, on the island of the same name near the W end of the Florida Keys, is a winter resort. Commercial fishing is one of the leading industries, but commerce is mostly in crude and refined oils. Cruise ships frequently call here, and the harbor is a safe haven for any vessel.

Prominent features.–Easy to identify when standing along the keys is the 300-foot-high radio tower about 0.3 mile ESE of Fort Taylor, the hotel cupola, the Naval Regional Medical Center cupola, and a 110-foot-high abandoned lighthouse, 0.5 mile ENE

of Fort Taylor. Numerous tanks, lookout towers, and masts are prominent but difficult to identify. The stacks of the city's electric plant on the E side of Key West Bight are prominent from the S. Also conspicuous are two white radar domes and an aerobeacon on Boca Chica Key, and the white dome of the National Weather Service station and the aerobeacon at Key West International Airport. From S, several apartment complexes on the S shore just W of the airport are prominent.

Sand Key Light (24°27.2'N., 81°52.7'W.), 109 feet above the water, is shown from a 120-foot brown square pyramidal skeleton tower, enclosing a stair cylinder and square dwelling on pile foundation on **Sand Key.**

Channels.-Main Ship Channel is the only deep-draft approach to Key West. Federal project depth is 34 feet from the Straits of Florida to a turning basin off the Naval Air Station Truman Annex Mole and inside the annex basin, thence 30 feet to an upper turning basin off Key West Bight, and then 12 feet to and including a turning basin in the bight. (See Notice to Mariners and latest editions of the charts for controlling depths.) The channel from the entrance to the upper turning basin is marked by lighted ranges and other aids to navigation. Spoil areas are W of the channel.

Northwest Channel is a medium-draft passage between Key West Harbor and the Gulf of Mexico. In April 1982, a reported depth of 12 feet could be carried through the channel with local knowledge. Vessels can pass directly across the reefs from the Gulf to the Straits of Florida by way of Northwest Channel and Main Ship Channel. The Gulf end of the channel is shifting W.

The jetties on either side of the Gulf entrance to Northwest Channel are 0.3 to 0.5 mile from the centerline of the channel, and only the outer part of the E jetty shows above low water. The NW end of the jetty is marked by a light. The channel is marked by lights, a lighted range, daybeacons, and lighted and unlighted buoys. The steel pilings and skeletal tower of a former Coast Guard lighthouse are about 0.3 mile SW of the S end of the W jetty.

Smith Shoal (chart 11439), about 4.5 miles N of the N entrance to Northwest Channel, is covered 11 feet and marked on its NE end by **Smith Shoal Light** (24°43.2'N., 81°55.0'W.). The light also marks the N approach to the channel and is shown 47 feet above the water from a small black house on a white, hexagonal, pyramidal skeleton tower on piles. A relatively flat-topped coral head, covered by a least depth of 11 feet, is about 3.3 miles WSW of the light.

Southwest Channel, a convenient approach to Key West from SW, has been swept to a depth of 23 feet, and is marked by buoys. In 1961, this depth was confirmed for midchannel. A general course following the aids leads to the outer anchorage and Main Ship Channel. Strangers should not attempt passage at night.

West Channel, a passage leading W from Key West between the keys and outer reefs, is deep but unmarked. It is used by shrimp boats and small craft bound toward the Dry Tortugas. Local knowledge is advised for safe passage.

Calda Channel leads N from Man of War Harbor to the open waters of the Gulf. The channel is narrow and crooked, but is well marked by daybeacons and a light at the N end. The reported controlling depth was 3 feet in April 1983, except for shoaling close to the aids marking the channel. The channel should be used only with local knowledge and during good visibility.

Garrison Bight Channel, well marked, leads from Man of War Harbor around the N end of Fleming Key, thence S for about 1.8 miles, thence E to Trumbo Point, thence into a turning basin just inside the entrance of Garrison Bight. In 1981, the centerline controlling depth was 7 feet with 7½ to 8 feet in the turning basin. An overhead power cable crosses the entrance and the N part of the bight; clearances are 50 feet at the entrance and 34 feet elsewhere. A privately dredged channel leads from the turning basin to a basin in the SW part of the bight. In April 1983, the privately dredged channel had a controlling depth of 5 feet. In April 1983, the channel was reported to be shifting; local knowledge is advised. A causeway bridge, with a 44-foot span and a clearance of 19 feet, crosses the SW part of the bight.

Garrison Bight can also be reached via an unmarked channel, locally known as Fleming Key Cut, that leads from Man of War Harbor E between Fleming Key and the N shore of Key West to a junction with Garrison Bight Channel at Trumbo Point. A depth of about 6 feet can be carried to the junction. Fleming Key Cut is reported to have very strong tidal currents and is not recommended for low-powered vessels. The channel is crossed by a 42-foot fixed span highway bridge with a clearance of 18 feet which connects Fleming Key with Key West. Garrison Bight has excellent small-craft facilities; these are described later in the chapter.

The Intracoastal Waterway from Miami to Key West joins Garrison Bight Channel off the N end of Fleming Key.

Anchorages.-The best anchorage for medium-draft vessels less than 200 feet long is N of the city in **Man of War Harbor** where depths are 14 to 26 feet. Mariners should exercise caution to avoid the visible and submerged wrecks in the harbor. It is protected against heavy seas by **Frankfort Bank** and **Pearl Bank,** on the W and **Fleming Key** on the E. Small craft usually anchor E of **Wisteria Island,** to the W of the main ship channel, or at Key West Yacht Club in **Garrison Bight** on the N side of the city. Anchoring in the vicinity of Key West Bight Channel Light 2, between Key West Bight Channel and the shoreline, is not recommended because of poor holding ground, strong currents, and obstruction of the dock approaches.

Vessels can anchor W of the city in depths of 20 to 26 feet, taking care, however, to avoid the reefs which rise abruptly in some places along the edges of the channels. The outer anchorages, SW of **Fort Taylor** and about 1 mile SSE of Eastern Triangle

Light, are favored by deep-draft vessels. They are somewhat exposed, but have depths of 22 to 36 feet and are safe for vessels with good ground tackle. The anchorage area at Key West is one of the best for large vessels S of Chesapeake Bay.

A **naval explosives anchorage** is about 2.5 miles SW of Key West. (See 110.1 and 110.189a, chapter 2, for limits and regulations.)

Dangers.–A **naval restricted area** is off the S side of Key West near its SW end. The waters near the naval facilities at Key West are **restricted.** (See 207.173, chapter 2, for limits and regulations.)

A **naval operational training area,** aerial gunnery range, and bombing and strafing target **danger zones** are in the Straits of Florida and the Gulf of Mexico in the vicinity of Key West. (See 204.95, chapter 2, for limits and regulations.)

Caution.–Craft approaching Key West, Boca Chica, and Safe Harbor from the E through Hawk Channel should be mindful that submerged rocks and reefs extend up to 0.6 mile off the keys and give little or no indication of their presence under certain conditions.

It is reported that rain squalls that move through the area during the rainy season can quickly obscure visual ranges and landmarks and make navigation of the narrow channels hazardous.

Fishermen operating out of the Florida Keys, particularly Key West, routinely use stakes to mark otherwise unmarked channels that they use as short cuts or for safe passage in rough weather. When the channels change or fall into disuse, these stakes are not removed. Visitors to the keys should not rely on them as channel markers without local knowledge.

Tides.–The mean range of tide is 1.3 feet at Key West. (See the Tide Tables for daily predictions.)

Currents.–A W current, counter to the prevailing E set of the Gulf Stream, at times exceeding 1 knot, has been reported in the vicinity of Key West Entrance Lighted Whistle Buoy. In the S approaches to Key West within the 10-fathom curve currents are weak and variable. In the main channel W of Fort Taylor, the flood (NNE) and the ebb (SSW) currents at strength average 1.0 knot and 1.7 knots, respectively. In the upper turning basin, the flood sets NE and the ebb SW with averages at strength of 0.8 and 1.1 knots, respectively. In Northwest Channel about 2.5 and 5.5 miles from Key West, the tidal currents average 1.3 knots and 0.6 knot, respectively. (See the Tidal Current Tables for daily predictions.) However, both the time and velocity of the tidal current are influenced by winds. In April 1982, it was reported that the current in the channel between Fleming Key and Key West reaches 6 knots during both flood and ebb, with currents of up to 9 knots having been observed N of Pier D-3 at the W end of the channel.

Weather.–Key West Harbor, because of the nearness of the Gulf Stream to the S and SE and the tempering effects of the Gulf of Mexico to the W and N, enjoys a mild tropical-maritime climate where average temperatures vary only about 14°F from summer to winter. Prevailing easterly trade winds and sea breezes suppress the usual summertime heating, while cold air in winter is modified by the warm Gulf water. Precipitation is produced mainly by thunderstorms, tropical systems, including easterly waves, and occasional cold fronts during the winter season.

At Key West, hurricane force winds can be expected, on the average, once every 7 years. Storm tides of 15 feet occur about once every 15 years. The most potentially destructive are those storms that originate in the W Caribbean and subsequently move N across Cuba. Medium draft vessels, capable of good anchorage, can find refuge in Man-of-War Harbor, while shallow draft vessels, if they cannot be removed from the water, could use Key West Bight or, if able to obtain an alongside berth, Garrison Bight.

Thunderstorms are most likely from June through September when they occur on 10 to 14 days per month, usually in the late afternoon or evening. They are sometimes associated with easterly waves and can produce torrential downpours that briefly restrict visibilities to near zero. Gale-force winds are infrequent, occuring in tropical cyclones, thunderstorms, or stong cold fronts.

The National Weather Service maintains an office at the Key West International Airport. **Barometers** can be compared and weather information obtained by telephone. (See appendix for address.)

(See page T-1 for **Key West climatological table.**)

Pilotage is compulsory for all foreign and U.S. vessels under register in the foreign trade drawing more than 7 feet (including tugs, barges, and tows) bound for Key West, Safe Harbor, Stock Island, Boca Chica Channel or the Gulf of Mexico through Key West channels. Pilotage is optional for U.S. coastwise mechanically-propelled vessels that have on board a pilot properly licensed by the Federal Government for the waters which that vessel travels. Vessels are boarded day or night at Key West Entrance Lighted Whistle Buoy (24°27.7'N., 81°48.1'W.) or Northwest Channel Entrance Lighted Bell Buoy 1 (24°38.8'N., 81°54.0'W.). Pilots board from various small boats and display International Code flag "H". Vessels being boarded should maintain a dead slow speed and provide a ladder to the water on the lee side. Pilot boats monitor VHF-FM channel 16 (156.80 MHz) when underway and use channel 14 (156.70 MHz) as working frequency. Arrangements for Key West Bar Pilots are made by ships' agents, by telephone (305-296-5512), or through the Key West marine operator on VHF-FM channel 26 (157.30 MHz) or 84 (157.225 MHz). A minimum 24-hour notice of time of arrival is requested, because there is only one pilot at Key West.

Towage.–A 440-hp tug, available at the port, is equipped with VHF-FM channel 16 (156.80 MHz). General equipment is available for heavy salvage work.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Key West is a **customs port of entry.**

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See U.S. Public Health Service, chapter 1.) The quarantine anchorage is in Man of War Harbor if size and draft of vessel permit. Larger vessels anchor in the outer harbor. County and private hospitals are available.

Coast Guard.–A Coast Guard station is at Pier D-2 on the NW side of Key West.

Harbor regulations.–The **harbormaster,** who is also the pilot, has direct supervision of the port, of anchoring and mooring all vessels, and collection of port dues. The harbormaster can be contacted through the Key West Bar Pilots. A 5-mph **speed limit** is enforced in Garrison Bight and in all constricted channel areas.

In the Main Ship Channel, not more than one vessel shall be in the reach of the channel between Lighted Buoys 23 and 25. Vessels in this reach shall have the right-of-way over vessels departing the Truman Annex Basin.

The reach of the channel from Lighted Buoys 14 and 15 to the N end of the Truman Annex Mole shall be kept clear except for vessels able to proceed to their berths without delay. Vessels shall not lie-to in this reach of the channel. If a vessel is unable to proceed because of harbor congestion, she shall pull aside to the westward and lie-to in safe water. No passing is permitted in this reach of the channel.

Vessels which will be delayed in berthing shall notify vessels astern of that fact in order that they may proceed.

Nothing in the above shall relieve masters or commanding officers of their responsibilities for observing the Navigation Rules and the practice of good seamanship.

A 7-knot **speed limit** is enforced between the piers at the Truman Annex Basin and the turning basin.

A 5-knot **speed limit** is enforced in the channel outside the Truman Annex Basin between points 200 yards on either side of the basin entrance.

Wharves.–Municipal Wharf, also known as Mallory Wharf (24°33′35″N., 81°48′28″W.), is 870 feet long and has a deck height of about 7 feet. The N half is privately owned, and the S half is owned and operated by the city of Key West as a general cargo facility. In June 1975, depths of about 20 feet were reported along the N half and 18 to 23 feet along the S half. In April 1982, the wharf was closed for repairs and available only in emergencies. The Municipal Wharf is under the jurisdiction of the Key West Port and Transit Authority. The other deep-water berths at Key West are used only for emergency docking. Contact the Key West Bar Pilots for further information.

Commercial fish wharves are in Key West Bight and Safe Harbor. Charter boats and yachts use Garrison Bight.

Supplies.–Gasoline, diesel fuel, water, ice, provisions, and marine supplies can be obtained in Key West.

Repairs.–A shipyard that specializes in repairs to wooden vessels is in Safe Harbor on the S side of Stock Island. The yard has a 300-ton floating drydock that can handle vessels to 80 feet long, 40 feet wide, and 7½ feet in draft. A 150-ton mobile hoist is available. There is a small repair yard at Key West on the W side of Garrison Bight. Lifts to 30 tons, and engine, hull, electrical, radio, and electronic repair facilities are available. Above-the-waterline repairs can also be made to larger vessels. In April 1983, shoaling to an unknown extent was reported at the entrance to the yard.

Small-craft facilities.–Berths, electricity, water, ice, and some marine supplies are available at Key West. Gasoline and diesel fuel are available in Garrison Bight. Hull, engine, electrical, and electronic repairs can be made. Small craft moor in Key West Bight, and in Garrison Bight at the Municipal Marina, or at the Key West Yacht Club, which are at the SW and E ends of the bight, respectively. A causeway across the SW part of Garrison Bight has a small-craft opening. The highway bridge over the opening has a 44-foot fixed span with a clearance of 19 feet at the center. An overhead power cable crossing the N part of Garrison Bight and the entrance has a clearance of 50 feet over the entrance channel and 34 feet elsewhere. Anchorage in 2 to 6 feet is available at Key West Yacht Club. Anchoring or mooring elsewhere in Garrison Bight, except in an emergency or as a shelter during bad weather, is not permitted. Public launching ramps are in Garrison Bight and at the foot of Simonton Street.

Communications.–There are no rail connections at Key West. Movement of freight in and out of the port is by vessel or truck. The Overseas Highway (U.S. Route 1) connects the city with Miami and points N, and there is air service to Miami. Bus service is available to mainland points.

Safe Harbor, 4 miles E of Key West, is a medium-draft harbor on the S side of Stock Island. Conspicuous objects include the stack and tanks at a power-plant and desalination plant on the E side of the harbor, and a large red dry storage building at a marina on the SE end of Stock Island. A privately dredged channel leads from Hawk Channel into the harbor. A light marks the approach; lights and a daybeacon mark the channel. In April 1983, the reported controlling depth in the entrance channel was 13 feet, with greater depths inside the harbor.

Piers with dolphins on the E side of the harbor near the entrance are used by barges to unload petroleum products for the power and desalination plants. Depths of 18 feet are reported alongside the piers.

The piers on the E and W sides of the harbor are used by cold storage and seafood packing plants; numerous shrimp boats tie up alongside the finger piers.

A boatyard at the head of the harbor has a mobile hoist that can handle craft to 60 tons. Diesel fuel, water, ice, and marine supplies are available. In April 1982, a depth of 30 feet was reported alongside the piers at the yard, and 300 feet of berthing space was available.

A privately dredged spur channel E of Safe Harbor leads to a large marina on the SE end of

Stock Island. In April 1982, a reported controlling depth of 18 feet was available to the facility. The channel is marked by private daybeacons. Berths, gasoline, diesel fuel, water, ice, electricity, a launching ramp, storage, and complete marine supplies are available. A forklift can haul out craft to 25 feet for hull and engine repairs. The **dockmaster** can be contacted on VHF-FM channel 16 (156.80 MHz).

Cow Key Channel, between Stock Island and Key West, is narrow and marked by private daybeacons. A shoal that bares is about 0.2 mile SSW of the SW point of Cow Key. In April 1983, the reported controlling depths were 3 feet in the channel to a point about 0.6 mile above the entrance, thence 2 feet to the highway bridges about 0.9 mile above the entrance. In April 1983, it was reported that the channel was subject to frequent change. Mariners are advised to seek local knowledge before entering the channel. Shallow-draft boats can pass through the highway bridges between the keys. The two fixed bridges have a least clearance of 16 feet horizontal and 8 feet vertical. N of the highway bridges the channel is difficult to follow. A deteriorating drive-in movie screen E of the channel and three radio antennas on the E side of the channel are prominent. A small marina just S of the bridges has berths, gasoline, water, ice, and some marine supplies. Scuba tanks can be filled at a diving facility on the E side of the channel at the bridges. About 0.5 mile N of the bridges, on Stock Island, a marina has berths, gasoline, storage, and marine supplies. A forklift can haul out boats to 25 feet for engine repairs. In April 1982, a reported controlling depth of 4 feet was available to the facility.

Charts 11439, 11434.–The area from Key West for 63 miles W to Dry Tortugas is a continuation of the keys with their intervening reefs and shoals. The keys are low, small in extent, and, except for the Dry Tortugas, generally covered with dense growths of mangrove.

About 5 miles S of the main chain of keys and reefs is a line of reefs, shoals, and generally broken ground which rises abruptly from the deep water of the Straits of Florida. Buoys, lights, and daybeacons mark the outer reefs. Deep-draft vessels standing along the keys should avoid this broken ground and also the areas with depths less than 10 fathoms, S and W of Rebecca Shoal and the Dry Tortugas.

Currents are variable along the edge of the reefs, being influenced by winds, by differences of barometric pressure in the Gulf and the Straits of Florida, and by the tides. At times there are strong tidal currents through the passages between the keys.

Between Key West Harbor and Boca Grande Channel there is an extensive shoal area in which are several small scattered keys. The white sand beaches of the southernmost keys are easily discernible from seaward. A large house on **Ballast Key** (24°31.3′N., 81°57.8′W.) is reported to be prominent.

Key West National Wildlife Refuge extends W from Key West to Marquesas Keys.

Boca Grande Channel, between **Boca Grande Key** and the Marquesas Keys, is about 15 miles W from Key West. The channel has a controlling depth of about 11 feet from the Straits of Florida to the Gulf of Mexico and is marked by daybeacons and a buoy, but is seldom used except by local boats of 6 feet or less draft. The channels through Key West Harbor are deeper and better marked, and offer a shorter passage from the Gulf to the Straits of Florida. Good anchorage is available 1 mile NE of Boca Grande Key for boats drawing less than 5 feet.

Currents.–In Boca Grande Channel the average velocity of the current is 1.2 knots; the flood current sets N and the ebb SSW. The velocity of the current is considerably influenced by the winds.

The **Marquesas Keys,** on the W side of Boca Grande Channel, are 4 miles in extent and surrounded by a large shoal area. The northernmost key is the largest and has a strip of sandy beach free of mangrove.

Mooney Harbor, a good anchorage for drafts of 4 feet or less, is inside the Marquesas Keys. In September 1982, the entrance to the harbor was reported to be closed by shoaling. However, it was reported that small craft can find protected anchorage in 1 to 4 feet with good holding ground in a small lagoon close W of Mooney Harbor. The lagoon should be entered only during daylight hours and caution should be exercised.

Ellis Rock, 4 miles NW of the Marquesas Keys, is covered 7 feet and surrounded by depths of 21 to 39 feet; the rock is marked by a light.

Danger zones of bombing and strafing target areas, centered on targets, are in the vicinity of Marquesas Keys. (See 204.95, chapter 2, for limits and regulations.)

A large shoal, the W part of which is known as **The Quicksands,** extends 18 miles W from the Marquesas Keys. The shoal is about 4.5 miles wide between the 18-foot curves and has a least depth of 2 feet over its E part. A strong E to W current was observed in the area of The Quicksands in 1975.

Halfmoon Shoal, covered 8 feet, is off the W end of The Quicksands. A wreck covered 6 feet and marked by a daybeacon is on the W edge of the shoal.

New Ground, a shoal with a least depth of 4 feet at its W end, is about 6 miles long. It extends in an E-W direction about 3.5 miles N of The Quicksands. A light is on the W side of the 4-foot spot. The water shoals abruptly on the N side of New Ground, and vessels should stay in depths greater than 13 fathoms to ensure clearing the shoal.

Between New Ground and The Quicksands is a natural channel about 2 miles wide with depths greater than 30 feet. The route should be used with caution because of the general irregularity of the bottom inside the 10-fathom curve.

A channel, sometimes used, lies W of Halfmoon Shoal, but is not recommended. SW of Halfmoon Shoal depths of 20 to 22 feet rise abruptly from depths of about 40 feet.

Issac Shoal, 5 miles W of Halfmoon Shoal and 2

miles SE of Rebecca Shoal, is covered 14 feet. The shoal rises from depths of 30 to 60 feet.

Rebecca Shoal, 43 miles W of Key West, is a small coral bank covered 11 feet. **Rebecca Shoal Light** (24°34.7'N., 82°35.2'W.), 66 feet above the water, is shown from a square skeleton tower on a brown pile foundation on the S edge of the shoal. A red sector from 254° to 302° in the light covers Isaac Shoal, Halfmoon Shoal, and The Quicksands. Several 18-foot spots are reported within 1 mile SE and W of the light.

Deep-draft vessels sometimes anchor 5 miles SE of Rebecca Shoal Light in 60 to 65 feet.

Currents.–Between Halfmoon Shoal and Rebecca Shoal at Isaac Shoal the current floods N with an average velocity at strength of about 1.0 knot and ebbs S with an average velocity of about 0.8 knot. The velocity of the current is considerably influenced by the wind.

The current S of New Ground Shoal has an average velocity of 0.7 knot with the flood setting NE and the ebb SW. The velocity and direction of the current are influenced considerably by the wind.

Chart 11434.–Rebecca Shoal Channel, immediately W of Rebecca Shoal Light, frequently is used by vessels bound from the Straits of Florida to points on the W coast of Florida. Vessels bound for Mobile and points W pass to the W of Dry Tortugas.

So far as known, Rebecca Shoal Channel is clear, but possibly there are undiscovered spots with lesser depths than those now charted. Deep-draft vessels should use the passage with great caution, and should continue about 15 miles past the lighted bell buoy marking the 28-foot shoal S of The Quicksands before turning N. The passage is well marked by lights. In February 1980, a sunken wreck was reported about 7 miles W of Rebecca Shoal Light, in about 24°33.6'N., 82°42.6'W.

Chart 11438.–The **Dry Tortugas** are a group of small keys and reefs 63 miles W from Key West. The group is about 11 miles long, in a NE-SW direction, and 6 miles wide. **Pulaski Shoal,** at the NE end of the group, is 12 miles NW of Rebecca Shoal. **Pulaski Shoal Light** (24°41.6'N., 82°46.4'W.), 49 feet above the water, is shown from a small black house on a hexagonal pyramidal skeleton tower on piles on the E side of the shoal.

The keys are low and irregular, and have a thin growth of mangrove. In general, they rise abruptly from deep water and have fairly good channels between them. They are continually changing in size and shape.

Garden Key is the site of historic **Fort Jefferson National Monument,** a hexagonal-shaped structure with walls 425 feet long rising from a surrounding moat. The fortress, once a military prison, is now a government reservation administered by the National Park Service. An abandoned lighthouse, 67 feet high, is behind the SE bastion. A fixed white light, visible at least 8 miles, is displayed at night from the tower by the National Park Service. Garden Key and the surrounding waters of the Dry Tortugas are subject to rules and regulations prescribed by the Secretary of the Interior. Commercial fishing is prohibited within these waters.

The S and N of the three wharves on the E side of the key are in ruins. The center wharf, off the SE front of the fort, is in good condition, with 16 to 22 feet alongside. No fuel, provisions, or water are available. The National Park Service permits berthing for a maximum of 2 hours.

Small craft should not try to make Dry Tortugas from Key West, because of the rough nature of the sea around Rebecca Shoal.

Loggerhead Key, the other of the two principal keys in the Dry Tortugas, is 2.5 miles W of Garden Key. **Dry Tortugas Light** (24°38.0'N., 82°55.2'W.), 151 feet above the water, is shown from a 157-foot conical tower, lower half white and upper half black, near the center of Loggerhead Key. A radiobeacon is near the light station.

Fort Jefferson and Dry Tortugas Light are good landmarks and can be seen at a distance of 10 to 12 miles on a clear day. Fort Jefferson has the appearance of a bare rocky island, and is an excellent radar target at distances greater than 12 miles.

Bush Key, just E of Garden Key, is a refuge for noddy and sooty terns. These birds come in early April and leave in September.

When approaching the Dry Tortugas from E or SE, soundings give little warning of danger, as depths of 10 to 15 fathoms are found close to the reefs in many places. The water shoals more gradually in the approaches from NW or SW, but an approaching vessel should stay in depths greater than 15 fathoms if uncertain of her position.

Southeast and Southwest Channels are the principal approaches; both are marked and the shoals can be identified on a clear day by the difference in color of the water. Northwest Channel is unmarked.

Southeast Channel skirts the reefs S of **East Key** and **Middle Key,** and passes between the 25-foot shoal S of **Hospital Key** and **Iowa Rock** off **Bush Key Shoal.** Iowa Rock is marked by a light. The reefs S of Middle Key can be cleared by keeping S of a line through the abandoned lighthouse on Fort Jefferson and Dry Tortugas Light. The channel has depths of 20 feet or more, but it should be used with caution by vessels drawing more than 18 feet.

In Southeast Channel, 1 mile E of Garden Key, the current floods N and ebbs S with an average velocity of 0.6 knot.

Southwest Channel leads between the reefs W and SW of Garden Key and those off Loggerhead Key. The least depth found along the marked channel is 31 feet, but the same caution is advised as with Southeast Channel. A lighted whistle buoy marks the entrance to Southwest Channel.

Among the reefs and keys are numerous places where vessels can anchor and find shelter from seas from various quarters. A good anchorage, although somewhat open to the N, is N and NW of Garden Key. The holding ground is good, and the depths range from 8 to 10 fathoms.

Excellent anchorage for small craft is found in the deep water of Bird Key Harbor, reached through the narrow channel encircling Garden Key, which is well marked. The entrance to **Bird Key Harbor** is narrow, and care is required to avoid the shoals on either side. The main entrance channel is marked by daybeacons.

In emergencies, the best shelter is SW of Garden Key and the channel encircling it, where protection is afforded from NW winds. However, the holding ground is poor, as boats drag anchor along the silty bottom.

A **general anchorage** is in Bird Key Harbor. (See 110.1 and 110.190, chapter 2, for limits and regulations.)

Tides and currents.–The mean range of tide at Garden Key is 1.1 feet. In Southwest Channel, 1 mile S of Loggerhead Key, the current floods N and ebbs SW at an average velocity at strength of 0.5 knot. In Southeast Channel the current floods N and the ebb S at an average velocity at strength of 0.6 knot.

Chart 11434.–For 10 miles W from the Dry Tortugas the bottom is broken and irregular, and consists of coral rock with patches of sand and broken shell. **Tortugas Bank,** the shoalest part of this area, is 7 miles W of Loggerhead Key and has a least known depth of 37 feet. Depths less than 10 fathoms are found for a distance of 2.5 miles in all directions. Between Tortugas Bank and the Dry Tortugas the depths range from 7¼ to 19 fathoms. Deep-draft vessels should avoid Tortugas Bank, especially in heavy weather.

Chart 11420.–From Cape Sable to San Carlos Bay the W coast of Florida is low, sandy, and generally wooded, and has few distinguishing features. Back of the coast is an extensive swampy region, thinly settled, known as **The Everglades.** Off the coast the water is generally shoal, and the 10-fathom curve roughly approaches a line drawn NNW from Key West to Tampa Bay. This part of the coast is seldom approached by deep-draft vessels.

Moderate-draft vessels bound up the coast from Key West can lay a straight course from Northwest Channel to Sanibel Island Light at the entrance to San Carlos Bay, a distance of 118 miles from Key West. This course is well clear of all dangers, and the light on Sanibel Island is a good landmark day or night. Because of frequent northers during the winter, this track is not recommended for small craft, and the route across Florida Bay is to be preferred.

Chart 11442.–Moser Channel, 36 miles E of Key West, affords passage between the keys from the Gulf of Mexico to Hawk Channel for vessels of 7 to 8 feet in draft. The swing span of Seven Mile Bridge across Moser Channel has been removed. In 1979, a fixed highway bridge with a design clearance of 65 feet was under construction S of the former swing span.

The tidal current at the Moser Channel bridge floods NNW with an average velocity of 1.4 knots and ebbs SSE with an average velocity of 1.8 knots. Wind effects modify considerably the current velocities and directions.

Charts 11462, 11452.–Florida Bay, a triangular-shaped body of water between the Florida Keys and the S coast of the mainland, extends in a general E-W direction from Shell and Bogie Keys to Cape Sable. Depths are shallow and irregular; the bottom is mostly mud. From April to October the waters of the bay are clear and the shoals plainly discernible, but during the winter the water frequently turns milky and renders the shoals indistinguishable.

In the E part of the bay are small keys and numerous mudflats which bare, or nearly bare, at low water. The W part of the bay has depths ranging from 7 to 13 feet, and the bottom is covered with loggerhead sponges and turtle grass.

A protected area of the **Everglades National Park** is in the northern part of Florida Bay.

For the protection of wildlife, all keys in the Florida Bay portion of Everglades National Park are closed to landing except those marked as designated camping areas. The killing, collecting, or molesting of animals, the collecting of plants, and waterskiing are prohibited by Federal Regulation.

Manatees.–Regulated **speed zones** for the protection of manatees are posted throughout the Everglades National Park.

COLREGS Demarcation Lines.–The lines established for Florida Bay are described in 80.740, chapter 2.

Chart 11433.–Flamingo, on the mainland about 9 miles E of East Cape (25°06.9′N., 81°05.2′W.), is a tourist center in Everglades National Park at the entrance of **Buttonwood (Flamingo) Canal.** A 300-foot tower and an 86-foot standpipe E of the canal about 0.3 mile NE of the visitors center are prominent. A privately dredged channel leads from the 7-foot contour of Florida Bay to the canal entrance. In April 1982, the channel had a reported controlling depth of 4½ feet. The channel is marked by lights and daybeacons. A dam blocks the canal about 200 yards above the entrance. Boat ramps and an 8-ton hoist at the dam allow the passage of craft to 26 feet long from Florida Bay to **Coot Bay** and **Whitewater Bay.** A highway bridge, about 0.5 mile above the mouth of the canal, has a reported 45-foot fixed span and a clearance of 10 feet. A marina on the W side of the canal just below the dam at Flamingo has berths with electricity, water, ice, and limited marine supplies. Gasoline, diesel fuel, and launching ramps are available on either side of the dam. A 5-mph no-wake **speed limit** is enforced in the canal.

Storm warning signals are displayed. (See chart.)

Charts 11452, 11431, 11429.–Cape Sable, the low and wooded SW tip of the Florida Mainland, has three points known as **East Cape, Middle Cape,** and

Northwest Cape. These are relatively steep-to and are partially cleared.

Small vessels can find anchorage 1.5 miles SE of East Cape in 7 to 8 feet of water. The even marl bottom is good holding ground, but the anchorage is reported to be unsheltered from winds, particularly from W. Vessels should anchor bow and stern to avoid being set onto the beach. **East Cape Canal,** a drainage canal opening into Florida Bay 1 mile E of East Cape, offers good protection for any boat that can enter. A depth of 2 to 3 feet can be carried into the canal at low water by approaching from due S. Fishing and pleasure craft frequent this area, but local knowledge is necessary to avoid the numerous snags inside the canal.

From Northwest Cape the coast trends N for 20 miles, then NW for about 30 miles to Cape Romano. Along this stretch of coast are the **Ten Thousand Islands,** innumerable small islands and keys interlaced by a network of small rivers and bayous leading to the interior. The islands and keys are generally lumps of mud, low and densely wooded, and almost impossible for a stranger to identify. Small in size, they are mostly awash at high water and fringed with oyster reefs. Except for the lights marking the offshore boundary of the Everglades National Park, the only other useful marks along this stretch of the coast are the light at the entrance to Little Shark River, and the slightly higher growths of timber on Shark River Island, Shark Point, and Highland Point. The water is shallow for a distance of 10 miles from the coast, depths of 7 feet being found as much as 3 miles offshore. With local knowledge, drafts of 3 to 6 feet can be carried into many of the rivers.

The rivers and inland lakes to the N of Northwest Cape are frequented mostly by fishing parties, particularly during the winter season. Strangers are advised to hire guides at Flamingo, Marco, or Everglades City. The rivers afford good anchorage for craft able to cross the bars off the entrances.

Charts 11433, 11432.-Small craft can traverse the system of tidal bays, creeks, and canals from Flamingo Visitors Center to the Gulf of Mexico, 6 miles N of Northwest Cape. The route through Buttonwood Canal, Coot Bay, Tarpon Creek, Whitewater Bay, Cormorant Pass, Oyster Bay, and Little Shark River is marked by daybeacons. The controlling depth is about 3½ feet.

The route from Flamingo to Daybeacon 48, near the W end of Cormorant Pass, is part of the Wilderness Waterway.

Wilderness Waterway (see also chart 11430) is a 100-mile inside passage winding through the mangrove wilderness of Everglades National Park from Flamingo on Florida Bay to Everglades City on the Gulf of Mexico. From Daybeacon 48, near the W end of Cormorant Pass, the waterway leads N through Shark Cutoff and then through various creeks, rivers, and open bays to Everglades City. The passage above Cormorant Pass is marked by the National Park Service. The National Park Service advises that boats with cabins or high windshields or boats over 18 feet in length should not attempt the entire passage, because of the narrow creeks and overhanging branches along some portions of the waterway.

Manatees.-Regulated **speed zones** for the protection of manatees are posted in the Wilderness Waterway.

Maps of the waterway and other information are contained in a booklet entitled, "A Guide to the Wilderness Waterway of the Everglades National Park", published by the University of Miami Press, Drawer 9088, Coral Gables, Fla. 33124.

Ponce de Leon Bay is a nearly rectangular bight 7 miles N of Northwest Cape. **Shark Point,** on the N side of the bight, and **Shark River Island,** on the S side, are heavily wooded to the water's edge, and stand out in bold relief against the tree line at the head of the bight. The N part of the bight is shallow, but fair anchorage is available for vessels drawing up to 6 feet off Shark River Island. The anchorage is sheltered from winds E of N or S, and the shoal on the NW affords considerable protection from that direction. Several narrow streams empty into the head of the bight. Boats drawing up to 5 feet can continue into the southernmost of these streams.

The area for some 10 miles E and SE of Ponce de Leon Bay is a complicated network of tidal channels around thousands of mangrove islands. These channels lead or enlarge into Oyster, Whitewater, and Tarpon Bays, from which, in turn, shallow rivers lead back into The Everglades. Generally, a depth of 5 feet can be carried through the various passes into Oyster and Tarpon Bays by giving a good berth to the points, which often have tidal bars projecting out from them.

Oyster Bay is about 2 miles inland from the SE corner of Ponce de Leon Bay. At the S end of Oyster Bay is the entrance to **Joe River,** a tidal channel extending some 10 miles in a SE direction to the S end of Whitewater Bay. A depth of 4 feet can be carried through Oyster Bay and Joe River by avoiding occasional bars.

Numerous channels lead E from Oyster Bay through a belt of mangrove about 2 miles wide into **Whitewater Bay.** The latter has numerous low mangrove islands, and its brackish water is from 2 to 6 feet deep. NE winds often cause drops in the water level of a half foot. At the S end of Whitewater Bay, **Tarpon Creek** leads into **Coot Bay,** which is about 1 mile in diameter and 3 feet deep. A 5-mph no-wake **speed limit** is enforced in Tarpon Creek. Boats going to and from Whitewater and Coot Bays can use Joe River, which is the southernmost passage, is easy to follow, and is deep enough for all boats that can navigate the bays.

Little Shark River, which empties into the Gulf on the S side of **Shark River Island** about 6 miles N of Northwest Cape, is a good channel to Oyster Bay for vessels drawing 4 feet or less. The river also provides anchorage of limited extent but is well protected. An entrance light and daybeacons as far as Oyster Bay mark the channel. Little Shark River

trends ENE from Oyster Bay to a junction with Shark River about 7 miles above the entrance light.

Shark River is the channel emptying into the middle of the E side of Ponce de Leon Bay. Some 8 miles NE, the channel joins Harney River and enlarges into **Tarpon Bay.** A depth of about 5 feet can be carried through Shark River and Tarpon Bay. Shallow rivers lead N and E from Tarpon Bay into the Everglades.

Harney River, emptying into the Gulf about 11 miles N of Northwest Cape, is a good passage to Tarpon Bay. Numerous bars at the entrance limit the depth to 2½ feet.

Broad River and **Rodgers River** enter the Gulf about 16 miles N of Northwest Cape. In April 1982, it was reported that about 2½ feet could be taken over the bar 1.5 miles SW of the entrance to Broad River. Vessels of that draft can anchor just outside the mouths of the rivers and be protected from the sea by the bars outside. These rivers extend back into The Everglades for about 15 miles. About 6 miles from the coast they connect with a chain of shallow bays and creeks that extend N along the coast for some 60 miles. Small craft drawing up to 1½ feet can traverse these inside passages from Broad River to Naples. However, the charts do not cover this area completely; local knowledge is required to navigate N of Everglades City to Marco.

Chart 11430.–Lostmans River is entered through **First Bay,** which is about 19 miles N of Northwest Cape. Local boatmen use the N entrance to the river. A depth of about 3 feet can be carried some 10 miles back into this river, which drains a large area of shallow bays. The crooked winding channel is marked by private daybeacons. **Lostmans River Ranger Patrol Station,** a periodically manned outpost of the National Park Service, is on the N side of the entrance to the river. The radio tower is prominent.

Charts 11431, 11430.–Seminole Point (25°36.9′N., 81°16.3′W.), 24 miles N from Northwest Cape, is fairly prominent when standing up the coast at a distance of 2 to 3 miles off. The point is the SW end of **Plover Key,** and is the most W land seen until Pavilion Key is picked up to the NW.

Charts 11429, 11430.–Pavilion Key (25°41.4′N., 81°21.2′W.), 30 miles N of Northwest Cape, is the first prominent land seen after leaving Seminole Point. Anchorage is available for drafts of 4 to 5 feet off the E point of the S end of Pavilion Key. The anchorage is exposed to SW winds. The approach to the anchorage passes close W of Dog Key, 0.3 mile SE of Pavilion Key.

In February 1980, a sunken wreck was reported about 6 miles WSW of Pavilion Key in about 25°40′30″N., 18°27′48″W.

Chatham River and **Huston River** empty into the Gulf 3 miles E of Pavilion Key. These rivers offer a connection to the system of shallow bays which parallel the coast. In April 1982, it was reported that a draft of about 1½ to 2 feet could be taken up these rivers, but local knowledge is necessary to avoid the numerous bars.

Jewel Key (25°47.1′N., 81°25.1′W.), 6 miles NNW from Pavilion Key, marks the entrance to **Chokoloskee Pass,** the approach to the town of Chokoloskee. Jewel Key is a small flat island.

In March 1983, an obstruction was reported about 2.6 miles S of Jewel Key in about 25°44′23″N., 81°25′07″W.

Chokoloskee is a year-round community on an island, about 0.5 mile in diameter, near the SE end of **Chokoloskee Bay** about 3 miles ENE of Jewel Key. The island is joined to the mainland near Everglades City by a long causeway which has a bridge opening off the mouth of Halfway Creek. The 23-foot fixed span has a clearance of 5 feet. Two channels, privately marked by stakes, lead from the Gulf through **Rabbit Key Pass** and Chokoloskee Pass to the facilities at Chokoloskee. In April 1982, it was reported that the channel through Rabbit Key Pass was closed and that with local knowledge 2 feet could be carried in the channel through Chokoloskee Pass. At low water, during periods of N winds, it was reported that very little water remains in these channels and the bay dries out for the most part. At these times local knowledge is essential. There is no marked channel across the bay from the island to the entrance to Barron River, but with local knowledge craft drawing up to 1 foot can make it ordinarily. A channel leads from the vicinity of Jewel Key through **Sandfly Pass** and thence into a privately dredged channel, marked by privately maintained daybeacons, across the bay to the National Park Service basin at the NW end of the causeway. In April 1982, the channel and basin had reported controlling depths of 3 feet.

The island has four marinas. One is at the N end on the E side of the causeway, and three are on the S side of the island. Two marinas have protected basins. All have berths with electricity. Gasoline, diesel fuel, water, ice, marine supplies, wet and dry storage, and launching ramps are available. A boatyard on the E side of the island has a marine railway that can handle craft to 53 feet for hull and engine repairs. Several of the marinas have 3-ton lifts available.

Indian Key, on the W side of the entrance to the pass, is wooded and, except for its shape, resembles the neighboring keys. Good anchorage is available in Indian Key Pass about 700 yards NE of Indian Key in depths of 8 to 13 feet, and about 1 mile NE of the key in 12 to 15 feet, gravel bottom. The anchorage is well protected from all winds, is suitable for drafts up to 7 feet, and is easily entered day or night.

Indian Key Pass (25°48.0′N., 81°28.0′W.), 38 miles N of Northwest Cape, is the approach to Everglades City. A dredged channel leads from the Gulf of Mexico through Indian Key Pass, across Chokoloskee Bay, and up the **Barron River** to a turning basin about 1.3 miles above the mouth of the river. In October 1981, the centerline controlling depth was 7

feet. The channel is well marked by lights and daybeacons. Overhead power cables with clearances of 65 feet and 49 feet cross the river about 0.5 and 0.7 mile above the mouth, respectively. A 5-mph no-wake **speed limit** is enforced on the river.

In February 1983, the microwave tower at Everglades City was reported to be a good landmark from offshore although it is obscured closer in. When making the approach to Indian Key Pass, it is reported that mariners should steer about 053° for the microwave tower while it is visible, then hold that course until Indian Key Pass Light 1 can be identified. The light is reported to be difficult to distinguish from its background.

A privately dredged channel, marked by daybeacons, leads SE from the channel at the mouth of the Barron River to a turning basin and the protected basin of the National Park Service. In September 1980, depths of less than 4 feet were reported in the channel and turning basin. A visitors center of The Everglades National Park is at the basin.

Indian Key Pass Light 1 (25°48.0′N., 81°28.1′W.), 16 feet above the water and shown from a pile on the S end of the bank extending off the S end of the key, marks the entrance to the pass. The mean range of tide is 3.4 feet at Indian Key.

Everglades City, about 0.5 miles above the mouth of the Barron River, is the tourist center for **Everglades National Park.** It is also a center for sport and some commercial fishing in **The Everglades** and the offshore waters of the Gulf. It is 3 miles by road, on State Route 29, from the Tamiami Trail (U.S. Route 41), the main highway across The Everglades from Miami to Tampa.

The town has several fish packing plants and marinas. (See the small-craft facilities tabulation on chart 11430 for services and supplies available.)

Local fishing guides will act as pilots for The Everglades and adjacent waters of the Gulf.

The mean range of **tide** is 2.0 feet at Everglades City.

Storm warning signals are displayed. (See charts.)

West Pass, 2.8 miles NW from Indian Key, extends generally NE for 3 miles from the N side of **Tiger Key** to **West Pass Bay.** A draft of 2 feet can be taken to West Pass Bay, thence E into Chokoloskee Bay and SE to Barron River and Everglades City. West Pass is unmarked.

Fakahatchee Pass, 4 miles NW from Indian Key, extends NE for 3 miles from the W side of **Round Key** to **Fakahatchee Bay.**

Faka Union Canal, 6.5 miles NW of Indian Key, is entered through a channel E of Panther Key that extends N for 4 miles through **Faka Union Bay** and **Faka Union River.** Private daybeacons mark the channel as far as Faka Union Bay. At the head of the canal is a marina that provides berths with electricity, gasoline, diesel fuel by truck, water, ice, limited marine supplies, wet or dry storage, a launching ramp, and a hoist that can haul out craft to 20 feet. In April 1982, a reported depth of 3 feet could be carried to the marina.

Manatees.–Regulated speed zones and a caution zone for the protection of manatees are in Faka Union Bay, River, and Canal. (See Manatees, chapter 3.)

Cape Romano is the S end of a large island 78 miles N from Key West. Here the coast changes its trend from NW by W to NNW.

N of Cape Romano deep water approaches the coast much more closely than it does S of the cape, and the coast is quite regular in outline although broken by many small inlets. The 12-foot curve is less than 0.5 mile offshore except at the entrances to some of the passes. The mouths of the passes are usually small and difficult to recognize unless close to shore. These passes are subject to change, developing and filling in rapidly, making local knowledge mandatory. There are several prominent apartments and hotels along the beach on the W side of Marco Island. Readily identifiable are the light at Capri Pass, and the pier, buildings, and water tank at Naples.

Cape Romano Shoals, extending 10 miles S from the cape, are a series of irregular patches that bare in places near the shore and have depths of 1 to 20 feet over them farther off. A lighted bell buoy marks the S end of the shoals. There is a strong current around the shoals, particularly on the seaward side and during spring tides. The mean range of **tide** at Cape Romano is 2.6 feet. The flood current sets S and the ebb N. In April 1982, it was reported that the character of Cape Romano Shoals appeared to be changing and that in some areas lesser depths than those charted may exist. It was further reported that breakers were observed and that shoaling to 6 feet was reported in about 25°46′21″N., 81°42′55″W. In December 1980, shoaling to 4 feet was within a 0.5-mile radius of 25°49′27″N., 81°41′33″W. Mariners are advised to exercise caution in this area.

A privately marked fish haven, with a minimum depth of 15 feet, is 6.1 miles WNW from Cape Romano.

Gullivan Bay is between Cape Romano and the islands to the E. At the head of the bay is **Coon Key,** which marks the S approach to Goodland, Big Marco River, and also the route W to Caxambas Bay. The approach from SE is marked by **Coon Key Light** (25°52.9′N., 81°37.9′W.), 22 feet above the water and shown from a triangular pyramidal slotted structure on piles with a red and white diamond-shaped daymark. As Coon Key is neared, the land behind becomes visible, but the key stands well above everything in the vicinity. When nearly up to the key, the entrance to Big Marco River is seen to E as a narrow gap between the more distant keys. The mean range of **tide** is 2.6 feet at Coon Key.

Caxambas Pass, 4 miles NW of Cape Romano, had a reported controlling depth of 2 feet in April 1982. However, local knowledge is required to follow the best water through the narrow twisting channel which is unmarked. Small craft should use extreme caution in the vicinity of the pass because of an unmarked row of piles mostly submerged; these are the remains of an old jetty which extends from the S point of the entrance.

Big Marco Pass, 8 miles N from Cape Romano, was considered unsafe for navigation due to shoaling in 1973, and the aids to navigation were removed. The channel over the bar is subject to continual change. Shoals extend 1 mile seaward on either side of the channel, and these are usually indicated by breakers or discolored water. Fish havens covered by 20 to 23 feet and marked by private unlighted buoys are located about 1.7 to 2.7 miles S of the former entrance to Big Marco Pass.

Capri Pass, about 0.5 mile N of Big Marco Pass, is used by boatmen to gain entrance to inland waters that were formerly entered through Big Marco Pass. In April 1982, an available depth of 6 feet was reported in the pass. Local knowledge is advised. **Capri Pass Approach Light** (25°58.6'N., 81°44.1'W.), 90 feet above the water, is shown from the roof of a building on the N side of the pass about 0.9 mile inside the entrance. The entrance is marked by a lighted buoy, a light, and daybeacons.

Big Marco River trends E and then S for about 11 miles from Big Marco Pass to Gullivan Bay, and affords a through passage behind Cape Romano. The controlling midchannel depth is about 4 feet. However, there have been numerous reports of shoaling between Capri Pass Light 4 and Big Marco River Daybeacon 18, and boats with more than 2-foot draft should exercise caution and obtain local knowledge before attempting passage. The channel, though narrow and crooked, is well marked by daybeacons. The approach from Gullivan Bay is over a shoal with a depth of 4 feet and is marked by Coon Key Light. This approach is protected from all directions except SE to SW, and any sea from those directions is reduced by the wide expanse of gradually shoaling water. Local knowledge of conditions is necessary to carry the best water through the channel.

A fixed highway bridge with a clearance of 55 feet crosses Big Marco River about 3 miles N of Coon Key. The approach piers of the former swing bridge immediately S of the fixed bridge remain and are used as fishing piers. The overhead power cable below the highway bridge has a clearance of 81 feet. A fixed highway bridge with a clearance of 55 feet crosses the river about 2.3 miles E of Capri Pass. An overhead power cable with a clearance of 65 feet at the center span and 55 feet reported elsewhere is close W of the bridge.

Marco Island, a large island situated between Caxambas Bay, Big Marco Pass, and Big Marco River, has for the most part been developed as a residential year-round community. Canals have been dredged and the marshland backfilled to provide for waterfront homesites. In April 1982, numerous homes and apartments had been built, and construction was continuing.

Goodland is a small fishing village and winter resort on Big Marco River at the E end of Marco Island. Several fish wharves and small-craft facilities are at the village. (See the small-craft facilities tabulation on chart 11430 for services and supplies available.) Local fishing guides are available and will act as pilots for the waters.

Marco is a settlement at the N end of Marco Island on the S side of Big Marco River about 1 mile from Capri Pass entrance. The town is known locally as **Old Marco Village.** It has several marinas. (See the small-craft facilities tabulation on chart 11430 for services and supplies available.) Local fishing guides act as pilots for the adjacent waters.

A **special anchorage** is on the S side of the river at Marco. (See 110.1 and 110.74, chapter 2, for limits and regulations.)

State Routes 92 and 951 connect all parts of Marco Island with the Tamiami Trail about 11 miles inland.

Collier Bay enters Big Marco River from the S of Old Marco Village. In January 1982, it was reported that 4 feet could be carried in the privately marked channel through the bay.

Isles of Capri is a year-round community on three interconnected islands at the head of Big Marco Pass opposite Old Marco Village and is connected by State Routes 951 and 92 with the Tamiami Trail. Marinas are on the S side of Johnson Bay. Berths with electricity, gasoline, diesel fuel by truck, water, ice, a launching ramp, and marine supplies are available. A forklift that can handle craft to 28 feet for hull, engine, and electronic repairs is available. Local fishing guides act as pilots for the adjacent waters of the Gulf, the bay, and channels. In April 1982, it was reported that 4 feet could be carried in the privately marked channel through Johnson Bay from the marinas at Isles of Capri to the inside passage to Naples with local knowledge. A 5-mph no-wake **speed limit** is enforced in Johnson Bay in the channel adjacent to the marinas on Isles of Capri.

Routes.–Approaching Big Marco River from Gullivan Bay, a course of **325°** from a position 0.3 mile NE of Coon Key Light leads between the N end of Coon Key and Big Marco River Daybeacon 2. Then follow the daybeacons. After passing the highway bridge, head NNE for 100 yards before heading N along the main channel. From Big Marco River, follow the daybeacons and light through Capri Pass to the lighted buoy off the pass.

An inside passage extends about 11 miles N from Marco to Naples through creeks, bays, and dredged landcuts. The waterway is well marked by lights and daybeacons. In January-February 1980, the centerline controlling depths were 4½ feet to the junction with Gordon Pass entrance channel, thence 7½ feet to Naples.

Hurricane Pass, 1.5 miles N from Big Marco Pass, had a reported controlling depth of 1 foot in April 1982.

Little Marco Pass, 3 miles N of Big Marco Pass, had a reported depth of 2 feet over the bar in April 1982. The pass is unmarked.

Gordon Pass, 16.5 miles N of Cape Romano, is the entrance to Naples Bay and also the N entrance to the inside passage and numerous waterways that traverse the area known as the Ten Thousand Islands, which extends along the lower Gulf Coast

from Naples to Cape Sable, including Everglades National Park. A dredged channel leads from the Gulf of Mexico through Gordon Pass, thence N to the highway bridge at Naples about 2.5 miles above Gordon Pass. In September 1983, the controlling depth was 8½ feet (10 feet at midchannel) in the entrance channel, thence 6 feet (7 feet at midchannel) to just below the highway bridge at Naples. **Gordon Pass Lighted Buoy 1** (26°05.5′N., 81°48.7′W.), marks the entrance. The channel is marked by lights and daybeacons.

Naples 2.5 miles N of Gordon Pass, is a large year-round tourist center on Naples Bay and the outer Gulf Coast. It has a sizable fishing industry, an airport, and a modern hospital, and is located on the Tamiami Trail. Canals have been dredged and the former marshland backfilled to form waterfront homesites in the areas of **Port Royal** at the S end of the city, **Royal Harbor** on the E side of Naples Bay, and **The Moorings** at the N end of the city.

A microwave tower and numerous hotels and apartment houses are prominent in Naples from offshore. The kiosk of the 1,000-foot municipal fishing pier is prominent inshore. It is reported that the television tower in 26°03′09″N., 81°42′09″W. is a good landmark when approaching at night from W or SW.

There are several boatyards and marinas on Naples Bay. A large municipal yacht basin is in **Crayton Cove.** (See the small-craft facilities tabulation on chart 11430 for services and supplies available.) There is a **dockmaster** at the municipal yacht basin who assigns berths and enforces the regulations. A no-wake **speed limit** is enforced in Gordon Pass and in Naples Bay between Crayton Cove and the bridge at Naples. The dockmaster can be contacted on VHF-FM channel 16 (156.80 MHz).

Few craft go above U.S. Route 41 (Tamiami Trail) highway bridge at the head of the harbor, which has a 29-foot fixed span with a clearance of 6 feet. Taxi and interstate bus lines serve the city.

Two fish havens, marked by private buoys, are about 3.2 miles NW of Gordon Pass.

Doctors Pass, locally known as **Mooring Pass,** about 5 miles N of Gordon Pass, has been privately dredged. The pass is the entrance to **Outer Doctors Bay, Inner Doctors Bay, Venetian Bay,** and **Moorings Bay.** The entrance is protected by two stone jetties. In July 1982, the controlling depth was 5 feet through the privately marked entrance except for shoaling along the edges, thence in April 1981, depths of more than 3 feet were reported in the various bays. Local knowledge is necessary to avoid numerous bars. Large apartment buildings on either side of the entrance are prominent.

Charts 11429, 11426, 11430.–Clam Pass, about 5 miles N of Naples, is a shoal drainage canal used only by outboards in good weather.

Charts 11426, 11427.–Wiggins Pass, 4 miles N of Clam Pass, had a reported controlling depth of 2 feet in April 1982. The pass is used by small craft entering **Cocohatchee River** and the chain of lagoons and inland waterways that lead N to the passes in Estero Bay. A marina in the basin on the N side of the mouth of Cocohatchee River provides gasoline, diesel fuel, water, ice, wet or dry storage, and marine supplies. A forklift can haul out craft to 28 feet for hull, engine, and electronic repairs. The marina can be contacted on VHF-FM channel 16 (156.80 MHz) for current conditions.

A highway leads along the coastal beach from **Bonita Beach** on **Little Hickory Island** and crosses Big Hickory Pass on a bridge with a 40-foot fixed span with a clearance of 10 feet. In September 1982, Big Hickory Pass was reported closed to navigation due to shoaling.

A microwave tower, about 7 miles inshore between Wiggins Pass and **Big Hickory Pass,** is reported to be prominent. The tower, 715 feet high, is marked at the top by a red aircraft light. A lighted green water tower on **Big Hickory Island** is also reported to be prominent.

A marina on the E side of the bridge over Big Hickory Pass has berths with electricity, gasoline, water, and ice. Stakes mark the channels leading N through Estero Bay to Big Hickory Pass, New Pass, and Big Carlos Pass. In April 1982, the stakes were reported to be unreliable; local knowledge is required to follow the best water.

The highway continues N from Big Hickory Pass over causeways on the islets in the S end of Estero Bay with bridges over New Pass, the pass just N of Big Hickory Island, and Big Carlos Pass. The bridge over New Pass has a clearance of 30 feet, and the one over the entrance to the lagoon on the E side of **Black Island** has a 30-foot fixed span with a clearance of 10 feet. An overhead power cable with a clearance of 36 feet crosses the entrance to the lagoon just W of the bridge.

In April 1982, the reported depth was 3 feet in **New Pass** and in the channel leading S to the marinas and fish camps near Big Hickory Pass. Stakes mark the channel. In February 1978, a row of pilings, centered in 26°22′42″N., 81°51′53″W., was reported to obstruct the channel through New Pass.

Charts 11427, 11426.–San Carlos Bay, 41 miles NNW from Cape Romano, is largely filled with shoals on which the depths vary between 1 and 6 feet, and is of importance chiefly as the approach to Caloosahatchee River, the Okeechobee Waterway, and the Intracoastal Waterway, Gulf Section. The bay and adjacent waters are frequented mostly by small vessels and yachts, and are popular with tourists and fishermen during the winter.

Sanibel Island Light (26°27.2′N., 82°00.9′W.), 98 feet above the water, is shown from a 102-foot brown square pyramidal skeleton tower enclosing a stair cylinder on **Point Ybel,** the E end of **Sanibel Island.**

San Carlos Bay Light 1 and San Carlos Bay Light 2, 3.6 miles SE and 3.7 miles SE from Sanibel Island Light, respectively, mark the entrance to San Carlos Bay.

COLREGS Demarcation Lines.–The lines established for San Carlos Bay are described in 80.748, chapter 2.

Channels.–A dredged channel leads from the Gulf of Mexico through San Carlos Bay to Punta Rassa and the mouth of the Caloosahatchee River. In April 1981, the centerline controlling depth was 11 feet from the Gulf to Punta Rassa. Lights and daybeacons mark the channel.

Matanzas (Estero) Pass opens into the SE end of San Carlos Bay, 2.5 miles from Sanibel Island Light. Small vessels can find secure anchorage just inside the pass. A dredged channel, marked by lights and daybeacons, leads from San Carlos Bay through Matanzas Pass to the upper shrimp terminals on San Carlos Island. In February 1983, the controlling depth was 6 feet to the turning basin off the shrimp terminals with 8½ to 11 feet available in the basin.

The highway bridge that connects Fort Myers Beach, on **Estero Island,** with **San Carlos Island** has a fixed span with a clearance of 65 feet. The highway bridge that connects San Carlos Island with Tamiami Trail on the mainland has a 31-foot fixed span with a clearance of 6 feet.

The Fort Myers Beach Coast Guard Station is on San Carlos Island near the N end of the bridge from Estero Island.

There are extensive small-craft facilities in the vicinity of the bridges that connect the N end of Estero Island with San Carlos Island and San Carlos Island with the mainland. (See the small-craft facilities tabulation on chart 11427 for services and supplies available.)

A channel, privately marked by poles, leads E from the vicinity of Light 9 to a marina at the NW end of the bridge connecting San Carlos Island with the mainland. In April 1982, the channel had a reported controlling depth of 4 feet, but local knowledge was recommended.

A channel, privately marked by daybeacons, leads SE between San Carlos Island and Estero Island, through Matanzas Pass to **Big Carlos Pass.** In April 1982, the reported midchannel controlling depth was 2 feet; caution should be exercised in navigating this channel. Drafts to 4½ feet can be carried through Big Carlos Pass with local knowledge. In April 1982, shoaling was reported to have developed across much of the pass; the SE side of the entrance should reportedly be favored. There are no navigational aids across the shoal waters outside the pass. A fish haven, marked by private buoys, is about 2.3 miles SW of Big Carlos Pass. In April 1982, a depth of 7½ feet was reported over the fish haven.

County Route 865 bridge with a 50-foot bascule span crossing Big Carlos Pass from Carlos Point to Black Island has a clearance of 23 feet at the center. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(2a), chapter 2, for drawbridge regulations and opening signals.)

About 1 mile NW of the bridge, a 2,100-foot privately dredged cut, 150 feet wide with several canals branching off from it, leads to a basin 500 feet long and 200 feet wide. In May 1972, there were reported depths of 20 feet in the cut and 15 feet in the basin. A marina in the basin has gasoline, diesel fuel, water, ice, marine supplies, and a launching ramp. A forklift can haul out craft to 24 feet.

Fort Myers Beach, on Estero Island, is a winter resort with numerous small-craft facilities. A good highway leads to Fort Myers and connects with the highway leading to Sanibel Island toll bridge. Small-craft facilities were covered previously.

Punta Rassa, on the E side of San Carlos Bay and 2 miles N of Sanibel Island Light, has several condominiums on the point and a marina where berths, gasoline, water, marine supplies, and open and covered dry storage are available. The marina has a 3½-ton forklift that can handle craft up to 26 feet for hull and engine repairs and storage. In April 1982, the reported controlling depth in the approach to the marina was 3 feet with 4 to 6 feet alongside. Launching ramps are available close S of the marina.

Sanibel Island Causeway and toll bridge crossing San Carlos Bay from Punta Rassa to Sanibel Island has three bridges over the channels. Bridge "A," the easternmost, over the main channel has a bascule span with a clearance of 26 feet at the center. Bridge "B" about the middle of the causeway has a 48-foot fixed span with a clearance of 9 feet. Bridge "C" over Sanibel Island Channel at the W end has a fixed span with a clearance of 26 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

A natural channel along the NE side of Sanibel Island from Point Ybel to Pine Island Sound had a reported controlling depth of 9 feet in April 1982. The channel is marked by lights and daybeacons.

A marina in the basin about a mile W of Point Ybel has berths with electricity, gasoline, diesel fuel, water, ice, marine supplies, and a launching ramp. Engine repairs can be made. In 1979-1980, depths of 5 feet were reported in the approach channel and basin.

Anchorages.–Vessels with drafts too deep to enter San Carlos Bay can obtain good anchorage in calm weather in depths of 15 to 25 feet, sticky bottom, 3 to 4 miles SE of Sanibel Island Light. With N winds there is good anchorage in depths of 16 to 24 feet under the lee of the S side of Sanibel Island, with the light bearing anywhere between NE and N by W. The anchorage off Punta Rassa is good, but the tidal currents have considerable velocity at times, and there is considerable boat traffic. There is good anchorage along the NE shore of Sanibel Island W of the light; the currents have considerable velocity, but spots of good holding ground can be found. Small skiffs find storm anchorage in Tarpon Bay.

Tides and currents.–The diurnal range of tide is 2.6 feet at Point Ybel and about 2.1 feet in Pine Island Sound. The average velocity of the current is 1.0 knot in San Carlos Bay off Point Ybel.

Chart 11427.–The **Caloosahatchee River** flows generally SW from its source in Lake Okeechobee and empties into San Carlos Bay at Punta Rassa. The river has an average width of about 1 mile to a point

3 miles above Fort Myers, and then narrows to little more than the width of the channel which has been dredged to Lake Okeechobee.

A list of hurricane havens, "Safe Harbors in Caloosahatchee River During Hurricanes," is available from Marine Advisory Agent, Lee County Extension Service, 3406 Palm Beach Blvd., Fort Myers, Fla. 33905.

A dredged channel, part of the Okeechobee Waterway, leads from Punta Rassa to Fort Myers. The channel is well marked by lights, daybeacons, and ranges. In April 1981, the midchannel controlling depth was 8 feet.

The diurnal range of tide in Caloosahatchee River is 2.4 feet at Punta Rassa and 1.2 feet at Fort Myers.

The dredged channel leading from the entrance of the Caloosahatchee River SW to Pine Island Sound is part of the Intracoastal Waterway to Brownsville, Tex., which is discussed in chapter 12.

Shell Point Village, about 500 yards SSE of **Shell Point,** is a large retirement development. A private marina is at the development. A privately marked channel, with a reported controlling depth of 2 feet in April 1982, leads from the Okeechobee Waterway to the marina.

Iona Cove is on the S side of the river about 1 mile above Shell Point. A privately marked channel leads through the cove to a small-craft basin. In April 1982, the reported controlling depths were 3 feet in the channel and 4 feet in the basin. Several oyster bars are close to the entrance channel; caution is advised.

A boat basin, entered through a privately marked channel, is on the S side of the river about 2.2 miles above Shell Point; berths with electricity, gasoline, diesel fuel, water, ice, and a launching ramp are available.

Cape Coral, the extensive canalized area NW of **Redfish Point** on the N side of the river 7 miles above the mouth, is the site of a large year-round community. A lighted, white, golf-ball-shaped water tank (26°34.0'N., 81°57.9'W.) at Cape Coral is prominent.

A privately marked channel, which had a reported controlling depth of 7 feet in April 1982, leads to a marina in Cape Coral Yacht Basin just W of Redfish Point. In 1982, there were depths of 4½ to 13 feet in the basin and lagoons of the development. Berths with electricity, gasoline, diesel fuel, water, ice, marine supplies, and launching ramps were available in the basin.

In April 1982, there was reported to be 5 feet in the privately marked channel leading to the W entrance to the lagoons at the W half of the Cape Coral developments.

A hospital is at Cape Coral.

Deep Lagoon, across the river from Cape Coral, provides good anchorage and moorings for drafts up to 7 feet. In August 1982, the reported controlling depth in the privately marked channel leading to the lagoon was 5 feet. A marina in the lagoon has gasoline, diesel fuel, water, ice, marine supplies, and launching ramps. Hull and engine repairs can be made. Lifts here can handle craft to 20 tons.

A privately marked channel leads to a yacht club about 0.5 mile NE of Deep Lagoon. The yacht club has water, ice, gasoline, diesel fuel, and marine supplies. In April 1982, the entrance channel had a reported midchannel controlling depth of 5 feet, with 5 feet available in the basin.

The highway bridge (Cape Coral Bridge) crossing Caloosahatchee River from Negro Head to Cape Coral has a fixed span with a clearance of 55 feet at the center.

Whiskey (Wyomi) Creek, on the SE side of the river 10 miles above the mouth, has a privately marked channel with a reported depth of 2 feet in April 1982. A housing development borders the creek, but there are no marine facilities. A fixed highway bridge, with a clearance of 12 feet at the center, crosses the creek about 0.1 mile above the mouth. An overhead power cable crossing the creek at the bridge has a clearance of 32 feet.

A privately marked channel leads W from the river to a small-craft basin about 3 miles SW of the Edison Memorial Bridge. In April 1982, depths of 5 feet were reported to and in the basin. A marina in the basin has berths with electricity, gasoline, diesel fuel, water, and limited marine supplies.

Waterway Estates is a community on the W side of the river opposite Fort Myers, about 2 miles SW of the Edison Memorial Bridge. Lagoons have been dredged to provide waterfront homesites. A channel leading to a basin and marina had a reported depth of 4 feet in April 1982, with 3 to 5 feet in the basins and lagoons. In April 1982, submerged obstructions were reported in the entrance channel in about 26°38'14"N., 81°54'22"W., and 26°38'16"N., 81°54'27"W. Favor the N side of the channel. Berths with electricity, gasoline, diesel fuel, water, ice, marine supplies, a portable 30-ton lift, and hull and engine repairs are available at the marina.

Hancock Creek, on the W side of Caloosahatchee River across from Fort Myers, leads to a housing development 1 mile upstream. In December 1983, the reported centerline controlling depths were 5 feet in the privately dredged entrance channel and 7 feet in the creek. The channel to the creek entrance and the channel in the creek are well marked by private daybeacons. A highway bridge, about 0.3 mile above the mouth, has a 27-foot fixed span with a clearance of 13 feet. A marina in the lagoon that branches E just inside the mouth of the creek has berths with electricity, water, ice, gasoline, diesel fuel, and sewage pump-out.

Fort Myers, on the SE side of Caloosahatchee River 14 miles above the mouth, is the commercial center for this part of the State. The city is served by the Seaboard System Railroad and is on the Tamiami Trail which connects Tampa and Miami. Other State highways lead to West Palm Beach and to Punta Rassa. Fort Myers has two hospitals and some fishing, canning, and manufacturing industries. A regional airport is SE of the city.

Weather.–Fort Myers has a subtropical climate

where temperature extremes, both hot and cold, are checked by the maritime influence of the Gulf of Mexico. Winters are mild, with many bright warm days and cool nights. Occasional cold snaps drop temperatures into the thirties, but rarely do they fall below freezing. Summers are warm and humid. While maximum temperatures frequently reach the 90°F range, they rarely top 100°F. Warm summer days are often cooled by sea breezes or afternoon thunderstorms.

Thunderstorms occur on more than 90 days each year. They are most likely from June through September, developing on about 14 to 22 days each month. Occasionally they generate gale force winds and briefly reduce visibilities to near zero in torrential downpours. When associated with a tropical system, thunderstorms or showers may produce 6 to 10 inches of rain within 24 hours. While the tropical cyclone season generally lasts from June through November, this area is particularly vulnerable to October hurricanes. However, it was hurricane Donna in September 1960 that brought 80-knot winds to Fort Myers. On the average, Fort Myers can expect hurricane force winds about once every 12 years.

Winter weather problems are usually the result of cold fronts that work their way down from the N. In addition to dropping temperatures, these fronts can also produce strong, gusty winds and showers. Only rarely do winds reach gale force. Visibilities, which are generally good, are sometimes restricted by a shallow early morning ground fog, which occurs on 3 to 5 winter days per month; this usually dissipates quickly with the rising sun.

The National Weather Service has an office in Fort Myers; **barometers** may be compared here or by telephone. (See appendix for address.)

(See page T-2 for the Fort Myers **climatological table.**)

Small-craft facilities.–There are numerous small-craft facilities on both sides of the Caloosahatchee River in the vicinity of Fort Myers. (See the small-craft facilities tabulation on chart 11427 for services and supplies available.)

Fort Myers Yacht Basin is between the Edison Memorial Bridge and the fixed highway bridge 0.4 mile SW of it. (See the small-craft facilities tabulation on chart 11427 for services and supplies available.) A **dockmaster** is in attendance to assign berths and can be reached by telephone (day, 813-334-8271; night, 813-332-0456).

Local fishing guides can be obtained as pilots for the adjacent waterways and the Gulf.

Edison Memorial Bridge, which crosses Caloosahatchee River at Fort Myers, has a bascule span with a clearance of 10 feet at the center and 6 feet at the fenders. (See 117.1b, 117.240, and 117.462, chapter 2, for drawbridge regulations and opening signals.)

U.S. Route 41 (Tamiami Trail) highway bridge crossing the river about 0.4 mile SW of Edison Memorial Bridge has a fixed span with a clearance of 55 feet at the main channel.

The **Okeechobee Waterway** is a shallow-draft passage across Florida by way of Caloosahatchee River, Lake Okeechobee, St. Lucie River, and the connecting canals. The Federal project for the waterway provides for a channel 8 feet deep from Fort Myers to the Intracoastal Waterway near Stuart. Controlling depths are given in Local Notice to Mariners. (See **United States Coast Pilot 4, Atlantic Coast, Cape Henry to Key West,** for detailed description of the waterway.)

The section of the Intracoastal Waterway from Caloosahatchee River, Fla., to Tampa Bay passing through the waters described in this chapter and places along its route is discussed in chapter 12.

Charts 11427, 11426.–Matlacha Pass is a shallow body of water extending N from San Carlos Bay to Charlotte Harbor between Pine Island and the mainland. The pass is navigable for drafts of 2 to 3 feet, but the channel, marked by private daybeacons, is narrow and crooked and has numerous oyster bars. This channel is not recommended without local knowledge as the hydrography in Matlacha Pass is from surveys made before 1900.

About 4 miles above the entrance, the pass is crossed by an overhead power cable with a clearance of 32 feet. State Route 78 highway bridge connects Pine Island, Little Pine Island and West Island with the mainland. The section of the bridge between Little Pine Island and West Island is a 27-foot fixed span with a clearance of 4 feet and the section of the bridge between West Island and the mainland is a bascule span with a clearance of 9 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(2–b), chapter 2, for drawbridge regulations and opening signals.) An overhead power cable on the S side of the bascule bridge has a clearance of 56 feet. Gasoline, water, ice, marine supplies, launching ramps, and some engine repairs can be obtained at the small piers near the bridge.

Bird Island and **Givney Key,** near the S end of the pass, are part of the **Matlacha Pass National Wildlife Refuge.**

The coast from San Carlos Bay trends NNW to Boca Grande, the entrance to Charlotte Harbor. The barrier islands of Sanibel, Captiva, North Captiva, and Cayo Costa are separated from the large Pine Island to the E by Pine Island Sound.

Sanibel Island is a 10-mile hook-shaped island almost tropical in climate and vegetation and with considerable resort development. A large portion of the island is part of the U.S. Department of Interior J.N. "Ding" Darling National Wildlife Refuge. (See chapter 12.)

Two fish havens, marked by private buoys, are 3 and 8 miles SW of Sanibel Island Light.

Blind Pass separates Sanibel Island from **Captiva Island.** The pass is unmarked and subject to change. In October 1982, the pass was reported navigable by boats of less than 3-foot draft with local knowledge. A highway bridge over the pass has a 33-foot fixed span with a clearance of 8 feet.

Redfish Pass leads into Pine Island Sound from

the Gulf between Captiva Island and **North Captiva Island.** This channel is winding and difficult, with strong currents and frequent changes in depth and position. The pass should not be attempted without local knowledge. In April 1982, the reported controlling depth was 6 feet. A partially submerged groin is on the S side of the pass. Fishing boats frequently use the pass.

A fish haven, marked by private buoys, is about 1.7 miles W of Redfish Pass.

Captiva Pass, leads from the Gulf into Pine Island Sound between North Captiva Island and **Cayo Costa,** is used to some extent by small fishing vessels. The channel is unmarked and subject to change, and local knowledge is required to carry the best water. The pass has about 6 feet of water. Fair anchorage is available for small boats in **Safety Harbor,** which is 0.5 mile S of Captiva Pass and on the inner side of North Captiva Island. The depth in the harbor is about 5 feet, but only small craft drawing less than 2 feet can enter, and local knowledge is advised. The holding ground is good, and the anchorage is well protected from all directions.

Charts 11425, 11426.–Charlotte Harbor, about 60 miles SSE from Tampa Bay, is the approach to Port Boca Grande, Boca Grande, Punta Gorda, and several smaller settlements. On the S side Charlotte Harbor opens into Pine Island Sound and on the N side into Gasparilla Sound, which are described in chapter 12 in connection with the Intracoastal Waterway. Matlacha Pass, on the S side, has been described earlier in this chapter.

Port Boca Grande on the inner side of the S end of Gasparilla Island is an important petroleum receiving port. The town of **Boca Grande** is about 2 miles to the N.

Prominent features.–In the approach to the entrance from the S or SW, the first object sighted in daytime should be **Boca Grande Entrance Range Rear Light** (26°44.5′N., 82°15.8′W.), 1.5 miles from the S end of Gasparilla Island. The light, 105 feet above the water, is shown from a white hexagonal pyramidal skeleton tower, enclosing a stair cylinder. A red sector in the light from 001° to 045° covers the shoals W of Cayo Costa S of the entrance.

Upon closer approach, the loading transporter and sampling tower at the abandoned phosphate terminal, the large storage sheds at the marina at Port Boca Grande, and four storage tanks about 0.4 mile N of the end of the island will be seen. A water tank and a microwave tower at the town of Boca Grande also are prominent. **Port Boca Grande Light** (26°43.0′N., 82°15.6′W.), 58 feet above the water, is shown from a skeleton tower on the S end of the island. Close SW of the light, the tower and attached dwelling of the former lighthouse are prominent.

COLREGS Demarcation Lines.–The line established for Charlotte Harbor is described in 80.750, chapter 2.

Vessels should approach the harbor through the Charlotte Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Channels.–The Federal project for Charlotte Harbor provides for a channel 32 feet deep from deep water in the Gulf to Port Boca Grande. (See Notice to Mariners and latest edition of the charts for controlling depths.) The channel is marked by a **036°** lighted range and other aids to navigation.

A natural channel, marked by lights and daybeacons, leads from deep water at Port Boca Grande through Charlotte Harbor to the mouth of Peace River. In April 1982, the reported controlling depth in the channel was 9 feet.

A break in the shoal on the N side of the channel near the S end of Gasparilla Island forms a swash channel which was reported to have a controlling depth of 8 feet in April 1982. The best water in this swash channel is about 150 yards off the point, using the end of the fishing pier as a guide. Local craft also cross the shoal on the N side of the channel between Boca Grande Entrance Range Front Light and Boca Grande Inner Channel Range Front Light. In April 1982, it was reported that about 7 feet could be carried across the shoal with local knowledge; however, this area is subject to frequent change.

Anchorages.–Vessels should anchor in the Charlotte Anchorage, SW of the Safety Fairway. (See 166.100 through 166.200, chapter 2.) In addition, good anchorage in Charlotte Harbor for large vessels is in depths of 20 to 40 feet at the inner end of the entrance channel; the holding bottom is good. This is the anchorage used by vessels waiting for loading berths at Port Boca Grande. The anchorage affords excellent shelter from all winds, and is used as a harbor of refuge by coasting vessels and others. Small vessels can anchor almost anywhere in Charlotte Harbor. Good depths for small craft can be found close inshore between Port Boca Grande and Boca Grande. Small craft also can use the lagoon at Boca Grande. Another good anchorage for small craft has been reported between **Johnson Shoals** and the NW side of Cayo Costa. Depths in the anchorage are 7 to 11 feet, but only craft drawing less than 5 feet can enter through the unmarked swash channel along the NW side of Cayo Costa.

Dangers.–Numerous floating piles have been reported in Charlotte Harbor and adjacent waterways, and in Boca Grande Channel and its approaches.

Tides and currents.–The diurnal range of tide in the harbor is about 1.8 feet, but the variations in the water surface due to the force and direction of the wind are as much as 4 to 5 feet, at times. The tidal currents in the entrance channel average 2.2 knots at strength. The ebb current, which is said to attain occasionally an extreme velocity of 3 to 4 knots, depending also upon the force and direction of the wind. In the harbor channel between Cape Haze and the N end of Pine Island, the average velocity of the current is 0.5 knot. In Matlacha Pass at Little Pine Island bridge the current floods to the SE with an average velocity of 0.6 knot; the ebb current is weak and variable. To the N at the Myakka River bridges the current floods to the NW with an average velocity of 0.5 knot; the ebb current is weak and variable. In Peace River the current floods to the

NE and ebbs to the SW with an average velocity of about 0.4 knot at strength. Predictions of the current at several places in Charlotte Harbor may be obtained in the Tidal Current Tables.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade. Pilotage is optional for U.S. coastwise vessels that have on board a pilot licensed by the Federal Government for these waters, however, most commercial vessels take a pilot. Pilots board vessels off Charlotte Harbor Entrance Lighted Bell Buoy 2 (26°39.8'N., 82°19.6'W.), and take vessels in day or night if a berth is available. The pilot boat, 44 feet long, has a white hull and superstructure and blue deck, the word PILOT in blue on both sides of the pilot house, and is equipped with portable radiotelephones. The pilots carry portable radiotelephones. The pilots monitor VHF-FM channels 16 (156.80 MHz), 13 (156.65 MHz), and 12 (156.60 MHz) when vessels are expected. The pilot boat displays International Code flag "P" by day. Vessels being boarded should maintain a dead-slow speed and provide a ladder 5 feet above the water on the lee side. Pilots can be obtained by prior notice by radiotelegraph, by radiotelephone through the Tampa Marine Operator, telephone 813-964-2245 or 813-964-2252; through the oil terminal, telephone 813-964-2461; or through ships' agents.

Towage.–A small tug is available for light towing jobs.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Boca Grande is a **customs port of entry.**

Wharves.–A 225-foot T-head petroleum pier is about 0.1 mile NE of Port Boca Grande Light. There is reported to be 33 feet alongside the pier. Caution should be exercised in coming alongside the pier because of the possibility of strong current eddies.

Supplies.–Bunker fuels are not available locally. Limited amounts of gasoline, provisions, and marine supplies are available locally; large amounts require advance notice. Unlimited amounts of ice are available on short notice. Fresh water is available.

Repairs.–There are no drydocking or major repair facilities for deep-draft vessels at Port Boca Grande; the nearest such facilities are at Tampa, Fla. Small machine-shop repairs are available locally; larger above-the-waterline repairs using portable equipment are available from the mainland on about 4 hours notice. Divers are available on a few hours notice.

A privately marked channel with a reported depth of 8 feet leads to a marina on the E side of Charlotte Harbor about 2.5 miles E of Cape Haze Light 6. Large and small craft are handled at the marina. Berths with electricity, gasoline, diesel fuel, water, ice, some marine supplies, provisions, wet and dry storage, two surfaced launching ramps, and a restaurant are available at the marina. A forklift can haul out craft to 24 feet for hull and engine repairs.

Chart 11426.–Riviera Lagoons is a development on **Alligator Creek,** on the E side of Charlotte Harbor about 14 miles NE of Boca Grande. Lagoons have been dredged to provide waterfront homesites. A marina has berthage in 6 to 7 feet, and, in April 1982, there was reported to be 2 feet in the channel leading to the creek. A private light and daybeacons mark the channel. Gasoline, diesel fuel, water, ice, and marine supplies are available. There is a launching ramp on which a large trailer can handle craft to 52 feet for hull and engine repairs, or storage.

An artificial reef, marked by private daybeacons, is about 2 miles SW of the entrance to Alligator Creek.

Peace River empties into the head of Charlotte Harbor from NE. Above Punta Gorda the river is navigable by small outboards with local knowledge as far as Hull, 15 miles above the entrance, but caution is necessary to avoid the snags in the upper reaches. Heavy growths of hyacinth also are found in the upper reaches, which completely block many of the small inlets, bayous, and lakes.

The entrance to the river is marked by a light about 1.7 miles W of **Mangrove Point.** The river channel is marked by a light and daybeacons as far as Long Island just above Cleveland, about 9 miles above the entrance; above that stakes mark the channel.

Port Charlotte is a year-round community on **Alligator Bay,** on the N side of Peace River 3 miles above the entrance. The town has two hospitals and bus connections.

Punta Gorda, a town on the S side of Peace River, 4 miles above the entrance, has rail and highway connections with points to the N and S as well as to the interior of the State. Punta Gorda is a commercial fishing port. The town has a hospital.

Vessels can anchor off Punta Gorda in depths of 6 to 10 feet. A dredged channel leads from the river to a marina at the SW end of town. The channel is marked by a light and daybeacons. In April 1982, the channel and marina basin had a reported controlling depth of 8 feet. A riprap breakwater protects the NE and NW sides of the marina basin. The marina has berths with electricity, gasoline, diesel fuel, water, ice, sewage pump-out, some marine supplies, and minor engine repair facilities.

U.S. Route 41 (Tamiami Trail) highway bridge crossing the river at Punta Gorda has fixed and bascule spans with clearances of 45 feet and 13 feet, respectively. In 1981, a fixed highway bridge with a design clearance of 45 feet was under construction immediately SW of the bascule bridge; when completed it will replace the bascule bridge. The channel span of the old highway bridge close NE of the bascule bridge has been removed, but the ruins of the N and S approach piers remain and are awash; extreme caution should be exercised in the area. An overhead power cable about 200 yards above the bascule bridge has a clearance of 75 feet.

A marina, on the S side of the river about 1 mile NE of the bridge, has gasoline and marine supplies. A privately marked channel, with a reported controlling depth of about 3 feet in April 1982, leads to the marina. Craft to about 28 feet can be handled on trailers for hull and engine repairs.

Charlotte Harbor is a community at the NW end of the bridge. A marina on the W side of the bridge can provide gasoline, water, marine supplies, a launching ramp, and dry storage. Berths are not available. A mobile hoist can haul out craft to 20 tons for hull and engine repairs. In April 1982, there was reported to be 4 feet of water in the approaches. Intercity bus service is available at Punta Gorda. The Seaboard System Railroad provides freight service.

Interstate Route 75 twin fixed highway bridges, with a clearance of 45 feet, cross Peace River 2.1 miles above the Route 41 bridge at Punta Gorda.

Cleveland is a small village on the S side of Peace River 3 miles above Punta Gorda. The only dock along the waterfront is for small boats only and is privately owned. No supplies are available. The natural channel above the highway bridge at Punta Gorda is marked by daybeacons as far as Long Island, about 1 mile above Cleveland. The controlling depth was reported to be about 3 feet in April 1982, but local knowledge is required to carry the best water. Overhead power cables crossing the river, about 5 miles and 6.1 miles above Punta Gorda, have a clearance of 60 feet.

There are numerous private fishing piers and fish camps along the Peace River above Punta Gorda. About 14 miles above the entrance, a highway bridge crossing the river has a fixed span with a clearance of 12 feet.

Myakka River empties into the head of Charlotte Harbor from NW. A depth of 9 feet can be taken into the mouth of the river, and 3 feet can be carried to a fish camp at **El Jobean,** at the N end of the bridges crossing the river 3 miles above the mouth; provisions are available. The highway bridge has a fixed span with a clearance of 24 feet, and the swing span of the railroad bridge has a channel width of 30 feet and a clearance of 3 feet under the drawspan and 6 feet under the trestle. The swing bridge is maintained in the open position.

Boats drawing 3 feet can navigate Myakka River for about 17 miles above the mouth with local knowledge. The Tamiami Trail highway bridge, 10 miles above the mouth, has a fixed span with a horizontal clearance of 43 feet and a vertical clearance of 15 feet. The nearby overhead power cable has a clearance of 32 feet. Berths, electricity, gasoline, water, a launching ramp, and limited marine supplies are available.

The flora and fauna of the Everglades region are preserved in Myakka State Park in the upper reaches of the river.

Charts 11425, 11414, 11426, 11424.-The coast between Charlotte Harbor and Tampa Bay trends about NW by N, and has a nearly straight sand beach that is broken in places by small inlets. Back of the barrier islands are shallow bays and lagoons which can be entered from the Gulf of Mexico through Gasparilla Pass, Stump Pass, Venice Inlet, Big Sarasota Pass, New Pass, and Longboat Pass. Most of these passes, though marked, are subject to change, and the aids are frequently shifted in position. The low shore is wooded nearly to the water's edge and has few prominent features except in the vicinity of Boca Grande, Venice, and Sarasota, and for the 720-foot Venice Fishing Pier, about 2.5 miles S of the entrance to Venice Inlet. The pier is reported marked at its end by two fixed red lights.

Gasparilla Pass between **Gasparilla Island** and **Little Gasparilla Island** affords passage from the Gulf to Gasparilla Sound, Placida Harbor, and the Intracoastal Waterway. Local knowledge is needed to carry the deepest water. The controlling depth over the bar through the unmarked channel was reported to be about 3½ feet in April 1982.

Stump Pass, 6 miles N of Gasparilla Pass, between **Knight Island** and Manasota Key, affords passage from the Gulf into the S end of Lemon Bay and the Intracoastal Waterway. The channel is subject to frequent change and should not be attempted without local knowledge. A private light with a daymark reading "Danger Navigate with Local Knowledge Only" marks the approach. In July 1982, the pass had a reported controlling depth of less than 3 feet. In April 1982, it was reported that the private daybeacons marking the channel may not mark the best water.

Venice Inlet, about 26 miles NW of Port Boca Grande, affords a passage from the Gulf to the Intracoastal Waterway, Roberts, Dona, and Lyons Bays. A dredged channel leads E from the Gulf between parallel jetties for about 0.5 mile to the Intracoastal Waterway. In 1979, the controlling depth in the channel was 7½ feet. Daybeacons mark the channel. **Venice Inlet Light 1** (27°06.8'N., 82°28.2'W.), 30 feet above the water, is shown from a skeleton structure with a square green daymark on the outer end of the N jetty.

An unmarked fish haven is about 1 mile SW of Venice Inlet.

Midnight Pass, 6 miles N from Venice Inlet, between **Casey Key** and **Siesta Key,** affords a passage from the Gulf to **Little Sarasota Bay** and the Intracoastal Waterway. The channel is narrow and unmarked and had a reported controlling depth of 2 feet in April 1982; strangers should not attempt passage.

Currents.-In Midnight Pass the flood current sets NE with an average velocity of 1.8 knots, and the ebb sets SW at an average velocity of 1.4 knots.

Big Sarasota Pass, 12 miles NNW from Venice Inlet, is an inlet from the Gulf of Mexico to the S end of Sarasota Bay and the Intracoastal Waterway. The pass lies between **Siesta Key** and **Lido Key,** and is marked by buoys, lights, and daybeacons. A lighted buoy marks the channel approach. In April 1982, the pass had a reported controlling depth of 4 feet. The approach channel over the bar and the

channel through the pass are subject to continual changes. Mariners are advised to exercise extreme caution. Several large hotel buildings at the S end of Lido Key and along the shore of Siesta Key are prominent.

In 1980, a submerged wreck was reported in the channel approach in about 27°16′26″N., 82°34′25″W. Caution is advised while navigating in the area.

Currents.–In Big Sarasota Pass the flood current sets N with an average velocity of 1.5 knots, and the ebb sets S with an average velocity of 1 knot.

Three unmarked fish havens are from 1.1 to 2.2 miles offshore between Big Sarasota Pass and New Pass.

New Pass, 2 miles NW from Big Sarasota Pass, between **Lido Key** and **Longboat Key,** affords passage from the Gulf of Mexico to Sarasota Bay and the Intracoastal Waterway. A dredged channel leads from the Gulf through the pass to the Intracoastal Waterway. The channel approach is marked by a lighted bell buoy, and the channel is marked by lights and daybeacons. In January 1983, the controlling depth was 6 feet (8½ feet at midchannel) from the channel entrance to Light 13, thence 5 feet on the centerline to the Intracoastal Waterway. The channel is subject to shoaling; local knowledge is advised.

State Route 789 bridge over the pass has a bascule span with a clearance of 13 feet. (See 117.1b, 117.240, and 117.462a, (c) and (d), chapter 2, for drawbridge regulations and opening signals.) In November 1983, the bridge was being maintained in the closed position for repairs. Until the repairs are complete, the bascule bridge at Longboat Pass, about 9 miles NW, will open on signal. In November 1983, a bascule highway bridge with a design clearance of 23 feet was under construction adjacent N of the existing bridge over New Pass.

Currents.–In New Pass the flood current sets NE with an average velocity of 1.6 knots, and the ebb sets SW with an average velocity of 1 knot.

Longboat Pass, 11 miles NW of Big Sarasota Pass, between Longboat Key and **Anna Maria Island,** affords passage from the Gulf of Mexico to Sarasota Bay and the Intracoastal Waterway. A dredged channel, marked by a light and daybeacons, leads from the Gulf to the Intracoastal Waterway. In August 1983, the controlling depth was 10 feet at midchannel to the highway bridge, thence 7 feet on the centerline to the Intracoastal Waterway. The channel is subject to changes at the entrance. Shoaling extends W and S in an arc from the S end of Anna Maria Island and also W from the NW end of Longboat Key. State Route 789 bridge over the pass has a 45-foot bascule span with a clearance of 17 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(3-c), chapter 2, for drawbridge regulations and opening signals.) In November 1983, the bascule span was opening on signal 24 hours a day.

Currents.–In Longboat Pass the flood current sets E with an average velocity of 1.8 knots, and ebb sets W with an average velocity of 1.6 knots.

Anna Maria Island, about 6.5 miles long and about 1 mile wide near the N end, extends NW from Longboat Pass to Passage Key Inlet on the S side of Tampa Bay Entrance. It is separated from the mainland by **Anna Maria (Sarasota Pass) Sound,** which joins Sarasota Bay with Tampa Bay. A fish haven, marked by two privately maintained buoys, has been established about 1 mile offshore from Holmes Beach, Anna Maria Key. There are several year-round communities and a yacht club, marinas, and boatyards on the island, which is also a winter resort.

In October 1981, an obstruction awash was reported about 0.5 mile NNW of Longboat Pass in about 27°27′04″N., 82°41′40″W.

5. TAMPA BAY TO APALACHEE BAY

This chapter describes the 170-mile Gulf coast of Florida from Tampa Bay to Apalachee Bay, the numerous rivers emptying into this section of the Gulf, and the passes making from the Gulf to the Intracoastal Waterway. Also described are the deep-water ports of Tampa, Port Tampa, Port Sutton, St. Petersburg, and Port Manatee, and many smaller ports.

The section of the Intracoastal Waterway from Tampa Bay to Anclote Anchorage passing through the waters described in this chapter and places along its route are discussed in chapter 12.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.750 through 80.805, chapter 2.

Chart 11400.–Depths of 18 feet extend nearly 5 miles from shore on either side of the dredged channel into Tampa Bay.

From Tampa Bay 35 miles N to Anclote Keys, the bottom is broken, and depths of 18 feet or less are sometimes found more than 4 miles offshore. The coast is bordered by a line of long narrow barrier islands which overlap at the ends. The Gulf sides of the islands are straight or gently curving sand beaches, backed by dense growth. Between the islands and the mainland is a chain of shallow bays and passages. Prominent N of Tampa Bay are water tanks and numerous tall buildings along the beaches; a large hotel in Clearwater and a water tank near the center of Clearwater Beach Island; and Anclote Keys Light.

Between Anclote Keys and Cedar Keys, 60 miles to the N, the low coast is fringed with marsh broken by shallow rivers and creeks that can be entered only by small craft. Small keys and islets border the coast, and broken ground extends as much as 15 miles from shore. The bottom slopes gradually shoreward, but there are many rocks and shoals in the deeper water. Between Anclote Keys and Cedar Keys there are no prominent landmarks.

Bird guano racks, consisting of square platforms on piles about 10 feet above water, have been built on the outermost shoals between Tampa and Apalachee Bays; some have been destroyed in aerial gunnery practice, leaving broken piling which constitute a hazard. Not all of the racks are charted.

Numerous fish havens, some marked by private buoys, extend as much as 10 miles offshore along this section of coast.

The coast extends in a general NW direction from Cedar Keys for about 75 miles to Apalachee Bay. The low marsh along the shoreline is 1 to 2 miles wide and is backed by pine forests. The coast is broken by several small rivers and creeks, some of which are navigable for drafts of 4 to 5 feet. The bottom is broken and irregular for a distance of about 10 miles from shore, and coral heads and reefs are numerous. This stretch of coast is frequented mostly by shrimpers and other fishermen, who can assist strangers to enter any of the rivers or creeks. The shoal water affords fair anchorage, with considerable protection from heavy seas, for light-draft boats.

Weather.–Along the coast from Tampa Bay to Apalachee Bay, tropical cyclones, thunderstorms, and cold fronts are the potential weather hazards. Within the June through November hurricane season, June and October present the greatest risk. Nine hurricanes have crossed this coast during the past 100 years. They usually approach the area from the S through SW. Tides have run 12 to 15 feet above normal. When Alma crossed the coast in June 1966, Crawfordville and Alligator Point reported 65- to 85-knot winds, while Gladys in October 1968 brought 73-knot winds to Bayport.

Thunderstorms develop on about 50 to 85 days annually along this section of coast. They are most likely from May through September when they occur on 8 to 20 days per month; July and August are the most active months. The Tampa Bay and Apalachee Bay areas are the most active. Offshore thunderstorms occur 5 to 6 percent of the time in July and August and are most frequent at night. Thunderstorms can spring up quickly, generate strong gusty winds, and may contain hail or even tornadoes or waterspouts. They can occur as isolated cells or as an organized squall line sometimes preceding a cold front.

Cold fronts from the N occasionally reach these waters from fall through spring. At Saint Marks, temperatures drop below freezing on 19 days annually compared to 4 days at Tampa. The Gulf modifies the cold air masses quickly. Strong winds from these fronts or low pressure systems that form in the Gulf of Mexico result in gale-force winds (34 knots or more) occurring 1 to 2 percent of the time and windspeeds of 28 knots or more blowing 3 to 5 percent of the time from November through March. Wave heights of 10 feet or more are encountered about 3 to 8 percent of the time during this period.

Visibilities are generally good along this section of coast. They may be briefly reduced to near zero in heavy showers or thunderstorms, but they fall below 2 miles less than 2 percent of the time from April through November over open waters. On the coast, fog occurs on 23 days annually at Tampa, compared to 27 days in the Saint Marks area. Most of this occurs from November through March. It is most likely during the early morning hours.

Chart 11412.–Tampa Bay, a large natural indentation about midway along the W coast of Florida, is one of the important harbors of the Gulf coast and is

easily accessible day or night. The bay extends NE for about 20 miles, and is 6 to 7 miles wide. It is the approach to Manatee River, Boca Ciega Bay, Old Tampa Bay, and Hillsborough Bay, and to the cities of St. Petersburg, Port Tampa, East Tampa, Bradenton, Port Manatee, and Tampa.

The entrance to Tampa Bay, between Mullet Key on the N, and Anna Maria Key on the S, is 4.5 miles wide. Egmont Channel, the main deepwater ship channel, has been dredged through shoals that extend about 6 miles W of the entrance. **Tampa Bay Lighted Whistle Buoy T** (27°35.3'N., 83°00.7'W.), 13 miles W of Egmont Key, marks the approach to the bay.

Prominent features.–Egmont Key, a low, sandy, and wooded island almost in the middle of the entrance to Tampa Bay, is about 1.6 miles long. **Egmont Key Light** (27°36.0'N., 82°45.6'W.), 85 feet above the water, is shown from a white tower on the N end of the key. A fog signal and a radiobeacon with a special radio direction finder calibration service are at the light. (See Light List for details.) A pilot station lookout tower near the center of the island and the buildings of the Coast Guard station are conspicuous. A draft of about 15 feet can be taken to the small pier just inside the N end of the key.

Old **Fort DeSoto** on the S end of **Mullet Key** and a tall water tank on St. Jean Key about 1.5 miles NE of the fort stand out at the head of Egmont Channel. Also prominent to the N are the numerous tall hotel and apartment buildings, an aquatorium, a church spire, and a very tall water tank at St. Petersburg Beach on Long Key; a tall building on Maximo Point; and farther N other numerous tanks and buildings along the beaches and at St. Petersburg and Gulfport.

COLREGS Demarcation Lines.–The lines established for Tampa Bay and tributaries are described in 80.750, chapter 2.

Vessels should approach the harbor through the Tampa Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Security Broadcast System, Tampa Bay.–The Coast Guard Captain of the Port, Tampa, has established a voluntary system of radiotelephone broadcast/reporting points designed to give masters and pilots real-time information on marine traffic in Tampa Bay. The system supplements the Vessel Bridge-to-Bridge Radiotelephone Regulations contained in 33 CFR 26 (see chapter 2), and all vessels subject to these regulations are urged to participate in the system. Nothing in these procedures shall supersede the Navigation Rules or relieve the master of a vessel of his responsibility for the safe navigation of the vessel.

Security Calls.–All participating vessels are requested to give a Security call on VHF-FM channel 13 (156.65 MHz) when approaching or reaching the appropriate broadcast/reporting points listed below. For certain of these points, the Security call is made only when proceeding in the direction specified. A broadcast/reporting point is defined as a line generally perpendicular to the navigable channel through the point indicated.

Each Security call shall contain the following information: name of vessel; if engaged in towing, the nature of the tow; present location; direction of movement; and name of the next waterway or channel the vessel will transit.

Broadcast/Reporting Points.–The following is a list of broadcast/reporting points, by number, including the direction of travel of vessels to which each applies:

No. 1, between Tampa Bay Lighted Whistle Buoy T and Egmont Channel Lighted Whistle Buoy 1 (27°35.4'N., 82°59.7'W.), inbound.

No. 2, approaching Egmont Channel Lighted Whistle Buoy 9 (27°36.1'N., 82°52.8'W.), inbound.

No. 3, approaching Mullet Key Channel Lighted Buoy 19 (27°36.4'N., 82°45.2'W.), inbound.

No. 4, abeam Southwest Channel Entrance Lighted Bell Buoy 1 (27°32.3'N., 82°47.6'W.), inbound.

No. 5, E of Egmont Key approaching Mullet Key Channel entrance (27°35.1'N., 82°44.1'W.), inbound.

No. 6, leaving Mullet Key Channel (27°36.3'N., 82°43.6'W.), outbound for Egmont Channel or Southwest Channel.

No. 7, abeam Mullet Key Channel Lighted Buoy 23 (27°36.6'N., 82°41.7'W.), inbound.

No. 8, junction of Tampa Bay Cut A Channel and Cut B Channel (27°38.1'N., 82°37.5'W.), inbound and outbound.

No. 9, junction of Tampa Bay Cut B Channel and Port Manatee Channel (27°39.6'N., 82°36.2'W.), inbound and outbound.

No. 10, off the entrance to St. Petersburg Channel (27°40.4'N., 82°36.5'W.), inbound and outbound.

No. 11, junction of Tampa Bay Cut C Channel and Cut D Channel (27°41.7'N., 82°33.4'W.), inbound and outbound.

No. 12, entering Tampa Bay Cut F Channel (27°46.6'N., 82°31.4'W.), outbound.

No. 13, entering Tampa Bay Cut G Channel (27°47.1'N., 82°31.9'W.), inbound.

No. 14, entering Gadsden Point Cut Channel (27°47.1'N., 82°31.0'W.), inbound.

No. 15, entering channel to Big Bend (27°48.6'N., 82°26.7'W.), inbound.

No. 16, entering Alafia River channel (27°50.8'N., 82°26.3'W.), inbound.

No. 17, in Hillsborough Bay Cut C Channel N of the junction with Alafia River channel (27°50.9'N., 82°26.6'W.), inbound.

Additional Broadcasts.–The list of broadcast/reporting points is considered to be the minimum number of points to provide a working system. Additional calls may be prudent depending on weather conditions, unique vessel characteristics, when a towing vessel is changing the configuration of a tow, or when a vessel is anticipating an unusual maneuver or activity. It is expected that there will be other communications on channel 13, both in the form of additional Security broadcasts and for making arrangements for meeting or passing.

An additional broadcast would be indicated if a

vessel intends to use a routing other than that normally undertaken. Security calls should be made by all participating vessels immediately prior to departing a berth or anchorage.

When a towing vessel with a tow intends to follow the common practice of tending hawser in the vicinity of Egmont Key Light in the Lower Bay prior to continuing, she should make a Security call. This call should be made when abeam Egmont Key when inbound and at broadcast/reporting point No. 6 when outbound and in both cases prior to maneuvering to tend the hawser.

An additional Security call is suggested for a vessel approaching an anchorage area when, in the opinion of the master or pilot, such a broadcast would serve to alert other vessels preparing to enter or leave the anchorage area of the presence of the former and thereby minimize the possibility of a surprise encounter or interference maneuvers.

Mariners should refer to Captain of the Port of Tampa Notice 2-83 when requesting additional information regarding the system or to obtain copies of the chartlets depicting the broadcast/reporting points. All requests should be addressed to: Commanding Officer, U.S. Coast Guard, Marine Safety Office, 155 Columbia Drive, Tampa, Fla. 33606.

Channels.–A Federal project provides for a main channel with depths of 36 feet in the entrance from the Gulf, thence 34 feet to Tampa and Port Tampa. (See Notice to Mariners and latest editions of charts for controlling depths.)

Egmont Channel, the main ship channel, extends between Mullet Key and Egmont Key and is used by all deep-draft vessels entering Tampa Bay. A lighted **083°30′** range and lighted buoys mark the dredged cut over the bar.

The main ship channel continues through Mullet Key Channel and dredged cuts leading up the bay through Tampa Bay, Hillsborough Bay, and Old Tampa Bay to Port Manatee, Big Bend, Alafia River, Port Sutton, Tampa, Port Tampa, and Weedon Island. The channels are marked by lighted ranges, and lighted and unlighted buoys.

Southwest Channel, a natural passage on the S side of Egmont Key, had a reported controlling depth of about 14 feet in April 1982, but is subject to shoaling. The approach is marked by a lighted bell buoy, and the channel by lighted and unlighted buoys. **Passage Key,** on the S side of Southwest Channel, is a low sand island about 0.3 mile long and showing about 4 feet above high water. The key is barren and is used as a bird refuge. **Passage Key Inlet,** between Passage Key and Anna Maria Key, has a controlling depth of about 9 feet in an unmarked shifting channel; it is used only by small local craft.

Measured course.–Four measured nautical mile courses, each connected to the other and forming a square, are on the NW side of Tampa Bay channel about 7 miles NE of Sunshine Skyway. The range for the southeasterly and northwesterly courses is **037°43′-217°43′** and the range for the northeasterly and southwesterly courses is **127°43′-307°43′**. The range markers are square white daymarks with black letters and orange reflective borders on piles.

Anchorages.–Vessels with good ground tackle should anchor in the Tampa Anchorages, N and S of the Tampa Safety Fairway leading to Egmont Channel. (See 166.100 through 166.200, chapter 2.) These anchorages can be used to ride out any gale short of a hurricane. The usual inside anchorages are S of Mullet Key in depths of 30 to 35 feet; and SW of Gadsden Point in natural depths of 29 to 32 feet.

Explosives and quarantine anchorages are E of Mullet Key, NE of Papys Point, and S of Interbay Peninsula. (See 110.1 and 110.193, chapter 2, for limits and regulations.)

Dangers.–Shoal areas extend seaward from Egmont Key as far as **Palantine Shoal,** which is 5 miles W of the key and on the S side of Egmont Channel entrance. Palantine Shoal consists of several small lumps with depths of 19 to 22 feet over them. Spoil areas, for the most part unmarked and with reported depths of 10 feet or less, border the dredged cuts of the main ship channel in Tampa Bay and the channels in Old Tampa Bay. Caution should be observed particularly at the entrances to the side channels leading to Port Manatee, Alafia River, and Port Sutton.

Local weather during the thunderstorm season is unpredictable, and intense winds can develop suddenly. Before entering or departing the port, mariners should obtain local weather forecasts, maintain a close watch on the weather, and ensure that light vessels are properly ballasted during the transit.

In February 1982, shoaling to 30 feet was reported about 0.8 mile E of Egmont Key Light in about 27°36.1′N., 82°44.8′W.

The **Sunshine Skyway** crosses lower Tampa Bay from Maximo Point to Terra Ceia Island. It is a landfilled causeway for the greater part of its length with bridge spans over the channels which it crosses. The high-level 800-foot twin fixed spans over the main ship channel in the middle of the bay have clearances of 149 feet at the center and 140 feet at the fenders. The clearances of the other bridge spans are given in the description of the channels which they cross.

Caution.–In May 1980, the W span of the Sunshine Skyway Bridge across the main ship channel was destroyed. Support columns of the remaining span of the bridge are unprotected. For this reason, mariners are cautioned to use moderate speed while approaching and transiting under the bridge.

In March 1983, a fixed highway bridge with a design clearance of 175 feet was under construction just E of the Sunshine Skyway Bridge. Upon completion, it will replace the existing bridge. Construction operations will be conducted in the vicinity of the channel for an extended period of time. When construction is completed, the support columns of the new bridge will be partially protected against accidental collisions. Mariners should use extreme caution while transiting the area of the bridges and should ensure that they have reviewed the latest Notices to Mariners before transiting.

Two survey platforms marked by private lights are close E of the Sunshine Skyway, one on either side of the dredged channel. Mariners are cautioned not to confuse the platform lights with Mullet Key Channel Range Front Light.

Tides and currents.–The diurnal range of tide in Tampa Bay is about 2.3 feet. (See the Tide Tables for predictions.) A strong offshore wind sometimes lowers the water surface at Tampa and in the dredged channels as much as 4 feet, and retards the time of high water by as much as 3 hours. A continued SW wind raises the water by nearly the same amount and advances the time of high water by as much as 1 hour.

Daily tidal current predictions for Tampa Bay Entrance are given in the Tidal Current Tables, and predictions for several places in Tampa Bay and vicinity may be obtained in those tables. There is a large daily inequality in the ebb, and velocities of 3 knots or more may be expected at the strength of the greater ebb of the day in Egmont Channel, Passage Key Inlet, and off Port Tampa. Flood velocities seldom exceed 2 knots. Winds have considerable effect in modifying the tidal current.

At a location 6.7 miles W of Egmont Key Light, the tidal current is rotary, turning clockwise, and has considerable daily inequality. The strengths of the greater floods and ebbs set N and S, respectively. Four days of current observations at this location during a period of moderate N winds indicated a resultant nontidal current of 0.4 knot setting S.

Weather.–Mild winters and warm summers characterize the maritime subtropical climate of Tampa Bay. The outstanding summer feature is the thunderstorms, which occur on an average of 91 days, mostly in the late afternoons or evenings during June, July, August, and September. These showers often help cool things off as Tampa records 80 days annually with readings of 90°F or more.

While tropical cyclones are likely from June through November, the Tampa Bay area seems most vulnerable in June and October, although this region has been one of the least active hurricane spots along the W coast. There is about 1 chance in 20 that a hurricane will strike the Tampa Bay area in any given year. The worst storm to strike the area occurred in September 1848. It drove tides 15 feet above mean low water and was followed less than 3 weeks later by another storm that produced 10-foot tides. The Labor Day Hurricane of 1935 brought 5-minute winds of 64 knots to the area.

Cold fronts may bring one or two freezes per winter to the area, although snowfall is negligible and below freezing temperatures are rare. These fronts may produce showers and strong, gusty winds; gales remain infrequent. The flat terrain aids in the formation of nighttime ground fogs during the cool-weather season. They form on about 3 to 6 nights per month in winter, but usually dissipate during the morning hours.

The National Weather Service office is at Tampa International Airport; **barometers** may be compared there or by telephone. (See appendix for address.)

(See page T-3 for **Tampa climatological table.**)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade. Pilotage is optional for U.S. coastwise vessels drawing over 7 feet that have on board a pilot licensed by the Federal government. Pilots board vessels day or night. Vessels entering by Egmont Channel are boarded between the Tampa Bay Lighted Whistle Buoy T (27°35.3'N., 83°00.7'W.) and Egmont Channel Lighted Bell Buoy 2 (27°35.4'N., 82°59.0'W.). Vessels entering by Southwest Channel are usually boarded between Southwest Channel Buoy 2 and Lighted Bell Buoy 3, or if desired, at the lighted bell buoy off the entrance to the channel.

Two pilot organizations, Tampa Bay Pilots and Tampa Tri-County Pilots Association, serve Tampa Bay. Tampa Bay Pilots have four launches, EGMONT, MANATEE, TAMPA, and TAMPA BAY PILOT, each with a black hull and white deckhouse with the word PILOT on either side. Tampa Tri-County Pilots have two launches; TRICO PILOT has a black hull, white deckhouse, and the word PILOT on either side, and SEA TAXI has a blue hull and the words SEA TAXI on either side. Both pilot associations monitor VHF-FM channels 10 (156.50 MHz), 12 (156.60 MHz), and 16 (156.80 MHz) continuously; calls, Tampa Bay Pilots and Tampa Trico Pilots. The Tampa Tri-County pilots also monitor VHF-FM channels 11 (156.55 MHz) and 13 (156.65 MHz). Both pilot associations' boats are equipped with VHF-FM channels 10, 12, and 16 and use channel 10 as a working frequency. The Tampa Tri-County Pilots also use channel 11 as a working frequency. All pilot boats fly the International Code flag "H". For boarding, pilots request that vessels maintain a speed of 6 knots or less and have the pilot ladder rigged 6 feet above the water. Vessels are requested to give a 24-hour and a 3-hour advance notice of their time of arrival. Length, beam, and maximum draft of the vessel should be provided with the first notification. Vessels are normally not moved in dense fog, and during strong NW winds vessels are boarded inside Egmont Key. In March 1984, the deepest draft entering Tampa Bay was 33 feet 6 inches. Pilots can be obtained by radiotelegraph (cable address: TAMPILOT for Tampa Bay Pilots and TRICO for Tampa Tri-County Pilots), by telephone (813-248-3732 for Tampa Bay Pilots and 813-251-1669 for Tampa Tri-County Pilots) through the Tampa Marine Operator, or through ships' agents.

Pilots for St. Petersburg and Port Manatee can be obtained through the Tampa Bay Pilots or Tampa Tri-County Pilots.

Towage.–The Port of Tampa area has several towing companies with radio-equipped tugs with up to 3,350 hp. Tugs are equipped for firefighting. Vessels are met at Buoy 4B, about 3 miles above the Sunshine Skyway Bridge. Large vessels usually require at least two tugs. Arrangements for tugs are usually made in advance by ships' agents.

The Port of Tampa is a **customs port of entry. Quarantine, customs, immigration, and agricultural**

quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Vessels are usually boarded at their berths. Tampa has several public and private hospitals with ample facilities.

Coast Guard.–A **Marine Safety Office** is in Tampa. (See appendix for address.)

Harbor regulations.–The Port of Tampa is under the direction of the Tampa Port Authority and includes Tampa proper, Port Tampa, Big Bend, and the mouth of the Alafia River. The Authority is composed of a five-member board appointed by the Governor of Florida. The board appoints a Port Manager to administer the regulations established by the Authority. The Authority publishes an Operations Manual, a Port Directory, and a Terminal Map which includes additional port information. (Address: P.O. Box 981, Tampa, Fla. 33601; telephone (813-248-1924).) There is a **harbormaster;** telephone (813-248-1924). The Authority maintains a patrol craft.

Chart 11414.–Mullet Key, on the N side of the entrance to Tampa Bay, is low and wooded. The fishing pier on the SE side of the key has a depth of about 10 feet at the face. A large pile of rocks, covered 2 feet, is to the N and nearly in line with the face of the pier. These rocks are a danger for vessels landing with a strong flood current but are usually marked by tide rips except at slack water.

Old Fort DeSoto and a concrete and shell tower, about 25 feet high, at the S end of the key, and a water tank on St. Jean Key are conspicuous. **Fort DeSoto Park** includes Mullet Key, **St. Jean Key, St. Christoper Key,** and **Madelaine Key,** which are connected with the mainland by the Pinellas Bayway. An 800-foot-long T-head fishing pier with a pavilion and a toll house on it extends into the Gulf from in front of the fort; two private, fixed red lights mark the end of the pier. The park has picnic areas, restrooms, bathhouses, surfaced launching ramps, and several large parking areas.

Manatee River empties into the S side of Tampa Bay just E of Sarasota Pass. The river width varies from 0.5 mile to nearly 1 mile for about 10 miles above the mouth, thence from 80 to 600 feet for some 8 miles to Rye. The river is well protected from all directions and affords good storm anchorage for small boats.

In Manatee River, a channel with several dredged sections leads from the entrance to Mitchellville Bridge at Rye, 18.6 miles above the mouth. In April-May 1982, the centerline controlling depths were 8½ feet to Daybeacon 21 off Bradenton, thence 3 feet to Daybeacon 31 near Rocky Bluff, and thence in 1969, 1 foot to Mitchellville Bridge. Snags and debris obstruct the river above Rocky Bluff. In April 1982, shoaling was reported in the entrance channel with 8½ feet available on the centerline. A light marks the entrance, and the channel is marked by lighted ranges, lights, and daybeacons as far as Ellenton.

Two fish havens are in Manatee River. One is on the N side of the river off Emerson Point, and the other is on the S side off Wares Creek. Two private daybeacons mark each haven.

Bradenton, a winter resort on the S side of the river 4.5 miles above the mouth, is the seat of Manatee County and the largest town on the river. Bradenton has a large municipal pier close W of the first highway (U.S. Route 41) bridge with berthing space for larger vessels along the end and numerous berths for small craft inside the pier head. In April 1982, depths of 10 feet were reported in the approach channel with 8 feet reported alongside the berths. Water and electricity are available. The **harbormaster** lives aboard a yacht at Slip No. 27. Radio station, WTRL, occupies the building on the pierhead.

The town has numerous stores, several hotels, and a hospital. The Sarasota-Bradenton Municipal Airport is about 6 miles S of the city. Local guides can be obtained as pilots.

DeSoto National Memorial of the National Park Service is on **DeSoto Point,** on the S side of the river entrance. A marina and boatyard are in a basin protected by an L-shaped concrete pier about 0.5 mile W of the point. Berths, water, and limited marine supplies are available. The larger of two marine railways at the yard can handle craft to 50 feet; hull, engine, and electronic repairs can be made.

Three bridges cross Manatee River at Bradenton. The first, U.S. Route 41 highway bridge close E of the municipal pier, has a bascule span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.463, chapter 2, for drawbridge regulations and opening signals.) The second, the Seaboard System Railroad (SCL) bridge 500 yards above the highway bridge, has a bascule span with a clearance of 5 feet. (See 117.1b, 117.240, chapter 2, for drawbridge regulations and opening signals.) The third, U.S. Route 301 highway bridge about 500 yards above the railroad bridge, has a fixed span with a clearance of 40 feet.

Emerson Point is on the N bank at the entrance to the river at the W end of **Snead Island. McKay Point** is on the S shore of the island about 1.5 miles E of Emerson Point. A marina and boatyard in a protected privately dredged basin on the E side of McKay Point has two marine railways and 60- and 20-ton mobile hoists. Craft up to 80 feet can be handled for hull and engine repairs or dry open storage. Gasoline, diesel fuel, water, marine supplies, and some berths with electricity are available. In April 1982, there was reported to be 8 feet in the privately marked approach channel and in the basin.

A **special anchorage** is on the N side of the river just E of the entrance to the marina and boatyard on McKay Point. (See 110.1 and 110.74a, chapter 2, for limits and regulations.)

A dredged cutoff channel at the E end of Snead Island leads into Terra Ceia Bay from Manatee River. Daybeacons mark each end of the cutoff channel. In April 1982, a reported depth of 3 feet

was available in the cut N into Terra Ceia Bay. Gasoline is available at several facilities along the cutoff. A highway bridge over the cutoff has a 33-foot fixed span with a clearance of 13 feet. An overhead power cable crossing close NE of the bridge has a clearance greater than that of the bridge.

A marina is in the lagoon E of the cutoff (27°31.5'N., 82°36.5'W.). The privately marked entrance channel had a reported controlling depth of 4 feet in April 1982. An 8-ton mobile hoist can handle craft up to 40 feet for hull and engine repairs or dry open or covered storage. Gasoline, water, open and covered berths with electricity, and marine supplies are available.

Palmetto is on the opposite side of Manatee River from Bradenton. **Ellenton** is on the N bank of the river 2 miles above the Seaboard System Railroad bridge. All three towns have rail and highway connections to all parts of the State. Manatee County is an important center for the raising of citrus fruits and vegetables. Pilings of a former pier extend 250 yards towards the channel from the N bank of the river about 200 yards W of the lower highway bridge, U.S. Route 41.

There is a small marina in a small basin at **Rocky Bluff,** about 1.5 miles E of Ellenton. In April 1982, a reported depth of about 2½ feet could be carried to the facility. Gasoline, berths, a launching ramp, provisions, and water are available. Interstate Route 75 twin fixed highway bridges with a clearance of 40 feet cross the river at Rocky Bluff. An overhead power cable with a clearance of 49 feet crosses the river at Rocky Bluff.

Manatee Memorial Hospital is a large white building in **Manatee** on the S bank of the river E of Bradenton. There is a large seafood packing and canning plant at Manatee.

Braden River empties into Manatee River about 2 miles above the upper highway bridge at Bradenton. In 1972, the river had a reported controlling depth of 1 foot to a point about 2 miles above the highway bridge. The channel is unmarked, and there are many shoals. State Route 64 highway bridge over Braden River has a 45-foot fixed span with a clearance of 8 feet at the center. Overhead power cables 0.1 mile and 0.6 mile above the bridge have clearances of 32 and 31 feet, respectively.

Terra Ceia Bay, just N of Manatee River on the SE side of Tampa Bay, may be entered from Manatee River through the cutoff between Snead Island and the mainland.

The other entrance to Terra Ceia Bay from Tampa Bay is the narrow and generally crooked channel between Snead Island and **Rattlesnake Key.** The channel is marked by a light at the entrance and by daybeacons and has a reported depth of about 4 feet. Local knowledge is advised. The Sunshine Skyway crosses the head of the bay on a highway bridge that has a 44-foot fixed span with a clearance of 10 feet. Overhead power and telephone cables close SW of the bridge have a least clearance of 29 feet.

There is a boat ramp at the head of **Bishop Harbor,** about 7 miles NE of the entrance to Manatee River.

Port Manatee (27°38.0'N., 82°33.7'W.), owned by the Manatee County Port Authority, is a deepwater terminal on the SE side of Tampa Bay, about 11 miles above Egmont Key. The terminal is reached through a privately dredged and marked channel that leads SE from the main ship channel about 4 miles NE of the Sunshine Skyway Bridge. The channel is marked by a **127°43'** lighted range, lights, and lighted buoys. In April 1982, the reported controlling depth was 35 feet in the channel and in the turning basin at the terminal.

Towage.–Tugs to 2,400 hp are based at Port Manatee. Larger tugs are available at Tampa.

Wharves.–There are five deep-draft facilities at Port Manatee. General cargo is usually handled by ships' tackle. Mobile cranes to 150 tons and a 100-ton floating crane are available at Tampa. All of the facilities have highway connections and four have rail connections. Bunkering, electrical shore power, and water connections are available at each ship berth. For a complete description of the port facilities refer to Port Series No. 17, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the operator.

Manatee County Port Authority Berth No. 11 (27°37'53"N., 82°33'49"W.): 650-foot face; 35 feet alongside; deck height, 8 feet; receipt and shipment of bulk liquid products; operated by Manatee County Port Authority.

Manatee County Port Authority Berths Nos. 9 and 10: S side of basin; 1,500-foot face; 35 feet alongside; deck height, 8 feet; 100-ton crawler crane; 234 acres open storage; storage tanks for 2½ million barrels; receipt and shipment of general cargo, miscellaneous dry bulk materials, steel, lumber, and scrap metal; receipt of crude oil, naphtha, and petroleum products; operated by Manatee County Port Authority, Belcher Oil Co., Beker Phosphate Corp., and Gulf Interstate Terminals, Inc.

Manatee County Port Authority Berth No. 8: E end of basin; 500-foot face; 35 feet alongside; deck height, 8 and 7 feet; 30,000 square feet covered storage; 1.7 acres open storage; receipt and shipment of general cargo, receipt of crude oil and petroleum products, occasional receipt of plywood; operated by Manatee County Port Authority and Belcher Oil Co.

Manatee County Port Authority Berths Nos. 6 and 7: E end of N side of basin; 1,500 foot face; 35 feet alongside; deck height, 8 feet; one fixed tower shiploader, 36-inch conveyor belt, loading/unloading rates average 750 to 1,250 tons per hour; covered storage for 130,000 tons bulk material and 45,000 tons cement clinker; receipt and shipment of miscellaneous bulk commodities, receipt of naphtha and petroleum products; operated by Manatee Terminals, Inc., National Portland Cement Company of Florida, Inc., and Belcher Oil Co.

Manatee County Port Authority Berth No. 5

(27°38'06"N., 82°33'47"W.): 250 feet of berthing space; 20 feet alongside; deck height, 6 feet; berthing of vessels; operated by Manatee County Port Authority.

All types of marine supplies are available at Tampa. Deep-draft vessels are usually bunkered at berth by barge. All types of hull and engine repairs can be made at Tampa.

Piney Point is a small projection on the SE side of Tampa Bay about 0.3 mile N of Port Manatee Terminal. An abandoned ferry slip is on the point.

Little Manatee River (see also chart 11412) empties into the SE side of Tampa Bay opposite St. Petersburg. The crooked channel across the bar at the mouth of the river is marked by a light and daybeacons. The controlling depth in the privately maintained channel to the railroad bridge, about 2.3 miles above the mouth, is about 3 feet. The channel, marked by private daybeacons, is difficult to follow without local knowledge. About 1.5 miles above the entrance to Little Manatee River, another privately maintained channel with a depth of about 3 feet leads through **Ruskin Inlet (Marsh Branch)** to the highway bridge at **Ruskin.** The bridge has a 25-foot fixed span with a clearance of 12 feet.

At **Shell Point,** on the N side of the entrance to Little Manatee River, is a fish camp with a small wharf. A launching ramp, water, ice, and provisions are available. A railroad bridge with a 35-foot swing span and a clearance of 4 feet crosses the river about 2.3 miles above the mouth. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(5), chapter 2, for drawbridge regulations and opening signals.) U.S. Route 41 highway bridge with twin fixed spans and clearances of 22 feet crosses the river close S of the railroad bridge. The E span of a former highway swing bridge, immediately S of the fixed spans, remains as a fishing pier. The overhead power cables at the bridge have a minimum clearance of 58 feet.

Bahia Beach, about 0.6 mile NE of Shell Point, is a settlement with dredged lagoons for waterfront homesites. A channel marked by private daybeacons, with a reported controlling depth of 5 feet in April 1982, leads to a marina at the head of the lagoons. A 20-ton mobile hoist that can handle craft up to 45 feet for hull and engine repairs, or dry open or covered storage is available. Electronic repairs can be made. Gasoline, diesel fuel, water, ice, a launching ramp, marine supplies, and open and covered berths with electricity are available. A motel dock, also at the head of the channel, has berths for transients.

Apollo Beach (chart 11413), about 4 miles NE of **Mangrove Point** on the E shore of Tampa Bay, is another waterfront development with lagoons and waterfront homesites. A **special anchorage** is on the N side of the harbor at Apollo Beach. (See 110.1 and 110.74b, chapter 2, for limits and regulations.)

Chart 11413.-Hillsborough Bay, the NE arm of Tampa Bay, is 8 miles long and 4 to 5 miles wide. The main ship channel follows a dredged cut up the middle of the bay to Tampa. Spoil banks border the E side of the channel for most of its length. Good anchorage is available for shallow-draft vessels in the central part of the bay W of the main channel.

At the turn in the main ship channel SE of Gadsden Point, a privately maintained channel leads E to a turning basin and chemical plant, thence S to a powerplant wharf at **Big Bend.** In April 1982, the reported controlling depth was 32 feet in the channel, turning basin, and alongside the powerplant wharf. The channel is privately marked by lighted ranges and lighted and unlighted buoys. Coal for powerplant consumption is unloaded from barges at the powerplant wharf.

Two miles N from the sharp turn in the main channel, a dredged channel leads E to **Alafia River.** Federal project depth for the channel is 30 feet from the ship channel in Hillsborough Bay to and including the turning basin at **East Tampa,** the site of a large chemical plant, on the N side of Alafia River 0.5 mile above the mouth. The channel is well marked. (See Notice to Mariners and latest editions of charts for controlling depths.)

Deep-draft facilities at Big Bend on the Alafia River are described under wharves at Tampa later in this chapter.

A draft of about 3 feet can be taken for about 8 miles up Alafia River at high water with local knowledge. A highway bridge, about 1 mile above the mouth of the river, has a 44-foot fixed span with a clearance of 28 feet; the nearby overhead power cables have a clearance of 33 feet. The railroad bridge just above the highway bridge has a 40-foot swing span with a clearance of 6 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The minimum clearance of the overhead power and telephone cables crossing the river above these bridges is 31 feet. Twin fixed highway bridges 2.8 miles above the entrance have a clearance of 28 feet.

Manatees.-Regulated speed zones for the protection of manatees are in the lower mile of Alafia River and in the approach to the river from the main channel through Hillsborough Bay. (See Manatees, chapter 3.)

Small-craft facilities on the Alafia River include a boatyard on the S side of the river about 0.2 mile E of the railroad bridge that has a 5-ton crane, and another marina on the S side of the river about 1.8 miles above the railroad bridge. These facilities can provide berths, gasoline, water, ice, launching ramps, and hull and engine repairs.

The boat basin for MacDill Field, on the W side of Hillsborough Bay about 2 miles N of **Gadsden Point** (27°49.3'N., 82°28.5'W.), is entered through a dredged channel marked by a light, daybeacons, and a **282°** lighted range. In April 1982, a controlling depth of 6 feet was reported in the channel and basin.

The MacDill Field marina, about 0.5 mile W of Gadsden Point, is entered from Tampa Bay through a privately marked channel. In April 1982, the channel had a reported depth of 3 feet.

Port Sutton is on the E side of Hillsborough Bay

just N of **Pendola Point** (27°54.0'N., 82°26.0'W.). A dredged channel leads NE from the main ship channel to a turning basin and slip at Port Sutton, the site of large power, chemical, and cement plants, and a scrap metal wharf. The stack atop the powerplant is floodlighted at night.

A Federal project provides for depths of 34 feet in the Port Sutton Entrance Channel, Port Sutton Turning Basin, East Bay Channel, and East Bay Turning Basin. (See Notice to Mariners and latest edition of chart for controlling depths.) The entrance channel is marked by a **054°-234°** lighted range, lights, and lighted buoys. In addition to several barge wharves, Port Sutton has eight deep-draft wharves which are described later in this chapter under Tampa wharves.

East Bay, immediately N of Port Sutton on the E side of **Hookers Point,** is a dredged basin with depths of about 32 feet. The Tampa Port Authority is developing port facilities on the west side of the bay.

McKay Bay, about 1.3 miles N of Port Sutton, is a shallow bay about 1 mile wide and 1.5 miles long. The 22nd Street highway causeway across the bay entrance has twin fixed spans with clearances of 40 feet. Overhead power and telephone cables close N of the causeway have clearances of 32 feet. About 0.3 mile N of the bridge is an overhead power cable with a clearance of 40 feet.

Tampa is an important manufacturing, shipping, and distribution center at the head of Tampa Bay. It has an expanding economy and sizable cigar, lumber, phosphate, and manufacturing industries. There is considerable foreign and domestic trade in shipments of phosphate rock, petroleum, liquid sulfur, cement, chemicals, cattle, bananas, citrus fruits, grain, scrap iron, machinery, and general cargo. The University of Southern Florida is at the N end, and the University of Tampa is on the W bank of the Hillsborough River in the city.

Channels.–The main ship channel leads into Tampa Harbor along the E side of **Davis Islands.** The channel divides off the S end of **Harbour (Seddon) Island; Seddon Channel** continues NW to a turning basin at the mouth of Hillsborough River, and **Sparkman Channel** leads N to the **Ybor Turning Basin** at the end of **Ybor Channel. Garrison Channel,** an E-W channel between Harbour Island and the Tampa waterfront, connects the two turning basins.

A Federal project provides for depths of 34 feet for the main ship channel, Sparkman and Ybor Channels, and Ybor Turning Basin, and 30 feet for Seddon and Garrison Channels. (See Notice to Mariners and latest editions of charts for controlling depths.)

In October 1983, two fixed highway bridges were under construction across Garrison Channel. The W bridge, at the junction with Seddon Channel, has a design clearance of 15 feet. The E bridge, midlength of the channel, has a design clearance of 10 feet.

A **barge anchorage** is close off the SE side of Davis Islands. (See 110.1 and 110.193 (a)(5), chapter 2, for limits and regulations.)

Only small boats can pass around the N end of Davis Islands. Two fixed highway bridges, about 100 yards apart, connect the N end of the islands with Tampa to the W; minimum width is 34 feet, minimum clearance is 9 feet.

Information on anchorages, tides, currents, pilotage, towage, quarantine, customs, immigration, agricultural quarantine, and harbor regulations can be found at the beginning of this chapter under general information for Tampa Bay.

Wharves.–Deep-draft facilities at Tampa are located at Big Bend, East Tampa (Alafia River), Port Sutton, Port Tampa, and Tampa proper. Most of the facilities have railroad and highway connections, and water and electrical shore power connections. A total of over 12¼ million cubic feet of freezer and cooler space is available at the port. General cargo is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Shore-based mobile cranes up to 150 tons can be rented, and a 100-ton floating crane is available. Only the deep-draft facilities are described; other active facilities are for barges, tugs, fishing boats, and other small vessels. For a complete description of the port facilities refer to Port Series No. 17, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the operator.

The office of the Tampa Port Authority is at the George B. Howell Maritime Center Wharf, Tampa, Fla., 33605; telephone (813-248-1924).

Facility at Big Bend:

Agrico Chemical Co., Big Bend Terminal Dock (27°48'22"N., 82°24'34"W.): S side of basin; 1,500-foot face; 35 feet alongside; deck height, 10 feet; one gantry shiploader, 3,000-ton-per-hour capacity; covered storage for 30,000 tons of material; open storage for 175,000 tons of material; storage tanks with 60,000-ton capacity; shipment of wet phosphate rock, dry fertilizer material, and phosphoric acid; owned by Agrico Chemical Co., and Mitsui (U.S.A.), and operated by Agrico Chemical Co. and Intercontinental Terminals Co.

Facilities at East Tampa (Alafia River):

Gardinier, Inc., Wharf and Slip (27°51'30"N., 82°23'28"W.): E and W sides of slip, each 448 feet long, 20 feet alongside; 500-foot wharf adjacent to W side of slip, 20 and 32 feet alongside; deck heights, 8 feet; ship-loading tower with conveyor boom, 800- and 600-ton-per-hour capacity; receipt of shell and miscellaneous bulk materials; shipment of phosphate rock and bulk phosphate products; owned and operated by Gardinier, Inc.

Gardinier, Inc., Liquid Products Wharf: immediately SW of Gardinier, Inc., Wharf; offshore wharf, 900 feet of berthing space with dolphins and in conjunction with Gardinier, Inc., Wharf; 30 feet alongside; deck height, 8 feet; one loading arm; pipelines extend to storage tanks, total capacity 40,000 tons of liquid sulfur, 47,000 barrels of fuel oil, 23,000 tons of phosphoric acid, 23,000 tons of sulfuric acid; receipt of liquid sulfur and fuel oil,

shipment of phosphoric and sulfuric acid; owned and operated by Gardinier, Inc.

Facilities at Port Sutton, S side of slip:

Western Fuels Dock: about 900 yards W of head of slip; 215 feet of berthing space with dolphins; 33 feet alongside; deck height, 8 feet; two loading arms; pipelines extend to storage tanks, total capacity 465,000 barrels; receipt and shipment of petroleum products; owned by Port Sutton, Inc., and operated by Western Fuels, Inc.

Paktank Florida Port Sutton Dock: about 600 yards W of head of slip; 700 feet of berthing space with dolphins; 32 feet alongside; deck height, 12 feet; 100-ton crawler crane; loading tower with 1,200-ton-per-hour capacity; covered storage for 292,000 tons of material; shipment of phosphate products; receipt of potash; owned by Port Sutton, Inc., and operated by Paktank Florida, Inc.

Brimstone Terminals Wharf: 300 yards W of head of slip; 700 feet of berthing space with dolphins; 34 feet alongside; deck height, 12 feet; two unloading arms; pipelines extend to storage tanks, total capacity 75,000 tons for liquid sulfur and 10,000 tons for liquid fertilizer; owned by Duval Corp., and operated by Brimstone Terminals, Inc.

Facilities at Port Sutton, N side of slip:

I.M.C. Corp., Phosphate Wharf: about 0.6 mile W of head of slip; 414-foot offshore wharf; 34 feet alongside; deck height, 6½ feet; loading tower, capacity, 2,200 tons per hour for phosphate rock and 1,100 tons per hour for superphosphate; open storage for 300,000 tons of wet phosphate; silo storage for 60,000 tons of dried phosphate rock; shipment of phosphate rock, triple superphosphate, diammonium phosphate, and animal feed (defluorinated phosphate); owned and operated by I.M.C. Corp.

W.R. Grace & Co. Wharf: about 200 yards E of slip entrance; 200 feet of berthing space with dolphins; 34 feet alongside; deck height, 7½ feet; pipeline extends to storage tanks, 49,000-ton capacity; receipt of anhydrous ammonia; owned by Port Sutton, Inc., and operated by W. R. Grace & Co.

Ideal Basic Industries Tampa Terminal Ship Dock (27°54′16″N., 82°25′38″W.): 27-foot offshore wharf, 700 feet usable with in-line bulkhead; 40 feet alongside; deck height, 7½ feet; pipelines extend to storage silos, 69,000-ton capacity; receipt of bulk cement; owned by Ideal Basic Industries, Inc., and operated by Ideal Basic Industries-Cement Division.

Pasco Terminals, Inc. Wharf (27°54′21″N., 82°25′40″W.): 525-foot face; 30 feet alongside; deck height, 7½ feet; pipeline extends to storage tanks, 57,500-ton capacity; receipt of liquid sulfur; owned by Pasco Terminals, Inc., and operated by Brimstone Terminals, Inc.

Commercial Metals Co. Wharf (27°54′25″N., 82°25′45″W.): 530-foot face; 30 feet alongside; deck height, 7½ feet; four 70-ton cranes with electromagnets; open storage for 20,000 tons; shipment of scrap metal; owned by Port Sutton, Inc., and operated by Commercial Metals Co.

Facilities in East Bay:

Seaboard System Railroad, Rockport Terminal Dock (27°54′50″N., 82°25′28″W.): 633-foot offshore wharf, 1,415 feet of berthing space with dolphins; 34 feet alongside; deck height, 12 feet; 3,000-ton-per-hour gantry ship-loader; covered storage for 148,000 tons of material; shipment of phosphate products; owned and operated by Seaboard System Railroad.

Eastern Associated Terminals Co. Wharf (27°55′10″N., 82°25′15″W.): 585 feet of berthing space along dolphins; 34 feet alongside; deck height, 10 feet; 3,000-ton-per-hour gantry ship-loader; storage for 290,000 tons of material; shipment of wet and dry phosphate products; owned and operated by Eastern Associated Terminals Co.

Tampa Port Authority Ro-Ro Ramp and Mooring Wharf (27°55′49″N., 82°26′06″W.): 30 feet alongside upper face and 34 feet alongside lower face; deck height, 7 feet; receipt and shipment of roll-on/roll-off general cargo; operates in conjunction with Berth 202; owned and operated by Tampa Port Authority.

Spessard L. Holland Terminal, Berth 202: about 100 yards SE of Tampa Port Authority Ro-Ro Wharf; 600 feet of berthing space; 34 feet alongside; deck height, 11½ feet; about 19 acres of open storage; receipt and shipment of containerized and general cargo, steel, and automobiles; owned and operated by Tampa Port Authority.

CF Industries Tampa Phosphate Terminal Wharf: 500 yards SE of Berth 202; 920 feet of berthing space with platforms; 34 feet alongside; deck height, 10 feet; loading tower with average loading capacity of 1,400 tons per hour; covered storage for 80,000 tons of material; shipment of phosphate fertilizer products; owned and operated by CF Industries, Inc.

Spessard L. Holland Terminal, Berth 209 (27°55′04″N., 82°25′46″W.): 1,800 feet of berthing space in conjunction with Berths 210 and 211; 34 feet alongside; deck height, 11½ feet; cranes to 100 tons; 13 acres paved open storage; 90,000 square feet of covered storage; receipt and shipment of general cargo, steel, and lumber; owned by Tampa Port Authority, and operated by Tampa Port Authority and Eller & Co.

Spessard L. Holland Terminal, Berths 210 and 211: adjacent S of Berth 209; 34 feet alongside; deck height 11½ feet; over 1¾ million cubic feet of cold storage; receipt and shipment of containerized and general cargo; owned by Tampa Port Authority, and operated by Tampa Port Authority and Uiterwyk Cold Storage Corp.

Facilities along W side of Hookers Point:

Liquid Bulk Dock, Berth No. 220 (27°54′45″N., 82°26′30″W.): 290 feet of berthing space with platforms; 30 feet alongside; deck height, 11 feet; two unloading arms; pipeline extends to storage tanks, 60,000-ton capacity; receipt of liquid sulfur; owned by Tampa Port Authority and operated by Tampa Port Authority and Texasgulf, Inc.

Kreher Terminal Dock, Berths 223 and 224 (27°55′05″N., 82°26′35″W.): SE side of slip; 1,120-foot face; 14 to 34 feet alongside; deck height, 8 feet; open storage for 50,000 tons of gypsum rock and 25,000 tons of rock salt; pipelines extend to storage

tanks with capacity of 27,300 barrels for petrochemicals, 50,000 tons for phosphoric acid, and 12,000 tons for caustic soda; receipt of automobiles, gypsum rock, rock salt, petrochemicals, phosphoric acid, and caustic soda; owned by Tampa Port Authority and operated by Tampa Port Authority, Standard Gypsum Corp., Union Carbide Corp., and South State Terminals Corp.

Richard E. Knight Pier, Berths 225, 226, and 227: immediately NW of Kreher Terminal; SE and NW sides 880 feet long; 34 feet along SE side; 30 to 22 feet along NW side; deck heights, 8 feet; one loading arm; pipelines extend to storage tanks with capacity of 905,000 barrels for petroleum products, 88 tons for anhydrous ammonia, 6 tons for caustic soda, and 15 tons for phosphoric acid; receipt of petroleum products, phosphoric acid, and caustic soda; receipt and shipment of anhydrous ammonia; owned by Tampa Port Authority and operated by Murphy Oil Corp., Petroleum Packers, Inc., Royster Co., South State Terminals Corp., and Union Oil Co. of California.

Tampa Port Authority Cattle Loading Wharf: about 0.3 mile NW of Kreher Terminal; 140-foot offshore wharf, 245 feet of berthing space with dolphins; 29 feet alongside; deck height, 6 feet; cattle loading chute and ramp; shipment of cattle; owned and operated by Tampa Port Authority.

Facilities along E side of Sparkman Channel:

Sulphur Terminals Co., Sulphur Wharf (27°55′51″N., 82°26′47″W.): 305 feet of berthing space with dolphins; 32 feet alongside; deck height, 8 feet; pipelines extend to tank storage, 90,000-ton capacity; receipt of liquid sulfur; owned by MTR Terminals Corp. and operated by Sulphur Terminals Co.

Amoco Oil Co., Tampa Terminal Wharf (27°55′58″N., 82°26′46″W.): 100-foot offshore wharf, 275 feet usable with dolphins; 32 feet alongside; deck height, 7 feet; pipelines extend to storage tanks, 602,000-barrel capacity; receipt and shipment of petroleum products; bunkering vessels; owned and operated by Amoco Oil Co.

American Petrofina Co. of Texas, Tampa Terminal Wharf: 100 yards N of Amoco Oil Co., Tampa Terminal Wharf; 240-foot face, 370 feet usable with dolphins; 31 feet alongside; deck height, 10 feet; pipelines extend to storage tanks, 322,000-barrel capacity; receipt of petroleum products; owned and operated by American Petrofina Co. of Texas.

General Portland Inc., Florida Division Wharf (27°56′07″N., 82°26′43″W.): 408 feet of berthing space with dolphins and 857 feet with shore moorings; 33 feet alongside; deck height, 9 feet; pipeline extends to storage tanks, 135,000-barrel capacity; covered storage for 44,000 tons of material; open storage for 200,000 tons of material; cement silos for 24,000 tons; receipt of gypsum rock, coal, and aragonite; occasional receipt of cement and fuel oil; owned and operated by General Portland Inc., Florida Division.

Tampa Electric Co., Hookers Point Plant Wharf (27°56′16″N., 82°26′39″W.): 571 feet of berthing space with dolphins; 26 to 29 feet alongside; deck height, 8 feet; pipelines extend to storage tanks, 520,000-barrel capacity; receipt of fuel oil and petroleum products; owned and operated by Tampa Electric Co. and Cities Service Co.

Tampa Bay Terminal, South Slip Wharf (27°56′23″N., 82°26′32″W.): N side of slip, 700-foot face; 22 to 34 feet alongside; deck height, 5 feet; 24,000 square feet covered storage; 6 acres open storage; two 40-ton cranes equipped with electromagnets; shipment of scrap metal and mooring vessels for repair; owned by Tampa Port Authority and operated by Tampa Bay Terminal, Inc., and Tampa Ship Repair and Dry Dock Co.

Facilities along Ybor Channel and Turning Basin, E side:

George B. Howell Maritime Center Wharf (27°56′30″N., 82°26′34″W.): 1,200-foot face; 34 feet alongside; deck height, 5 feet; 38,000 square feet covered storage; 4 acres open storage; three 45-ton mobile cranes; receipt and shipment of general cargo and steel products; owned by Tampa Port Authority and operated by Southport Stevedores, Inc.

Texaco Tampa Terminal Wharf: about 0.2 mile N of George B. Howell Maritime Center Wharf; 280 feet of berthing space with dolphins, 600 feet with shore moorings; 34 feet alongside; deck height, 6 feet; pipelines extend to storage tanks, 1¼-million-barrel capacity; receipt of petroleum products; owned by Texaco, Inc., and operated by Texaco, Inc., and Marathon Oil Co.

Cargill, Inc., Wharf: about 0.2 mile N of Texaco Tampa Terminal Wharf: 320 feet of berthing space with dolphins, 700 feet with shore moorings; 32 feet alongside; deck height, 10 feet; 15,000-bushel-per-hour ship-loading spout; 20,000-bushel-per-hour marine leg; 1-million-bushel grain elevator; covered storage for 701,000 bushels of citrus pellets; receipt and shipment of grain and citrus pellets; owned and operated by Cargill, Inc.

Phillips Petroleum Co. Wharf (27°57′04″N., 82°26′31″W.): 310 feet of berthing spaoe with dolphins; 34 feet alongside; deck height, 9½ feet; pipelines extend to storage tanks, 383,000-barrel capacity; receipt of petroleum products; owned and operated by Phillips Petroleum Co.

Facilities along Ybor Channel, W side:

Detsco Terminals Phosphate Loading Wharf: at head of Ybor Channel; 380-foot face; 32 feet alongside; 1,200-ton-per-hour ship loader; storage tank capacity, 10,000 tons; silo capacity, 20,000 tons; covered storage for 13,000 tons; shipment of phosphate products and receipt of liquid sulphur; owned and operated by Detsco Terminals, Inc.

Metroport Terminal, North Wharf, Berths Nos. 263 and 264: immediately S of Detsco Terminals Phosphate Loading Wharf; N side of slip, 680 feet long, 25 to 27 feet alongside; head of slip 350 feet long, 20 to 25 feet alongside; deck heights, 10 feet; 1 acre open storage; banana unloading conveyor; receipt of bananas and shipment of general cargo; owned by Tampa Port Authority and operated by

Tampa Port Authority and Southern Stevedoring Co., Inc.

Metroport Terminal, South Wharf, Berths Nos. 265 and 266: across slip from Metroport Terminal, North Wharf; channel side at S entrance to slip, 275 feet long, 28 feet alongside; S side of slip, 750 feet long, 18 to 25 feet alongside; deck heights, 10 feet; 48,000 square feet covered storage; about 0.9 acre of open storage; 20-ton crane; receipt and shipment of general cargo; owned by Tampa Port Authority and operated by Bay Terminal and Stevedoring Co., G & C Stevedoring Co., and Metro Stevedores, Inc.

S.E.L. Maduro Wharf (27°56′56″N., 82°26′38″W.): 1,200-foot face; 34 feet alongside; deck height, 8 feet; 150,000 square feet covered storage; 15 acres open storage; 25-ton mobile crane; receipt and shipment of containerized and general cargo; owned and operated by S.E.L. Maduro (Florida), Inc.

Garrison Terminals East Wharf: N side of Ybor Turning Basin; 927 feet of berthing space; 30 feet alongside; deck height, 7 feet; two 150- and one 65-ton mobile cranes; 158,000 square feet covered storage; about 4.5 acres of open storage; receipt and shipment of general cargo; receipt of refrigerated products, bulk nitrate, and potash; shipment of fertilizer; owned by Trans-Florida Warehouse Corp. and Garrison Terminals, Inc., and operated by Garrison Terminals, Inc.

Garrison Terminals West Wharf: N side of Ybor Turning Basin; 840-foot face; 30 feet alongside; deck height, 8 feet; 126,000 square feet covered storage; 100,000 square feet open storage; use of equipment from East Wharf; receipt and shipment of general cargo; shipment of fertilizer; owned and operated by Garrison Terminals, Inc.

Facilities along the N side of Garrison Channel:

Sunmark Industries Tampa Terminal Dock: just E of Seaboard System Railroad Bridge; 60-foot offshore wharf, 200 feet of berthing space with dolphins; 20 feet alongside; deck height, 8 feet; pipelines extend to storage tanks, 45,000-barrel capacity; receipt of petroleum products; owned and operated by Sunmark Industries, Division of Sun Co. of Pennsylvania.

Tampa Import and Export Terminal Wharf: about 0.2 mile W of Seaboard System Railroad Bridge; 950-foot face; 30 feet alongside; deck height, 10 feet; 142,000 square feet covered storage; mobile cranes to 35 tons with 2½-cubic-yard buckets, operating rate 200 to 400 tons per hour; receipt of fertilizer products and shipment of fertilizer and bulk citrus pellets; owned and operated by Tampa Import and Export Terminal, Inc., and Tampa Stevedoring Co., Inc.

Facilities at Port Tampa Dock (Slip entrance at 27°51′40″N., 82°33′10″W.):

Gold Bond Building Products Tampa Plant Wharf: S side of slip at entrance; 1,200 feet of berthing space available along dolphins in conjunction with Chevron U.S.A. and Shell Oil Co.; 34 feet alongside; deck height, 6 feet; hopper and belt conveyor system, unloading rate, 2,000 tons per hour; 96,000 square feet covered storage; receipt of gypsum rock by self-unloading vessels; owned by Atlantic Land & Improvement Co. and Seaboard System Railroad, operated by Gold Bond Building Products, Division of National Gypsum Co.

Chevron U.S.A. Port Tampa Dock: S side of slip about 130 yards E of entrance; 880 feet of berthing space available; 32 feet alongside; deck height, 10 feet; pipelines extend to storage tanks, 800,00-barrel capacity; receipt of petroleum; owned by Atlantic Land & Improvement Co. and Seaboard System Railroad; operated by Chevron U.S.A., Inc., and U.S. Government Defense Logistics Agency.

Shell Oil Co. Picnic Island Terminal Wharf: S side of slip about 330 yards E of entrance; 1,200 feet of berthing space available; 34 feet alongside; deck height, 8 feet; pipelines extend to storage tanks, over 1-million-barrel capacity; receipt of petroleum products; owned by Atlantic Land and Improvement Co. and Seaboard System Railroad and operated by Shell Oil Co. and Gulf Oil Co.-U.S.

Union Chemicals Wharf: S side of slip about 0.4 mile above the entrance; 100-foot face, 480 feet of berthing space with dolphins; 34 feet alongside; deck height, 8 feet; pipelines extend to storage tanks, 2¾-million-gallon capacity; receipt of naphtha and solvents; owned by Atlantic Land and Improvement Co. and Seaboard System Railroad and operated by Union Chemicals Division of Union Oil Co. of California.

I.S. Joseph Co. Port Tampa Wharf: N side of slip at the entrance; 730 feet of berthing space with dolphins; 34 feet alongside; deck height, 7 feet; conveyor loading system, 600-ton-per-hour loading rate; storage tanks for 10,000 tons of material; shipment of citrus pellets and animal feed; owned by Atlantic Land and Improvement Co. and Seaboard System Railroad. and operated by I.S. Joseph Co., Inc., Florida Division.

Foreign-Trade Zone No. 79 is in Tampa. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.-All grades of fuel oil are available. Large oceangoing vessels are normally bunkered at berth by tank barges. Bunkers can also be obtained from Amoco Oil Co., Tampa Terminal Wharf on the E side of Sparkman Channel. Water is available at most of the piers. Marine supplies and provisions are available in any quantity.

Repairs.-The Port of Tampa has facilities for making all types of hull and engine repairs to vessels of all sizes. Several companies operate waterfront facilities at the port for the repair and conversion of ocean-going vessels, tugs, barges, and small vessels. The largest shipyard, on the E side of Sparkman Channel, has a graving dock that is 907 feet long at the bottom, 150 feet wide, and 22 feet deep over the sill. The largest floating drydock, on the E side of Ybor Channel, has a 3,000-ton capacity, a length of 348 feet, a clear width of 52 feet, and a depth of 22 feet over the keel blocks. The largest marine railway, at the shipyard on the N side of East Bay, has a 200-ton capacity and can haul out vessels to 90 feet

long, 25 feet wide, and 10-foot draft. The yard specializes in construction and repair of wooden, fiberglass, and steel-hulled commercial fishing vessels. The yard will also perform emergency repairs to yachts and recreational vessels. Machine, foundry, carpenter, and electric shops, outfitting wharves, and cranes up to 175 tons are available at shipyards at Tampa.

In addition, a number of firms without waterfront facilities engage in marine repair work. These companies maintain shops and portable equipment for making above-the-waterline repairs and for installing equipment, gear, and machinery on all types of craft at their berths.

Communications.–Tampa is served by the Seaboard System Railroad. Regular scheduled steamship service is maintained between Tampa and foreign ports, and Carribbean and West Indies ports. Several major airlines provide frequent scheduled service between Tampa International Airport, at the W end of the city, and domestic and overseas points. There is bus and trucking service to all points.

A privately owned radio station WPD, adjoining the Municipal Terminal on Ybor Channel, is used locally for communication with ships. Operating hours are 0800 to 1700. Radio station WFLA transmits coastal storm warnings and emergency marine information.

Small-craft facilities.–Small-craft facilities in Tampa are limited. The municipal boat landing is on the W side of the entrance to Hillsborough River. The Majorie Park Yacht Basin on Davis Islands, on the W side of Seddon Channel, has gasoline, water, a launching ramp, and open and covered berths for boats up to 50 feet. Diesel fuel is available by truck. The basin has depths of about 7 feet.

Hillsborough River flows S through the city of Tampa into the turning basin at the N end of Seddon Channel. Daymarkers mark the channel for a short distance to the NW side of North Boulevard Bridge. The stream is narrow above Tampa and relatively deep. The head of navigation is the dam at Sulphur Springs, 8 miles above the mouth. In January 1978, the controlling depth in the dredged channel in the river was 4½ feet to just above Columbus Drive Bridge, about 2.5 miles above the mouth.

The minimum width of the drawspans of the bridges over Hillsborough River between the entrance and Sligh Avenue, 6 miles above the mouth, is 50 feet, and the minimum clearance is 7 feet. About 0.1 mile above the mouth, are the twin fixed spans of the South Crosstown Expressway with a clearance of 40 feet. At Scott Street, 1 mile above the mouth, are the expressway twin fixed bridges with a clearance of 40 feet. Highway bridges at North Boulevard and at Buffalo Avenue, 3.2 miles above the mouth, have fixed spans with a minimum clearance of 35 feet. The Hillsborough Avenue Bridge, 4.3 miles above the mouth, has a lift span with a clearance of 53 feet up and 10 feet down. Several highway bridges and one railroad bridge between Sligh Avenue and Sulphur Springs have fixed spans with a minimum channel width of 38 feet and minimum clearance of 5 feet. An overhead power cable with a clearance of 60 feet crosses the river at 26th Avenue. About a mile below this, an overhead power cable crossing the river has a clearance of 45 feet. (See 117.1b, 117.240, and 117.245 (i)(4-b), chapter 2, for drawbridge regulations and opening signals.)

Old Tampa Bay, the NW arm of Tampa Bay, is separated from Hillsborough Bay by Interbay Peninsula. Old Tampa Bay is 12 miles long and ranges in width from 2.5 miles at the entrance, to 6 miles; about three-fourths of the bay area has depths ranging from 6 to 17 feet. A branch of the main ship channel leads through the shoals at the entrance to Old Tampa Bay to the wharves and turning basin at Port Tampa. A Federal project provides for a depth of 34 feet to and including the turning basin. (See Notice to Mariners and latest editions of charts for controlling depths.) The channel is well marked by buoys and lighted ranges. Spoil banks border the E side of the N-S reaches of the channel; several spoil islands 5 to 10 feet high are just S of Port Tampa.

A swash channel from Port Tampa parallels the SW shore of Interbay Peninsula at a distance of about 0.6 mile. The channel is marked by daybeacons and has a controlling depth of 7 to 8 feet.

A **danger zone** of a small-arms firing range and aircraft jettison is SW of Interbay Peninsula. (See 204.100, chapter 2, for limits and regulations.)

A privately dredged channel extends from the S end of Port Tampa (Cut K) Channel NW to a turning basin at the powerplant at Weedon Island. In July 1981, the reported controlling depths were 32 feet for a midwidth of 270 feet in the channel to the bend, thence 29 feet for a midwidth of 150 feet to the turning basin, and 32 feet in the basin. The channel is marked by a private lighted range and lighted buoys. A slip at the plant has a controlling depth of 32 feet.

An **explosives anchorage** is about 0.6 mile N of the junction of the Port Tampa Channel and the channel to the powerplant at Weedon Island. (See 110.1 and 110.193 (a)(3), and (b)(2), chapter 2, for limits and regulations.)

Port Tampa is an important shipping terminus on the E shore of Old Tampa Bay just inside the entrance. The elevators, oil tanks, and the long slip are conspicuous from Tampa Bay as are two high radio towers near the W end of Gandy Bridge Causeway and the stacks of the powerplant on Weedon Island. The terminal facilities at Port Tampa are at the entrance and along both sides of a long dredged slip. These facilities were described under Tampa wharves, earlier in the chapter.

Gandy Highway Bridge (U.S. Route 92), crossing Old Tampa Bay about 1.5 miles N of Port Tampa, has twin fixed spans with a clearance of 43 feet through the opening about 1 mile W of the Interbay Peninsula shore.

In October 1980, numerous submerged pilings were reported about 0.2 mile S of the E end of the bridge. Caution should be exercised in the area.

There are three small-craft facilities at the E end of Gandy Highway Bridge at **Rattlesnake.** Un-

marked channels lead to the basins. The marina on the N side of the bridge has covered storage facilities for boats to 65 feet. In April 1982, the reported controlling depth was 8 feet in the channel to the marina. Gasoline, water, ice, provisions, and open and covered berths with electricity are available.

An unmarked channel leads along the S side of the E end of Gandy Bridge approach to a shipyard at the head of the channel. In April 1982, there was reported to be 17 feet in the channel and 16 feet in the basin at the yard. The yard has a 1,000-ton floating drydock that can lift vessels to 240 feet long, 43 feet wide, and 16-foot draft for hull and engine repairs. There are complete repair facilities at the yard including machine, welding, joiner, paint shops, and a 100-ton floating crane. The yard builds wood and steel vessels and barges; dredging and salvage equipment is available. A liquid propane gas handling terminal for barges is on the S bank of the turning basin W of the shipyard.

A yacht basin at the E end of the channel has a 60-ton lift. Dry covered storage, gasoline, diesel fuel, electricity, marine supplies, and hull, engine, and electronic repairs are available.

A boatyard about 0.4 mile S of the bridge has a 60-ton lift. Electricity, water, dry covered storage, and hull and engine repairs are available.

South Gandy Channel leads along the S side of the fill at the W end of Gandy Bridge to **Snug Harbor,** where small craft can find good anchorage from storms. Open and covered berths with electricity and open and covered storage are available at several marinas and boatyards. Craft to 60 feet can be handled on a 40-ton marine hoist for hull, engine, and electronic repairs. Gasoline, water, ice, and marine supplies are available. The controlling depth in South Gandy Channel to the marinas is about 7 feet.

The approach to South Gandy Channel is from S, between shoals that can be avoided with a little care. When about 100 yards from the outer end of the highway fill, turn W and steer parallel with the fill, following the channel markers.

Along the E shore of Old Tampa Bay, N of Gandy Bridge, are several shallow basins suitable only for small craft. Most of these are privately marked.

The W. Howard Frankland Bridge (Interstate Route 75) and Causeway crosses Old Tampa Bay about 3 miles N of Gandy Bridge from just N of Beach Park to just S of Big Island on the W shore. The bridge across the main channel has a fixed span with a clearance of 44 feet. Two other bridges in the causeway crossing the S end of **Big Island Gap** have 44-foot fixed spans with a clearance of 6 feet.

Courtney Campbell Parkway (State Route 60) crosses Old Tampa Bay about 6 miles above Gandy Bridge. This is a causeway, mostly fill, with a total length of 8 miles. The causeway has four twin fixed span bridges. The main twin spans, near the middle of the causeway, have clearances of 40 feet. The three remaining twin bridges, two near the W end and the other near the E end of the causeway, have 35-foot spans with 10-foot clearances.

In January 1976, a shoal, bare at low water, was reported to extend across the E two-thirds of the channel above the twin spans 1 mile E of the W end of the causeway.

Safety Harbor is a health resort town on the NW shore of Old Tampa Bay 2 miles N of the Courtney Campbell Parkway. A draft of 8 feet can be taken to within 0.5 miles of the town landing.

In April 1982, a reported depth of about 1½ feet could be taken to the small basin on the S side of the large waterfront fill 1.6 miles N of the Courtney Campbell Parkway; depths of 3 feet were reported in the basin. Berths with water and electricity are available.

At the head of Old Tampa Bay about 1 mile N of the town of Safety Harbor is the entrance to a large bight also known as Safety Harbor. A draft of 6 feet can be taken into the bight. An overhead power cable crossing the bight entrance from Booth Point to Philippe Point has a clearance of 98 feet. The town of **Oldsmar** is on the NE shore of the bight.

Charts 11414, 11413, 11410.–St. Petersburg, a large winter resort on the W side of Tampa Bay 6 miles S of Gandy Bridge, is the terminus of the Seaboard System Railroad, and major highways connect it with all parts of the State. The Gandy Bridge and Frankland Bridge offer a short route to Tampa, and the Sunshine Skyway, a toll bridge, connects with points to the S.

St. Petersburg has a city hospital and several private hospitals. Gasoline, diesel fuel, water, ice, provisions, and marine supplies are available in quantity. Boats can be chartered and guides engaged. The St. Petersburg–Clearwater International Airport is N of the city, and the Albert Whitted Municipal Airport is on the E waterfront at the center of the city.

Prominent features.–The large Municipal Auditorium and the baseball stadium on the E waterfront S of the yacht basins, several large office buildings and hotels, radio towers, tanks, and the dome of a church are all prominent.

Channels.–A channel with dredged sections extends N for about 5.5 miles from deep water in lower Tampa Bay to an entrance channel leading W to basins at the Port of St. Petersburg and **Bayboro Harbor.** In June 1977, the controlling depth was 18 feet (20 feet at midchannel) in the two dredged sections leading N to the entrance channel, thence in June 1982, 17 feet to the Port of St. Petersburg, with 19 feet available in the basin except for shoaling to 12 feet in the NE corner, thence 15 feet to the basin at Bayboro Harbor with 7½ to 12 feet available in the basin.

A draft of 25 feet can be taken within 0.5 mile of St. Petersburg by following the main ship channel in Tampa Bay through the W reach leading to Port Tampa, then turning SW into the natural deepwater area extending toward St. Petersburg. The channels are marked by lights, daybeacons, and lighted and

unlighted buoys. Marked and unmarked fish havens are in the natural deepwater area NE of St. Petersburg.

Pilotage.-Pilots for St. Petersburg are obtained through the Tampa Pilot Association. (See pilotage for Tampa.)

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A city hospital and several private hospitals are in St. Petersburg.

St. Petersburg is a **customs port of entry.**

Port of St. Petersburg, the deepest and southernmost basin along the city waterfront, is about 500 yards long and 400 yards wide. In March-April 1976, the controlling depth was 15 feet in the dredged port basin. The Port of St. Petersburg's cement wharf with warehouse, along the N side of the basin, provides about 1,500 feet of berthing space with a reported 22 feet alongside and a deck height of 8 feet. Fresh water, electrical shore power connections, and telephone service are available. The wharf is used for the receipt of cement, lumber, and general cargo and the shipment of frozen and canned foods. Cargo is handled by rented mobile cranes or ships' gear. Limited warehouse facilities are available. A Coast Guard station and buoy depot are at the outer end of the basin.

Bayboro Harbor, which is entered from the inner end of the ship basin, is used by numerous fishing boats and other small commercial craft. In 1960, depths of 9 to 12 feet were in the harbor. Boatyards on the harbor can handle craft to 40 feet for complete repairs.

Oil terminals, marinas, boatyards, and other commercial landings are along the banks of **Salt Creek,** which empties into the S side of Bayboro Harbor. Controlling depths in the creek are about 8 feet to the first bend, thence 5 feet to about 100 yards E of the first bridge at Third Street South, which is the head of navigation. A marina near the head of navigation has a 20-ton mobile hoist that can haul out craft for complete repairs. Berths with electricity and water are available.

Northward along the St. Petersburg waterfront from the ship basin are the Municipal Pier and three yacht basins. The pier is a concrete structure about 0.5 mile long with a five-story concrete structure in the shape of an inverted pyramid at its outer end. Lights mark the NE and SE corners of the pier and the top of the inverted pyramidal structure. North Yacht Basin and Central Yacht Basin are on either side of the inner half of the pier. Both basins are enclosed by sea walls and provide excellent protection for vessels up to about 125 feet. Depths of about 10 feet are in North, Central, and South Yacht Basins. Gasoline, diesel fuel, water, ice, marine supplies, launching ramps, and open and covered berthage are available at the St. Petersburg Municipal Marina and the yacht club in Central Basin. North Yacht Basin is used exclusively as an anchorage area, but is reported to have poor holding ground. A marina manager is at the Municipal Marina; telephone, 813-893-7329.

Lights mark the ends of the moles on either side of the entrance to the Central Yacht Basin. A submerged obstruction, the ruins of a former railroad pier, S of the entrance channel is marked by a light. Numerous slips are on the N and W sides of the basin, and a public landing is on the W side. The St. Petersburg Yacht Club is in the Central Yacht Basin.

Coffeepot Bayou, 1 mile N of the Municipal Pier, affords good anchorage for small craft that can pass under Snell Isle Boulevard bridge, which has a 34-foot bascule span with a clearance of 6 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(4), chapter 2, for drawbridge regulations and opening signals.) The entrance channel is well marked with private daymarkers, and a depth of about 3 feet can be carried.

Smacks Bayou, about 1 mile NE of Coffeepot Bayou, has a depth of about 4 feet; the approach from the S is marked by private daybeacons. Inside, there is deeper water resulting from dredging to provide land fill. Any vessel able to enter and pass Overlook Drive Highway Bridge, which has a 38-foot fixed span with a clearance of 11 feet, will find good shelter. A marina just inside the entrance has gasoline, water, ice, and berthing for about 30 boats.

Bayou Grande, about 1.8 miles N of Smacks Bayou and about 3.3 miles S of the Gandy Bridge, empties into the W side of Tampa Bay. The depth into the bayou is about 2½ feet, but local knowledge is needed to carry the best water. The basins on the S side of the bayou entrance offer good protection for small boats during periods of very bad weather.

The center 100-foot section of the former Weedon Drive Highway Bridge crossing the N end of Bayou Grande has been removed, and the fixed portions of the bridge on either side of the channel remain as fishing piers. Above Bayou Grande, the waterway is known as **Riviera Bay.** A highway bridge at the W end of the bay has a 22-foot fixed span with a clearance of 10 feet.

Big Bayou is a mile S of the St. Petersburg ship basin. The entrance channel, marked by private daybeacons, has a depth of about 3 feet.

Bayou Bonita, a small-boat channel behind **Coquina Key (Lewis Island),** connects Big and Little Bayous. It is crossed by two highway bridges, each with a 40-foot fixed span and a pipeline attached. The minimum clearance is 9 feet. Overhead power cables crossing the bayou immediately N of each bridge have a minimum clearance of 36 feet.

Little Bayou is 2.5 miles S of the St. Petersburg ship basin. Two channels marked by private daybeacons lead into the bayou. A privately owned yacht basin is in the S part of the bayou.

Point Pinellas is the SE extremity of Pinellas Peninsula. A channel, marked by private daybeacons, leads to several launching ramps.

Charts 11414, 11410.-The Intracoastal Waterway leads from Sarasota Pass, across the lower part of

Tampa Bay, thence through **Boca Ciega Bay,** The Narrows, Clearwater Harbor, and St. Joseph Sound to Anclote Anchorage. The section of the Intracoastal Waterway from Tampa Bay to Anclote Anchorage passing through the waters described in this chapter and places along its route are discussed in chapter 12.

Bunces Pass (27°38.9'N., 82°44.4'W.), at the N end of Mullet Key, is a passage into the S part of Boca Ciega Bay from the Gulf, and through to Tampa Bay. It is unmarked and, in May 1982, had a reported midchannel controlling depth of about 3 feet over the bar at the Gulf entrance with greater depths inside. Local knowledge is necessary to use the pass. The Pinellas Bayway Bridge over the pass has a fixed span with a clearance of 19 feet. The Sunshine Skyway Bridge over the E end of the pass has a fixed span with a clearance of 16 feet at the center.

A stake-marked channel with a controlling depth of 3 feet leads from Bunces Pass to the S end of **Mullet Key Bayou.** Small craft can anchor in the bayou.

St. Petersburg Beach, N of Bunces Pass and about 5 miles N of Egmont Key Light (27°36.0'N., 82°45.6'W.), is a winter resort city that occupies most of the 5-mile-long barrier island known as **Long Key. Pass-a-Grille Beach, Don Ce Sar Beach,** and **Lido Beach** are sections of the resort city. A large hotel with four towers, other hotel and apartment buildings, the large gold dome of an aquatorium, and a church spire are prominent. Farther inland, a water tank in Gulfport and cupola to the NW can be seen from seaward.

Tierra Verde, immediately E of the S part of Long Key, is a winter resort on what was formerly **Pine Key** and formerly a part of **Cabbage Key.**

North Channel, immediately S of Long Key, is a dredged channel that leads over the bar from the Gulf and connects with **Pass-a-Grille Channel** which separates the S part of Long Key from Tierra Verde and joins the main channel of the Intracoastal Waterway at the N end of Tierra Verde. North Channel and Pass-a-Grille Channel are well marked by a lighted buoy, lights, and daybeacons. In July 1982, North Channel had a centerline controlling depth of 8 feet. **South Channel** leads to Pass-a-Grille Channel from the SW and passes E of Shell Key; it is unmarked and not recommended.

In Pass-a-Grille Channel the flood current sets N with an average velocity of 1.2 knots and ebbs S with an average velocity of 1.4 knots. (See Tidal Current Tables for daily predictions.)

In May 1982, it was reported that depths of 8 to 10 feet could be taken to the service wharf and marina on the island channel between Long Key and **Vina del Mar.** Berths, gasoline, diesel fuel, water, ice, marine supplies, and storage are available. A 20-ton mobile lift and other smaller lifts are available at the marina; complete hull and engine repairs can be made.

Mud Key Channel connects the island channel between Long Key and Vina del Mar with the main channel of the Intracoastal Waterway N of Vina del Mar. Submerged pilings of former private daybeacons may exist in the channel. Caution is advised. A bridge of the Pinellas Bayway from Long Key to the landfill E has a 19-foot fixed span with a clearance of 9 feet. About 500 yards E, another bridge over the main channel of the Intracoastal Waterway has a bascule span with a clearance of 25 feet at the center. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Blind Pass, about 4 miles N of North Channel, is a shallow pass from the Gulf to Boca Ciega Bay between the N end of Long Key and Treasure Island. Near the pass are several very prominent landmarks that include a large white 10-story apartment hotel, an aquatorium with a large gold dome S of the entrance, a large hotel with penthouse, and a church spire. The pass is used by local fishing boats and other small craft and, in May 1982, had a reported controlling depth of 3 feet. State Route 699 highway bridge crossing the pass near the inner end has a 22-foot fixed span with a clearance of 9 feet. Overhead power cables at the bridge have a minimum clearance of 30 feet. There is a marina on the W side of the Intracoastal Waterway about 0.2 mile S of its junction with the channel leading to Blind Pass. Marine supplies, covered dry storage, a 40-ton mobile hoist, and a forklift that can handle craft to 26 feet for hull and engine repairs are available.

Treasure Island is a winter resort with many hotels, motels, and other conveniences.

Chart 11410.–Treasure Island Causeway crosses Boca Ciega Bay from Treasure Island via Paradise Island and South Causeway Isles to the mainland at St. Petersburg. The causeway has a bascule span over the Intracoastal Waterway with a clearance of 8 feet. The bridgetender can be contacted on VHF-FM channels 12 (156.60 MHz) and 16 (156.80 MHz); call sign, WQZ 367. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The E and W openings between the mainland and South Causeway Isles and between Paradise and Treasure Islands have fixed spans with clearances of 4 and 5 feet, respectively.

Johns Pass, about 3 miles N of Blind Pass, between Treasure Island and **Sand Key,** affords passage for small craft from the Gulf to the N part of Boca Ciega Bay. A dredged channel leads from the Gulf of Mexico through Johns Pass thence N to the Intracoastal Waterway. In July-August 1983, the controlling depth was 6 feet to the bridge over the pass, thence 6 feet on the centerline to the junction with the Intracoastal Waterway. In January 1984, shoaling to 4½ feet was reported between Daybeacons 3 and 5. The entrance to the channel is marked by a lighted bell buoy, and the channel is marked by lights and daybeacons. A natural channel just inside the pass leads E to the Intracoastal Waterway; it is marked at its E end by a daybeacon. In Johns Pass the flood current sets NE at an average velocity of 2.0 knots and ebbs SW at an average velocity of 1.5

knots. (See Tidal Current Tables for daily predictions.)

State Route 699 highway bridge over the pass has a bascule span with a clearance of 25 feet at the center. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Numerous fishing piers are near Johns Pass Bridge.

Small-craft facilities inside and N and S of Johns Pass can provide berths, gasoline, diesel fuel, water, and ice. A large marina and two boatyards at **Madeira Beach** have marine railways and lifts, the largest of which is 0.8 mile NW of Johns Pass Bridge and can handle craft up to 45 feet long and 5 feet draft for hull and engine repairs. The northerly of the two boatyards is in a cove locally known as Snug Harbor.

Sand Key is a 12-mile-long barrier island that extends from Johns Pass to Clearwater Pass. The island has been developed as a winter resort and has several well-developed communities.

Prominent features.–The 1,000-foot fishing pier at **Redington Shores,** large apartment hotels with penthouses on the island, and the water tank at the Veterans Hospital at Bay Pines are all conspicuous.

Clearwater Pass, 12 miles N from Johns Pass, extends E from the Gulf between the N end of Sand Key and the S end of **Clearwater Beach Island.** The pass is crossed by County Route 699 highway bascule bridge with a clearance of 24 feet at the center. (See 117.1b, 117.240, and 117.467, chapter 2, for drawbridge regulations and opening signals.) The bridgetender can be contacted on VHF-FM channel 16 (156.80 MHz), call sign KFN 203, or by telephone (813-462-6000, ext. 6959).

There are many prominent features in the Clearwater area including a large white apartment hotel near the N end of Clearwater Beach Island, a tall water tank near the middle of the island, a large hotel on the island on the N side of the Clearwater Memorial Causeway, several tall radio towers, and several other prominent buildings. At Dunedin, 3 miles N of Clearwater, a large hotel, two tanks, and a stack are conspicuous.

A dredged channel leads from the Gulf through Clearwater Pass to a junction with the Intracoastal Waterway, and a dredged side channel leads N from just inside the pass along the E side of Clearwater Beach Island to a turning basin at the W end of Clearwater Memorial Causeway. In May 1982, the controlling depth was 7 feet to the highway bascule bridge (State Route 699) over the pass, thence 7½ feet to the Intracoastal Waterway except for shoaling to 6½ feet along the N flared edge at the junction with the waterway. In May 1982, the controlling depth was 5 feet at midchannel in the side channel to the turning basin, thence in 1980, 8 feet was available in the basin. The channels are well marked by lights and daybeacons. **Clearwater Pass Lighted Bell Buoy 1** (27°58.1'N., 82°50.7'W.) marks the entrance from the Gulf.

The **tidal current** in Clearwater Pass averages about 1.2 knots. The mean range of **tide** at Clearwater is 1.8 feet.

The city of Clearwater operates the City Pier and Municipal Marina at the turning basin at the W end of Clearwater Memorial Causeway. The marina can provide berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies. The **harbormaster** has his office at the marina and assigns berths. He can be contacted on VHF-FM channel 16 (156.80 MHz) or by telephone (813-462-6954) for marine information or berthing instructions. The Clearwater police boat is based at the marina. The Clearwater Coast Guard Station is at the Island Estates Marina on the N side of the causeway about 0.25 mile NE of the Municipal Marina.

Clearwater Harbor is a link in the Intracoastal Waterway, Caloosahatchee River, Fla., to Brownsville, Tex. Clearwater Harbor and the city of Clearwater are described in chapter 12.

Charts 11410, 11412.–St. Joseph Sound extends N from Clearwater Harbor nearly to Anclote Keys, and is separated from the Gulf for a part of the distance by narrow strips of beach known as **Caladesi Island** and **Honeymoon Island.**

COLREGS Demarcation Lines.–The lines established for St. Joseph Sound are described in 80.753, chapter 2.

Dunedin Pass, 3 miles N of Clearwater Pass at the opposite end of Clearwater Beach Island, is marked by private daybeacons. The reported controlling depth was 2 feet in May 1982.

A fish haven about 1.3 miles long and 300 yards wide and marked by private buoys is about 3 miles W of the pass.

Hurricane Pass, between Caladesi Island and Honeymoon Island, is subject to change, but in May 1982, it was reported that with local knowledge 3 to 5 feet could be carried. A light and daybeacons mark the pass.

A fish haven, 600 feet wide and 2,000 feet long on a N-S heading and marked by private buoys, is about 4.5 miles W of the pass.

Five miles off St. Joseph Sound the current floods N with a velocity of 0.4 knot and ebbs S with a velocity of 0.6 knot.

Anclote Keys, several in number, are about 13 miles N of Clearwater. **Anclote Keys Light** (28°10.0'N., 82°50.7'W.), 101 feet above the water, is shown from a brown square pyramidal skeleton tower enclosing a stair cylinder, on the S end of Anclote Key, the largest of the group. The trees on the S end of Anclote Key are rather tall and can be made out from well offshore.

Anclote Anchorage, between the keys and the mainland, offers good protection from W gales for vessels up to 7 feet in draft. The anchorage can be reached by passing either N or S of the keys, both passages being well marked. Vessels drawing more than 7 feet can anchor W of the keys where, though more exposed to W winds, the water shoals so gradually that the seas are never very heavy, and vessels with good ground tackle can ride out any-

thing but a hurricane. In Anclote Anchorage, the tidal current has an average velocity of 0.6 knot on flood and 0.8 knot on the ebb.

Anclote River empties into Anclote Anchorage over a broad shoal area. A radar installation and a tall powerplant stack on the N side of the entrance are conspicuous from the NW at a distance of 10 miles. The tall stack at the powerplant is marked by strobe lights.

A channel, with dredged sections and with its entrance about 1.75 miles SW of Anclote Keys Light, leads from the Gulf to a turning basin at Tarpon Springs. In December 1974, the centerline controlling depth was 7 feet from the Gulf to Anclote Anchorage; thence in January 1983, 7 feet (8 feet at midchannel) from the entrance to the turning basin with 7 to 8 feet available in the basin except for shoaling to 3 feet in the N part. The channel is marked by lighted ranges and numerous lights and daybeacons. Above Tarpon Springs the river is navigable for drafts of no more than 2 to 3 feet.

Anclote is a small town on the N bank of Anclote River about 1 mile above the mouth. A marina has gasoline, water, electricity, marine supplies, and a marine railway that can haul out vessels to 45 feet for hull and engine repairs. A TV tower marked by strobe lights E of town, and a large elevator and water tank at a chemical plant nearby, can be seen for 10 miles; the tank has a light on top.

Tarpon Springs is a winter resort and commercial fishing center on the S bank of Anclote River, 3 miles above the mouth. Two water tanks in the town are visible from several miles offshore. Tarpon Springs, headquarters for the sponge fishing fleet on the W coast of Florida, has a municipal hospital, and rail and highway connections to all parts of the State. The municipal landing is a marginal wharf 330 feet long at the Sponge Exchange, just below the Alternate U.S. Route 19 highway bridge.

There are several small-craft facilities and a yacht club at Tarpon Springs. The largest marine railway in the area, on the S side of the channel W of Alternate U.S. Route 19 highway bridge, can handle craft up to 100 feet for engine and hull repairs. Craft up to 90 feet are built. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, dry open or covered storage, electronic repairs, and lifts are available. The yacht club is on the E bank of Tarpon Bayou opposite Chesapeake Point. The mean range of **tide** at Tarpon Springs is 1.9 feet.

Alternate U.S. Route 19 highway bridge with a 40-foot fixed span and a clearance of 10 feet crosses Anclote River about 3 miles above the mouth at Tarpon Springs. A railroad bridge with a 28-foot fixed span and a clearance of 16 feet is about 1 mile upstream of the highway bridge.

Kreamer Bayou and **Whitcomb Bayou** empty into Anclote River along the W side of Tarpon Springs. The junction is at the N end of a small island; the river channel passes to the E of the island, and Anclote River South Channel to the bayous passes to the W. The South Channel branches at Chesapeake Point into Kreamer Bayou on the W and via Tarpon Bayou into Whitcomb Bayou on the E. The channel to Kreamer Bayou has shoaled, and only small skiffs can enter. The highway bridge over Tarpon Bayou (South Channel) has a 25-foot bascule span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(5–a), chapter 2, for drawbridge regulations and opening signals.) The clearance of the nearby overhead power cable is 38 feet. A public wharf and launching ramp are S of the entrance to **Spring Bayou,** the E arm in Whitcomb Bayou; and another public wharf is at the yacht basin at the entrance. A draft of 3 feet can be carried from Anclote River through Whitcomb Bayou, which is centrally located in the town of Tarpon Springs.

Chart 11409.–The shoals that extend over 10 miles offshore along the coast for 40 miles N from Anclote Keys are known under the general name of **St. Martins Reef.** Many of the rocks and shoals are marked by private daybeacons. The outer limit of shallow water and detached shoals is marked by **St. Martin Outer Shoal Light 10** (28°26.0′N., 82°55.0′W.), 16 feet above the water and shown from a dolphin with a red triangular daymark.

Strangers should approach the coast with care, and deep-draft vessels should stay in depths of 30 to 35 feet. Small craft of 3 to 4 feet in draft usually follow the coast more closely, especially during windy weather, and find comparatively smooth water by keeping about 7 miles offshore. Hazy atmosphere frequently obscures this section of the coast, and the vessels standing inshore close enough to sight land are mostly spongers and fishermen, who sometimes anchor in shoal water, soft bottom, behind shell reefs and ride out the heaviest gales.

Two privately maintained and marked channels, about 3.5 and 4 miles N of Anclote River, respectively, lead E to a private housing development known as **Gulf Harbor.** No known services are available.

An unmarked fish haven is about 7 miles W of the entrance to Pithlachascotee River, and fish havens marked by private buoys are about 11.5 and 15 miles W of the river entrance.

Pithlachascotee River, locally known as the **Cotee River,** empties into the Gulf 7 miles N of Anclote River. The river has an extensive shoal area off the mouth and numerous oyster reefs just inside. A dredged channel, marked by lights and daybeacons, leads from the Gulf to a turning basin just below the first bridge at Port Richey, about 1.2 miles above the mouth. In June-July 1977, the controlling depth was 5½ feet to the basin with depths of 5½ to 6 feet in the basin. Depths of about 4 feet can be carried across the shoals to the channel entrance. Depths of 2 feet and greater can be carried to New Port Richey with local knowledge.

Three bridges cross the Pithlachascotee River. The first bridge, U.S. Route 19 highway bridge about 1.2 miles above the mouth, has a 48-foot fixed span with a clearance of 13 feet. An overhead power

cable with a clearance of 69 feet is close W of the bridge. An overhead power cable about 2 miles above the mouth has an estimated clearance of 40 feet. The second bridge, a highway bridge about 2.7 miles above the mouth, has a 32-foot fixed span with a clearance of 10 feet. The third bridge, a highway bridge about 3.6 miles above the mouth, has a 27-foot fixed span with a clearance of 6 feet; overhead power and telephone cables 0.25 mile E of the bridge have a clearance of 38 feet. In January 1984, a fixed highway bridge with design clearances of 10 feet vertical and 27 feet horizontal was under construction about 0.25 mile above the third bridge.

Port Richey is a small town at the entrance to the river. Several small marinas and a boatyard are here. The boatyard on the N side of the river just below the first highway bridge about 1.2 miles above the mouth has a marine railway that can handle craft up to 40 feet for engine, hull, and electronic repairs. There are marinas just below the same highway bridge that have gasoline, diesel fuel, water, ice, berthage, launching ramps, and marine supplies. Shrimp boats operate from the river.

New Port Richey is a small town about 2.5 miles above the mouth of Pithlachascotee River. The municipal water tank at the town is prominent from offshore. There is a small public wharf and launching ramp at the town. Gasoline, oil, water, ice, and provisions are available in the town but not on the waterfront.

Hudson is a small town on Hudson Creek, which empties into the Gulf 12 miles N of Anclote River. In May 1982, the entrance channel had a reported controlling depth of about 1 foot. The channel is marked by a private light and daybeacons. Berths, water, ice, covered dry storage, and forklifts that can handle craft to 27 feet are available. Gasoline and diesel fuel are available by truck.

Aripeka is a village on **Hammock Creek,** 17 miles N of Anclote River. There are numerous deep springs and shoals in the creek, which has a depth of about 1 foot. The approach to Aripeka is marked by a private light and daybeacons. The highway bridges over the channels around the N and S sides of the island, in the middle of the creek, have fixed spans with a clearance of 2 to 3 feet. There are fish camps on the creek. Gasoline in cans, water, ice, and provisions are available at the N of the two highway bridges. The village, on State Route 595, has a launching ramp.

Hernando Beach is the site of a large housing development 20 miles N of Anclote River. Gasoline, diesel fuel, water, ice, provisions, a launching ramp, and a forklift capable of hauling out craft to 25 feet for hull and engine repairs are available. The approach channel is marked by a private light and daybeacons and can be followed by keeping several yards S of the jetty and fill spit. The channel had a reported controlling depth of 2½ feet in May 1982.

Bayport is a village at the mouth of **Weeki Wachee River,** 23 miles N of Anclote River. On a favorable tide a draft of about 2 feet can be taken to a small marina about 1.5 miles above the mouth. Gasoline, water, ice, marine supplies, and outboard engine repairs are available. Bayport Channel Approach Light BP (28°32.8′N., 82°42.4′W.) marks the approach to the channel to Weeki Wachee River. **Beacon Rock,** close N of the light, covers at high water and is marked by a private daybeacon. The remainder of the channel is marked by private daybeacons and a light, and continues in a generally E by S direction through the oyster reefs and into the river. A public launching ramp and wharf are near the N side of the river entrance.

Chassahowitzka River empties into **Chassahowitzka Bay** 31 miles N of Anclote River. On a favorable tide a draft of about 2 feet can be taken into the river. The channel is marked by a light and private daybeacons. From Johns Island to the village of Chassahowitzka, the river is shallow and partly blocked by grass and during the summer by hyacinths; the depth is about 1½ feet. **Chassahowitzka** is a small fishing village with a lodge, cabins, and a trailer park; a road connects with the State highway. Berthing, gasoline, water, ice, limited marine supplies, and a launching ramp are available.

Bird Island is prominent in the entrance to Chassahowitzka Bay. **Black Rock,** 1.3 miles seaward from the island, bares at half tide. **Chassahowitzka Point,** on the N side of the bay, is a high and conspicuous mangrove key.

Homosassa River empties into **Homosassa Bay** 37 miles N from Anclote Keys Light. **St. Martins Keys** are prominent mangrove islets on the N side of the bay entrance. In 1966, an obstruction consisting of a bent railroad track rail was reported about 2.6 miles W of South Point of St. Martins Keys and about 5 miles off the entrance to the river. In June 1981, a rock awash was reported about 2.7 miles W of Homosassa Bay Entrance Light 2, in about 28°41′36″N., 82°51′42″W.

Homosassa is a small fishing community 4 miles above the mouth of the river. Several commercial fish houses, a public pier for transient craft, and marinas are here; berths with electricity, gasoline, ice, marine supplies, covered dry storage, launching ramps, and a forklift capable of hauling out craft to 26 feet for engine repairs are available. A launching ramp and berths are available just inside the entrance to Halls River, which empties into the N side of Homosassa River about 1 mile above Homosassa. A highway leads from Homosassa to the town of Crystal River.

In August 1982, the controlling depth was 2½ feet from Daybeacon 24 to Homosassa. In May 1982, a reported depth of 3 feet could be taken to **Homosassa Springs,** about 2.3 miles above Homosassa. **Homosassa Bay Entrance Light 2** (28°41.4′N., 82°48.7′W.), about 3.3 miles SW of the entrance to the channel, marks the approach. The river entrance is clearly marked by lights and daybeacons. Shoals on either side of the channel are discernible by their lighter color. The river channel is marked by daybeacons.

The overhead power cables crossing Homosassa River below Homosassa have a reported least clearance of 45 feet.

Manatees.–Regulated speed zones for the protection of manatees are in Homosassa River. (See Manatees, chapter 3.)

Crystal River empties into the N side of **Crystal Bay,** 46 miles N of Anclote Keys Light and 23 miles SE from the town of Cedar Keys. **Mangrove Point,** on the S side of the entrance to the bay, is prominent in the approach from the SW. The white shell of **Shell Island,** on the S side of the river's entrance, is prominent when approached from the dredged channel across Crystal Reefs.

A marked channel with dredged sections leads from the Gulf through Crystal Bay and Crystal River to **Kings Bay** and the town of Crystal River at the river head. From **Crystal River Approach Lighted Buoy 2** (28°47.5'N., 82°58.6'W.), a course of **048°** leads to Approach Daybeacon 3, thence a course of **081°** leads to Entrance Light 1A at the entrance to the dredged section through **Crystal Reefs.** If approaching the river from S, keep at least 5 miles off the outer islands until reaching Approach Daybeacon 3. The channel through Crystal Reefs to the mouth of the river on the N side of Shell Island is marked by daybeacons. In May 1982, the centerline controlling depth was 4½ feet. In September 1982, shoaling to bare was reported in the vicinity of Crystal River Entrance Light 1A and Entrance Daybeacon 2. During periods of prolonged NE winds, depths in the river may be lowered 1 to 2 feet below normal levels. The channel in the river is unmarked from just above the mouth to Kings Bay. Depths of about 6 feet can be carried. The best water is reported to be in the middle of the river, but local knowledge is necessary and a lookout for shoals must be maintained.

Salt River joins Crystal River about 4 miles above the mouth. An overhead power cable with a clearance of 47 feet crosses the entrance to Salt River. Berths, gasoline, and hull and engine repairs are reported available at a marina just above the entrance. Water is available on the N side of Crystal River, 5 miles above the mouth.

The town of **Crystal River,** at the head of the river 6 miles above the mouth, has rail freight and highway connections. Several commercial fish houses, marinas, and boatyards are at Crystal River in the coves on the NE side of Kings Bay. When entering the coves, keep close W of the small island in the entrance. In May 1982, it was reported that 3 to 4 feet could be carried into the coves; caution is advised. Overhead power cables crossing the coves have a least clearance of 32 feet. Berths, electricity, gasoline, diesel fuel, water, ice, provisions, marine supplies, storage, and launching ramps are available; a marine railway can haul out craft to 60 feet for hull and engine repairs and dry open or covered storage. A **no-wake idle speed** is enforced in the coves.

The mean range of tide at the mouth of the river is about 2.5 feet.

Manatees.–Regulated speed zones and a motorboat prohibited area for the protection of manatees are in Kings Bay. (See Manatees, chapter 3.)

Chart 11408.–A privately dredged channel, marked by private lights, leads E from the Gulf for about 14 miles to a turning basin at the Florida Power Corporation's Crystal River powerplant about 2 miles NW of Crystal River entrance. In May 1982, the channel had a reported controlling depth of 20 feet. The inner end of the channel is protected by two dikes extending to shore. The N dike is about 3 miles long, and the S dike about 2 miles long. Spoil banks extend along the N side of the channel for about 3.5 miles seaward from the end of the N dike. Two stacks on the N side of the turning basin, two 600-foot stacks in about 28°58.0'N., 82°41.8'W., a cooling tower, and the powerplant are conspicuous. A radiobeacon is about 0.7 mile N of the turning basin. The stacks at the turning basin, with alternating bands of white and red, are marked on top by flashing red lights, and by fixed and flashing red lights on the lower section. The 600-foot stacks and the cooling tower are marked by strobe lights. The powerplant has a T-head pier with 500 feet of usable berthing space and 20 feet reported alongside. The pier is used to unload coal from barges. Fresh water and electrical shore-power connections are available.

Cross Florida Barge Canal, with an indefinite completion date, enters the Gulf about 2.5 miles N of the Crystal River powerplant. The 8.5-mile approach channel, marked by lights and daybeacons, can be approached by way of the two outermost reaches of the powerplant entrance channel which are almost in line with the barge canal channel. In October 1981, the approach channel had a centerline controlling depth of 11 feet. The canal will be primarily for barge traffic, but will also be open to pleasure and fishing boats. It will extend from the Gulf for 93 miles to the St. Johns River at a point about 12 miles S of Palatka, 60 miles S of Jacksonville, and 81 miles above the entrance to the river from the Atlantic Ocean. The canal will have a Federal project depth of 12 feet and will have five navigation locks.

Withlacoochee River rises in the central part of the Florida Peninsula and empties into the Gulf about 17 miles SE of Cedar Keys. **Withlacoochee River Entrance Light 1** (28°58.1'N., 82°49.8'W.), 16 feet above the water and shown from a pile with a green square daymark, marks the approach.

A dredged channel leads from the Gulf to **Croom,** 74 miles above the mouth. In March 1981, the controlling depth was 5½ feet on the centerline to the powerplant and turning basin at Inglis, thence in 1977-March 1981, 4 to 6 feet in the basin, thence in 1975, 4 feet to the powerplant spillway and to Stokes Ferry, 11 miles and 36 miles, respectively, above the mouth, and thence 1½ feet to Croom. The entrance channel is marked by lights and daybeacons. Above the entrance the river channel is marked by stakes or private daybeacons.

U.S. Route 19 dual highway bridges crossing the river at Inglis have 38-foot fixed spans with clearances of 10 feet. Floating logs and other debris

partially obstruct the channel above Inglis making it passable by small boats only.

A spillway obstructs the river about 11 miles above the entrance. Vessels desiring to go above the spillway must enter the barge canal and be locked through. The pool created by the spillway extends to **Dunnellon,** 24 miles above the mouth.

Port Inglis was a town at the mouth of the river which has been abandoned; only a few scattered ruins remain. A public launching ramp and park are on the N side of the entrance. A marina, in a basin on the N bank of the river about 2 miles above the mouth, has a marine railway that can handle craft to 45 feet for hull and engine repairs or dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, and covered and open berthage with electricity are available.

Yankeetown, the principal town on the river, is a small winter resort and fishing village 3 miles above the mouth. A city boat basin with a launching ramp, several fish camps with wharves, and a seafood receiving plant are at the town. A **Coast Guard** station is at Yankeetown. State Route 40 connects the town and the marina below it, with the main coastal highway, U.S. Route 19, at Inglis.

Inglis is a small town 7 miles above the mouth of the river. Gasoline, oil, water, and provisions are obtainable. Overhead power cables crossing the river in the vicinity of the powerplant have a minimum clearance of 40 feet.

Tides and currents.–The mean range of tide is 2.5 feet. Off the mouth of the river a tidal current sets E during the flood and W during the ebb. The ebb has a reported velocity of 3 knots at times, and this must be taken into account by vessels coming in from the entrance buoy. A strong NE wind may increase the velocity of the ebb current, and a SW wind may decrease it.

Manatees.–Regulated speed zones and a caution zone for the protection of manatees are in the Withlacoochee River and its approaches. (See Manatees, chapter 3.)

Waccasassa River, 10 miles N of Withlacoochee River, has the extensive **Waccasassa Reefs** off its entrance. A channel marked by private daybeacons leads E of the reefs and, in May 1982, had a reported controlling depth of 2 feet with greater depths inside the river. A public launching ramp and a marina are on the N shore about 4 and 4.3 miles, respectively, above the mouth. The marina is in a small basin. Gasoline, berths, water, ice, some marine supplies, and a launching ramp are available.

Cedar Keys, 95 miles N of Tampa Bay, are a group of low sandy islets covered with mangrove trees. Prominent from offshore is the white tower of the abandoned lighthouse on **Seahorse Key,** the outermost of the group. The tower, which is flanked by two white-roofed buildings, shows to seaward among the trees; the tower is 30 feet high and stands on a 45-foot mound on the S side of the key. **Seahorse Reef,** a dangerous shoal with little depth over it, extends 11 miles SW from Seahorse Key. The outer end of the reef is marked by **Seahorse Reef Light** (28°58.5'N., 83°09.2'W.), 43 feet above the water and shown from a white triangular pyramidal skeleton structure on piles. A lighted whistle buoy is about 3.8 miles SW of the light.

Main Ship Channel, a dredged channel, leads from the Gulf in a general NE direction between East Bank and West Bank, E of Seahorse Key and Grassy Key; thence by a crooked and winding channel W of Atsena Otie Key into Cedar Key Harbor. In April 1981, the centerline controlling depth was 5½ feet. The channel is well marked by lights and daybeacons. Extreme caution must be exercised at two hairpin curves.

Northwest Channel, a dredged channel, leads from the W between North Bank and South Bank. In April 1981, the centerline controlling depth was 2½ feet from the entrance to the Main Ship Channel. In September 1983, shoaling to 2 feet was reported in the channel in the vicinity of Daybeacons 21 and 22. The channel is marked by lights, daybeacons, and an approach light. Small craft bound up the coast should enter by Main Ship Channel and leave by Northwest Channel rather than cross Seahorse Reef. In May 1982, local fishermen reported a controlling depth of 4 feet in **Deadmans Channel,** a natural channel, which is unmarked and should not be used without local knowledge.

South Bar Channel, the approach channel to Cedar Key from the E, had a reported depth of about 2½ feet in May 1982. The channel is marked by an entrance light and several daybeacons.

Fog.–This area has considerable fog during the winter; S winds bring it in, and N winds clear it away.

Tides and currents.–The mean range of tide at Cedar Keys is 2.6 feet. Outside the entrance channel the current sets E on the flood and W on the ebb. Inside, the currents generally follow the channels. Currents are strong in the vicinity of the city dock, and caution must be observed when docking with a fair current.

Cedar Key is a small town on **Way Key.** The most prominent object in the town is the municipal water tank, 140 feet high. A radio tower is nearby. In May 1982, it was reported that a draft of about 8 feet could be taken through the main channel to the city dock which had reported depths of 8 to 15 feet alongside; a depth of 4 feet was reported alongside the fuel pier. Gasoline, diesel fuel, water, ice, and some supplies for small boats are available. A circular boat basin, accessible through a causeway with an estimated clearance of 3 feet, is also used by small boats at Cedar Key.

A marina in the small cove just NE of the city dock can provide berths, gasoline, diesel fuel, water, ice, electricity, and marine supplies. In May 1982, a reported depth of about 3 feet could be carried in the privately marked channel leading to the marina.

The **Cedar Key State Memorial and Museum** is on the W side of Way Key. An airstrip is here. Several launching ramps are available.

Suwannee Sound, 7 miles N from Cedar Keys, has a long line of narrow shoals on the seaward side

known as **Suwannee Reef.** The sound is about 8 miles long and has an average width of about 3 miles. The principal entrance to Suwannee Sound is through **Derrick Key Gap,** a dredged channel 4 miles NW from Cedar Keys. In 1962, the centerline controlling depths were 5 feet from Suwannee Sound South Entrance Daybeacon 5 to Derrick Key Gap Channel Daybeacon 2, thence in 1977, 3 feet in Derrick Key Gap channel. The channel is marked by daybeacons. The passage through Suwannee Sound from Derrick Key Gap is W of **Lone Cabbage Reef,** which extends about 2.3 miles NW from **Lone Cabbage Island.** Lone Cabbage Reef bares in spots at low water and is to be avoided.

Steamboat Gap, Ranch Bar Gap, and **West Gap,** unmarked secondary channels with depths of 4 feet or less, should not be entered without local knowledge. **White Shell Bar Gap,** about 1 mile NW of Ranch Bar Gap, has a controlling depth of about 3 feet through an unmarked channel.

Suwannee River empties into the N part of Suwannee Sound through the three mouths known as **East Pass, West Pass,** and **Wadley Pass.** Wadley Pass is the main entrance. West Pass is unmarked, little used, and good only for shallow-draft boats. East Pass is closed due to shoaling.

The entrance channel to Wadley Pass, dredged by the Suwannee River Authority, leads on a bearing of 102° from a point in the Gulf about 1.4 miles 260° from **Axe Island** (29°18.8'N., 83°10.5'W.), thence through Wadley Pass S and E of **Little Bradford Island** to its junction with West Pass. At the SE end of Little Bradford Island, a branch channel leads N through **Northwest Pass,** thence NE into **Salt Creek** to the village of **Suwannee.** Suwannee is also fronted on its E side by the Suwannee River. In September 1979, the centerline controlling depths were 1½ feet in the entrance channel and Wadley Pass to its junction with West Pass, thence 1½ feet in Northwest Pass and Salt Creek to Suwannee. A depth of 2½ feet may be carried through the entrance channel and passes with local knowledge. Private lights and daybeacons mark these channels.

There is little commerce on the river.

The mean range of **tide** at the mouth of the river is 2.4 feet. Fluctuations are extreme because of freshets. Low river stage occurs in the winter, and high river stage in the fall months.

Once inside the river the centerline controlling depths, in April-May 1977, were 1½ feet from the junction of East and West Passes (29°19.0'N., 83°07.2'W.) to **Fanning,** about 26 miles above the junction, thence in 1977, 3 feet to **Ellaville,** 109 miles above the junction. At high water stages small boats can go to **White Springs,** 147 miles above the junction.

An unmarked sandbar, locally known as **Jack's Sandbar,** is about 13.7 miles above the junction of East and West Passes. The bar is about 800 yards long and 200 yards wide in places, and is said to cover almost two-thirds of the E side of the river. Depths over the bar range from less than 1 foot to 3 feet. The bar is not discernible because vegetation colors the water a dark brown. It can best be avoided by passing close to the W shore to within 75 to 100 feet of the shore vegetation.

Marinas in the dredged canals on the N side of Suwannee River at the town of Suwannee can provide berths, gasoline, diesel fuel, launching ramps, marine supplies, and hull, engine, and electronic repairs. There are marinas, several fish camps, fish wharves, and a seafood packing plant at the town on Salt Creek. Berths, gasoline, a limited supply of water, and launching ramps are available. Minor hull and engine repairs can be made. There is a post office at the town, and State Route 349 connects the town with Old Town on the main coastal highway.

Water is available at a fish camp at **Vista** about 7.5 miles above the junction of East and West Passes. Gasoline, water, a launching ramp, and marine supplies can be obtained at **Fowlers Bluff** (Fowler Bluff), 10 miles above the junction of East and West Passes; at **Manatee Springs State Park,** 16 miles above the junction; and at **Old Town** at U.S. Route 19 highway bridge, 25 miles above the junction. This bridge, the first above the mouth, has a fixed span with a clearance of about 30 feet at low water stage and 15 feet at high water stage. The minimum channel clearance of the bridges crossing the river is at the Seaboard System Railroad Bridge at **Old Town** and 28 miles above the junction of East and West Passes. This bridge has a swing span with a channel width of 48 feet and a clearance of 5 feet at high water stage and 15 feet at low water stage. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(6), chapter 2, for drawbridge regulations and opening signals.) An overhead pipeline and numerous overhead power cables cross Suwannee River between the mouth and Ellaville, least clearance is 23 feet.

Boiler Gap, about 1 mile 290° from Axe Island, was formerly used as a passage by local boats going up Salt Creek to Suwannee. The channel through Northwest Pass is now used.

Chart 11407.-Horseshoe Beach is a village on **Horseshoe Point,** which is 5 miles WNW from Shired Creek. The village has a seafood packing plant, several fish wharves, a county wharf, and is a shrimp boat base. State Route 351 connects the village with **Cross City** on U.S. Route 19, the main coastal highway. **Horseshoe Beach Approach Light 2** (29°23.3'N., 83°20.4' W.), 16 feet above the water and shown from a dolphin with a triangular red daymark, marks the approach. A dredged channel leads from the Gulf to a turning basin at the 100-foot marginal county wharf. In September 1981, the centerline controlling depth was 2½ feet in the channel with 2 to 4 feet in the basin. The channel is marked by lights and daybeacons. A branch channel leads from the turning basin around Horseshoe Point to a basin on the N side of the point. This channel is marked by private stakes.

Spoil banks are on either side of the entrance channel about in the middle of the dredged cut. In

January 1981, a sunken wreck was reported about 3.5 miles SSW of the entrance light in about 29°20'N., 83°22'W. A fish haven is about 6 miles SE of the entrance light. There are fish wharves on a dredged basin that extends about 1,000 feet NE from the E end of the turning basin. There is a boatyard at the head of the basin with a marine railway that can handle craft up to 50 feet for hull and engine repairs. Berths, gasoline, diesel fuel by truck, wet and dry covered storage, water, ice, marine supplies, and a launching ramp are available.

Overhead power cables leading from the mainland at Horseshoe Beach to offlying Grassy Island, Bird Island, and Cotton Island have clearances of 34 feet.

Pepperfish Keys, about 5 miles NW of Horseshoe Point, are the only features that a stranger can recognize between Cedar Keys and St. Marks River. Pepperfish Keys are 0.3 to 1 mile off the mainland and can be made out at a distance of 5 to 6 miles. The white sand beach on the northwesternmost key is easily identified. Protected anchorage is available for small craft N of this key where depths are 3 to 10 feet and the bottom is sand with patches of boulders. The approach to the anchorage is through an unmarked channel that extends in an ESE direction. Boats of less than 3 feet in draft can enter by keeping in dark water; the shoals are discernible by lighter color.

Steinhatchee River empties into **Deadman Bay** about 15 miles NNW of Horseshoe Point. **Steinhatchee River Light 1** (29°39.4'N., 83°27.4'W.), 30 feet above the water and shown from a square pyramidal tower on piles with a square green daymark, marks the entrance. A dredged channel leads through Deadman Bay to a turning basin at the seafood plants on the S bank of the river about 2 miles above the mouth. In July 1982, the centerline controlling depth was 4 feet in the entrance channel with 3 to 6 feet in the basin. Lights and daybeacons mark the channel. A water tank at Steinhatchee is reported to be prominent from seaward.

A fish haven, marked by private buoys, is about 9 miles W of the light marking the entrance to Steinhatchee River.

Steinhatchee is a small village and fishing resort on the N bank of the river about 1.2 miles above the mouth. It is the base for a commercial fishing fleet. There are marinas with boat lifts and several fish camps. Craft up to 23 feet can be handled for hull and engine repairs, or open or covered storage. Berths, electricity, gasoline, diesel fuel, water, marine supplies, ice, provisions, and launching ramps are available. On the S bank of the river about 0.5 mile above Steinhatchee are seafood packing plants and two private boatyards. Craft up to 50 feet can be handled in an emergency.

State Route 358 highway bridge, 2.2 miles above the mouth, has a 45-foot fixed span with a clearance of 25 feet. At **Jena,** about 3 miles above the mouth, there is a fish packing house. Overhead power cables 0.8, 1.6, and 2.5 miles above the bridge have clearances of 43, 43, and 40 feet, respectively. There are several fish camps on the river above Jena. State Route 358 connects Jena with the main coastal highway, U.S. Route 19. State Route 51 runs along the N bank of the river to the main highway. State Route 361 runs along the coast as far as Adams Beach and joins U.S. Route 19 a few miles S of **Perry.**

Dallus Creek, 5 miles NW from Steinhatchee River, has a bar across its mouth that bares at low water. Small boats of not more than 2 feet in draft use the creek as far as **Dallus Creek Landing** a mile above the mouth, where a road connects with the main highway.

The pine trees on **Piney Point,** 10 miles NW from Steinhatchee River, are visible from well offshore on a clear day. Several small villages N of Piney Point have roads connecting with State Route 361 and the main U.S. Route 19 coastal highway, but offer no supplies. The village of **Fish Creek** is 0.5 mile above the mouth of Fish Creek, 2 miles N from Piney Point.

A data tower marked by a private light is 10.4 miles WSW of Piney Point in about 29°42'28"N., 83°46'21"W. Mariners are advised not to pass within 150 feet of the tower to avoid its guy wires.

Cedar Beach on **Cedar Island,** about 13 miles NW of Steinhatchee and about 3 miles N of Piney Point, has a boat ramp and a fishing pier for the use of Cedar Island residents. Fresh water is available. The approach is marked by a private light and daybeacons.

Keaton Beach, a fishing village 4 miles NW of Piney Point, is reached through a small-boat channel that had a reported controlling depth of 3 feet in May 1982. The approach is marked by a private light and daybeacons. Small docks and several marinas are at the village. Berths, gasoline, diesel fuel, water, ice, a launching ramp, marine supplies, and hull and engine repairs are available as well as a hoist that can handle craft up to 40 feet.

Jug Island, a summer resort 5 miles NW of Piney Point, has a small-boat wharf. **Dekle Beach,** about 0.5 mile N of Jug Island, has a boat ramp, rental cottages, and a grocery store. **Adams Beach** is 8 miles N from Piney Point. **Yates Creek Landing** and **Spring Warrior** are small landings on the creeks of the same names 9 and 11 miles, respectively, NNW from Piney Point. A fish camp is about 0.5 mile above the mouth of the Spring Warrior Creek on the N side. Berths, gasoline, ice, provisions, and a launching ramp are available. The creek is marked by a private light and piles and is reported navigable by craft drawing 3 feet on a favorable tide.

Fenholloway River empties into the Gulf of Mexico E of Apalachee Bay and about 17 miles NW of Piney Point. A draft of 3 feet can be taken into the river on a favorable tide, but a knowledge of local conditions is needed. A private light marks the W side of the entrance to the river. The river is navigable for only a few miles above the mouth. About 2 miles above the river's mouth is a small-boat landing but no supplies are available. A paved road connects the landing with U.S. Route 98 at

Hampton Springs where gasoline and supplies are available.

6. APALACHEE BAY TO MOBILE BAY

This chapter describes the coasts of Florida and Alabama bordering the Gulf of Mexico from Apalachee Bay to Mobile Bay and the numerous bodies of water emptying into the Gulf including Apalachee Bay, St. George Sound, Apalachicola Bay, St. Joseph Bay, St. Andrew Bay, Pensacola Bay, and their tributaries. Also discussed are the ports of Port St. Joe, Panama City, and Pensacola, and other smaller ports and landings.

The Intracoastal Waterway for this section of the coast is described in chapter 12.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.805, through 80.815, chapter 2.

Charts 11400, 11360.–The coast consists of a chain of generally narrow and wooded sand islands that trends SW for about 40 miles from Apalachee Bay to Cape St. George, thence NW for 95 miles to Choctawhatchee Bay, and thence about 80 miles W and SW to Mobile Bay.

A **danger zone** for a guided missile test operations area extends well offshore between Apalachee Bay and Choctawhatchee Bay. (See 204.135, chapter 2, for limits and regulations.)

Caution.–Mariners engaged in bottom dragging operations are advised that the area between 29°23.5'N. and 29°50.5'N. and from 86°36.5'W. to 86°48.0'W., has previously been used for emergency release of munitions, and unexploded munitions are lying on the bottom.

From Apalachee Bay to St. Andrew Bay, the 10-fathom curve extends as much as 19 miles offshore; shoals with as little as 3 feet over them extend several miles from the E end of St. James Island, from Cape St. George, and from Cape San Blas. From St. Andrew Bay to Pensacola Bay the 10-fathom curve is close inshore and the beach is steep-to. The 10-fathom curve gradually extends farther offshore beyond Pensacola Bay until off Mobile Bay where it is about 11 miles offshore.

The coral formation which characterizes the coast from the Florida Keys to Apalachee Bay begins to give way in the vicinity of Cape St. George and Cape San Blas to the sand formation to the W.

Weather.–Along the coast from Apalachee Bay to Mobile Bay, navigational weather hazards include tropical cyclones, thunderstorms, and cold fronts. The tropical cyclone season generally runs from June through November. August and September have been the most likely months for a hurricane. During the past 100 years, some 26 hurricanes have crossed the coast between St. Marks and Mobile; 15 of these crossings occurred in August or September. There were some severe hurricanes in the early 1900's. In September 1975, Eloise generated 110-knot winds, nearly 15 inches of rain, and 12- to 16-foot tides along this coast.

Thunderstorms develop on about 60 to 70 days annually along this coast. Most occur during the afternoon or evening hours from May through September on about 5 to 15 days per month; June, July, and August are the most active months. Over open waters, thunderstorms are observed 3 to 5 percent of the time from June through September; they often occur at night.

During the winter season, some 15 to 20 frontal systems dip into the area and bring adverse weather. As the cold front passes, a polar air mass follows, often bringing strong N winds and low temperatures. Gale-force winds blow about 1 to 3 percent of the time over open waters from September through February; autumn frequencies result from both tropical and extratropical systems. Waves of 8 feet or more are encountered 5 to 11 percent of the time and are most likely during January and February.

Visibilities in this area are briefly restricted in showers and thunderstorms, while fog, which occurs throughout the year, varies from a summer minimum to a maximum in the colder months. There is a peak in March when warm southeasterlies blow across colder waters. Frequency and density of the fog increases when approaching the coast. Visibilities drop below 2 miles 1 to 2 percent of the time during February, March, and April; fog is reported up to 6 percent of the time in March over open waters. Shore stations observe fog on about 4 to 7 days per month from December through April.

Chart 11405.–Apalachee Bay, about 170 miles NW of Tampa Bay, is formed by the bend in the coastline from a NW to a SW direction. Depths range from 6 to 20 feet with numerous shoals and rocks, some bare at low water. The bay is the approach to St. Marks River.

COLREGS Demarcation Lines.–The lines established for Apalachee Bay are described in 80.805, chapter 2.

Danger zone.–An Air Force rocket-firing range has been established in the Gulf S of Apalachee Bay. (See 204.111, chapter 2, for limits and regulations.)

Econfina River, entering the E part of Apalachee Bay, is shallow and navigable by boats drawing about 2 feet at half tide or better; although lesser depths may be found during protracted periods of offshore winds. A private light marks the E side of the entrance to the river. The river channel is rocky and should be used only with local knowledge. **Econfina Landing,** on the W bank 2 miles above the mouth, has facilities for small craft. Gasoline, water, ice, a launching ramp, and limited berthage are available. State Route 14 leads to the main coastal highway U.S. Route 98.

Aucilla River flows into Apalachee Bay 4.5 miles NW of Econfina River. The approach for a distance of 3 miles is a narrow winding channel that is difficult for strangers. A private light on **Gamble Point** marks the entrance to the river. The river above the mouth is reported to be poorly marked, fast-flowing, and with depths of over 5 feet. It has been further reported that by giving the bends in the river a good berth, and by avoiding the rocks in the channel which are discernible by ripples, boats drawing 4 feet will have little difficulty. Local knowledge is advised.

St. Marks National Wildlife Refuge covers much of the coastal area between Aucilla River and Ochlockonee Bay, about 12 miles SW of St. Marks River.

Chart 11406.-St. Marks River flows into the head of Apalachee Bay 83 miles NW of Cedar Keys and 54 miles NE of Cape St. George. The river is the approach to the town of **St. Marks** about 5.5 miles above the entrance. A cracking plant, several oil terminals, and a powerplant, which is about 0.5 mile above the town, are the principal facilities on the river. Barges constitute the major traffic on the river.

Prominent feature.-St. Marks Light (30°04.4'N., 84°10.8'W.), the most conspicuous object in the approach to St. Marks River, is 82 feet above the water and shown from an 80-foot white conical tower adjoining a one-story dwelling. The light also serves as the rear light to the **356°** lighted entrance range.

Channels.-A dredged channel leads from the Gulf into St. Marks River to a turning basin at St. Marks, thence to the powerplant about 0.5 mile above the turning basin. In September 1982-July 1983, the controlling depths were 6½ feet (8 feet at midchannel) to the turning basin, thence in September 1982, 12 feet in the turning basin, and thence in July 1983, 9½ feet (12 feet at midchannel) to the powerplant. The channel is marked by a lighted range, lights, daybeacons, and lighted and unlighted buoys. The natural channel of the river has depths of 8 feet or more from the head of the dredged channel to the U.S. Route 98 highway bridge at Newport, about 4 miles above St. Marks.

A land cut, about 500 yards long, has been dredged from the E side of Spanish Hole, about 0.3 mile NW of St. Marks Light for the St. Marks National Wildlife Refuge. In May 1982, the channel had a reported controlling depth of about 3 feet. A public launching ramp is available on the land cut.

Dangers.-Shoal water extends about 3 miles S of St. Marks Light, and numerous shoals are on both sides of the channel. They are for the most part unmarked.

Tides and currents.-The mean range of tide in St. Marks River is 2.4 feet. (See the Tide Tables for predictions.) Prolonged winds from the N will cause tides to be 1 to 2 feet below predicted levels, and prolonged winds from the S will cause tides to be 1 to 2 feet above predicted levels. The tidal current in St. Marks River approach averages about 0.5 knot at strength. In the river the average is from 0.3 to 0.4 knot, although 2-knot currents have been reported.

Wakulla River enters St. Marks River 5 miles N of St. Marks Light. A draft of about 7 feet can be taken upriver for about 0.4 mile above the confluence, and about 3 feet to just above U.S. Route 319 highway bridge, about 5 miles above St. Marks. At this point the river is closed to navigation by a 6-foot-high fence across the river that provides protection for a wildlife refuge. The channel is obstructed by grass, and local knowledge is needed to carry the best water.

The **San Marcos De Apalache State Park and Monument** is on the point formed by the confluence of St. Marks and Wakulla Rivers. A private yacht club and a fish camp are on the E side of Wakulla River about 0.5 and 0.8 mile, respectively, above the confluence of the rivers. Berths, gasoline, a launching ramp, and a forklift that can haul out craft to 25 feet for hull and engine repairs and covered wet and dry storage are available.

A **no-wake idle speed** is enforced on St. Marks and Wakulla Rivers in the vicinity of all wharves and small-craft facilities.

Wharves.-The river front at St. Marks has several oil terminal wharves and a power company wharf. The wharves are used to unload petroleum products from barges and, in May 1982, had reported depths of 10 to 15 feet alongside. There are several marinas, two of which have boatyards. The larger of two marine railways can handle craft up to 60 feet for hull and engine repairs. Open or covered storage is available as well as open and covered berthage with electricity and launching ramps.

Supplies.-Gasoline, diesel fuel, water, ice, and marine supplies are available.

An overhead power cable with a clearance of 65 feet crosses St. Marks River about 0.5 mile below Newport.

Newport is a small resort about 3.4 miles above St. Marks. U.S. Route 98 highway bridge crossing the river at the N part of the town has a 40-foot bascule span with a clearance of 9 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i) (6-a), chapter 2, for drawbridge regulations and opening signals.) A public launching ramp is above the bridge. Fuel and some supplies are available nearby.

Chart 11405.-A beach resort is at **Shell Point** (30°03.4'N., 84°17.4'W.), about 5 miles W of St. Marks River. A marina is in a privately dredged basin on the point. Berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. There is a concrete launching ramp and a 25-ton mobile hoist that can haul out craft for engine and hull repairs or storage. A motel and restaurant are nearby. In May 1982, depths of 5 feet were reported in the privately marked entrance channel and 5 to 10 feet in the basin. The mean range of **tide** is 2.5 feet. **Shell Point Light** (30°02.4'N., 84°17.5'W.), 17 feet above the water and shown from a pile with a green and white diamond-shaped daymark, marks

the approach. Private sailboat mooring facilities are in a basin just N of the marina.

Spring Creek, 2 miles NW of Shell Point, is entered through a narrow, winding, and privately marked channel that leads between oyster bars to a small marina on the E side of the creek, about 0.5 mile above the entrance. Local knowledge is advised. Berths, gasoline, marine supplies, and some engine repairs are available at the marina.

Panacea Harbor, in **Dickerson Bay,** is about 11 miles SW of St. Marks Light. A dredged channel, with a controlling depth of 6½ feet (7 feet at midchannel) in July 1983, leads from Apalachee Bay to the public wharf at the town of Panacea. The channel is marked by lights and daybeacons. Panacea is a summer resort and fishing center with a seafood processing plant in the harbor and several more in town. Gasoline and some supplies can be obtained in town.

Ochlockonee Bay, on the W side of Apalachee Bay, is a shallow bay 5 miles long and a mile wide. The approach from Apalachee Bay is obstructed by shoals, which probably shift from time to time. The S half of the mouth is closed entirely by oyster bars. The entrance is between **Ochlockonee Point** on the N and **Bald Point** on the S. **Ochlockonee Bay Light 2** (29°56.0'N., 84°18.0'W.), 16 feet above the water and shown from a pile with a red triangular daymark, about 3 miles SE of Ochlockonee Point, marks the approach to the bay. The mean range of **tide** is 2.0 feet.

A narrow channel marked by private markers leads into the bay. In May 1982, it was reported that craft drawing up to 6 feet experienced no trouble going to the facilities about 1.5 miles above the bridge.

U.S. Route 98 highway bridge, about 2.3 miles W of the entrance to the bay, has a 36-foot fixed span with a clearance of 13 feet. A launching ramp is at the S end of the bridge.

About 1.5 miles W of the bridge on the N bank, there is a marina in a basin. In May 1982, the reported controlling depth was 6 feet in the channel from the bay and in the basin. The channel is marked by private daybeacons. Berths, gasoline, water, ice, marine supplies, and storage are available. There is a concrete launching ramp and a 7½-ton forklift that can haul out craft up to 25 feet for hull and engine repairs, or dry open or covered storage.

With local knowledge, a depth of 4 feet can be carried through **Buckhorn Creek** into **Sopchoppy River** to the fixed highway bridge about 7 miles from the bay. The bridge has a 33-foot channel span and clearance of 6 feet. The creek is little used.

Ochlockonee River, emptying into the head of Ochlockonee Bay, leads W to the junction of Crooked River and then turns N and finally E. A depth of 5 feet, with local knowledge, can be found for 29 miles. U.S. Route 319 highway bridge about 6 miles above the mouth has a fixed span with a clearance of 10 feet. The river is little used. About 8 miles above the mouth, piling of a former railroad bridge is a hazard in the river. A launching ramp is available at a State park on the N side of the river, about 4.5 miles above the mouth.

Crooked River, a narrow, crooked tidal stream 22 miles long, connects Ochlockonee River with Carrabelle River. Crooked River is completely blocked by trees and growth about 10 miles above the E mouth.

Ochlockonee Shoal, lying about 8 miles SE of Ochlockonee Point, has depths of 3 to 17 feet. Although the shoal is separated from St. James Island by lanes of moderate depths, there is no safe passage between the shoal and the island except for small craft. A lighted bell buoy is SE of the shoal. The buoy also marks the approach to St. Marks River and Apalachee Bay.

There are three fish havens in Apalachee Bay. The first is about 2.2 miles 167° from Shell Point Light, the second about 4.6 miles 161° from St. Marks Light, and the third about 4.5 miles 108° from Ochlockonee Bay Light 2. The first two are unmarked; the third is marked by private buoys.

Charts 11405, 11401.–St. George Sound and **Apalachicola Bay** are adjoining bodies of water, 40 miles long and 3 to 6 miles wide, separated from the Gulf by Dog, St. George, Little St. George, and St. Vincent Islands. Both sound and bay are generally shallow with numerous oyster reefs and shoals dangerous to navigation. East Pass, West Pass, and Government Cut are the principal entrances to the sound and the bay from the Gulf, and thence into the towns of Carrabelle and Apalachicola.

COLREGS Demarcation Lines.–The lines established for St. George Sound and Apalachicola Bay are described in 80.805, chapter 2.

St. James Island is the 20-mile-long portion of coast from **Lighthouse Point,** on the W side of Apalachee Bay, W to Carrabelle. The island is separated from the mainland by Ochlockonee Bay, and by Ochlockonee, Crooked, and Carrabelle Rivers.

South Shoal extends S from the E end of St. James Island for about 6 miles. The sea breaks on portions of the shoal even in good weather. A lighted bell buoy marks the S end of the shoal.

Duer Channel, unmarked and subject to frequent changes, lies at the E end of St. George Sound between South Shoal and Dog Island Reef. The channel is used occasionally by light-draft vessels with local knowledge, but is difficult for strangers. A visible wreck is on the E side of the channel in about 29°49.1'N., 84°22.3'W.

Alligator Harbor, a shallow body of water at the E end of St. George Sound, is formed by a long, narrow spit of land that extends W from Lighthouse Point to Peninsula Point. The harbor is entered from Duer Channel through a crooked privately dredged channel, marked by private daybeacons, that leads from W of **Peninsula Point** NW to the vicinity of **Wilson Beach,** thence SE into the harbor. In May 1982, a reported depth of 4½ feet was available in the channel. In May 1982, it was reported that the former entrance to the harbor, just N of Peninsula Point, had shoaled to bare and should be avoided.

Good anchorage can be found in depths of 5 to 7 feet, hard sand bottom, N of Peninsula Point.

A marina is in a small basin about 0.6 mile E of the point. Gasoline, diesel fuel, electricity, water, ice, marine supplies, storage facilities, and a 40-ton mobile hoist that can handle craft up to 65 feet are available at the marina; hull and engine repairs can be made. The marina monitors VHF-FM channel 16 (156.80 MHz) during working hours.

Prominent at Alligator Harbor are the large green boat storage building and skeleton tower at the marina, and the water tank at Southwest Cape, about 1.7 miles W of Lighthouse Point.

Dog Island Reef, lying 5 to 6 miles offshore S of St. James Island, extends from a point about 5 miles WSW of Lighthouse Point to the E end of Dog Island. There are depths of 2 to 6 feet over a considerable part of the reef. Local fishermen sometimes enter St. George Sound through the shoal close to the eastern side of Dog Island. The reef is marked near its NE extremity by a light and by a buoy near its W end about 2.7 miles E of the E end of Dog Island.

N of Dog Island Reef and about 4.5 miles W of Peninsula Point a privately dredged and marked channel, with a reported controlling depth of 10 feet in May 1982, leads to a basin on which is the Florida State University's Marine Laboratory. The 180-foot concrete marginal wharf had a reported depth of 8 feet alongside.

Dog Island, a narrow, sparsely wooded island over 5 miles long, is the first land sighted in approaching East Pass from the SE. Several houses are on the island, and lodging is available. A privately marked channel, with a reported controlling depth of 6 feet in May 1982, leads to a small cove on the N side of the E end of the island. Water and limited berthage are available at a small marina in the cove.

A visible wreck is N of Dog Island in about 29°49.0'N., 84°37.5'W.

Chart 11404.–Carrabelle Harbor is at the entrance to Carrabelle River which flows into St. George Sound. The principal entrance to the harbor and the sound is through **East Pass** between Dog and St. George Islands, about 31 miles SW of St. Marks Light. **Carrabelle** is a small town at the mouth of the river that has several seafood processing plants. The town is on the main coastal highway, U.S. Route 98, and a good road leads to the interior.

Carrabelle River flows into St. George Sound 5 miles NNE of East Pass. River currents are rather strong on the ebb. A fixed highway bridge with a clearance of 40 feet crosses the river about 0.5 mile above the turning basin. An overhead power cable with a clearance of 50 feet is about 2 miles above the bridge.

Prominent features.–Approaching East Pass from SE on a clear day, the first objects to be seen are the sand dunes on Dog and St. George Island. On closer approach, the trees on the mainland can be seen over the islands and a few pine trees will be noticed near the W end of Dog Island. A water tower and severa radio towers are also prominent.

Crooked River Light (29°49.6'N., 84°42.1'W.), 11 feet above the water, is shown from a 103-foo square skeleton tower, lower half white, upper hal dark red, on the N shore of St. George Sound, abou 2.3 miles SW of the town.

Channels.–A dredged channel leads from the Gul of Mexico for 3 miles through East Pass to a point W of Dog Island, thence for 5 miles through St George Sound and Carrabelle River to a turning basin at the town of Carrabelle. From the turning basin, the channel continues for 3 miles to the confluence of New and Crooked Rivers. In July 1983, the controlling depths were 10 feet from the Gulf to the turning basin, thence 10 feet in the basin, thence 3½ feet (4 feet at midchannel) to the confluence of New and Crooked Rivers.

The channels are marked by lighted ranges, a light, lighted and unlighted buoys, and daybeacons. A **022°24'** lighted range leads through the harbor channel, and a **324°** lighted range leads into the river entrance.

In heavy seas, deep-draft vessels should stay in depths of 30 to 40 feet until Carrabelle Channel Lighted Bell Buoy 2 is picked up. In 1969, a submerged object, covered 15 feet, was reported in the vicinity of the bell buoy.

Anchorages.–Vessels may anchor in St. George Sound behind the W end of Dog Island in depths of about 20 feet and to the NW of the E end of St. George Island in depths of 18 to 20 feet. At these anchorages, vessels with good ground tackle can safely ride out any gale except a hurricane. Small boats can anchor closer inshore behind the hook at the E end of St. George Island or at various points in the sound where depths are suitable.

Tides and currents.–At East Pass and Carrabelle the diurnal tidal range is about 2.6 feet. The tidal currents are strong, sometimes having a velocity of 3 to 4 knots, and ordinarily at least 1 knot. They usually set across the shoals at an angle with the channel, and great care should be taken not to be set toward the shoals on either hand.

Pilotage.–Arrangements can be made for local fishing guides to pilot yachts from Carrabelle to Tampa and other coast ports.

Carrabelle is a **customs port of entry.**

Wharves.–The flour company wharf, with a reported depth of 7 feet alongside, is the largest wharf at Carrabelle. A town wharf, several fish wharves, and service wharves with reported depths of 7 to 15 feet alongside are along the waterfront. There is a tieup berth for barges on the S bank of the river opposite the town.

Small-craft facilities.–A marina and a boatyard with a marine railway are at Carrabelle. The railway can haul out craft to 40 feet for hull and engine repairs. Berths, gasoline, diesel fuel, water, ice, marine supplies, and launching ramps are available at the marina. A forklift can haul out craft to 24 feet for limited repairs or covered dry storage.

Charts 11404, 11402, 11401.-St. George Island and **Little St. George Island,** the S boundary of Apalachicola Bay, extend about 24 miles W from East Pass. The islands are densely wooded except the E end of St. George Island, which is a low and barren spit. A marked channel leads to the town of **Eastpoint,** 1 mile NE of Cat Point. In July 1983, the controlling depths were 6 feet in the entrance channel, thence 5½ feet in the W arm of the channel paralleling the shore at Eastpoint and 5 feet in the E arm. In November 1983, detached breakwaters paralleling the E and W arms of the channel were under construction. A bridge-causeway extends from Cat Point to St. George Island. The fixed span over the waterway has a clearance of 50 feet. Gasoline in cans, groceries, ice, a launching ramp, and some marine supplies are available on St. George Island from a store at the SW end of the causeway. Gasoline, diesel fuel, and limited marine supplies are available at the wharves at Eastpoint. There are seafood packing plants and numerous fish piers at Eastpoint.

Bulkhead Shoal, which extends from Cat Point S to Bulkhead Point on St. George Island, marks the dividing line between St. George Sound and Apalachicola Bay. The Intracoastal Waterway has been dredged through this shoal. An overhead power cable with a clearance of 40 feet crosses along the shoal, but is submerged at the waterway channel.

West Pass enters Apalachicola Bay between **Sand Island,** the NW tip of Little St. George Island, and **St. Vincent Island.** The pass is the W approach to Apalachicola Bay and the town of Apalachicola.

Apalachicola is on the N shore of Apalachicola Bay at the mouth of the Apalachicola River. The principal industries are fishing and oystering. Waterborne commerce consists of petroleum products, chemicals, fertilizer products, sand, gravel, cement, liquid and dry sulfur, grain, feeds, and logs. The port is the gateway for the extensive river systems of the Chattahoochee and Flint Rivers. The Intracoastal Waterway enters Apalachicola River, passes the town, and then continues W through Jackson River. (See chapter 12.) The town has several historic buildings, a museum, and a hospital.

Prominent features.-Cape St. George Light (29°35.2'N., 85°02.8'W.), 72 feet above the water and shown from a white conical tower on the SW tip of Little St. George Island, is the most conspicuous object in the West Pass area. From inside the pass on the approach to Apalachicola, the water tank, several microwave and radio towers, and the highway bridges are prominent.

Dangers.-A fan-shaped test firing area, marked by unlighted buoys, is centered about 4 miles S of Cape St. George Light. (See 204.112, chapter 2, for limits and regulations.)

Channels.-The main entrance to Apalachicola Bay is through **Government Cut,** a dredged cut between St. George and Little St. George Islands from the Gulf into the bay about 4.9 miles E of St. George Light. The entrance to the cut is protected by twin jetties. In August 1983, the controlling depth was 5½ feet (6½ feet at midchannel). The channel is marked by a lighted bell buoy at the entrance, lights, and daybeacons.

The channel from the Gulf through West Pass and Apalachicola Bay to Apalachicola is entered through a buoyed bar channel, marked at the entrance by a lighted buoy, about 3.7 miles W of Sand Island. The passage from inside the pass to Apalachicola is via a channel, marked by lights and a daybeacon, that leads SE along the N side of the W end of Little St. George Island to the Lower Anchorage and Horseshoe Cove, thence NE via an unmarked route across Apalachicola Bay to the Intracoastal Waterway, and thence to Apalachicola. The bar channel is subject to frequent shoaling and is marked by buoys which may be relocated to mark the best water without prior notice. Mariners should use caution when transiting West Pass. Once inside the pass, depths of about 9 feet can be carried to Apalachicola.

A swash channel, used considerably by local fishermen, lies between **East Bank** and Sand Island. The channel has a depth of about 3 feet and is passable in all but severe weather. Government Cut and the West Pass channels join the Intracoastal Waterway about 3.5 miles S of Apalachicola.

Two Mile Channel, a dredged channel, leads N for 1.2 miles from the bay to a lateral channel leading E and W, parallel to the shore, off the fishing village of **Two Mile,** about 2 miles W of the entrance to Apalachicola River. In August 1983, the controlling depths were 3½ feet in the entrance channel and 4½ feet in the channel paralleling the shoreline. An entrance light and daybeacons mark the channel.

Scipio Creek Channel, a dredged channel, leads from the river off Apalachicola to a municipal boat basin in **Scipio Creek.** In August 1983, the controlling depths were 7½ feet in the channel and 6½ feet in the basin.

Anchorages.-Vessels may anchor anywhere in **Upper Anchorage** in Apalachicola Bay where depths are suitable. Good anchorage in depths of 12 to 15 feet may be found in **Lower Anchorage,** E of Sand Island. Another good anchorage is about 1 mile S of the turn in the channel leading to Apalachicola.

Dangers.-An Air Force **restricted area** for drone recovery is close W of Government Cut. (See 204.113, chapter 2, for limits and regulations.)

Cape St. George Shoal extends 11 miles S from **Cape St. George,** the SW tip of Little St. George Island. The shoal consists of several detached spots with moderate depths between them. The shoal is marked by a lighted bell buoy on its S end and by a buoy off its E side. A sunken wreck is 1 mile E of the lighted bell buoy in about 29°23.2'N., 85°01.0'W.

Shoals extend more than 3 miles offshore at West Pass. The approach is marked by a lighted buoy and several other buoys which are shifted to conform to changes in the channel.

Caution.-The Apalachicola River entrance lighted range is partly obstructed by the highway bridge. The front range is a flashing light suspended below the bridge deck in the third bent W of the swing

span and is difficult to see from the channel entrance. The rear range shows above the bridge deck, but may be difficult to identify in the daytime if vessels with tall masts are docked at the wharves north of the bridge. On the sides of the channel are ruins of wooden jetties extending 2 miles S of the highway bridge.

Tides and currents.–The diurnal range of tide at West Pass is about 1.4 feet and at Cat Point 2.2 feet. The currents are influenced by the winds and by freshets, and at times are very strong, especially the ebb; at flood they are generally weak. A velocity of 3 knots has been observed in West Pass channel at a point inside the bar about 0.8 mile NE of Lighted Buoy 2. The ebb current runs out through West Pass and divides, part going to the S over the breakers and part following the deeper water to the bar, the latter being the stronger.

In Apalachicola River, the diurnal range of tide is about 1.7 feet at Apalachicola and the current is principally ebb. With strong winds from the N and E there will be little or no flood current or even slack water, and the height of the water in the bay and river will be reduced a foot or more. The tides meet somewhat to the W of Bulkhead Shoal, the ebb current flowing E through the cut.

Weather.–The climate of Apalachicola is typical of that experienced along most of the coast of the N Gulf of Mexico, which tends to moderate temperatures, resulting in a subtropical regime. However, since winter weather often comes from the continent, there are wide temperature variations on occasion. Summer temperatures are more uniform. High temperatures reach 90°F or more on 58 days annually, 40 to 50 days less than more inland locations.

Rainfall results from summer showers and thunderstorms, tropical cyclones, and winter cold fronts. Most rain occurs from June through September. Thunderstorms develop on 10 to 16 days per month during this period and have resulted in brief, heavy rains and strong, gusty winds. Apalachicola has not recorded hurricane-force winds, although 11 hurricanes have passed close-by during the past 100 years. During hurricane Agnes in June 1972, tides in the Apalachicola area measured 5 to 9 feet above mean sea level. A stronger storm could drive these tides several feet higher.

Winter weather is usually mild, but interspersed with brief cold spells. Temperatures drop below freezing on just 6 days per year on the average. Snow has fallen on rare occasions, but usually melts as it falls. Only twice has snow accumulated enough to be measured. Strong winds are most likely in winter, but gales are rare.

The National Weather Service maintains an office at the airport. **Barometers** may be compared there or by telephone.

(See page T–4 for **Apalachicola climatological table.**)

Pilotage.–Pilots are not available, but local fishing guides can be hired as pilots for the adjacent waters and the Gulf.

Apalachicola is a **customs port of entry**.

There is a public hospital in Apalachicola.

Agricultural quarantine officials are stationed in Pensacola. (See appendix for address.)

The Coast Guard **vessel documentation office** in Pensacola serves Apalachicola. (See appendix for address.)

Apalachicola River, formed by the junction of Flint and Chattahoochee Rivers, flows S for about 98 miles into the N part of Apalachicola Bay. The Intracoastal Waterway extends through the lower part of Apalachicola River, branching W through **Jackson River** at its confluence with Apalachicola River about 5 miles above the latter's mouth. (See chapter 12.) A Federal project provides for a 9-foot channel in Apalachicola River from Jackson River to Chattahoochee River. (See Local Notice to Mariners for latest controlling depths.) The channel is marked by daybeacons and unlighted buoys.

The John Gorrie Memorial Bridge, a highway causeway, crosses the mouth of the Apalachicola River from **East Point** to Apalachicola. The bridge has a swing span of 28 feet over the main channel. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Overhead power and telephone cables immediately N of the bridge have a clearance of 84 feet.

About 3.7 miles above the mouth, the river is crossed by a railroad swing bridge with a clearance of 11 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

N and S of the John Gorrie Memorial Bridge are numerous private docks with small-craft berths. The municipal pier and basin are about 300 yards S of the bridge. Berths and a launching ramp are available. In May 1982, the pier had a reported depth of about 3 feet alongside the outer face, with 5 feet reported in the basin.

Small-craft facilities.–There are several other small-craft facilities at Apalachicola. The largest haul-out capacity is at a boatyard on the Apalachicola River just above the highway bridge where a marine railway can handle craft to 40 feet for hull and engine repairs. There are fish piers on Two Mile Channel. (See the small-craft facilities tabulation on chart 11404 for services and supplies available.)

Communications.–The town is served by the freight service of the Apalachicola Northern Railroad Company, and the main coastal highway U.S. Route 98 passes through the town.

Chattahoochee River, about 365 miles long, rises in NE Georgia and flows generally SW and S to a confluence with Flint River and Apalachicola River at the SW corner of the State. A Federal project provides for a 9-foot channel from the confluence with Flint and Apalachicola Rivers to Columbus, Ga., a distance of 142 miles. (See Local Notice to Mariners for latest controlling depths.)

There are three dams and navigation locks which are 450 feet long, 82 feet wide, and have a minimum depth of 13 feet over the sills. **Jim Woodruff Dam and Lock,** on the Apalachicola River about 93 miles above the mouth, is 0.5 mile below the confluence of

the three rivers. **George W. Andrews (Columbia) Dam and Lock** is about 40 miles above the confluence. **Walter F. George Lock and Dam** is about 65 miles above the confluence. There are general cargo wharf and an oil terminal, and a public ramp at Columbia, Ala., about 43 miles above the confluence, and a marginal masonry general cargo wharf at Columbus, Ga.

Flint River, about 287 miles long, rises in central Georgia, flows generally southeastward to **Albany, Ga.,** thence SW to its confluence with Apalachiola and Chattahoochee Rivers, about 25 miles below **Bainbridge, Ga.** There is a public concrete general cargo wharf and an oil terminal at Bainbridge. There is a private wharf with railroad siding at **Chattahoochee,** Fla., a few miles below Jim Woodruff Dam. The wharf is used mainly for handling of sand and gravel. There are recreation and small-craft facilities on the three rivers.

Navigation charts for the Apalachicola, Chattahoochee, and Flint Rivers System are available from the Mobile Corps of Engineers Office. (See appendix for address.)

St. Vincent Sound is a shallow and unimportant extension of Apalachicola Bay at its NW end. The sound can be entered from E through Apalachicola Bay or from the W through **Indian Pass,** a narrow, shifting, unmarked channel. Strangers should not attempt the pass, which is shallow and used only by local fishing vessels.

Cape San Blas, 16.5 miles WNW of Cape St. George, is low and wooded. **Cape San Blas Light** (29°40.2'N., 85°21.4'W.), 136 feet above the water, is shown from a white skeleton tower. A radiobeacon is at the light. A 96-foot-high former lighthouse close NNE of the light is prominent.

Cape San Blas Shoals, with depths of 18 feet or less, extend 4 miles S from the cape. Depths of 24 to 30 feet are found 10 miles S and SW of the cape. A lighted bell buoy is moored about 13.5 miles SW of the cape. The waters inshore from the buoy should be avoided by all except light-draft vessels.

With a fresh breeze from any quarter S of E and NW, rough water may be expected at the cape and a breaking sea may run far offshore. Between December and March, fog is frequently encountered off Cape San Blas.

A swash channel marked by buoys crosses the shoals about 2 miles S of the light; depths are about 12 to 14 feet. Although local craft use this channel on a smooth sea, strangers should not. Close inshore is the foundation of a former lighthouse, covered 5 feet.

A **danger zone** of an air-to-air firing practice range is in the Gulf S and W of Apalachicola. (See 204.114, chapter 2, for limits and regulations.)

Charts 11393, 11389.–St. Joseph Bay, which extends about 12 miles N of Cape San Blas, is separated from the Gulf by **St. Joseph Peninsula (St. Joseph Spit),** a long, narrow strip of land and sand hills, wooded in places, that curves NNW from the cape. St. Joseph Bay, recognized as one of the best harbors on the Gulf, is easily entered by vessels with drafts to 25 feet except during periods of very severe weather such as hurricanes. **St. Joseph Bay Entrance Lighted Whistle Buoy SJ** (29°52.0'N., 85°29.5'W.) marks the entrance.

Port St. Joe is a town on the E shore of St. Joseph Bay. A large papermill on the waterfront and two chemical plants on Gulf County Canal furnish the main industry for the town. Fumes from the papermill may discolor paint overnight if docked or anchored on the leeward side of the stack. Waterborne commerce consists mainly of paper, marine supplies, petroleum products, and chemical products.

Time.–Port St. Joe is in the eastern time zone.

Prominent features.–The stack and buildings of the papermill and the chemical plant are the most prominent objects visible from the Gulf. Several water tanks are conspicuous at a closer distance inshore.

Vessels should approach the harbor within the Port St. Joe Safety Fairway. (See 166.100 through 166.200, chapter 2.)

In July 1982, a sunken wreck was reported in the safety fairway in about 29°50.2'N., 85°41.6'W.

A fish haven with an authorized minimum depth of 34 feet is close off the SE side of the entrance to the Port St. Joe Safety Fairway about 1.6 miles S of St. Joseph Bay Entrance Lighted Whistle Buoy SJ.

COLREGS Demarcation Lines.–The lines established for St. Joseph Bay are described in 80.810, chapter 2.

Channels.–From the Gulf, the dredged channel leads across 18-foot shoals to the deeper water inside. Federal project depths are 37 feet to a point about 0.5 mile N of St. Joseph Point, thence 35 feet to Harbor Channel and to a turning basin immediately to the W, thence 35 feet to South Channel, thence 27 feet in South Channel; project depth in the turning basin is 32 feet. (See Notice to Mariners and latest editions of the charts for controlling depths.) A shoal tends to build E from the extremity of St. Joseph Point into the W side of the entrance channel. South Channel is no longer maintained; in March 1981, the controlling depth was 20 feet.

The channels, except for South Channel, are marked by lights and buoys; lighted ranges mark the entrance channel and North Channel. Port St. Joe Entrance Channel lighted range on top of the papermill is often difficult to see because of the smoke and fumes from the mill.

A swash channel with a depth of 14 feet follows the shore of **St. Joseph Point** at a distance of 0.2 mile and passes between the shore and a shoal that has a depth of about 8 feet. The channel is subject to frequent changes and should be used only with local knowledge.

Gulf County Canal, a dredged cut, provides a connection between St. Joseph Bay and the Intracoastal Waterway. In October 1983, the controlling depth was 6½ feet (8 feet at midchannel) from the W entrance to the Intracoastal Waterway. Near the bay

entrance the canal is crossed by a bascule bridge with a clearance of 10 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The bridge is equipped with radiotelephone. The bridgetender can be contacted on VHF-FM channels 12 (156.60 MHz), 13 (156.65 MHz), and 16 (156.80 MHz); call sign, KBA-338. Overhead power cables crossing the canal at Highland View and about 1.4 miles above the mouth have a minimum clearance of 85 feet.

Anchorages.–Vessels should anchor in Port St. Joe Anchorages, N and S of the Safety Fairway leading to the entrance channel. (See 166.100 through 166.200, chapter 2.) Depths of 24 to 37 feet with hard sand or hard mud bottom are available throughout most of the interior part of the bay. The S third of the bay, a shelf along the sides, and several spoil areas along the entrance channel and along the E side of St. Joseph Peninsula are shoal. Shoaling to 11 feet is close N of South Channel centered in about 29°48′37″N., 85°19′43″W. **Explosives anchorages** are in St. Joseph Bay. (See 110.1 and 110.193a, chapter 2, for limits and regulations.) In 1982, explosives anchorage No. 1 had a reported controlling depth of 21 feet, mud bottom.

In St. Joseph Bay, the diurnal range of **tide** is about 1.4 feet.

Currents.–Strong and erratic crosscurrents are reported at the entrance to St. Joseph Bay NE of St. Joseph Point. These currents are reported to be particularly strong during the ebb. Caution is advised when entering the bay.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade if drawing more than 6 feet of water. Pilotage is optional for U.S. coastwise vessels that have on board a pilot licensed by the Federal government. Vessels desiring a pilot should give at least 18 hours' advance notice to Port St. Joe Pilots Association by radiotelephone through the Mobile Marine Operator (WLO), telephone (904-227-1518), or through the ships' agents. Telegraph service is not available at night. Pilots board incoming vessels in the vicinity of sea buoy (St. Joseph Bay Entrance Lighted Whistle Buoy SJ, 29°52.0′N., 85°29.5′W.). The 44-foot pilot boat has a black hull with the word PILOT on either side of its white deckhouse. A white light over a red light are displayed at night. The pilot boat monitors VHF-FM channel 16 (156.80 MHz) 2 hours in advance of the ETA, and is also equipped with VHF-FM channels 6 (156.30 MHz), 10 (156.50 MHz), and 12 (156.60 MHz).

Towage.–Tugs are obtained from Panama City when required.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A hospital is in the city.

Customs.–Vessels bound for Port St. Joe notify the customs officer at Pensacola of their arrival. Port St. Joe is a **customs port of entry.** The Deputy Collector of Customs at Panama City usually comes to the vessel at the first opportunity. The records for St. Joe are maintained at Panama City.

Harbor regulations.–There are no formal printed harbor regulations. The Port St. Joe Port Authority has jurisdiction over the port. The **harbormaster** can be reached by telephone (904-227-1319). A **speed limit** of 4 m.p.h. is posted in the harbor.

Wharves.–A large papermill and an adjoining oil storage depot have a dock 0.5 mile long with depths of from 26 to 32 feet alongside on the waterfront.

Supplies.–Bunker C is available on an emergency basis. Diesel fuel, provisions, water, and limited marine supplies are available.

Repairs.–There are no facilities for making major repairs or drydocking deep-draft vessels at Port St. Joe; the nearest facilities are at Mobile. Above- and below-the-waterline repairs can be made to small vessels. A marine railway in the basin on the N side of the Gulf County Canal can haul out craft to 85 feet for complete repairs.

Small-craft facilities.–A boat basin on the N bank of the Gulf County Canal just NE of the highway bridge provides berths, gasoline, diesel fuel, water, ice, and marine supplies.

Communications.–Port St. Joe is served by the Apalachicola Northern Railroad and is on the main coastal highway, U.S. Route 98.

Bell Shoal is the broken ground NW of the entrance channel making off from St. Andrew Point, 6.5 miles NW of St. Joseph Point.

Mexico Beach is a small resort community about 4.5 miles N of St. Joseph Point. An unmarked channel leads to **Salt Creek;** the entrance is subject to shoaling and should not be attempted without local knowledge. In March 1983, the reported depths inside the creek were 5 feet. An overhead power cable at the entrance to the channel has a clearance of 44 feet. U.S. Route 98 highway bridge, on the E branch of the creek about 0.3 mile above the entrance, has a fixed span with a reported clearance of 13 feet. Several small marinas are on the E branch above the bridge. Berths with water and electricity, gasoline, ice, and marine supplies are available; a 10-ton forklift can haul out craft to 26 feet for storage or hull and engine repairs. A no-wake **speed limit** is enforced on Salt Creek.

Crooked Island is a narrow island extending 7 miles NW from St. Andrew Point. The island encloses **St. Andrew Sound,** a shallow, unimportant body of water.

A **restricted area** of a drone launch corridor extends through St. Andrew Sound into the Gulf of Mexico. (See 207.175e, chapter 2, for limits and regulations.)

Charts 11391, 11390.–St. Andrew Bay, a narrow irregularly shaped harbor, lies 30 miles NW of Cape San Blas. Excellent anchorage and protection during hurricanes can be found in this nearly landlocked harbor and its tributary inlets, West, North, and East Bays. A ship channel, protected by jetties, in a land

cut through **Shell Island,** forms a passage from the Gulf to St. Andrew Bay. A fish haven lies about 2.5 miles SW of the entrance.

Panama City is the seat of Bay County. One of the largest papermills in the world is at **Bay Harbor,** E of Panama City proper. Waterborne commerce consists mainly of general cargo, paper and petroleum products, shell, steel and iron products, marine supplies, chemicals, fertilizers, and small amounts of fish.

Time.–Panama City is in the central time zone.

Prominent features.–On the approach from seaward, the shore first appears as a low unbroken line of woods. Closer approach shows the sand beach in an unbroken white line, with exception of East Entrance which shows as dark breaks in the white expanse. A Navy-maintained research platform 11 miles SW of the channel entrance, and a large condominium apartment building 2.5 miles NW of the channel entrance are prominent. The condominium is reported to be a good radar target at more than 32 miles. The dredged cut will not show unless the vessel is on or near the line of the cut. The first landmarks to be seen are the smoke and tall stacks of the papermill at Bay Harbor and two 130-foot water tanks at **Tyndall Air Force Base,** about 5 miles SSE of the stacks. An aerolight is atop the E tank. Next seen is the Municipal Auditorium at the Panama City Marina.

St. Andrew Bay Entrance Lighted Whistle Buoy SA (30°05.5'N., 85°46.4'W.) about 2.2 miles SW of the entrance to the dredged channel, marks the approach.

Vessels should approach the harbor through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for St. Andrew Bay are described in 80.810, chapter 2.

Channels.–The Federal project for Panama City Harbor provides for a jettied entrance cut through Shell Island 34 feet deep, thence 32 feet deep in the bay. (See Notice to Mariners and latest editions of charts for controlling depths.) The entrance channel is marked by a **052°10'** lighted range and lighted buoys.

Submerged jetties, marked at the outer ends by lighted buoys, extend channelward from the NW and SE harbor entrance points. Mariners are cautioned to keep within the buoyed channel while navigating the land cut through Shell Island.

The entrance SE of Shell Island is not marked, constantly shifting, and considered unsafe for navigation.

Anchorages.–Vessels should anchor in the Panama City Anchorage, E of the Safety Fairway. (See 166.100 through 166.200, chapter 2.) In addition, excellent anchorage can be found almost anywhere in the bay where the depth is suitable. The usual anchorage for large vessels is off the wharves at Panama City to the W of **Redfish Point** in depths of 35 to 40 feet.

Dangers.–Danger zones for small arms firing ranges are SE of the entrance to St. Andrew Bay. (See 204.120, chapter 2, for limits and regulations.)

Prohibited areas with lighted platforms and fog signals are 11 miles SW and 2.3 miles W of the entrance to St. Andrew Bay. (See 204.126, chapter 2, for limits and regulations.)

Tides.–The diurnal range of tide is about 1.5 feet. Winds greatly affect the tide. S winds of long duration raise the water level in the bay, and N winds lower it.

Currents.–The strong ebb current sets outward through the dredged cut and causes heavy tide rips if the wind is S and of moderate strength. With a S or W breeze, small vessels bound in or out should endeavor to reach the entrance during flood current.

Weather.–Panama City has a pleasant subtropical climate that is occasionally interrupted by cold air outbreaks in winter and thunderstorms in summer. There is also a threat of a tropical cyclone from June through November. Thunderstorms, which can occur in any month, are most likely in June, July, and August when they occur on an average of 10 to 14 days per month. Peak wind gusts have been close to 70 knots in August and September. In September 1975, Eloise, generating estimated 110-knot winds, became the first hurricane of the 20th century to hit this area. A 98-foot tower 13 miles off Panama City measured 80-knot winds with 135-knot gusts while high water marks reached 18.2 feet above mean sea level in some areas. Fog is most likely late at night and during early morning hours from November through April, when visibilities drop below 0.5 mile on 5 to 8 days per month.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for U.S. coastwise vessels that have on board a pilot licensed by the Federal Government. Panama City Pilots may be arranged for by telephone (904-769-0058 or 785-2209) through the Mobile Marine Operator, or through ships' agents. The pilots request ETA information 48, 24, 12, 8, and 4 hours prior to arrival. Pilots board at the sea buoy and take vessels in day or night. For boarding, pilots request that vessels' engines are stopped and that the pilot ladder is rigged 3 feet above the water on the lee side of the vessel. The pilot boat, CAPT OTWAY, is 45 feet long with a red hull and white superstructure with International Code flags spelling the word PILOT painted on either side of the cabin. The alternate pilot boat, CAPT W. E. SPIVA, is 43 feet long, with a red hull and white superstructure. The International Code flag "H" is flown. The boat is equipped with VHF-FM channel 16 (156.80 MHz), monitored 1 hour before a vessel is expected, and channel 14 (156.70 MHz) is used as the working frequency. Pilots carry portable radiotelephones.

Towage.–Tugs up to 1,700 hp are available. The tugs can be contacted over VHF-FM channel 16 (156.80 MHz) or by telephone (904-785-6471).

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with the

regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Panama City is a **customs port of entry.**

A **Coast Guard** station is on **Alligator Bayou,** opposite Dyers Point.

Wharves.–The deep-draft facilities of Panama City are located at Dyers Point, W of Panama City; on the waterfront proper just W of Massalina Bayou; and at Bay Harbor. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 19, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the private operator. All these facilities have rail and highway connections, and water and electrical shore power connections. Cargo is generally handled by ships' tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Floating cranes to 225 tons are available by special arrangement.

Facilities at Dyers Point:

Panama City Port Authority Docks: 260,000 square feet covered storage, 3 acres open storage; forklift trucks; receipt and shipment of general cargo, and shipment of forest products and iron and steel products; owned by the city of Panama City and operated by Panama City Port Authority.

Panama City Port Authority West Dock (30°10′36″N. 85°43′58″W.): 980-foot marginal wharf; 32 feet alongside; deck height, 8½ feet.

Panama City Port Authority, South Dock: immediately E of Panama City Port Authority West Dock; 1,100-foot marginal wharf; 32 feet alongside; deck height 8½ feet; shipment of peanuts, peanut meal, drilling mud, paper products, and naval stores.

Facilities at Bay Harbor:

Southwest Forest Industries, Oil Dock (30°08′09″N., 85°37′46″W.): 230-foot face; 28 feet alongside; deck height, 8 feet; pipelines extend to storage tanks, 205,000-barrel capacity; receipt of petroleum products; owned and operated by Southwest Forest Industries.

Southwest Forest Industries No. 3 Dock (30°08′12″N., 85°37′41″W.): 435-foot marginal wharf; 30 feet alongside; deck height, 10 feet; 24,000 square feet covered storage; shipment of wood pulp, liner board, naval stores, peanuts, and chemicals; owned and operated by Southwest Forest Industries.

Southwest Forest Industries No. 2 Dock: immediately NE and in line with Southwest Forest Industries No. 3 Dock; 485-foot marginal wharf; 29 feet alongside; deck height, 10 feet; more than 55,000 square feet covered storage; receipt of salt and shipment of paper products, naval stores, and chemicals; owned and operated by Southwest Forest Industries.

Southwest Forest Industries No. 1 Dock; about 0.1 mile E of Southwest Forest Industries No. 2 Dock; E and W sides 400 feet of berthing space; 28 to 29 feet alongside; deck height, 9 feet; 11,000 square feet covered storage; storage tanks for 140,000 barrels of fuel oil, 675,000 gallons of turpentine, and 150,000 gallons of fatty acid; receipt of salt, wood chips, and fuel oil for plant consumption, shipment of naval stores and fatty acids; owned and operated by Southwest Forest Industries.

Foreign-Trade Zone No. 65 is in Panama City. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–Bunker C is available to oceangoing vessels on an emergency basis at the Southwest Forest Industries No. 1 Dock. Diesel fuel and Bunker C can be supplied by truck to vessels at their berths. Water and marine supplies are available.

Repairs.–There are no facilities for making major repairs or drydocking deep-draft vessels at Panama City; the nearest facilities are at Mobile. There are machine shops in the city, and above- and below-the-waterline repairs can be made to small vessels. The largest marine railway can handle vessels up to 150 feet long and 250 tons.

Small-craft facilities.–There are large municipal yacht basins at the head of the main ship channel in Panama City and in St. Andrew. Other small-craft facilities are on Watson and Massalina Bayous, Lake Ware, and at the Hathaway Bridge near Dyers Point. (See the small-craft facilities tabulation on chart 11390 for services and supplies available.)

Communications.–Panama City is served by the Atlanta and St. Andrews Bay Railway and has bus connections to all points. There is some foreign and coastwise shipping. Maritime radio service is through the Mobile Marine Operator (WLO). Panama City County Airport is about 4 miles NW of the center of the city.

Watson Bayou is an irregularly shaped body of water with depths of 9 to 17 feet. There are several piers for light-draft vessels. Over the E arm, near **Millville,** is a railroad bridge with a 26-foot fixed span and a clearance of 13 feet. A fixed highway bridge is close E of the railroad bridge. Several oil terminals, served by barges, are on the bayou. U.S. Route 98 highway bridge crossing the bayou, about 1.2 miles above the entrance, has a 35-foot fixed span with a clearance of 9 feet. There are two marinas at the bridge. The channel is unmarked.

In **Massalina Bayou,** N of Bunkers Point, are many landings for small craft. A submerged jetty, marked at its outer end by a light, is on the NW side of the entrance. In May 1982, it was reported that a depth of about 8 feet could be carried through the mouth of the bayou, thence depths of 5 to 10 feet were available to the U.S. Route 98 highway bridge about 0.4 mile above the entrance. The drawspan of the bridge at the mouth of the bayou and a prominent tank about 0.7 mile to the NE form a good range for the channel. Beach Drive Highway Bridge over the entrance has a 40-foot bascule span with a clearance of 7 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) U.S. Route 98 highway bridge has a 28-foot fixed span with a clearance of 6 feet.

About 400 yards NW of Massalina Bayou is the Municipal Pier and Yacht Basin. In May 1982,

depths along the face of the inner fuel area were reported to be about 9 feet. It is protected by small jetties from wind and seas from the SW through the NW. Another municipally owned long pier and yacht basin at St. Andrew N of **Buena Vista Point** is used as a public landing for sport fishermen.

Grand Lagoon extends about 5 miles NW from just within the dredged entrance to St. Andrew Bay. A dredged channel leads into the lagoon from St. Andrew Bay to a point about 0.4 mile E of State Highway 392 Bridge, thence branches to serve facilities of both the N and S shores; these branches are connected by a channel running parallel to the highway bridge. In August 1982, the controlling depth was 6½ feet. The channel is marked by a light and daybeacons. State Route 392 bridge has a 23-foot fixed span with a clearance of 8 feet. Marinas near the highway bridge provide gasoline, diesel fuel, berths, electricity, water, ice, and marine supplies. A 30-ton mobile hoist can haul out craft for complete repairs and storage.

Chart 11389.-East Bay, an arm of St. Andrew Bay, extents in a general ESE direction for about 18 miles. The several small towns on East Bay are of little commercial importance.

West Bay, the NW arm of St. Andrew Bay, is generally free from dangers except for several oyster bars with depths of 5 to 8 feet over them. A small island, created by the dredging of the new Port Authority Terminal, is off Dyers Point; the island is marked by a light.

Panama City Beach, Long Beach Resort, Edgewater Gulf Beach, Florida Beach, Gulf Resort Beach, and **Laguna Beach** are sections of the residential and resort areas. **St. Andrews State Park** is on both sides of the dredged cut of the main ship channel in St. Andrew Bay entrance.

The route of the Intracoastal Waterway is through East Bay, St. Andrew Bay, and West Bay. East Bay, West Bay, and North Bay are discussed in chapter 12 in connection with the waterway.

Chart 11360.-From St. Andrew Bay W for 85 miles to Pensacola Bay, the shoreline is a gently curving sand beach, unbroken except at the entrance to Choctawhatchee Bay, 44 miles W of St. Andrew Bay entrance. Except at the entrances to the bays, the beach is steep-to and can be approached closely. Depths of less than 30 feet are rarely over 0.3 mile offshore. For this reason, the sea rolls in with undiminished strength and breaks heavily on the shore when driven by S winds. Small craft bound W from St. Andrew Bay should use the Intracoastal Waterway.

Chart 11388.-Topsail Bluff, a slightly elevated knoll, is about 10 miles E of the entrance to Choctawhatchee Bay and can be seen for several miles.

The **danger zones** of aerial gunnery and bombing ranges are in Choctawhatchee Bay. (See 204.130, chapter 2, for limits and regulations.) The **danger zone** of a guided missiles test operations area is in the Gulf S of Choctawhatchee Bay. (See 204.135, chapter 2, for limits and regulations.)

Charts 11385, 11388.-Choctawhatchee Bay Entrance. East Pass, about 44 miles WNW of St. Andrew Bay entrance, extends into the W part of Choctawhatchee Bay between Moreno Point and Santa Rosa Island, and is protected by two jetties. The E jetty is marked by a light off its seaward end. A 1,000-foot-long low weir section in the W jetty permits the passage of littoral drift into a dredged deposition basin located between the jetty and the channel. **Choctawhatchee Bay Entrance Lighted Whistle Buoy CB** (30°22.3'N., 86°30.8'W.), about 0.5 mile off the entrance to the channel, marks the approach. To carry the best depths, mariners should be guided by the color of the water. Passage should not be attempted in rough weather. Local knowledge is advised. In February 1982, the controlling depth was 6 feet from Buoy CB to the jetties, thence 8½ feet in the dredged channel from the entrance between the jetties into the bay, with 6 feet in the channel to the harbor at Destin. However, the channel S of the bridge is subject to frequent changes and shoals rapidly between dredgings. The channel is marked by lights, buoys, and daybeacons.

In September 1979, extensive shoaling was reported between Choctawhatchee Bay Entrance Lighted Whistle Buoy CB and the channel entrance W of Choctawhatchee Bay Entrance Light 2. Mariners transiting the area are advised to exercise caution.

An unlighted wreck of a shrimp boat with red superstructure lies sunk and awash in 30°20'30"N., 86°42'50"W., about 3 miles offshore and 10 miles W of the entrance.

From close offshore the entrance is easily identified by U.S. Route 98 fixed highway bridges crossing the channel just inside the E end of Santa Rosa Island. The parallel bridges have a least clearance of 50 feet.

Choctawhatchee Bay, about 25 miles long, extends nearly parallel with the coast and separated from it by a strip of land varying in width from 0.3 to 4 miles. Depths in the bay decrease gradually from W to E with 18 to 43 feet in the W two-thirds, except near the shores, and 8 to 16 feet in the E third. Traffic in Choctawhatchee Bay consists principally of travel along the Intracoastal Waterway and oil deliveries to Freeport. There are good highway connections to Pensacola and Panama City on both the N and S shores of the bay.

U.S. Route 331 highway causeway over the bay at **Wheeler Point** has a bascule span at the Intracoastal Waterway channel with a clearance of 10 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and openings signals.) A small-craft opening near the point has a 23-foot fixed span with a clearance of 8 feet.

Choctawhatchee River empties into the E end of Choctawhatchee Bay. **Cypress River, Indian River,** and **Mitchell River** are branch outlets N of the main river. The mouth of Choctawhatchee River is very

shallow, and boats generally enter through Cypress River. A rectangular area of exposed piling, about 1.2 miles long and 0.5 mile wide just off the mouths of the several rivers in this system, is used as a radar target range by Eglin Air Force Base. Cypress River entrance, marked by a light, has a controlling depth of about 6 feet. The river extends 1.5 miles inland to a junction with Choctawhatchee River. **Black Creek,** with depths of 8 feet inside but bars of about 1-foot depth blocking the entrance, leads to the village of **Black Creek.** Berths, gasoline, a launching ramp, water, ice, and some marine supplies are available at a small fish camp on the W bank of the creek about 1.6 miles above its mouth. Outboard engine repairs are available nearby.

Freeport, a small town on **Fourmile Creek,** which empties into **LaGrange Bayou,** is a distribution point for petroleum products, grain, and molasses which are brought in by barge.

A dredged channel leads from Choctawhatchee Bay to a turning basin at the head of navigation just S of the fixed highway bridge at Freeport. In December 1982, the controlling depths were 5 feet in the channel and 7 feet in the turning basin. The channel is well marked. The bridge at Freeport has a fixed 18-foot span with a clearance of 5 feet. An overhead power cable with a clearance of 24 feet crosses the channel close E of the bridge.

Access channels have been dug through the spoil banks to a channel along the E bank as far as **Ramsey Bayou.** Depths of about 2½ feet were reported in these channels in May 1982. A small marina on Ramsey Bayou provides berths, gasoline, a launching ramp, marine supplies, and outboard engine repairs.

There are numerous private piers and fish piers on LaGrange Bayou and Fourmile Creek. Gasoline and some marine supplies can be obtained at stores and service stations on U.S. Route 331 and State Route 20 in Freeport.

Basin Bayou is a landlocked lake about 5 miles W of LaGrange Bayou. State Route 20 highway bridge across the narrow entrance has a 15-foot fixed span with a clearance of 4 feet. A paved launching ramp is near the bridge and gasoline is available in cans. The launching ramp is accessible at high water only.

Rocky Bayou, about 10 miles W of Basin Bayou, has depths of 10 to 20 feet and affords good anchorage for small craft. A channel about 0.9 mile above the entrance to the bayou leads SE to a marina in **Ward Cove.** The channel is marked by a private buoy and had a reported controlling depth of about 6 feet in May 1982. Gasoline, diesel fuel, berths with water and electricity, ice, a launching ramp, and marine supplies are available.

Boggy Bayou, about 1.5 miles W of Rocky Bayou, leads to two towns on the bayou. **Niceville,** a small town at the head of the bayou, has a hospital, an oil terminal with wharf, a small marina, and a fish packing plant. There are many private piers. Berths are available at the marina.

Valparaiso is a small town on the W bank of the bayou at the intersection of the bayou with **Toms Bayou.** There is a public park with a launching ramp on the point. A boatyard on the N bank just inside the entrance to Toms Bayou has a marine railway that can handle craft up to 83 feet for hull and engine repairs.

A fixed highway bridge across Toms Bayou has a 33-foot channel span with a clearance of 11 feet. The overhead power and TV cables close W of the bridge have a clearance of 38 feet.

A **restricted area** has been designated in **Weekley Bayou,** an arm of Boggy Bayou. (See 207.175b, chapter 2, for limits and regulations.)

Eglin Air Force Base covers the NW shore of Choctawhatchee Bay from Boggy Bayou to Garnier Bayou. The tanks and buildings at the base are conspicuous.

Bens Lake, about 1.7 miles NE of **Black Point,** is an Air Force **restricted area.** (See 207.175c, chapter 2, for limits and regulations.)

Joes Bayou, 2 miles NE of the bay entrance, is entered through a channel marked by daybeacons which, in May 1982, was reported to have a controlling depth of 8 feet. The bayou affords good anchorage for small craft. A marine railway here can handle craft to 50 feet for hull repairs.

Garnier Bayou and **Cinco Bayou** have a common entrance at the NW corner of Choctawhatchee Bay, and each has depths of 7 feet or more and excellent anchorage against bad weather. State Route 85 highway crossing Garnier Bayou, about 0.5 mile above the entrance, has a 50-foot fixed span with a clearance of 19 feet. A large marina is in a protected basin on the E shore about 0.3 mile S of the bridge at **Shalimar.** A tall cylindrical water tank, which resembles a stack near the marina, is prominent. A 30-ton mobile hoist at the marina can haul out craft up to 35 feet for hull and engine repairs or dry open or covered storage. Berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. In May 1982, depths of 10 to 12 feet were reported in the basin.

There are two marinas on the W shore of the bayou, about 0.3 and 0.5 mile NW of the highway bridge. Berths, gasoline, water, ice, marine supplies, and mobile hoists that can haul out craft to 10 tons for storage or complete repairs are available. A marine railway S of the marinas can handle craft up to about 45 feet for hull and engine repairs.

A yacht club on **Smack Point,** on the S side of the entrance to Cinco Bayou, has berths and other services for members and guests.

State Route 85 fixed highway bridge crossing Cinco Bayou, about 0.5 mile W of the entrance, has a clearance of 19 feet. An overhead power cable at the bridge has a clearance of 55 feet.

Fort Walton Beach, at the W end of Choctawhatchee Bay, is on the Intracoastal Waterway, which is described in chapter 12.

Destin is a small fishing village and resort on **Moreno Point.** There are several marinas in **Destin Harbor (Old Pass Lagoon),** a lagoon behind the spit on the E side of the entrance to East Pass, Choctawhatchee Bay Entrance. There is reported to be

excellent anchorage in the lagoon along the S shore. Gasoline, diesel fuel, water, ice, marine supplies, and limited berths are available. A mobile hoist can handle craft to 50 tons for hull, engine, and electronic repairs. Local fishing guides can be hired as pilots for the bay and the waters of the Gulf. Numerous charter boats moor along the N side of the lagoon, and a few moor on the bay side of Destin close N of the bridge. In February 1982, the controlling depth through the channel was 6 feet. It is reported that the channel shoals rapidly after dredging.

A marina is on Santa Rosa Island about 3 miles W of the highway bridge over East Pass, Choctawhatchee Bay Entrance. There is a mobile hoist that can handle craft to 15 tons for hull and engine repairs or storage. Berths, electricity, and water are available. There is a fuel dock at the S end of the bridge over The Narrows to Fort Walton Beach. Gasoline and diesel fuel are available.

A Coast Guard station is on Santa Rosa Island, about 0.5 mile WSW of the highway bridge over East Pass.

Charts 11360, 11382, 11388, 11385, 11378.-Santa Rosa Sound and its E continuation, **The Narrows,** parallel the coast between Choctawhatchee Bay and Pensacola Bay and are separated from the Gulf by **Santa Rosa Island,** a narrow strip of beach. Santa Rosa Sound and The Narrows have a combined length of 33 miles and a width varying from 1.8 miles in the widest part of the sound to 200 yards in the narrowest part. The W part of the sound has a depth of 15 feet or more; the central part and The Narrows have been dredged where necessary to provide a channel for the Intracoastal Waterway. The Narrows and Santa Rosa Sound are discussed further in chapter 12 in connection with the waterway.

The **danger zones** of two Air Force proving grounds have been established in Santa Rosa Sound and the Gulf. (See 204.134 and 204.136, chapter 2, for limits and regulations.)

Unexploded ordnance lies on the bottom a mile offshore from Santa Rosa Island, about 8 miles W of Choctawhatchee Bay Entrance.

Santa Rosa Island and the E part of Perdido Key, W of the entrance to Pensacola Bay, are part of **Gulf Islands National Seashore** and subject to the rules and regulations of the U.S. Department of the Interior's National Park Service.

Charts 11384, 11383, 11382.-Pensacola Bay lies 110 miles WNW of Cape San Blas and 125 miles NE of South Pass, Mississippi River. The bay, about 12.5 miles in length, has depths of 20 to 50 feet, and affords excellent shelter and anchorage; it is frequently used as a harbor of refuge. The bay is the approach to several towns and the city of Pensacola; to Escambia and East Bays, extending N and E, respectively, from its E end; and to Santa Rosa Sound.

Vessels approaching Pensacola Bay by day can verify their positions by the appearance of the land. For 40 miles E of the entrance, Santa Rosa Island presents a white sand beach and low white sand hills with scattered clumps of trees and bushes; back of this on the mainland are thick woods. For 40 miles W of the entrance, the shore is low and thickly wooded nearly to the water, showing no breaks and very few hillocks. Soundings will indicate whether a vessel is E or W of the entrance, the 10-fathom curve approaches the coast much more closely E of the entrance. Depths of 10 fathoms less than 3 miles off the beach indicate the vessel is E of the entrance.

At night or in thick weather it is well for a vessel uncertain of her position to stay in depths of at least 12 fathoms until the light is sighted or the position is otherwise determined.

Pensacola,7 miles above the entrance to Pensacola Bay, is a commercial city and the site of a U.S. Naval Air Station. The port has good facilities for coastwise and foreign shipping. Shipments through the port include bagged foodstuffs, seafood products, logs, lumber, steel products, scrap iron, marine supplies, grain, petroleum products, sand and gravel, flour, canned goods, paper products, produce, chemicals, fertilizer, rice, peanuts, and general cargo.

Prominent features.-Pensacola Light (30°20.8'N., 87°18.5'W.), 191 feet above the water, and shown from a 171-foot conical brick tower, lower third white, upper two-thirds black, on the shore N of the entrance, is the principal mark for the entrance.

Fort Pickens, on the E point of the entrance, is a part of Gulf Islands National Seashore. The buildings of the park ranger station 2.5 miles E of the entrance, two spherical elevated tanks 8.6 and 10.8 miles E, and a 220-foot water tank about 26.5 miles E of the entrance are prominent when coming from the E. The span of the Perdido Pass highway bridge 13 miles W of the entrance, and the buildings at Gulf Beach 6.5 miles W are conspicuous when coming from the W. The wreck of the old battleship MASSACHUSETTS on the S end of Caucus Shoal, W of the entrance, is visible but cannot be seen for any distance offshore; the wreck is marked by a lighted bell buoy. The buildings, tanks, towers, and other features of the naval air station on the neck S of Warrington can be seen over Santa Rosa Island from the S.

In Pensacola, the Municipal Auditorium on the end of the Municipal Pier, the large water tank, a church steeple, the radio mast atop the telephone building, the Empire Building, the highest building in town which has a small square elevator house on top, and a large green 11-story building about 3.3 miles W of the Municipal Pier can be identified from offshore. At night the numerous radio towers with occulting red lights on top and the aviation lights are easily seen.

Vessels should approach the harbor through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.-The lines established for Pensacola Bay are described in 80.810, chapter 2.

Channels.–The entrance to Pensacola Bay, 0.6 mile wide, is through **Caucus Channel,** a cut dredged through shoals that extend 1.5 miles seaward from the entrance. A Federal project provides for a depth of 35 feet for 5 miles from the Gulf to a large turning basin off the naval air station. The U.S. Navy provides an additional depth to 37 feet for a width of 800 feet in Caucus Channel. (See Notice to Mariners and latest editions of charts for controlling depths.)

Bay Channel extends NE for about 4 miles to two parallel channels, **West Channel** and **East Channel,** that lead N to **Inner Harbor Channel,** along the wharves at Pensacola. Project depth in these channels is 33 feet. (See Notice to Mariners and latest editions of charts for controlling depths.)

Bayou Chico Channel is a dredged channel that leads from the bay to a turning basin about 1 mile above the entrance to the bayou. In June 1983, the controlling depth was 5 feet (8½ feet at midchannel) to the turning basin, thence in 1981-May 1982, 5½ to 12 feet in the basin.

The channels are marked by lighted ranges, lights, daybeacons, and lighted and unlighted buoys.

Anchorages.–Vessels should anchor in the Pensacola Anchorage, E of the Safety Fairways. (See 166.100 through 166.200, chapter 2.) In addition, good anchorage can be found in any part of the bay except S of the naval air station. Inside Pensacola Bay, the usual anchorage is off the city of Pensacola where the holding ground is good.

Dangers.–East Bank and **Middle Ground** form an extensive shoal area that extends 1.6 miles S from the W end of Santa Rosa Island. **Caucus Shoal,** with depths of 2 to 18 feet, extends 1.5 miles S from the W side of the entrance. Because of shoaling on the E side of the entrance, large vessels are advised to navigate as close as possible to the range line.

A seaplane **restricted area** is in Pensacola Bay. (See 207.176, chapter 2, for limits and regulations.)

Tides and currents.–The diurnal range of tide at the entrance is 1.1 feet, at Pensacola 1.3 feet, and at Milton on Blackwater River 1.6 feet. (Daily predictions for Pensacola are given in the Tide Tables.) N winds sometimes lower the water surface 1.5 feet, and hurricanes may raise the water surface from 2 to 9 feet. The diurnal velocity of the tidal current in Pensacola Bay Entrance in midchannel is about 1.7 knots at strength, although currents of up to 8 knots have been reported in the entrance and up to 5 knots at the Pensacola Naval Air Station pier.

In Caucus Cut, for 2 hours at the strongest of the ebb, the normal current has a velocity of 2 to 2.5 knots, setting SE somewhat across the channel in the vicinity of Fort Pickens. The flood has less velocity and sets along the channels. The flood has greater velocity following a norther than at other times.

Weather.–Pensacola is situated in latitude 30°25′N., longitude 87°13′W., on a somewhat hilly, sandy slope which borders Pensacola Bay, an expanse of deep water several miles in width, which in turn is separated from the Gulf of Mexico by a long, narrow island that forms a natural breakwater for the harbor. Elevations in the city range from a few feet above sea level to more than 100 feet in portions of the residential sections, and most of the city is well above storm tides.

The hurricane season extends from late May into early November when there is about a 1 in 10 chance of hurricane force winds at Pensacola. An average of one tropical storm or hurricane passes within 180 miles of Pensacola each year. In a recent 56-year period, 22 of the 61 tropical cyclones that passed within this distance generated hurricane-force winds. At Pensacola, hurricane-force gusts occurred nine times, including 96-knot gusts in 1926 and 1929 and a gust of 83 knots during Frederic in September 1979. Only the 1926 hurricane has generated sustained hurricane-force winds at Pensacola. September is the most likely month for a tropical cyclone. The principal threat is from storms moving in from the SE, S, and SW. The port of Pensacola is vulnerable to strong winds from the SE through SW while Escambia and Blackwater Bays are vulnerable to winds from N or S. Strong winds do pose a wind wave problem at all deepwater berths because of the large expanse of open water in greater Pensacola Bay, which encompasses East, Blackwater, Escambia and Pensacola Bays. It is protected from ocean waves by the sand barrier islands of Perdido Key and Santa Rosa Islands; these barriers are breached only during a severe storm surge. While storm tides of up to 10 feet above mean sea level have occurred in the past, it has been estimated that 100-year storm tides could reach 13.5 feet in Blackwater and Escambia Bays.

The location of Pensacola in the hurricane belt and the absence of sheltered facilities and anchorages renders Pensacola Bay a poor hurricane haven. Large vessels are advised to leave the area well ahead of the storm's arrival. Small craft, if they cannot be taken out of the water, should seek shelter in the many bayous, slews, creeks, and rivers that border the greater Pensacola Bay.

Because of Pensacola's nearness to the Gulf of Mexico, it benefits from its moderating effect, which tempers the cold northers of winter and provides cool sea breezes during summer afternoons.

While 90°F temperatures occur about 56 times each year, readings of 100°F or more are observed on about 18 days each summer. Winter temperatures fall below freezing on about 18 days also. These freezes are brought by cold fronts that are often accompanied by strong, gusty winds and rain or, on rare occasions, snow. Gusts have reached 50 to 60 knots and, on occasion, gone higher in fronts or winter storms. Approaching the port, winds climb to 17 knots or more about 7 to 9 percent of the time from November through April; September is also a likely month for strong winds. Summer winds are usually light and strengthen in thunderstorms or tropical cyclones. While thunderstorms may occur in any month, they are most likely from May through September when they develop on about 5 to 15 days per month; July and August is the most active period. Fog is most likely during winter and spring when visibilities fall below 0.5 mile on 4 to 7

days per month. At other times visibilities are reduced briefly in heavy showers.

The National Weather Service maintains an office in Pensacola. **Barometers** may be compared there. (See appendix for address.)

(See page T-5 for **Pensacola climatological table.**)

Storm warning signals are displayed. (See chart.)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade if drawing over 6 feet. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. Pilots board vessels seaward of Pensacola Bay Entrance Lighted Gong Buoy 1, day or night. For boarding, pilots request that vessels reduce speed to slow and rig the pilot ladder 4 to 5 feet above the water on the lee side. The pilot boat is white with gray trim, 50 feet long, with the word PILOT in large black letters on the bows. The Pensacola Bar and Harbor Pilots monitor VHF-FM channel 16 (156.80 MHz) two hours prior to the expected arrival of a vessel. They can be contacted by radiotelegraph, by telephone (904-433-3632 or 932-4837) through the Mobile Marine Operator, on VHF-FM channel 16 through ships' agents.

Towage.-Tugs up to 1,800 hp for assisting vessels in docking and undocking are obtainable only on advance notice. The towing companies in the area specialize in towing through the Intracoastal Waterway.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) There are several hospitals in Pensacola.

Pensacola is a **customs port of entry.**

Coast Guard.-A Coast Guard station is on the north side of Big Lagoon.

Harbor regulations.-The City of Pensacola, Department of Marine Operations, establishes regulations governing the piers under the control of the Port of Pensacola. The **Port Director** is the manager of the Port of Pensacola and has an office at Port of Pensacola Building No. 1.

Bridges.-No bridges cross Pensacola Bay between the entrance and Pensacola. A highway causeway over the bay between the E part of the city and Town Point has a fixed span with a clearance of 50 feet.

Wharves.-Pensacola has more than 25 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 19, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported depths; for information on the latest depths contact the port authorities. All the deep-draft facilities are at the head of East Channel. The facilities are owned by the City of Pensacola and operated by the Port of Pensacola. Water, electrical shore power, and railroad and highway connections are available. General cargo at the port is usually handled by ship's tackle; cranes up to 110 tons are available. The port has 400,000 square feet of covered storage for general and dry bulk cargoes and 9½ acres of open storage.

Port of Pensacola Terminal (30°24.2'N., 87°12.6'W.):

Port of Pensacola, Roll-on/Roll-off Facility Wharf: N end of Berth 1; 37 feet of berthing space; 24 feet alongside; deck height, 6 feet; receipt and shipment of roll-on/roll-off cargo.

Berths 1 and 2: W side of the terminal has a 1,000-foot marginal wharf with 35 feet alongside. The deck height for Berth 1 on the N end is 11¾ feet for 650 feet. Berth 2 on the S end has a deck height of 11 feet for 400 feet; storage tanks for over 1½ million barrels of various products; receipt and shipment of bagged foodstuffs, general cargo, fertilizer and creosote; receipt of lumber, fish meal, potash, petroleum products, and crude oil; shipment of sulphur; bunkering vessels.

Berths 3, 5, and 6: on S side of terminal; 1,430-foot marginal wharf; 35 feet alongside; deck height, 11 feet; storage tanks for 200,000 barrels of crude oil; receipt and shipment of general cargo, paper products, bagged foodstuffs, steel, scrap metal, tallow oil, pine oil, and lumber; receipt of crude oil.

Facilities at the Naval Air Station (30°20.7'N., 87°15.9'W.), SW of Pensacola proper, include a long marginal wharf with a depth of 34 feet alongside, and slips with depths alongside of 25 feet and 8 to 15 feet, respectively. A daybeacon marks the end of submerged seawall, about 125 yards S of the S slip.

Supplies.-Bunker fuel is available at Port of Pensacola, Berth No. 1. Water, gasoline, diesel fuel, and marine supplies are available.

Repairs.-Facilities are available for making repairs to hulls and machinery. The largest marine railway, at a shipyard in Bayou Chico, can handle vessels or barges to 1,000 tons or 225 feet. Woodworking, machine, and steel fabrication shops are available for almost any type of repairs. A mobile 25-ton crane is available. Above-the-waterline repairs are made anywhere in the port area.

Small-craft facilities.-Limited transient berths, gasoline, diesel fuel, water, ice, and marine supplies are available in Bayou Chico. Hull and engine repairs can be made. Mobile hoists to 50 tons are available. (See Repairs for largest facility.) Additional facilities along the Intracoastal Waterway SE and SW of Pensacola are discussed in chapter 12.

Communications.-Pensacola is a seaport terminal for freight service of the Burlington Northern and Seaboard System Railroad. Sailings are made to ports throughout the world.

The Pensacola Regional Airport is in the NE part of the city.

Bayou Chico, an inlet in the SW part of the city, extends about 1.1 miles W from the Pensacola Bay where it divides into a N arm and a SW arm. Bayou Chico Channel, a dredged channel in the bayou, is discussed earlier in this chapter under Channels. Waterborne commerce on the bayou includes petroleum products, shell, rafted logs, stone and crushed

rock, gravel and sand, and trailers on barges. The Barrancas Avenue highway bridge, crossing the bayou 0.3 mile above the mouth, has a bascule span with a clearance of 13 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(11), chapter 2, for drawbridge regulations and opening signals.) The bridge is equipped with radiotelephone. The bridgetender can be contacted on VHF-FM channels 9 (156.45 MHz) and 16 (156.80 MHz); call sign, WHF 855. An overhead power cable with a clearance of 100 feet crosses the bayou just W of the bascule bridges. Burlington Northern railroad bridge, crossing the mouth of the N arm, has a 29-foot fixed span with a clearance of 7 feet. The twin 28-foot fixed spans of Navy Boulevard Bridge, crossing the N arm 0.2 mile above the railroad bridge, have clearances of 7 feet. Pensacola Yacht Club and basin is on the N side of the entrance to the bayou, and an oil-handling berth is on the S side. There are several marinas, two boatyards, a shipyard, and shell, sand, and gravel plants on the bayou.

Bayou Texar joins the bay just E of the highway causeway to Town Point. The entrance to the bayou is marked by a light and a daybeacon. A channel, marked by private piles, leads to a marina on the E side of the bayou about 0.6 mile above the entrance. In May 1982, the channel had a reported controlling depth of 2½ feet. Gasoline, water, and outboard engine repairs are available at the marina. Two fixed bridges cross the bayou. The Seaboard System Railroad (L&N) bridge at the mouth has a 20-foot fixed span with a clearance of 16 feet. The U.S. Route 90 highway bridge, about 0.5 mile upstream, has a 39-foot fixed span width with a clearance of 12 feet.

Warrington is a suburb of Pensacola on **Bayou Grande,** which is 3 miles SW of the center of the city. The bayou entrance channel is marked by a private light and private daybeacons and is reported privately maintained to a depth of 6 feet.

Admiral Murray highway bridge, with a 33-foot fixed span and a clearance of 14 feet, crosses Bayou Grande about 0.2 mile W of **Jones Point.** In July 1983, a fixed highway bridge with a design clearance of 14 feet was under construction just east of Admiral Murray highway bridge; upon completion, it will replace the existing bridge.

Charts 11382, 11385, 11378.–Escambia Bay, extends 9 miles N from Pensacola Bay. About 5 miles above its mouth the bay is crossed by a railroad causeway with a swing bridge having a clearance of 6 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The channel is through the W draw. The twin spans of Interstate Route 10 highway bridge cross the bay about 0.3 mile S of the railroad swing bridge; clearances are 50 feet. The depths in the bay shoal gradually from 15 feet at the mouth to 7 feet in the upper reaches. A dredged channel, marked by lights and daybeacons, leads from 2 miles above the entrance to the bay to about 6.1 miles above the mouth of Escambia River. In 1981-May 1982, the controlling depth in the dredged channel was 8½ feet through the mouth of the river to Daybeacon 20, thence 9½ feet to the twin fixed highway bridges about 1.5 miles above the mouth, thence 7 feet could be carried to the head of the Federal project 6.1 miles above the mouth.

N of **Devils Point** are shoals and submerged obstructions along the W shore of Escambia Bay. This shore should not be approached closer than 0.5 mile. Above the bridge draw, in line with Escambia River, are a 5-foot shoal and a pile awash at low water. These are outside the dredged channel.

Escambia River, which flows into Escambia Bay from NW, extends N for 48 miles to the Alabama State line, where it is known as the **Conecuh River.** The twin highway bridges about 1.5 miles above the mouth have fixed spans with clearances of 43 feet. There is a nylon fiber plant and some commerce in cypress logs and petroleum on this river, the latter barged to a powerplant about 2 miles above the bridge.

Overhead power cables crossing the river 1.7 and 2.3 miles, respectively, above the bridge have minimum clearance of 60 feet. There are fish camps along the highway bridge on the Escambia and White Rivers that have fuel, berths, launching ramps, and some marine supplies.

East Bay, an E extension of Pensacola Bay, is entered by way of a passage 1 mile wide between the shoals off **Garcon Point** and **Redfish Point.** Depths in the bay vary from 8 to 13 feet, with several small scattered shoals of 6 feet or less. The channel through the bay is marked.

Blackwater River empties into **Blackwater Bay,** the N arm of East Bay. The dredged channel through Blackwater Bay is narrow, and vessels drawing close to maximum draft must keep on the ranges. In December 1982, the controlling depth was 7½ feet (8 feet at midchannel) through the bay and river to **Bay Point** (30°34.2′N., 87°00.1′W.), thence 9 feet was available with local knowledge to the town of Milton. The channel is marked by lighted ranges, lights, and daybeacons.

Numerous wrecks, submerged piling, and other obstructions constitute hazards in Blackwater River. **Wright Basin** and **Marquis Basin** are filled with such obstructions. Twin fixed highway bridges with clearances of 45 feet cross the river at Shields Point.

Milton is a small town about 4 miles above the mouth of Blackwater River. There is some barge traffic in grains, soybeans, and petroleum products. Berthage is available at the town wharf above the bridges with depths of 10 to 15 feet reported alongside in May 1982. The Seaboard System Railroad (L&N) bridge crossing the river at Milton has a swing span with a clearance of 4 feet. U.S. Route 90 highway bridge, 0.2 mile above the railroad bridge, has a bascule span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.245(a) through (e) and (i) (6–b) and (6–c), chapter 2, for drawbridge regulations and opening signals.) A marina in the small cove just above the highway bridge can provide berths, water, electricity, outboard engine repairs,

and marine supplies. Launching ramps are nearby. A small marina for Navy personnel is about 1 mile above the bridge on the E side of the river. Gasoline is available in an emergency.

Chart 11360.-The coast between Pensacola Bay and Mobile Bay appears as a low, thickly wooded, unbroken beach. Depths of 5 fathoms or less extend as much as 4 miles offshore between the two bays.

Charts 11382, 11378.-Big Lagoon, which extends W from Pensacola Bay, is about 5 miles long and from 0.2 to 1 mile in width. The lagoon is separated from the Gulf by a narrow strip of sand beach, and is the route of the Intracoastal Waterway, which is discussed in chapter 12.

Perdido Bay, an irregularly shaped body of water, is 13 miles W of Pensacola Bay entrance and 26 miles E of Mobile Bay entrance. Depths of 6 to 20 feet are found in the bay and in **Perdido River,** the latter being the river that serves as a boundary between the States of Florida and Alabama. **Arnica Bay** and **Bay La Launch** connect Perdido Bay with **Wolf Bay** on the W. Bayou St. John and Perdido Pass connect the bay with the Gulf to the S.

The highway causeway over Perdido Bay at **Cummings Point** has a fixed span with a clearance of 39 feet.

Perdido Pass, extending between **Florida Point** and **Alabama Point,** is easily distinguished from offshore by State Route 182 highway bridge across its entrance with two openings. The fixed span over Perdido Pass Channel has a clearance of 35 feet. The 47-foot fixed span over Cotton Bayou Channel has a clearance of 29 feet. The dredged entrance channel leads from the Gulf through Perdido Pass to a fork at the highway bridge; thence into two channels, one leading N into **Terry Cove** and **Johnson Cove** and the other leading E into **Bayou St. John.** The entrance to the pass is protected by a jetty on the W and by a combination weir and jetty on the E; the top of the weir is submerged 6 inches at mean low tide. In April 1983, shoaling to about 5½ feet was reported in the approach to the pass. In March 1983, a depth of 6 feet could be carried through the marked entrance channel that leads close to the W jetty, thence the controlling depths were 7½ feet in the channel leading to Bayou St. John and 4½ feet in the channel leading to Terry and Johnson Coves. In November 1983, a submerged obstruction was reported in the entrance channel in about 30°16′19″N., 87°33′30″W. The channels are well marked; a lighted whistle buoy off the entrance marks the approach.

COLREGS Demarcation Lines.-The lines established for Perdido Pass are described in 80.810, chapter 2.

The Intracoastal Waterway in the lower part of Perdido Bay is reached from Perdido Pass via a marked channel through Bayou St. John. In May 1982, shoaling to 6 feet was reported in Bayou St. John between Daybeacons 6 and 8. An overhead power cable with a clearance of 59 feet crosses the channel leading to Terry Cove and Johnson Cove, about 0.4 mile from State Route 182 fixed bridge. Several small-craft facilities are in the coves. (See the small-craft facilities tabulation on chart 11378 for services and supplies available.)

Cotton Bayou, on the W side of Perdido Pass 0.7 mile above the entrance, has a marina where berths, gasoline, water, marine supplies, a launching ramp, and open and covered storage are available. A forklift can handle craft to 26 feet for general repairs.

Old River enters Perdido Pass from E between Florida Point and **Ono Island.** In May 1982, a reported depth of 5 feet could be carried through the river with local knowledge. The Florida-Alabama State boundary passes through Old River. A fixed highway bridge with a clearance of 24 feet crosses Old River about 1 mile E of Perdido Pass. An overhead power cable with a clearance of 35 feet crosses Old River between the E end of Ono Island and Perdido Key.

Chart 11376.-Little Lagoon is a shallow body of water about 6 miles long and 0.5 mile wide lying just back of the beach between Perdido and Mobile Bays. An opening 15 miles E of Mobile Point connects the lagoon with the Gulf. In 1982, the reported controlling depth through the opening was 5 feet.

7. MOBILE BAY TO MISSISSIPPI RIVER

This chapter describes the coasts of Alabama, Mississippi, and Louisiana bordering the Gulf of Mexico from Mobile Bay to the Mississippi River and the numerous bodies of water emptying into the Gulf, including Breton Bay, Mobile Bay, Mississippi Sound, Lake Borgne, Lake Pontchartrain, Chandeleur Sound, Breton Sound, and their tributaries. Also discussed are Mobile, Pascagoula, Biloxi, and Gulfport, and other smaller ports and landings.

The Intracoastal Waterway for this section of the coast is described in chapter 12.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.815, chapter 2.

Weather.–The warm, temperate climate of the coast from Mobile Bay to the Mississippi River is influenced by the Gulf of Mexico, which is partly responsible for the warm, humid summers and the relatively mild winters. During spring and summer, the Bermuda High generates moist SE to S winds that keep the temperatures cooler than those farther inland and also aids in thunderstorm development. Cold continental air pushes far enough S in winter to occasionally drop temperatures below freezing and even produce some snow. Cold spells usually last about 3 days.

About 15 to 20 significant frontal systems penetrate the Gulf of Mexico each year, bringing cool air and strong N winds. The collision of this air with the warm air to S sometimes generates strong low pressure systems. This pattern continues until the Bermuda High begins to exert its influence in spring. At sea, gales blow about 1 percent of the time from November through March, while waves of 8 feet or higher are encountered 4 to 6 percent of the time. Fog is also a problem in winter and spring, particularly when warm air invades the region and moves over relatively cooler water. Near shore, visibilities drop below 2 miles from 2 to 7 percent of the time from December through April; January and March are the worst months.

While tropical cyclones can affect this coast at any time, late May to early November is considered the hurricane season. A tropical cyclone (tropical storm or hurricane) moves across this stretch of coast every other year, on the average, while the hurricane frequency is about once in 5 years. Intense hurricanes can generate 175-knot winds, 40-foot seas, tides 10 to 25 feet above normal, and 15 inches of rain. Of all the storms that have affected this coast, about 45 percent occurred in September; about one-half of these were hurricanes. Most tropical cyclones approach from SE through SW. The two most devastating storms to hit this coast in recent years were hurricanes Camille, in September 1969, and Frederic, in September 1979.

Charts 11376, 11378.–Mobile Bay, 40 miles W of Pensacola and 90 miles NE of South Pass, Mississippi River, is the approach to the city of Mobile and to the Alabama and Tombigbee Rivers. The bay has depths of 7 to 12 feet outside the dredged channels. The entrance is 3 miles wide between Mobile Point on the E and Pelican Point on the W, but most vessels will prefer to follow the dredged channel rather than chance passage between the breakers and shoals that extend 4 miles S on both sides.

Shipping Safety Fairways.–Vessels should approach Mobile Bay through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

Prominent features.–The general appearance of the land is a guide to finding the entrance to Mobile Bay. For a distance of 40 miles E of the entrance, the shore, although low, is wooded and unbroken. For 50 miles W of the entrance there is a chain of islands which, although wooded in places, is generally low and bare.

The most conspicuous landmark near the entrance is the 131-foot black conical tower (30°11.3′N., 88°03.0′W.), which was the base for the former Sand Island Light. A two-story white house is on the NW side of the tower.

Fort Morgan, an historic State shrine, is on **Mobile Point** on the E side of the entrance. The walls of this old brick pentagon-shaped fort are conspicuous when approaching the entrance. **Mobile Point Light** (30°13.7′N., 88°01.5′W.), 125 feet above the water, is shown from a skeleton tower. Mobile Point Range Rear Light is shown below and on the same structure as the light. A radiobeacon with a special radio direction finder calibration service is near the light. (See Light List for details.)

The concrete gun emplacements of later fortifications E of the old fort are also conspicuous.

Fort Gaines, an historic landmark and museum on the E end of Dauphin Island, is on the W side of the entrance. A spherical elevated tank is 2 miles W of the fort.

COLREGS Demarcation Lines.–The lines established for Mobile Bay are described in 80.815, chapter 2.

Channels.–Main Ship Channel, the entrance or bar channel, leads from the Gulf between Southeast Shoal and Mobile Point on the E and Sand Island and West Bank on the W. Federal project depth is 42 feet over the bar. (See Notice to Mariners and latest editions of charts for controlling depths.) In addition to the dredged channel across the bar, the natural channel has depths of 18 feet or more. Inside the bar, depths in the channel increase to as much as 56 feet, with a least width of 500 yards between the shoals which rise abruptly from deep water. The wreck of the MAGNOLIA, on the E side of the channel 0.7 mile SW of Mobile Point, is marked by a

lighted buoy; one mast extends about 20 feet above the water. The channel is marked by lighted buoys and a **020°30′** lighted range on Mobile Point. The rear range light is on the same structure and below Mobile Point Light.

From W, boats drawing up to 6 feet can enter Mobile Bay via **Pelican Passage** and **Pelican Bay,** only with local knowledge, owing to the shifting character of the bottom. The channel passes between the shoal SE of Pelican Passage and Dauphin Island, thence E into Pelican Bay. The best water can be found by passing to the S of **Dauphin Island Spit** before shaping a course N into Mobile Bay. The channel is marked by two daybeacons.

From E, only about 3 feet can be taken across Southeast Shoal around Mobile Point. It is necessary to pass very close to shore; the passage should only be attempted under most favorable weather conditions and with local knowledge. The channels shift frequently.

Mobile Bay Channel extends from the lower anchorage off Fort Morgan through Mobile Bay to Mobile River. Federal project depth is 40 feet to and in a turning basin off **Magazine Point** at the head of Mobile Ship Channel. Although the channel is subject to shoaling, the project is generally maintained. (See Notice to Mariners and latest editions of charts for controlling depths.) The channel is well marked with lighted ranges, lights, and lighted and unlighted buoys.

The secondary and other channels are covered geographically under their respective headings.

Anchorages.–Vessels should anchor in the Mobile Bay Anchorage, S of and between the safety fairways. (See 166.100 through 166.200, chapter 2.) The best anchorages in the lower bay for deep-draft vessels are found N and NW of Mobile Point in depths ranging from 20 to 45 feet with excellent holding ground. This anchorage is secure, but during a norther a short heavy choppy sea is raised which may be uncomfortable for small vessels. A circular **explosives anchorage** is just N of Mobile Point. (See 110.1 and 110.194, chapter 2, for limits and regulations.) A **general anchorage** for unmanned and other nondescript vessels is near Cedar Point. (See 110.1 and 110.194a, chapter 2, for limits and regulations.)

Vessels are not permitted to anchor in the Bar Channel, Mobile Bay Channel, or Mobile River Channel.

In emergencies, light-draft vessels can anchor in Mobile River above Cochrane (U.S. Route 90) highway bridge with permission of the harbormaster.

Small boats sometimes anchor N and E of Fort Morgan in **Navy Cove.** Several piles and other obstructions are in this locality.

Dangers.–Shoals extend about 4.5 miles S and W of Mobile Bay entrance. **Southeast Shoal,** covered 3 feet, is on the E side of the Bar Channel, and **Sand Island Shoal,** covered 1 foot, and **West Bank,** covered 3 feet, are on the W side.

The wreck of the Civil War vessel TECUMSEH is N of Mobile Point Light in 30°13′47.5″N., 88°01′37.5″W. The wreck is marked by a buoy with orange and white bands. The vessel is reported to be in an unstable condition, and ammunition and powder aboard the wreck could be detonated if the vessel shifts. Mariners are cautioned not to anchor in the area of the buoy and to reduce speed producing as little wake as possible when transiting Mobile Channel between Buoys 15 and 17.

A nearly continuous spoil bank extends along either side of the bay channel from just inside Mobile Bay entrance to the mouth of Mobile River. Through these spoil banks are several charted openings for passage to various points in Mobile Bay.

Fish havens, consisting of concrete pipe, lie within a 3.5-mile-square area which extends offshore from 2.7 miles to 6.2 miles E of Mobile Point.

Fish havens, consisting of old automobile bodies lashed together, scrap iron, and concrete, have been or may be established on the bottom along the 10-fathom curve off the Alabama coast. While they are not dangerous and are reported to have a minimum depth of 10 fathoms over them, vessels are advised not to anchor in their vicinity.

Tides and currents.–The tides are chiefly diurnal and the rise and fall is very small, averaging 1.2 feet at Mobile Point and 1.5 feet at Mobile. During the winter, northers may depress the water surface as much as 1.5 feet below mean low water, while hurricanes have been known to raise the level as much as 11.5 feet. (See the Tide Tables for daily predictions.)

In this area strong winds have considerable effect in modifying the times and velocities of the current; in using the tables, allowance should be made for such effects. (See the Tidal Current Tables for daily predictions of current in Mobile Bay entrance and other locations in Mobile Bay.)

The tidal current near the outer end of the Main Ship Channel is rotary. Both the flood and ebb currents set somewhat to the left of the channel direction before reaching their strength, and to the right of the channel direction after the times of strength. During 3 days of current observations at this location there was an outflow of 0.5 knot average velocity combined with the tidal current.

It has been reported that velocities of 8 to 10 knots have been observed in the Bar Channel and Mobile Bay Channel on the runoff of the ebb after protracted periods of strong S winds. Low-powered and deep-draft vessels should be guided by the advice of the pilots under these conditions.

Weather.–The climate of Mobile Bay is influenced by the waters of the N Gulf of Mexico and of the bay itself. While summers are warm, the heat is tempered by the ocean and bay breezes. Temperatures climb to 90°F or above on about 40 to 60 days each summer, compared to 80 days just a few miles inland. During winter, the waters help moderate the colder temperatures. Minimums fall below freezing on about 4 to 13 days each season, compared to 20 to 25 days, on average, inland. Cold snaps usually last about 3 days, and occasionally they will bring some snow flurries. The winds behind these fronts some-

times blow for an extended period and are known as "northers". If they persist, they can lower the water in the bay and this can interfere with the deeper draft vessels bound through the dredged channel.

In addition to these northers, strong winds and rough seas on the bay are generated by extratropical storms, thunderstorms, and tropical cyclones. While gale-force winds are infrequent, winds in the 17- to 33-knot range occur about 5 to 10 percent from November through May. March and April are often the windiest months. Thunderstorm winds are usually in the form of gusts and can reach 50 to 60 knots. Frontal thunderstorms, which are usually the most severe, can occur in any month and are most likely in spring. Air mass thunderstorms are most frequent in summer; during June, July, and August, thunderstorms are observed on about 10 to 17 days per month, often in the afternoon. The strongest winds are generated by hurricanes, except for those in a rare tornado. Hurricane winds have reached 175 knots along the N Gulf coast.

While a tropical cyclone may be expected to affect this region about every 2 years on average, destructive storms have been infrequent on Mobile Bay during this century. Eight hurricanes have crossed the coast near Mobile Bay since 1900. In September 1979, hurricane Frederic, generating 115-knot substained winds and a 12-foot storm tide, became the first hurricane since 1926 to directly strike Mobile. During the storm, Dauphin Island reported gusts to 126 knots.

Tropical cyclones are a threat from late May through early November, while September is the most active month. Most storms approach the area from SE through SW. They are often in the process of recurving and intensifying before moving inland. Mobile Bay is protected by Dauphin Island to the W and banks and shoals to the E. However, during southerly gales it is not usually safe for vessels of over 25-foot draft to attempt to cross the bar.

Visibilities may be briefly restricted to near zero in heavy showers or thunderstorms throughout the year. However, fog is more persistent and is most likely in winter and spring when warm air from S occasionally moves across relatively cooler waters. During this period, it is associated mainly with SE and S winds. From November through April, visibilities fall below 0.5 mile on 4 to 8 days per month. Conditions are usually worst during the late night and early morning hours, improving during the early afternoon.

The National Weather Service maintains offices in Mobile. **Barometers** may be compared at these offices or by telephone. (See appendix for addresses.)

(See page T-6 for **Mobile climatological table.**)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government.

The Mobile Bar Pilots Association maintains a station on Dauphin Island and operates two pilot boats, ALABAMA and MOBILE PILOT, based at Fort Gaines. The boats have gray hulls and white superstructures with green trim and the word PILOT on each side of the wheelhouse. The boats monitor VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz), and the station monitors channel 16. The pilot boats and harbor tugs are interconnected with the harbormaster's office on the intraport radiotelephone system, VHF-FM channel 65A (156.275 MHz). The pilots board vessels day or night in the vicinity of Mobile Entrance Lighted Whistle Buoy M (30°08.1'N., 88°03.9'W.). For boarding, the pilots request that the pilot ladder be rigged 6 feet above the water on the lee side of the vessel.

Pilots can be ordered by telegraph (cable address: MOBARPI), by telephone (205-432-2639 or 432-2630), by radiotelephone through the Mobile Marine Operator, or through ships' agents. The pilots request a 48-hour advance notice of arrival and a 1½-hour notice of sailing.

Bon Secour Bay, extending about 14 miles E of Mobile Bay entrance, has depths of 7 to 10 feet. Oyster beds are very extensive along the NE shore of the bay. The bay is the route of the Intracoastal Waterway, which crosses Mobile Bay Channel at a point 2.6 miles N of the latter's entrance. The waterway is described in chapter 12. A marina on the N side of Mobile Point about 0.8 mile E of Fort Morgan provides berths with water and electricity, gasoline, diesel fuel, ice, a launching ramp, and marine supplies. The approach to the facility is marked by private daybeacons and was reported navigable by craft drawing 8 feet or less in May 1982.

Bon Secour River empties into the E part of Bon Secour Bay. A dredged channel leads from the Intracoastal Waterway through Bon Secour Bay and into Bon Secour River, a total distance of 3.4 miles. A turning basin is on the S side of the channel 1.6 miles above the waterway. In September 1981, the controlling depth was 5 feet (7 feet on the centerline) to Daybeacon 30, thence 5½ feet to the head of the channel. The turning basin had depths of 3½ to 6 feet. The channel is marked by a light and daybeacons.

About 1 mile above the mouth, an unnamed arm of water leads S from Bon Secour River to shallow **Oyster Bay.** A fixed highway bridge crossing the arm limits navigation to the S to skiffs only.

The town of **Bon Secour** is on the N side of Bon Secour River about 1.5 miles above the mouth.

Small-craft facilities on the E side of the arm leading to Oyster Bay and at the town of Bon Secour can provide berths, gasoline, diesel fuel, water, ice, marine supplies, launching ramps, storage, and hull and engine repairs. The largest marine railway, at a boatyard on the E side of the arm leading to Oyster Bay, about 0.4 mile N of the fixed highway bridge, can handle craft to 80 feet. A channel marked by private stakes, with a reported depth of 7 feet in May 1982, leads to the boatyard. In May 1982, it was reported that a depth of 4 feet

could be carried for about 1.3 miles above the dredged channel.

Chart 11376.-Weeks Bay, on the E side of Mobile Bay about 6.8 miles NW of Bon Secour River, has an average depth of 2 to 5 feet. A privately marked channel, with a reported controlling depth of about 4 feet in May 1982, leads through the entrance and across the bay to **Fish River.** About the same depth can be carried into **Magnolia River** on the E side of the bay.

The approach to the bay is marked by a light about 1 mile W of the entrance. An overhead power cable with a clearance of 56 feet crosses the bay at the entrance.

Small boats go to **Marlow** on Fish River and **Magnolia Springs** on Magnolia River. State Route 98 highway bridge over Fish River at **Yupon** has a fixed span with a clearance of 35 feet. A small marina on the W side of the river just below the bridge has berths, gasoline, diesel fuel, water, electricity, ice, some marine supplies, and a launching ramp.

State Route 32 highway bridge crossing Fish River at Marlow, about 5.5 miles above the mouth, has a fixed span with a clearance of 22 feet. A marina on the W side, a short distance below the bridge, has berths, electricity, gasoline, water, ice, some marine supplies, and a launching ramp.

East Fowl River enters the W side of Mobile Bay about 13.8 miles N of the bay entrance. It extends generally SW. The entrance is marked by lights and daybeacons. In July 1983, the controlling depth was 3 feet from the entrance in Mobile Bay to a point in 30°26′17″N., 88°07′10″W., about 1 mile above the mouth. Above this point, the reported controlling depth was 2 feet to West Fowl River in May 1982; local knowledge is advised. State Route 163 highway bridge, about 0.5 mile above the mouth of the river, has a 43-foot fixed span with a clearance of 24 feet. A marina on the N side of the river just E of the bridge has berths with water and electricity, gasoline, diesel fuel, ice, a launching ramp, and limited marine supplies. Outboard engine repairs are available. East Fowl River leads into West Fowl River, and thence into Fowl River Bay; these are discussed later in this chapter.

Fowl River, the NW branch, joins East Fowl River about 2 miles above the mouth. It is navigable for about 3 miles by small craft with local knowledge.

Great Point Clear is on the E side of the bay about 16 miles N of the entrance; a light marks the shoals extending W from the point.

Point Clear, Battles Wharf, Seacliff, and **Daphne** are summer resorts along the E shore. Many of the numerous boat landings are in ruins and constitute a danger to small boats navigating close inshore. A large hotel on Great Point Clear has a prominent water tank. A privately dredged channel with a reported controlling depth of 6 feet in May 1982, leads to a yacht basin at the hotel; it is marked by private lights and daybeacons. Berths, electricity, gasoline, diesel fuel, and water are available at the basin.

Fairhope, on the E side of the bay about 17.6 miles above the entrance, is a town with bus connections. There is a 1,450-foot municipal pier at the town. A channel marked by private daybeacons, with a reported controlling depth of 4 feet in May 1982, leads to a marina in a basin adjoining the N side of the pier. Berths with water and electricity are available at the marina. Fairhope Yacht Club is located in **Fly Creek,** N of the municipal pier. A dredged channel leads E from Mobile Bay to a turning basin about 0.1 mile above the mouth of the creek. In March 1982, the controlling depth was 1 foot in the entrance channel (3 feet in the S half) and 6 feet in the turning basin. The entrance to the channel is marked by a light. A municipal fish dock, on the W side of Fly Creek about 0.3 mile above the entrance, can provide gasoline and diesel fuel. Marinas on the creek can provide berths with water and electricity, gasoline, and limited marine supplies. A forklift can haul out craft to 25 feet for storage.

Fairhope Yacht Club race course, W of Fly Creek and about 2.2 miles in diameter, is marked by private daybeacons.

Theodore Ship Channel leads from a point in Mobile Bay Channel about 15 miles N of the entrance NW for 4.5 miles to an anchorage area and thence through a 1.5-mile landcut to a turning basin at an industrial park. The Federal project depth is 40 feet to and in the turning basin. The channel is marked by lights and a **123°23′** lighted range. The S side of the anchorage area is marked by daybeacons. (See Notice to Mariners and latest edition of chart for controlling depths.) A barge channel extends 1.2 miles W from the head of the turning basin. In October 1983, the controlling depth was 1 foot. Overhead power and telephone cables with a least clearance of 50 feet cross the landcut about 1 mile above the entrance. A fixed highway bridge with a clearance of 45 feet crosses the barge channel about 0.15 mile above the turning basin. In February 1983, it was reported that a bulkhead on the N side of the turning basin had partially collapsed; caution is advised.

Hollingers Island Channel leads W from a point in Mobile Bay Channel, 18 miles N of the entrance, to a pier on the W shore of Mobile Bay. In August 1982, the reported midchannel controlling depth was 6½ feet, thence in May 1982, 10 feet was reported alongside the pier. The channel is well marked by lights, a buoy, and daybeacons. The pier has 600 feet of usable berthing space on both the N and S sides and is used for the receipt of oil by barges.

Dog River, emptying into the W side of Mobile Bay at a point about 21 miles N of the entrance, is used considerably by yachts and small boats. Boats approaching Dog River generally leave Hollingers Island Channel just W of Light 6, then steer 322° for Dog River Light 1. In May 1982, a reported depth of 7 feet could be carried from Hollingers Island Channel to Dog River entrance channel, thence about 3½ feet for about 7 miles to the Seaboard

System Railroad (L&N) bridge, which has a 22-foot fixed span with a clearance of 8 feet. The entrance is marked by lights and a daybeacon. State Route 163 highway bridge crossing the mouth of Dog River has a bascule span with a clearance of 11 feet at center. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead cable at the bridge has a clearance of 68 feet.

There are several small-craft facilities on the river at which berths, electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies are available; hull, engine, and electronic repairs can be made. A 60-ton mobile hoist at a marina in a dredged basin on the N side of the river just above the highway bridge and two marine railways at a marina and boatyard about 3 miles above the highway bridge can each handle craft up to 60 feet.

Along the W shore of the bay, N and S of Dog River, there are numerous small-craft landings; many, however, are in ruins.

Mobile, 28 miles N of the bay entrance, is one of the largest and most important seaports on the Gulf of Mexico. A fully equipped ocean terminal, excellent transportation facilities, large shipyards, and all kinds of marine supplies can be obtained at Mobile. Principal foreign exports are marine supplies, paper products, lumber, wood pulp, flour, aluminum, chemicals, grain, soybeans, coal and bunker oil, iron and steel products, and fertilizer. The principal foreign imports are bauxite, mahogany, crude rubber, sugar, newsprint, seafood, rubber, pig iron, ores, molasses, automobiles, fishmeal, frozen foods, and chemicals. The coastwise trade consists mainly of petroleum products, shell, lumber, iron and steel products, chemicals, and food products. Inland waterway transportation facilities for handling iron and steel products, ore, sugar, grain, and coal serve the Warrior, Tombigbee, and Alabama River systems with connections to the Mississippi River.

Prominent features.–From about the center of the bay, a water tank at Great Point Clear and the battleship ALABAMA moored at the entrance to Tensaw River are conspicuous. On nearing the city, the 33-story First National Bank Building and other tall buildings near the waterfront are first seen. Next seen are the water tanks NW of Garrows Bend. At night, the fixed red lights on the water tank at Great Point Clear are visible from Mobile Bay Channel. An aviation light at Brookley Field, S of Mobile, and the occulting red lights on the radio towers at the mouth of Tensaw River are prominent.

Channels.–Main Ship Channel, the dredged bar channel, and Mobile Bay Channel leading from the entrance to Mobile River Channel were discussed earlier in this chapter.

From a point 25.7 miles N of the bay entrance, **Arlington Channel,** a dredged channel, leads WNW from Mobile Bay Channel to a turning basin in the W part of Garrows Bend. In October 1983, the controlling depth was 21 feet in the channel with 20 feet in the turning basin. The channel is marked by a lighted **289°20′** range, lights, and daybeacons. A Coast Guard station is at the W end of the channel.

Garrows Bend Channel, a dredged channel, leads NE from the turning basin to a causeway between McDuffie Island and the mainland. In July 1983, the controlling depth was 12 feet from the turning basin to Buoy 5, thence 1½ feet to the causeway. The channel is marked by private buoys and a daybeacon for a distance of about 0.3 mile above the turning basin. In February 1980, it was reported that the channel was no longer being maintained beyond Buoy 5.

Mobile River Channel extends from Mobile Bay Channel for 4 miles to the bridge at **St. Louis Point.** Federal project depths are 40 feet from the mouth of the river to and inside **Mobile Turning Basin,** thence 40 feet to St. Louis Point, and thence 25 feet to the mouth of and in Chickasaw Creek for about 2 miles to just below **Shell Bayou** entrance. (See Notice to Mariners and latest editions of charts for controlling depths.) In 1982, it was reported that Mobile-Chickasaw Port Facility, Inc., was maintaining Chickasaw Creek to a depth of 37 feet from St. Louis Point to Shell Bayou.

Threemile Creek leads W from Mobile River Channel just S of **Magazine Point.** About 0.6 mile above the creek entrance, **Industrial Canal** leads S for about 1 mile. Depths of about 9 feet can be carried in the creek to the canal, thence 12 feet in the canal. Chemicals, seafood, cement, gypsum, sand and gravel, lumber, chemical plants, and oil terminals are on the canal. The large bulk material handling plant of the Alabama State Docks, with over 1,600 feet of berthing space in 40 feet, is on the south side of the entrance to Threemile Creek. (See Wharves.)

The old ship channel around the S end of **Pinto Island,** which leads to Tensaw River, had a controlling depth of 8 feet in 1972. The channel is unmarked.

Anchorages.–In emergencies, light-draft vessels may anchor in Mobile River above Cochrane (U.S. Route 90) highway bridge crossing at St. Louis Point with the permission of the harbormaster.

Bridges.–There are no bridges over the main channel from the Gulf to the State docks. Above the docks, at St. Louis Point, Mobile River is crossed by Cochrane (U.S. Route 90) highway bridge with a vertical lift span with clearances of 23 feet down and 135 feet up. Just above this bridge, at the mouth of Chickasaw Creek, is the Seaboard System Railroad (L&N) bridge with a swing span with a clearance of 6 feet; the channel is through the S draw. (See 117.240 and 117.491, chapter 2, for drawbridge regulations and opening signals.) The U.S. Highway 90 bridge is equipped with radiotelephone. The bridgetender can be reached on VHF-FM channel 13 (156.65 MHz); call sign KZA-922.

Twin fixed highway bridges with clearances of 125 feet cross the river about 18 miles above the mouth.

Five bridges cross Threemile Creek below the fixed highway bridge at the head of navigation. The first, Seaboard System Railroad (L&N) bridge, has a

swing span with a clearance of 10 feet. The channel is through the N draw. The second, the Alabama Terminal Docks railroad bridge, has a swing span with a clearance of 4 feet. The channel is through the N draw. In December 1983, a bascule railway bridge was under construction just E of the swing bridge; upon completion it will replace the existing bridge. Beyond the Industrial Canal are the U.S. Route 43 highway and the Southern railway bridge with swing spans having a minimum clearance of 1 foot. The channel is through the N draw. (See 117.1b, 117.240, and 117.245 (a) through (e), and (i)(19) and (i)(20), chapter 2, for drawbridge regulations and opening signals.) About 0.15 mile below Route 43 highway bridge, an overhead power cable crosses with a clearance of 53 feet. About 0.4 mile above the Southern railway bridge, the Gulf, Mobile, and Ohio railroad bridge has a fixed span with a clearance of 12 feet.

Twin highway tunnels cross under Mobile River between Mobile and **Blakeley Island** about 1.5 miles above McDuffie Island.

Weather and pilotage information for Mobile is discussed earlier in this chapter.

Towage.–Diesel-powered tugs and oceangoing tugs up to 3,600 hp are available at Mobile.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine.–Quarantine laws are enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Mobile has several hospitals and clinics.

Mobile is a **customs port of entry.**

Coast Guard.–A **Marine Safety Office** is at Mobile. (See appendix for address.)

Harbor regulations.–The Alabama State Docks Department has jurisdiction over the bay, harbor, and that part of all the tributary streams in which the tide ebbs and flows, and extends to the outer shoal 5 miles SSW of Fort Morgan at the entrance to the harbor. It has supervision over harbor pilotage, State wharves and shipping, as well as authority in all matters relating to the arrival, departure, loading, and discharging of all vessels at State wharves. Most routine functions are administered through the **harbormaster.**

The harbormaster controls all of the waterway traffic in the area, assigns berths, and enforces the rules and regulations of the port. Ships are normally taken to their berths by the bar pilots, but any subsequent shifting or redocking of vessels in the harbor is done by the harbormaster and his deputies. The harbormaster's office is in the Administration Building at the State Docks and is connected by the intraport radiotelephone system with all pilot boats and tugs on VHF-FM channels 16 (156.80 MHz) and 65A (156.275 MHz). The harbormaster can be reached by telephone (205-690-6075).

Speed limit.–No vessel, except launches, shall exceed 6 m.p.h. in the inner harbor between Mobile Channel Light 76 to and including Chickasaw Creek, and shall take all possible precautions to prevent disturbance of vessels berthed at marginal wharves.

Wharves.–The Port of Mobile has more than 100 piers and wharves, most of which are located on both sides of the Mobile River between the mouth and the confluence with Chickasaw Creek about 4 miles above the mouth. Facilities are also on Theodore Industrial Park Ship Canal, Arlington Channel, Threemile Creek, Industrial Canal, Chickasaw Creek, Hog Bayou, and Black Bayou.

The facilities on the W side of the Mobile River are generally for handling cargo, while the facilities on the E side are service and industry related. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 18, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths of the facilities described are reported; for information on the latest depths contact the Alabama State Docks Department or the private operators. All deep-draft facilities have rail and direct highway connections, and almost all have water and electrical shore power connections.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Floating cranes to 110 tons are available.

In the port area, the Alabama State Docks Department and private companies operate warehouses and transit sheds having a total of more than 3 million square feet of dry storage space. About 36 acres of open storage space is available.

Facilities on Mobile River, W side:

Alabama State Docks McDuffie Terminals, Ship Dock Berth No. 1 (30°39′14″N., 88°01′58″W.): 850 feet of berthing space with dolphins; 40 feet alongside; deck height, 15½ feet; one traveling gantry shiploader with 96-foot conveyor boom, served by a 72-inch electric belt conveyor; loading rate, 2,800 to 3,300 tons per hour; shipment of coal by vessel; owned by the State of Alabama, operated by Alabama State Docks Department.

Alabama State Docks McDuffie Terminals, Ship Dock Berth No. 2 (30°39′24″N., 88°01′58″W.): 1,100 feet of berthing space with dolphins; 40 feet alongside; deck height, 15½ feet; one traveling gantry shiploader with 222-foot boom conveyor having 115-foot outreach from front rail, served by a 96-inch conveyor system; maximum loading rate 7,000 tons per hour; shipment of coal by vessel; owned by the State of Alabama and operated by the Alabama State Docks Department.

Alabama State Docks Pier No. 4 (30°40′00″N., 88°02′05″W.): W end of S side, 240 feet long, 35 feet alongside; E end of S side, 235 feet long, 35 feet alongside; N side, 495 feet long, 35 feet alongside; deck heights, 9 feet; four hand-operated mast-and-boom derricks, one with two 20-foot booms, three each with one 20-foot boom; pipelines extend from pier to storage tanks; receipt of petroleum products, chemicals, and petrochemicals by barges; receipt of molasses and liquid livestock feed; owned by the

State of Alabama, and operated by Triangle Refineries, Inc., Shell Oil Co., and Pro Rico Industries, Inc.

Texaco, Mobile Terminal Pier: about 300 yards N of Alabama State Docks Pier No. 4; S side, 630 feet long, 2½ to 28 feet alongside; N side, 630 feet long, 20 to 30 feet alongside; deck heights, 12 feet; three hand-operated cranes for hose-handling, one 2-ton fork lift truck, pipelines extend from pier to storage tanks, total capacity, 415,000 barrels; 25,596 square feet of covered storage; receipt and shipment of petroleum products; bunkering vessels, and loading barges for bunkering vessels at berth; mooring tank barges; owned and operated by Texaco, Inc. and Colle Towing Co.

Marine Bulk Handling Corp. Ship Pier: about 400 yards N of Alabama State Docks Pier No. 4; S side, 255 feet long, 12 feet alongside; N side, 1,000 feet long, 42 feet alongside; deck heights, 10 feet; loading tower with cantilevered boom and bucket system, belt-conveyor system serves rail and barge loading hoppers, 150-ton traveling hopper for self-unloading vessels; open storage for 25,000 tons of coal; receipt of iron, manganese, and fluorspar ores; receipt and shipment of shale; bunkering vessels; owned by U.S. Steel Corp., and operated by Marine Bulk Handling Corp.

Del Monte Banana Co. Wharf (30°41′30″N., 88°02′15″W.): 562-foot face; 28 to 30 feet alongside; deck height, 6 feet; receipt of bananas; owned by State of Alabama, and operated by Southern Stevedoring Co., subsidiary of Del Monte Banana Company, Inc.

Alabama State Docks, Berths 2 through 8, Piers A through D, and Bulk Material Handling Plant; owned by the State of Alabama, operated by the Alabama State Docks Department. These docks form a modern port terminal, open to all users alike. The facilities include many concrete wharves, fireproof shipside transit sheds and covered warehouse space, grain elevators, bonded general cargo warehousing, terminal rail connections, and numerous auxiliary facilities. The largest crane at the terminal is a 100-ton stiff-leg derrick. Floating cranes up to 80-ton capacity are also available, as are smaller cranes, lift trucks, trailers, and conveyors.

Berths 2, 3, 4, and 5 (30°41′50″N., 88°02′18″W.): 2,394-foot marginal wharf; 37 to 40 feet alongside; deck height, 11 feet; 135,000 square feet covered storage; 24 acres of open storage; receipt and shipment of steel, heavy-lift cargo, and general and containerized cargo.

Berths 6, 7, and 8 (30°42′05″N., 88°02′25″W.): E face, 1,080 feet long; corner face, 160 feet long; N face, 495 feet long; 35 to 38 feet alongside; deck heights, 11 feet; 210,00 square feet covered storage; receipt and shipment of general and roll-on/roll-off cargo; shipment of lumber.

Pier A, South Wharf (30°42′17″N., 88°02′26″W.): S side, 570 feet long, 38 feet alongside, deck height, 11 feet; head of pier, 330 feet long, 38 feet alongside, deck heights, 6 feet; 68,000 square feet covered storage, 2½ acres open storage; pipelines to storage; receipt and shipment of bulk liquids, including molasses, vegetable and tung oil, receipt of crude rubber and liquid latex; receipt and shipment of general cargo.

Pier A, North Wharf: N side, 1,520 feet long, 38 feet alongside, deck height, 11 feet; head of slip, 457 feet long, 32 to 38 feet alongside, deck height, 6 feet; 102,000 square feet covered storage; warehouses; receipt and shipment of general cargo.

Pier B: about 300 yards N of Pier A; S side, 1,540 feet long; head of pier, 650 feet long; N side, 1,625 feet long; 32 feet alongside; deck heights, 11 feet; 352,800 square feet covered storage; 1¾ acres of open storage; receipt and shipment of general cargo and lumber products.

Pier C: about 600 yards N of Pier A; S side, 1,540 feet long; head of pier, 810 feet long; N side, 1,420 feet long; 38 to 40 feet alongside; deck heights, 11 feet; 450,000 square feet covered storage; 5¾ acres of open storage; 75-ton lift; one 50-ton gantry crane with 110-foot boom; conveyor system with 1,200-ton-per-hour loading capacity; receipt and shipment of general cargo including heavy-lift items; shipment of bulk commodities.

Pier D, South Grain Elevator Wharf, Berths 2 and 3: about 0.5 mile N of Pier A; inner portion of S side of Pier D; 830 feet with dolphins; 38 feet alongside; deck height, 11 feet; 3-million-bushel grain elevator; 15,000 bushel per hour unloading rate; 40,000 bushel per hour loading rate; receipt of grain by barge; shipment of grain by vessel.

Pier D, South Grain Elevator Wharf, Berth 1: outer portion of S side of Pier D; 645 feet with dolphins, 40 feet alongside; 200 feet of barge berthing space with dolphins, 12 feet alongside; deck height, 11 feet; receipt and shipment of grain.

Pier D, North Wharf (30°42′55″N., 88°02′29″W.): 500-foot face; 38 feet alongside; deck height, 11 feet; 38,000 square feet covered storage, 1¾ acres of open storage; receipt and shipment of general cargo; bunkering vessels.

Alabama State Docks, Bulk Material Handling Plant Wharf (30°43′30″N., 88°02′44″W.): on S side of Threemile Creek; 1,540-foot marginal wharf; 40 feet alongside; deck height, 9½ feet; covered warehouse space for 30,000 tons of bulk material; open storage space for 460,000 tons of ore; one traveling loading tower, capacity 1,800 tons per hour; one traveling barge loading tower, capacity 2,000 tons per hours; two traveling unloading towers, 1,500 tons per hour each; receipt and shipment of dry bulk commodities including coal, coke, bauxite, gravel, manganese, iron ore, and ilmenite; owned by State of Alabama, operated by Alabama State Docks Department.

Hess Ship Dock (30°43′40″N., 88°02′38″W.): 74-foot offshore wharf, 290 feet with dolphins; 40 feet alongside; deck height, 12 feet; one 5-ton derrick with a 30-foot boom; pipelines extend from wharf to the storage tanks; shipment of crude oil; receipt and shipment of petroleum products; owned and operated by Amerada Hess Corp.

Gulf Oil Co.-U.S., Wharf (30°43′58″N., 88°02′38″W.): 100-foot offshore wharf, 377 feet with

dolphins; 40 feet alongside; deck height, 8 feet; one hand-operated derrick with a 20-foot boom; pipelines extend from wharf to storage tanks, total capacity, 760,000 barrels; fueling small vessels; receipt of petroleum products and shipment of crude oil by barge and ship; owned and operated by Gulf Oil Co.-U.S. and Citmoco Services, Inc.

Facilities on Mobile River, E side:

Paktank Atlantic Company Wharf (30°43′15″N., 88°02′23″W.): 200 feet of berthing space with dolphins; 35 feet alongside; deck height, 11 feet; storage capacity for 80,000 barrels; receipt of caustic soda and other bulk liquids; owned and operated by Paktank Atlantic Company.

Chevron Asphalt Co. Wharf (30°42′25″N., 88°02′12″W.): 105-foot offshore wharf, 240 feet with dolphins; 23 feet alongside; deck height, 7 feet; three hand-operated mast-and-boom derricks with 30-foot booms; pipelines extend from wharf to storage tanks, total capacity, 623,000 barrels; receipt and shipment of asphalt; owned and operated by Chevron U.S.A., Inc., Asphalt Division.

Mobile Bulk Terminal Wharf (30°41′45″N., 88°02′06″W.): 250-foot offshore wharf, 800 feet with dolphins; 38 feet alongside; deck height, 10 feet; two hydraulic mast-and-boom derricks with 25-foot booms; pipelines extend from wharf to storage tanks, total capacity, 1¼ million barrels; receipt and shipment of petroleum products and crude oil; owned by Ergon, Inc., and operated by Mobile Bulk Terminal.

Facilities on Chickasaw Creek:

Buchanan Lumber Mobile Wharf (30°45′45″N., 88°03′02″W.): 850-foot face; 25 feet alongside; deck height, 12 feet; receipt of lumber; owned and operated by Buchanan Lumber Mobile, Inc.

Mobile Bay Refining Co. Wharf (30°45′50″N., 88°03′10″W.): 680-foot face; 23 feet alongside; deck height, 12 feet; storage capacity for 190,000 barrels; receipt of crude oil, shipment of petroleum products; owned by Port of Chickasaw, Inc., and operated by Mobile Bay Refining Co., Inc.

Gilbert Imported Hardwoods Wharf: immediately W of Mobile Bay Refining Co. Wharf: 456-foot face; 19 to 23 feet alongside; deck height, 12 feet; receipt of hardwood lumber; owned and operated by Gilbert Imported Hardwoods, Inc.

Delta Hardwoods Corp. Wharf (30°45′52″N., 88°03′27″W.): 1,010-foot face; 240-foot lower side; 37 feet alongside; deck height, 12 feet; 4 acres open storage; receipt of lumber; owned and operated by Delta Hardwoods Corp.

Mobile Bay Refining Co. Pier: N of Delta Hardwoods Corp. Wharf; 350-foot face; 1,010-foot S side; 1,085-foot N side; 36 feet alongside; deck height, 1 foot; receipt of crude oil; owned by Port of Chickasaw, Inc., and operated by Mobile Bay Refining Co., Inc.

Foreign-Trade Zone No. 82 is in Mobile. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–Marine supplies of all kinds are available in Mobile. Bunker fuel, diesel oil, and lubricants are available. Large vessels can be bunkered at the Texaco Terminal Pier, Alabama State Docks, Piers B, C, and D North Wharf, or at other berths by tank barges. Water, almost chemically pure, is available at most of the berths.

Repairs.–There are three large shipyards in the Mobile area; all types of repairs can be made to deep-draft vessels. The largest floating drydock, at a shipyard on the W side of Pinto Island, has a capacity of 19,400 tons, an overall length of 732 feet, a minimum clear inside width of 105 feet, and a depth of 27 feet over the blocks. Smaller shipyards with marine railways and smaller floating drydocks are on Blakeley Island, on the W side of Mobile River at Mobile, at Chickasaw, and on Dog River.

Salvage tugs, seagoing and equipped for heavy work, are available. Barges, derricks, pumps, and diving outfits are available for virtually any type of work.

Small-craft facilities.–Berths and other facilities for small craft are limited at Mobile due to heavy commercial traffic. Facilities for small craft at Fort Morgan, East Fowl River, Fairhope, Fly Creek, and Dog River are discussed earlier in this chapter.

Communications.–Mobile is served by four trunk-line railroads, major airlines, and highway connections. Regular steamer communications with most major ports in the world and all the important Gulf, Atlantic, Caribbean, and Pacific ports are made from Mobile. Inland boats and barges serve the river ports in the interior of the State and also connect with Gulf ports. Radio station WLO at Mobile handles general commercial radio and radiotelephone business between the hours of 0430 and 0030. The station is equipped to handle traffic on VHF-FM radiotelephone and cable traffic. Radio station WNU, New Orleans, handles traffic for station WLO between the hours of 0030 to 0430. The harbormaster's office is equipped with VHF-FM channel 16 (156.80 MHz) and channel 65A (156.275 MHz) on the intraport radiotelephone system which connects all pilot boats, tugs, and all waterway traffic in the area.

Mobile River and **Tensaw River** are formed by the confluence of Alabama River and Tombigbee River about 39 miles above Mobile. In 1972, the reported depth to the confluence was about 14 feet. The channel in Mobile River is marked by lights, buoys, and daybeacons.

Tensaw River is crossed at its mouth by two U.S. Route 90 highway bridges, which have fixed spans with a minimum clearance of 23 feet. An overhead power cable with a clearance of 74 feet crosses the river just N of the bridges. Twin fixed highway bridges with a clearance of 24 feet cross the river about 0.3 mile N of the U.S. Route 90 bridges. The S end of Blakeley Island has been extended E by dredged fill to the W side of the entrance to Tensaw River. The battleship ALABAMA is permanently moored on the E side of the fill at a State park.

The **Mobile-Tensaw Rivers Cutoff** connects the two rivers about 8 miles above Mobile. The cutoff had a reported depth of about 13 feet in July 1972. From the cutoff the channel into Tensaw River is marked by buoys and an unlighted range on the E

bank of the river; the controlling depth on the range is about 3 feet. For craft drawing more than 3 feet, it is necessary to turn S at the E end of the cutoff, pass around the S end of **Gravine Island,** and then proceed upriver in the E branch.

A railroad bridge over Mobile River, 8.3 miles above the city, has a swing span with a clearance of 4 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

A railroad bridge crossing Tensaw River about 13 miles above the mouth has a swing span with a clearance of 11 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(17), chapter 2, for drawbridge regulations and opening signals.) Tensaw River is crossed by overhead power cables on both sides of Gravine Island. The cable crossing the W channel about 1.7 miles below the cutoff has a clearance of 74 feet, and the cable over the E channel about 1.2 miles below the cutoff has a clearance of 68 feet. Interstate Route 65 twin fixed highway bridges, with clearances of 42 feet, cross the Tensaw River about 19.6 miles above the mouth.

Light-draft boats can reach Tensaw River either by going up Mobile River to **Spanish River** and thence down that river, or from the main channel through the channel S of Pinto Island. An overhead power cable with a clearance of 68 feet crosses Spanish River about 0.1 mile below its confluence with Mobile River.

Blakeley River and **Apalachee River** are crossed at their mouths by twin fixed highway bridges with clearances of 16 feet. About 0.7 mile above the bridges, the rivers are crossed by U.S. Route 90 fixed highway bridges, which have a minimum horizontal clearance of 31 feet and a minimum vertical clearance of 12 feet. Overhead power cables on the N side of the U.S. Route 90 bridges have clearances of 33 feet. A fish camp about 0.4 mile S of **Vessel Point** has berths, water, ice, and a launching ramp.

D'Olive Bay, on the E side of Blakeley River, is entered through a channel marked by private daybeacons about 0.9 mile below the U.S. Route 90 bridges. In May 1982, the reported controlling depth was about 3 feet across Blakeley River Bar and through the lower river into the bay. A yacht club in the bay has gasoline, diesel fuel, and limited marine supplies.

Navigation is possible above Mobile to the inland Alabama ports of **Jackson,** mile 78, **Demopolis,** mile 187, **Tuscaloosa,** mile 296, **Port Birmingham,** mile 347, and various landings via dredged channels in the **Black Warrior-Tombigbee River System.** Mobile River joins the Tombigbee River about 39 miles above Mobile. Just above Demopolis, at the junction of the Black Warrior and Tombigbee Rivers at about mile 188, the waterway continues via the Black Warrior River and thence at about mile 335 divides into two navigable forks. The head of navigation on **Mulberry Fork** is at about mile 374, and on **Locust Fork** at mile 355. A Federal project provides for a 9-foot channel in the Black Warrior-Tombigbee River System. (See Local Notice to Mariners for latest controlling depths.)

Six lock and dam systems are on the waterway. The size of vessel that can navigate the waterway is controlled by the dimensions of the smallest lock, the William Bacon Oliver Lock and Dam at mile 293.8. This lock is 460 feet long and 95 feet wide, with a depth of 11 feet over the sill.

Several bridges and numerous overhead power cables cross the waterway. Bridges over the section of the waterway from the mouth of Tombigbee River to the junction with the upper forks are of the vertical-lift or fixed-span type; least clearance is 40 feet for the fixed spans, and 15 feet for the vertical-lift spans. (See 117.1b, 117.240, and 117.245(a) through (e) and (i)(15) and (15-a), chapter 2, for drawbridge regulations and opening signals.) Only bridges of the fixed type cross Mulberry and Locust Forks; least clearance is 31 feet over Mulberry Fork, and 38 feet over Locust Fork. Least clearance of overhead power cables crossing the waterway is 40 feet.

Waterborne commerce on the waterway between Mobile and Port Birmingham is in pulpwood, chemicals, petroleum products, shell, sand and gravel, limestone, ores, pig iron, coal, grain, and steel products.

Navigational charts for the Black Warrior-Tombigbee Rivers System are available from the Mobile Corps of Engineers Office. (See appendix for address.)

Above Demopolis, Tombigbee River is being developed into a system of canals and locks and dams which will connect the Black Warrior-Tombigbee River System with the Tennessee River. In May 1982, the Tennessee-Tombigbee Waterway was open as far as Columbus, Miss., about 102 miles above Demopolis. The Federal project provides for a 9-foot channel to this point. Locks at Gainesville and Aliceville, Ala., are 600 feet long and 110 feet wide with 15 feet over the sill.

Mobile River joins **Alabama River** about 39 miles above Mobile. A Federal project provides for a 9-foot channel in Alabama River from the mouth to Montgomery, Ala., about 290 miles above Mobile. In June 1981, the controlling depth was 9 feet to Claiborne, about 58 miles above the mouth; thence in 1972, 3½ feet to the head of the project. Greater depths can normally be carried from November to June. The channel is marked by buoys and daybeacons. Least clearance of bridges crossing the river is 17 feet for swing bridges, 42 feet in the up position for vertical lift bridges, and 36 feet (at Montgomery) for fixed bridges. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(12), (i)(12-a), and (i)(12-b), chapter 2, for drawbridge regulations and opening signals.) Least known clearance of overhead power cables crossing the river is 50 feet. Least vertical clearance is 27 feet at the cable ferry guide cable about 112 miles above Mobile.

Cable ferry.–A cable ferry crosses the river about 112 miles above Mobile. The ferry carries vehicles and passengers and operates between 0700 and 1700

daily. The ferry guide cable is suspended 27 feet above the water. The ferry crossing is marked by signs on both sides of the river. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Lock and dam systems are on the river at mile 63.0, mile 115.6, and mile 205.2. The locks are each 600 feet long, 84 feet wide, and have 13 feet over the sills.

Waterborne commerce on the river consists of pulpwood, petroleum products, sand, and gravel.

Navigational charts for the Alabama River are available from the Mobile Corps of Engineers Office. (See appendix for address.)

Charts 11360, 11373, 11374, 11372.–Mississippi Sound extends 70 miles W of Mobile Bay between a chain of narrow, low, sand islands and the mainland, providing a sheltered route for the Intracoastal Waterway from Mobile to New Orleans. Natural depths of 12 to 18 feet are found throughout the sound, and a channel 12 feet deep has been dredged where necessary from Mobile Bay to New Orleans. (See chapter 12 for Intracoastal Waterway.) Mississippi Sound can be entered from Mobile Bay through Pass aux Herons; from the Gulf through Petit Bois, Horn Island, Dog Keys, and Ship Island Passes, and Cat Island Channel; from Lake Borgne through Grand Island Pass.

Ship, Horn, and Petit Bois Islands, barrier islands separating Mississippi Sound from the Gulf of Mexico, are part of **Gulf Islands National Seashore** and subject to the rules and regulations of the U.S. Department of the Interior, National Park Service. **Petit Bois Island National Wildlife Refuge** and **Horn Island National Wildlife Refuge** are within the National Seashore.

COLREGS Demarcation Lines.–The lines established for Mississippi Sound are described in 80.815 chapter 2.

Charts 11376, 11378.–Pass aux Herons connects the SW corner of Mobile Bay with the E end of Mississippi Sound and is part of the Intracoastal Waterway. (See chapter 12 for Intracoastal Waterway.)

Grants Pass, 0.3 mile N of Pass aux Herons, connects Mobile Bay and Mississippi Sound. The channel is unmarked and is used only by small boats.

Dauphin Island is a fishing village and summer resort at the NE part of Dauphin Island. A dredged channel leads from Mississippi Sound through **Bayou Aloe** to an anchorage basin at Dauphin Island village. In July 1982, the controlling depth was 6 feet in the channel; thence in 1980, 2 to 7 feet was available in the basin. The channel is marked with lights and daybeacons. There are a marina and fish camps at the village; berths, gasoline, diesel fuel, water, and marine supplies are available.

Dauphin Island Bay is a shallow bay at the E end of Dauphin Island between Dauphin Island Bridge and Little Dauphin Island. The bay is accessible from Mississippi Sound through a privately marked and dredged channel and from Mobile Bay through an inlet protected by a jetty about 0.2 mile N of Pelican Point. A channel marked by lights and daybeacons leads from Mobile Bay to the inlet entrance, thence a dredged channel leads through the inlet to an anchorage basin at Fort Gaines, thence a connecting channel leads from the anchorage basin to Dauphin Island Bay. In 1982-March 1983, the controlling depths were 2½ feet (3½ feet at midchannel) in the entrance channel, thence 7 feet in the basin, and thence 4 feet in the connecting channel.

Fort Gaines has a small-boat basin where Coast Guard craft and pilot boat tenders moor. Gasoline and water are available. Shrimp boats and fishing vessels dock at the bulkhead on the S side of the anchorage basin just inside the inlet.

A large marina on the W shore of the bay has surfaced launching ramps and a 10-ton mobile hoist. Craft up to 40 feet can be handled for hull, engine, and electronic repairs, or dry, open or covered storage. Berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. An offshore breakwater protects the marina from N. In July 1972, there was reported to be 8 to 9 feet at the berths and 5 feet in the privately maintained and marked channel that leads along the S and W shores of the bay from the connecting channel to the marina and N and W into Mississippi Sound. Dauphin Island Bridge across the mouth of Dauphin Island Bay has a fixed span with a clearance of 25 feet. An overhead power cable W of the bridge has a clearance of 44 feet.

Heron Bay is a shallow bay used mainly by skiff-size crabbing and oyster boats; local knowledge is advised.

Heron Bay Cutoff, locally known as **The Cutoff,** about 1.8 miles N of Cedar Point, is a pass joining Heron Bay with Mobile Bay. Tidal currents of considerable velocity run through this pass which is used only by small boats. A fixed highway bridge over the pass has a clearance of 16 feet.

Charts 11376, 11374.–West Fowl River enters **Fowl River Bay** about 4 miles NW of Cedar Point. It extends NE along the W side of **Mon Louis Island,** separating it from the mainland, and is joined to East Fowl River by a channel reported to be navigable by craft drawing about 2 feet or less. State Route 188 highway bridge, about 2 miles above the mouth, has a 30-foot fixed span with a clearance of 25 feet. The entrance to the river from Mississippi Sound is marked by private daybeacons from E of Cat Island to just below the highway bridge. A small marina on the E bank of the river about 0.5 mile below the highway bridge can provide berths with water and electricity, gasoline, diesel fuel, ice, a launching ramp, limited marine supplies, and engine repairs.

Coden is a small fishing village on **Bayou Coden** on the N shore of **Portersville Bay,** NE of Isle aux Herbes. A dredged channel leads from Bayou La Batre channel through Portersville Bay to the mouth of Bayou Coden, thence N to the State Route 188 highway bridge about 0.5 mile above the mouth of

the bayou. A turning basin is on the W side of the channel about 500 feet below the bridge. In August 1983, the controlling depth was 5½ feet in the channel, thence in 1978, 4½ to 6½ feet in the basin. The channel is marked by lights and daybeacons. State Route 188 highway bridge has a 15-foot fixed span with a clearance of 6 feet. There are seafood packing plants and several commercial shipyards that specialize in the construction of steel tugs and supply vessels.

Charts 11373, 11374.–A dredged channel leads from deep water in Mississippi Sound through **Bayou La Batre** to a turning basin about 0.5 mile below State Route 188 highway bridge at the town of **Bayou La Batre,** thence to the bridge. In October-November 1983, the controlling depth was 7 feet (11 feet at midchannel) in the entrance channel and bayou to the turning basin with 12 feet in the basin, thence 10 feet (12 feet at midchannel) to the bridge. The channel is marked by lights and daybeacons. State Route 188 highway bridge has a bascule span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.488, chapter 2, for drawbridge regulations and opening signals.) In March 1983, the bridge was being converted to a vertical lift span with design clearances of 6½ feet down and 73 feet up. An overhead power cable at the bridge has a clearance of 60 feet.

Shrimp, fishing, and party-boat fleets operate out of Bayou La Batre. The town has several seafood packing plants and canneries. Several boatyards on the bayou build commercial steel and wooden vessels up to about 115 feet in length. Machine shop facilities are also available.

There are several small-craft facilities on Bayou La Batre; most are along the E side. (See the small-craft facilities tabulation on chart 11374 for services and supplies available.)

The diurnal range of **tide** is 1.5 feet. **Storm warning signals are displayed.** (See chart.)

The Alabama-Mississippi boundary is about 6.5 miles W of Bayou La Batre.

Petit Bois Pass, an entrance from the Gulf between Dauphin Island and **Petit Bois Island,** is used primarily by fishing vessels with local knowledge drawing about 6 feet or less. The pass is subject to frequent changes; passage can generally be made by following the deep green water during calm weather and by avoiding the breakers during rough weather. A lighted gong buoy on the Gulf side marks the E approach to Petit Bois Pass. Lighted and unlighted buoys on the E side of the pass mark the passage from the Gulf to Mississippi Sound. The chart and knowledge of local conditions are the best guides.

Charts 11375, 11374, 11373.–Pascagoula Harbor, one of the important deepwater ports on the Gulf Coast, is on Mississippi Sound about 9 miles N of **Horn Island Pass.** By water, it is 72 miles W of Mobile and 51 miles E of Gulfport. The facilities in the port area include a 3-million-bushel grain elevator, shipyards, and other industries at the mouth of Pascagoula River and an industrial area centered around Bayou Casotte, about 3 miles E of Pascagoula River.

Pascagoula, at the mouth of **Pascagoula River,** is a city with many large industries in shipbuilding and ship repair, manufacture of paper products, textiles, containers, seafood packing and processing, oil refining, fertilizer and chemicals, and refractory brick materials. A hospital is in the city. Waterborne traffic in addition to those mentioned above is in petroleum products, crude oil, sand and gravel, liquid sulphur, ores, and logs.

Prominent features.–The most conspicuous object is a tall concrete grain elevator on the W side of Pascagoula River which may be seen for several miles. The three refinery flares, E of Bayou Casotte, are very prominent from offshore at night. The cranes of the shipyard, a tall elevated tank 0.5 mile E of the mouth of the river, and the twin tanks in Pascagoula are prominent from the sound. The range light towers on the W end of Petit Bois Island, the cracking towers and tanks at the oil refinery E of Bayou Casotte, and the towers, tanks, and elevators of the fertilizer and refractory plants on the E bank of Bayou Casotte are also prominent.

Horn Island Pass Lighted Whistle Buoy HI (30°10.6′N., 88°32.6′W.) marks the approach to Horn Island Pass.

Shipping Safety Fairways.–Vessels should approach Horn Island Pass and Pascagoula Harbor through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Horn Island Pass are described in 80.815, chapter 2.

Channels.–The deepwater entrance is through dredged cuts in **Horn Island Pass Channel,** and in Mississippi Sound for about 4 miles N of Petit Bois Island where the channel divides, **Pascagoula Channel** leading about 6 miles NW to a turning basin at the railroad bridge at Pascagoula, and **Bayou Casotte Channel** leading about 4 miles N to the turning basin at the head of Bayou Casotte. A Federal project provides for a depth of 40 feet in Horn Island Pass Channel and 38 feet in the sound and in Pascagoula and Bayou Casotte Channels to the 38-foot turning basins. (See Notice to Mariners and latest editions of charts for controlling depths.) The channel across the bar is marked by a **041°** lighted range and lighted buoys, and the other channels are marked by lighted ranges, lighted and unlighted buoys, lights, and a daybeacon.

Pascagoula River channel above Pascagoula and Escatawpa River channel are discussed later in this chapter.

Anchorages.–Deep-draft vessels may anchor 1 to 2 miles S or SE of the sea buoy, weather permitting. Anchorage for vessels up to 15-foot draft is available in Mississippi Sound E of the channel.

Explosives anchorages are N and S of the W end of Petit Bois Island. (See 110.1 and 110.194b, chapter 2, for limits and regulations.)

Caution.–Petit Bois Island and Horn Island are

reported to be poor radar targets when approaching Pascagoula Harbor from seaward. Caution should be exercised when making landfall at night and during poor visibility.

Dangers.–Shoal water up to 30 feet extends about 2 miles SW of the W end of Petit Bois Island. Spoil banks are on the W side of Pascagoula Channel and on both sides of Bayou Casotte Channel. Strangers should not enter the channel before the pilot boards, especially light vessels during periods of strong winds and adverse weather.

In October 1978, pilings, reported to cover at high water, were reported immediately W of Bayou Casotte Light 11 in about 30°19′41″N., 88°30′50″W.

Tides and currents.–The diurnal range of tide is 1.7 feet at Horn Island Pass and 1.6 feet at the mouth of the Pascagoula River. In Horn Island Pass the tidal current is reported to flood N and ebbs S averaging 1.2 knots at strength. In the dredged cut across the bar, the ebb and flood follow the direction of the cut. Winds greatly affect the velocity and direction of the currents, as well as the rise and fall of the tides.

Weather.–Pascagoula is in a low-lying area heavily wooded with pines and live oaks. Its climate is characterized by warm, humid summers and relatively mild winters. This is reflected by the temperatures which climb to 90°F or more on about 70 summer days, while falling below 32°F on only about 15 days each winter. Precipitation is frequent year round, but most likely from July through September. This is due, in part, to thunderstorms, which occur on about 9 to 16 days per month in June, July, and August. Strong winds, which can occur in thunderstorms or tropcal cyclones, are most frequent from November through April when winter storms and cold fronts are prevalent. Gales are unlikely, but sustained winds of 17 to 33 knots occur 3 to 5 percent of the time. Poor visibilities are most likely during this same period and fall below 0.5 mile on 3 to 8 days per month. The tropical cyclone threat, which is rare in May and November, gradually increases through June, July, and August, reaching a peak in September and then falling off in October. During hurricane Camille in August 1969, the Ingalls Shipbuilding Corporation recorded a peak gust of 81 mph, while storm tides in the area rose to 11.2 feet above mean sea level. During Frederic in September 1979, Pascagoula was battered by gusts of 127 mph, 11 inches of rain, and 6-foot storm tides.

Storm warning signals are displayed. (See chart.)

Pilotage is compulsory for all foreign vessels and all U.S. vessels over 250 tons under register in foreign trade. Pilotage is optional for U.S. coastwise vessels that have on board a pilot licensed by the Federal Government. The Pascagoula Bar Pilots board vessels about 1 mile S to SE of Horn Island Pass Lighted Whistle Buoy HI, day or night. Shoaling in certain areas of the channel restricts movement of larger vessels to daylight hours only, and the narrowness of the channels limits ocean traffic to one way at all times.

The pilot boats, PILOT I, 37 feet long with a forward house, and PILOT II, 35 feet long with an aft house, each have a black hull with a white house and the word PILOT on the forward part of the house. The pilot boats and pilot station monitor VHF-FM channel 16 (156.80 MHz) and use VHF-FM channels 19A (156.95 MHz) and 74 (156.725 MHz) as working frequencies. Vessels to be boarded should contact the pilot boat for vessel speed and boarding side and rig the pilot ladder about 3 feet above the water. Pilots can be arranged for by telephone (601-762-1151) through the Mobile Marine Operator or through ships' agents. A minimum of 2 hours advance notice is requested.

Towage.–Tugs up to 4,200 hp are available at Pascagoula. Arrangements should be made in advance through ships' agent.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine.–Quarantine laws are enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

The Singing River Hospital, which is operated by Jackson County, is at Pascagoula.

The Pascagoula Coast Guard Station is on the E side of the Pascagoula River about 1 mile above the entrance.

Customs.–Pascagoula is a **customs port of entry.**

Harbor regulations.–The Port of Pascagoula is under the control of the Jackson County Port Authority, which is responsible jointly with the Jackson County Board of Supervisors for the industrial development of the port. The Jackson County Port Authority through its **Port Director** is responsible for port and harbor improvement, harbor management, and regulation enforcement. The office of the Port Director is in Pascagoula; telephone (601-762-4041). Dock superintendents at the Port Authority Terminals and grain elevators assign the berths.

Speed limit.–No oceangoing vessel shall proceed in excess of 5 m.p.h. in Pascagoula River or Bayou Casotte.

Bridges.–No bridges cross the channel from the Gulf to the municipal wharf. The Seaboard System Railroad (L&N) bridge crossing Pascagoula River about 1.3 miles above the mouth has a swing span with a clearance of 7 feet. U.S. Route 90 highway bridge 0.2 mile above the railroad bridge has a bascule span with a clearance of 31 feet at the center. (See 117.1b, 117.240, and 117.495, chapter 2, for drawbridge regulations and opening signals.)

Overhead power cables 1.5 miles and 2.6 miles above the mouth of the river have clearances of 68 feet and 80 feet, respectively.

Wharves.–The Port of Pascagoula which includes the lower 5.9 miles of the Pascagoula River, the lower 5.2 miles of the Escatawpa (Dog) River, and Bayou Casotte, has more than 60 piers, wharves, and docks. The principal facilities are on both sides of the Pascagoula River and at the Bayou Casotte. General cargo piers operated by the Jackson County Port Authority are on the W side of the Pascagoula

River and on the E side of Bayou Casotte. The other major deep-draft facilities are privately operated by petroleum, chemical, and shipbuilding and repair companies. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 19, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths of the facilities described are reported; for information on the latest depths contact the Jackson County Port Authority or the private operators. All the piers described have direct highway connections, and most have railroad connections. Water and electrical shore power connections are available at most of the piers and wharves described.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Floating cranes to 50 tons and mobile cranes to 150 tons are normally available. Cranes to 400 tons may be obtained by special arrangement.

Facilities on Pascagoula River, W side:

Jackson County Terminal, Grain Elevator Wharf (30°21′25″N., 88°33′59″W.): 780-foot marginal wharf with 900 feet of berthing space; 38 feet alongside; deck height, 8 feet; barge facility N and in line with deep-draft berth; 3-million-bushel grain elevator, 25,000 bushels per hour barge unloading rate, 60,000 bushels per hour ship loading rate; receipt of grain by barge, shipment of grain by vessel, occasional shipment by barge; owned by the Jackson County Port Authority and operated by the Louis Dreyfus Corporation.

Jackson County Port Authority, Terminal A Wharf: about 0.3 mile N of Grain Elevator Wharf; 500-foot marginal wharf; 38 feet alongside; deck height, 11 feet; 80,000 square feet covered storage; 15,500 square feet of paved open storage; stevedoring equipment available; receipt and shipment of general cargo and bulk materials; owned and operated by the Jackson County Port Authority.

Jackson County Port Authority, Terminal B Wharf: immediately N of Terminal A Wharf; 544-foot marginal wharf; 38 feet alongside; deck height, 10½ feet; 145,000 square feet covered storage; stevedoring equipment available; receipt and shipment of general cargo including rubber, rice and liner-board; owned and operated by the Jackson County Port Authority.

Facility on Pascagoula River, E side:

National Marine Fisheries Service Wharf (30°21′58″N., 88°33′48″W.): 170-foot marginal wharf; 24 feet alongside; deck height, 9 feet; mooring National Marine Fisheries Service vessels; owned by the City of Pascagoula and operated by the National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

Facilities on Bayou Casotte:

Chevron, U.S.A., Pascagoula Refinery, Wharf No. 2, Berths 6 and 7 (30°19′54″N., 88°30′37″W.): 1,750 feet of berthing space with dolphins; deck height, 15 feet; 38 feet alongside; pipelines extend from wharf to storage, total capacity, 13½ million barrels; four hydraulic loading arms; receipt of raw and distilled crude oil; loading barges for bunkering vessels berthed in harbor; owned and operated by Chevron, U.S.A., Inc., Division of Standard Oil Co. of California.

Chevron, U.S.A., Pascagoula Refinery Wharf No. 1, Berths 1–5 (30°20′23″N., 88°30′37″W.): offshore wharf about 1,400 feet long providing two tanker berths, Berths 4 and 5, 710 feet with dolphins, Berths 2 and 3, 523 feet with dolphins; 40 feet alongside; deck height, 12 feet; inner side of wharf used for barges; pipelines extend from wharf to storage; receipt of raw and distilled crude oil; shipment of petroleum products, ammonia, and petrochemicals, liquified petroleum gas, and caustic soda; bunkering tankers berthed at wharf, and loading barges for bunkering vessels berthed in harbor; owned and operated by Chevron, U.S.A., Inc., Division of Standard Oil Co. of California.

Jackson County Port Authority, Terminals G and H Wharf: about 0.3 mile N of Chevron, U.S.A., Pascagoula Refinery, Wharf No. 1; W face, 556 feet long; N face, 516 feet long; 38 feet alongside; deck height, 12 feet; transit shed with 175,000 square feet of covered storage; receipt and shipment of general cargo including rubber, bagged animal feed, and flour; owned and operated by the Jackson County Port Authority.

Jackson County Port Authority, Terminals E and F Wharf: about 0.4 mile N of Chevron, U.S.A., Pascagoula Refinery, Wharf 1; S face, 737 feet long; W face, 517 feet long; 38 feet alongside; deck height, 12 feet; transit shed with 175,000 square feet of covered storage; 11 acres of open storage; receipt and shipment of bulk materials including fertilizer, metallic ores, minerals, and petrochemicals; owned and operated by the Jackson County Port Authority.

Mississippi Chemical Corp., South Dock: about 0.5 mile N of Chevron, U.S.A., Pascagoula Refinery Wharf No. 1; 83-foot offshore wharf, 415 feet with dolphins; 34 to 35 feet alongside; deck height, 9 feet; one hand-operated, hose-handling derrick; chemical pipelines and storage tank capacity for 31,400 tons of sulfuric acid; 9,300 tons of sulfur; 10,600 tons of liquid fertilizer; receipt and shipment of sulfuric acid; shipment of liquid fertilizer; receipt of liquid sulfur; owned and operated by Mississippi Chemical Corp.

Mississippi Chemical Corp., North Dock: about 0.6 mile N of Chevron, U.S.A., Pascagoula Refinery Wharf No. 1; 76-foot offshore wharf, 500 feet of berthing space with dolphins; 32 to 34 feet alongside; deck height, 9 feet; conveyor and a 50-ton electric stiff-leg derrick with 900-ton-per-hour unloading rate; chemical pipelines to storage tanks; total storage, 9,300 tons of liquid sulfur; 25,000 short tons of liquid ammonia; 33,000 tons of phosphate; receipt of phosphate rock, sulfuric acid, and liquid sulfur; shipment of liquid ammonia and sulfuric acid; owned and operated by Mississippi Chemical Corp.

Chicago Bridge and Iron Co. Wharf (30°20′57″N., 88°30′32″W.): 668-foot marginal wharf; 20 feet

alongside; deck height, 3 to 7 feet; receipt of steel and launching of newly constructed barges and offshore oil structures; owned and operated by Chicago Bridge and Iron Co.

Supplies.–Marine supplies of all kinds are available in Pascagoula. Bunker fuel, diesel oil, and lubricants are available. Large vessels are bunkered at their berths by barge. Water is available at most of the berths.

Repairs.–The Ingalls Shipbuilding Corp. is engaged primarily in new construction and major overhauls. Their facilities are on the E and W sides of Pascagoula River just above the mouth, and include shipbuilding and launching ways, outfitting piers, and electrical, electronic, sheet metal, pipe, and machine shops. The shipyard's floating drydock on the W side of the river can handle vessels up to 820 feet long and 170 feet wide, has a depth of 41 feet over the keel blocks, and has a lifting capacity of 38,000 tons. On the E side of the river, the shipyard has a graving dock 485 feet long, 85 feet wide on the keel blocks, with a depth of 35.8 feet over the keel blocks. Cranes up to 60-ton capacities are at the outfitting piers, and floating cranes up to 50-ton capacities are available.

Several smaller shipbuilding and repair yards are in Pascagoula where numerous tugs, barges, and offshore supply vessels are built. The largest of these is on the S side of Krebs Lake. A floating drydock at the yard can handle vessels to 190 feet long and 45 feet wide, has a depth of 12 feet over the keel blocks, and has a lifting capacity of 800 tons. A 100-ton marine railway that can handle vessels to about 100 feet long and a 60-ton mobile hoist are at the yard. Other yards have marine lifts and marine ways with facilities for handling vessels and barges. Machine shops are available. Several of the smaller yards build wooden and steel vessels up to 140 feet and barges up to 250 feet. Deep-sea diving and salvage equipment are available.

Communications.–The port is served by freight service of the Seaboard System Railroad and freight service by the Mississippi Export Railroad which connects with the Illinois Gulf Central Railroad at **Evanston** about 35 miles N of the city. Jackson County Airport, which provides charter or private aircraft service but no scheduled airline services, is about 2 miles NE of the city. Major bus lines and several motor freight lines serve the city.

Small-craft facilities.–There is a municipal boat basin with berths for small craft up to 40 feet at the head of Lake Yazoo, which is entered through a channel on the E side of the river entrance. In June 1982, a reported depth of 5 feet could be carried to the basin. There are no services. Daybeacons mark the entrance. There are several marinas, service wharves, and boatyards along the Pascagoula River, above and below the bridges at Pascagoula. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and launching ramps are available. Hull, engine and electronic repairs can be made, and dry storage is available.

A dredged channel in **Pascagoula (Singing) River** leads from the deep-draft turning basin just below the Seaboard System Railroad bridge at Pascagoula to a junction with **Escatawpa (Dog) River,** thence to the State Route 613 highway bridge crossing the river 0.7 mile above the mouth. In August 1983, the controlling depth was 10 feet to the bridge. Above the bridge, 12 feet was available through **The Cutoff** for about 1.8 miles to plants along the river as far as the Mississippi Export railroad bridge. The channel is marked by lights and daybeacons.

Pascagoula River is navigable to the confluence of **Leaf River** and **Chickasawhay River** about 64 miles above its junction with Escatawpa River. In June 1982, the reported controlling depth was 12 feet to **Caswell Lake** about 18 miles above the junction with Escatawpa River, thence 2 feet to the confluence of the Leaf and Chickasawhay Rivers.

A privately dredged channel leads from the dredged channel in Pascagoula River about 0.3 mile N of U.S. Route 90 highway bridge to a shipyard pier at the SW corner of **Krebs Lake.** The channel is marked by buoys and a daybeacon. In 1982, the reported controlling depth was 12 feet.

Moss Point is a city on the Escatawpa River about 2 miles above the junction with the Pascagoula River. There are industries in chemicals, rubber, paper products, shipbuilding, fertilizer, seafood processing, and lumber. State Route 613 highway bridge crossing the river about 0.7 mile above the mouth has a swing span with a clearance of 9 feet. (See 117.1b, 117.240, and 117.485, chapter 2, for drawbridge regulations and opening signals.) Above the bridge are shipyards that build vessels up to 185 feet, and several menhaden processing plants. A fixed highway bridge with a clearance of 73 feet crosses the river about 2.4 miles above the mouth. About 2.6 miles above the mouth, the Mississippi Export railroad bridge has a swing span with a clearance of 5 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Overhead power cables crossing at the bridge have clearances of 80 feet.

About 0.5 mile N of the highway bridge at Pascagoula, a privately dredged canal, with a reported controlling depth of about 6 feet in June 1982, leads from Pascagoula River through **Marsh Lake** to West Pascagoula River. The canal is unmarked.

About 2.5 miles N of the U.S. Route 90 highway bridge at Pascagoula, a cutoff leads from Pascagoula River through **Bayou Chemise** and **West Pascagoula River** to Mississippi Sound. It is marked by a daybeacon at its E entrance and a daybeacon in Bayou Chemise. The controlling depth is about 7 feet. An overhead power cable crossing Bayou Chemise has a clearance of 80 feet. West Pascagoula River is crossed about 0.8 mile above the mouth by a Seaboard System Railroad (L&N) bridge with a fixed span with a clearance of 7 feet, and about 1 mile from the mouth by U.S. Route 90 highway bridge with a fixed span with a clearance of 12 feet. Overhead power cables just above and 1.1 miles

above the highway bridge have clearances of 33 and 80 feet, respectively.

Mary Walker Bayou enters West Pascagoula River about 0.2 mile N of the highway bridge. Several marinas are along the S side of the bayou and on the W side of West Pascagoula River. (See the small-craft facilities tabulation on chart 11374 for services and supplies available.)

Charts 11372, 11373.–Dog Keys Pass forms a connection between Mississippi Sound and the Gulf at the W end of Horn Island. The pass has a depth of about 13 feet over the bar and is used primarily by local fishing craft. Most vessels entering from the Gulf use Ship or Horn Island Pass in preference to Dog Keys Pass. The entrance is marked by **Dog Keys Lighted Buoy 2** off the W end of Horn Island. Dog Keys Pass Lighted Gong Buoy 1, about 1.9 miles SSW of the W end of Horn Island, marks the channel across the bar.

COLREGS Demarcation Lines.–The lines established for Dog Keys Pass are described in 80.815, chapter 2.

Isle of Caprice formerly existed midway between Horn Island and Ship Island. The island was destroyed by a hurricane about 1917, leaving only a 4-inch diameter pipe from an artesian well. In July 1972, this pipe was reported still intact and discharging freshwater. The well is protected by 3-inch diameter pipes with private markers. Only a shoal remains of the former island.

Little Dog Keys Pass, about 2.5 miles W of Dog Keys Pass, is used by sport fishermen and some fishing craft. In July 1972, depths of 14 feet or more were reported available in the pass, and it was often used in preference to Dog Keys Pass. In 1967, an unmarked wreck covered 12 feet was reported in Little Dog Keys Pass in about 30°14′10″N., 88°49′51″W.

Charts 11372, 11373.–Biloxi is a city on a peninsula jutting E into Mississippi Sound about 40 miles W of Mobile Bay and 11 miles E of Gulfport. It is an important sport fishing center and resort with a large commercial seafood industry. Hundreds of shrimp and oyster boats operate from the port in the season. Numerous large shrimp and oyster processing plants are along the E part of the waterfront on the sound and in Back Bay of Biloxi. Keesler Air Force Base and a large veterans hospital are at the W end of the city. The waterfront on the sound is protected by **Deer Island,** and the harbor in Back Bay of Biloxi is landlocked. The port is accessible from the Gulf through Dog Keys Pass and Little Dog Keys Pass and from the Intracoastal Waterway which passes through Mississippi Sound about 6 miles S of the city. (See chapter 12 for Intracoastal Waterway.) Principal shipments through the port are seafood, coal, building materials, wood products, petroleum products, iron and steel, and machinery.

Prominent features.–The tank and radio tower at Ocean Springs, five tanks at **Keesler Field,** the Biloxi Lighthouse, and several large hotels in and W of Biloxi are prominent from offshore. At night the aviation light at Keesler Field is conspicuous. **Biloxi Light** (30°23.7′N., 88°54.1′W.), 61 feet above the water, is shown from a 53-foot white conical tower with black balustrade on the shore in the SW part of Biloxi proper.

Shipping Safety Fairways.–Vessels bound for Biloxi via Dog Keys Pass should approach the pass through the Biloxi Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Two channels connect Mississippi Sound and the Biloxi waterfront and Biloxi Bay. **Biloxi East Channel,** a dredged channel, leads from a point in Mississippi Sound 2.5 miles N of Dog Keys Pass, through Biloxi Bay E of Deer Island, to U.S. Route 90 highway bridge. In November 1983, the controlling depth was 6 feet (9½ feet at midchannel). The channel is marked by lights, buoys, and daybeacons. **Biloxi Channel,** a dredged channel, leads N from Mississippi Sound W of Deer Island, thence E along the S Biloxi waterfront to a junction with Biloxi East Channel at a point about 1 mile SE of U.S. Route 90 Highway Bridge. In November 1983, the controlling depth was 5½ feet (6 feet at midchannel). The channel is marked by lights and daybeacons. In January 1979, a submerged obstruction, covered about 3 feet, was reported on the W side of the junction of Biloxi Channel and Biloxi East Channel in about 30°23.6′N., 88°49.9′W.

A privately dredged side channel leads NE from Biloxi East Channel, about 1 mile SE of U.S. Route 90 highway bridge, to a small-craft basin at **Ocean Springs.** In June 1982, the reported controlling depth was 6 feet. The channel is marked by a light.

The channel into Back Bay of Biloxi, a continuation of Biloxi East Channel above U.S. Route 90 highway bridge, and Industrial Seaway are discussed later in this chapter.

Anchorages.–Smallcraft can anchor off the waterfront north of Deer Island, or in Back Bay of Biloxi where there is excellent anchorage in depths of 5 to 15 feet, soft bottom, and good protection from all directions. A general anchorage for unmanned barges and scows is in Mississippi Sound S of Biloxi. (See 110.1 and 110.194a, chapter 2, for limits and regulations.)

Between Plummer Point and Biloxi the bay is crossed by the U.S. Route 90 highway bridge with a bascule span having a clearance of 40 feet at the center. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Dangers.–A visible wreck was reported about 1.5 miles SE of Biloxi Channel Light 2, in 30°20.2′N., 88°53.6′W.

Tides.–The diurnal range of tide at Biloxi is about 1.8 feet.

Weather.–Biloxi winters are mild and moist, while summers are hot and humid. The Gulf of Mexico is the primary moisture source and moderating influence. Severe weather is usually in the form of tropical cyclones or thunderstorms with damaging winds. Large hail and tornado outbreaks are usually confined to the interior, although there are occasion-

al reports of waterspouts and tornadoes throughout the year. During winter, freezing precipitation and temperatures are much more frequent inland than at Biloxi.

During winter, there are usually three types of weather problems that affect navigation in this area. Low pressure systems sometimes develop off Texas and move NE across the area. These systems can bring drizzle, fog, and thunderstorms. Polar outbreaks usually bring cool, dry weather. The most impressive cold front is one that accompanies continental polar air. It is rare, except in a decayed state, but if active can bring extremely cold temperatures and snow. Usually there is little weather associated with it except for gusty winds. Most of the cold fronts are of the maritime variety which push in from W accompanied by widespread precipitation and often squall lines with thunderstorms. Advection fog creates a third winter weather problem in the Biloxi area. It is caused by the coastal waters being cooled by cold river discharges. When warm air flows across these waters a fog blanket forms. visibilities may improve somewhat by midday, with fog returning before evening. A less common problem is the formation of a fog bank if a S flow persists. These banks can fluctuate between the shore and offshore for a period of several days.

From late spring through early fall, the Bermuda High brings warm, moist air to this coast. This air mass is responsible for the thunderstorms that develop almost daily. They usually form inland during the day and, if conditions are right, move toward the coast during the afternoon or early evening, sometimes bringing winds gusting to 30 knots or more. If the air mass is unstable, nocturnal thunderstorms may develop offshore after midnight and intensify to a peak just before sunrise. The most severe thunderstorms to affect Biloxi are those that move SW from inland areas NE of the city. They often form late in the afternoon and bring strong winds.

Tropical cyclones are a threat from June into November. Usually one passes within 500 miles of Biloxi each year, on average, but a direct hit is likely once every 10 years, on average. In September 1979, hurricane Frederic generated sustained winds of 61 mph and gusts to 98 mph at Biloxi. During Camille in August 1969, storm tides between Biloxi and Gulfport reached 20 feet in some spots.

Pilotage.–No regular pilots are stationed at Biloxi.

Towage.–The nearest tugs are based at Gulfport.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine.–Quarantine laws are enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) The city has two hospitals and numerous clinics.

Harbor regulations.–The harbor is controlled by the Biloxi Port Commission, headed by a Port Director, who establishes regulations. A **harbormaster** enforces the regulations and assigns berths at the small-craft harbor.

Wharves.–The S waterfront has many docks. Some of these are private facilities for fishing companies, but several are open to the public. The Biloxi small-craft harbor is a basin protected by breakwaters and located N of the W end of Deer Island. Private lights mark the entrance to the harbor. In June 1982, the reported controlling depth in the basin and the channel leading to it was 8 feet.

Storm warning signals are displayed. (See chart.)

Supplies.–Gasoline, diesel fuel, water, ice, provisions, and marine supplies are available at Biloxi.

Repairs.–Several shipyards are located on the waterfront and in Back Bay of Biloxi. A yard on Back Bay of Biloxi, about 0.4 mile E of Rhodes Point, has a 50-ton mobile hoist that can handle craft up to 60 feet. Boats up to 140 feet are built at Biloxi.

A shipyard is at the head of Industrial Seaway. The floating drydock at the yard can handle vessels to 154 feet long and 65 feet wide, and has a depth of 14 feet over the keel blocks and a lifting capacity of 1,600 tons. The yard has complete machine shop facilities. Cranes to 125 tons are at the yard.

Small-craft facilities.–Berths, electricity, gasoline, diesel fuel, water, ice, launching ramps, and marine supplies are available, and hull and engine repairs can be made at small-craft facilities at Biloxi proper, Ocean Springs, and Back Bay of Biloxi.

Communications.–The Seaboard System Railroad serves the city with freight service. U.S. Route 90 passes through the city, and State Route 15 leads N to the central part of the State. Scheduled airline service is available at Gulfport Municipal Airport, about 8 miles W of the city. Bus lines and several motor freight lines serve the city.

A channel with dredged sections leads from a junction with Biloxi East Channel at the U.S. Route 90 highway bridge through **Back Bay of Biloxi** and **Big Lake** to the entrance to Industrial Seaway. In November-December 1983, the controlling depth was 11 feet (12 feet at midchannel), and thence in 1981, 8 feet was reported through Industrial Seaway. The channel is marked by lights and daybeacons. A dredged channel, marked by private daybeacons, leads N from Biloxi East Channel, about 0.5 mile above the U.S. Route 90 highway bridge, to the entrance of **Old Fort Bayou** N of **Fort Point.** In April 1979, the reported controlling depth was 7 feet. The natural channel in the bayou is marked by private daybeacons for about 1.2 miles above Fort Point.

The swing span of a former highway bridge just above U.S. Route 90 highway bridge has been removed, but the approach structures remain and are used for public recreation.

A dredged branch channel leads SW from the channel about 0.2 mile above U.S. Route 90 highway bridge to a turning basin in **Ott Bayou.** In December 1983, the controlling depth was 6 feet in the channel, thence in January 1983, 8 to 10 feet in the basin except for shoaling to 3 feet along the E edge, and thence 5½ feet in the side channel that leads SW from the basin. Daybeacons mark the channel.

The Seaboard System Railroad (L&N) bridge about 0.3 mile above U.S. Route 90 highway bridge

has a swing span with a clearance of 14 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The overhead power cable at the bridge is submerged at the drawspan.

Fishing piers, the remains of a former highway swing bridge, extend close to the channel edges from the N and S sides of the Back Bay of Biloxi near **Shipyard Point.** A highway bascule bridge, with a clearance of 60 feet at the center, crosses the bay about 0.2 mile W of the fishing piers. (See 117.1b, 117.240, and 117.245 (a) through (e), and (i)(20-b), chapter 2, for drawbridge regulations and opening signals.) An overhead power cable with a clearance of 85 feet crosses immediately W of the fishing piers, and another overhead power cable with a clearance of 84 feet at the main channel and 40 feet elsewhere crosses about 2.5 miles W of the bascule bridge.

A bascule highway bridge with a clearance of 25 feet crosses the bay at **Deep Point.** (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Biloxi River empties into the NE side of Big Lake and is reported navigable for a draft of 6 feet for 6 miles and for a draft of 3 feet for an additional 5 miles. The twin fixed spans of Interstate Route 10 highway bridge, about 3.5 miles above the mouth, have clearances of 40 feet. U.S. Route 49 fixed highway bridge, about 4.3 miles above the mouth, has a clearance of 9 feet; a fixed county highway bridge, about 7.8 miles above the mouth, has a clearance of 4 feet. A powerplant is on the river.

Tchoutacabouffa River empties into Biloxi River about 1 mile N of Big Lake from the NE. The river is reported navigable for drafts up to 5 feet to **New Bridge,** about 7.2 miles above the mouth, and for drafts of 3 feet for an additional 6 miles. The twin fixed spans of Interstate Route 10 highway bridge, with clearances of 42 feet, cross the river about 3.5 miles above the mouth. Cedar Lake Bridge, about 4.5 miles above the mouth, has a swing span with a clearance of 5 feet. The center pier of the former swing bridge is close downstream. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) New Bridge has a fixed span with a clearance of 38 feet. Lamey Bridge, about 3 miles above New Bridge, has a swing span which is reported inoperative; the channel is on the N side of the pivot pier; the clearance is 3 feet.

Bernard Bayou, which empties into Big Lake from W, is good for a draft of 8 feet from the entrance at Shallow Point in Big Lake to a junction with Industrial Seaway at Gulfport Lake, NNE of Gulfport Municipal Airport. Overhead power cables cross the bayou about 0.5 mile above the mouth and have a clearance of 80 feet. The highway bridge at Handsboro has a bascule span with a clearance of 12 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Small-craft facilities about 1.5 and 1.8 miles above the mouth of the bayou can provide berths with electricity, gasoline, water, ice, open and dry covered storage, marine supplies, and complete engine and hull repairs. A 110-foot marine railway and a 50-ton fixed lift are also available.

Industrial Seaway, a canal privately dredged by the Harrison County Development Commission, affords access to industrial areas along the seaway and Bernard Bayou N of Gulfport. The canal leads from a junction with the dredged channel section at the W end of Big Lake through a landcut from Shallow Point on the N side of the entrance to Bernard Bayou for about 2.5 miles, thence through Bernard Bayou and Gulfport Lake for about another 2 miles to a turning basin in the vicinity of Three Rivers Road. In January 1983, the controlling depth in the seaway was 7½ feet except for shoaling to 3 feet in about 30°25′36″N., 89°03′11″W., thence 3½ to 12 feet in the turning basin. The channel is marked by lights. Plans provide for the extension of the seaway farther W to Wolf River and Bay St. Louis at a later date. Pilots for the seaway are available at Gulfport.

About 1.5 miles W of Shallow Point, the Eugene P. Wilkes Bridge at Lorraine Road has a bascule span with a clearance of 29 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable crossing the seaway 0.4 mile E of the bridge has a clearance of 81 feet. An overhead power cable about 2.8 miles W of the bridge has a clearance of 80 feet.

Beauvoir, part of the city of Biloxi about 6 miles W of Biloxi Bay, has a large domed convention center and a tank which are prominent. A privately dredged channel leads N from Mississippi Sound to a yacht basin in front of the hotel. In June 1982, the reported controlling depth was 10 feet in the channel and the basin. The channel is marked by private lights. A private white light is displayed from a white lighthouse at the basin. Gasoline, diesel fuel, water, ice, marine supplies, and open and covered berths are available at the basin. There is a hoist that can handle craft up to 2½ tons for minor hull, engine, and electronic repairs. Radiotelephone watch on VHF-FM Channel 16 (156.80 MHz) is maintained from 0700 to 1700 at the basin. There is a **harbormaster,** and a **dockmaster** assigns the berths.

A wreck, marked by green and red cannisters, is about 1.5 miles offshore in about 30°22.1′N., 88°55.1′W. Two privately marked oyster reefs are centered 0.4 and 1.7 miles NW of the wreck. Mariners are advised to exercise caution while transiting between Biloxi Channel and Beauvoir.

Charts 11373, 11372.–Ship Island Pass lies immediately W of **Ship Island,** about 50 miles W of Mobile Bay entrance and 11 miles N of the northernmost of the Chandeleur Islands. The pass is approached from the Gulf through a dredged channel about 6 miles long, which is marked by lighted buoys and a light.

Gulfport, the seat of Harrison County, is a seaport and tourist center. It is about midway between Mobile and New Orleans by rail, and on U.S. Route 49 and 90 highways. Fishing, steel products, construction of barges and heavy cranes, chemicals, canning, glass making, and aluminum are some of

the city's important industries. Waterborne commerce includes frozen meats and poultry, bananas, shell, sisal and jute, fertilizers, chemicals, seafood, flour, woodpulp and products, lumber, general and containerized cargo, and scrap iron. A cotton compress is at Gulfport.

Gulfport Harbor Basin is a State-owned and controlled harbor about 10 miles NW of Ship Island Pass. The rectangular deepwater ship basin is between two moles at the head of Gulfport Channel. Bert Jones Yacht Harbor, also protected by a mole, is adjacent to the E, and a commercial small-craft harbor is on the W side of the inshore end of the W mole.

Prominent features.–On a clear day vessels from the E, bound for Ship Island Pass, usually sight first the trees on the E part of Ship Island, then the light and **Fort Massachusetts,** a semicircular brick fort with sodded parapet, located near the W end of Ship Island. Vessels approaching from S may see Chandeleur Light first.

On the approach to Gulfport, a 15-story building and several water tanks in Gulfport are conspicuous. At night the occulting red lights on the tops of several radio towers can be seen from the sound. An aviation light is shown from a 62-foot tower at the municipal airport.

Ship Island Light (30°12.7'N., 88°58.0'W.), 84 feet above the water, is shown from a skeleton tower on a concrete block. The light is on the same structure as Ship Island Range Rear Light.

Chandeleur Light (30°02.9'N., 88°52.3'W.), 99 feet above the water, is shown from a square pyramidal skeleton tower, brown below the gallery and black above, near the NW end of the northernmost of the Chandeleur Islands. The light presents a good radar target.

Shipping Safety Fairways.–Vessels should approach Ship Island Pass and Gulfport through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Ship Island Pass are described in 80.815, chapter 2.

Channels.–Ship Island Bar Channel leads for 6 miles NW from the Gulf in a dredged cut to Ship Island Pass; it is marked by lighted buoys. **Gulfport Channel** leads 10 miles NW through a dredged cut from the pass through Mississippi Sound to Gulfport Harbor Basin; it is marked by lighted ranges, lights, and lighted and unlighted buoys. Federal project depths are 32 feet for the bar channel and 30 feet for Gulfport Channel and Harbor Basin. (See Notice to Mariners and latest editions of charts for controlling depths.)

A dredged commercial small-craft harbor and entrance channel are just W of Gulfport Harbor Basin. The entrance channel leads NW from Gulfport Channel for about 1.2 miles to the small-craft harbor. In August 1983, the controlling depth was 7 feet in the channel with 8 feet in the basin except for shoaling to ½ foot in the S and E parts. The channel is marked by daybeacons, lights, and an unlighted buoy.

Anchorages.–Large vessels can anchor outside the sound anywhere W of a line between Chandeleur and Ship Island Lights and have rather smooth water. Deep-draft vessels generally anchor within a 2-mile radius of Ship Island Pass Lighted Whistle Buoy SI in depths of 25 to 35 feet. Just S of the bar, the holding ground is good, and bar pilots report good anchorage 0.5 mile S of Ship Island Pass Lighted Gong Buoy 13.

Ship Island Harbor, N of Ship Island, is one of the best natural harbors on the Gulf Coast and is easily accessible at all times for vessels with drafts up to 20 feet, but there is swinging room for only one large vessel. Depths in the harbor range from about 20 to 30 feet with a soft bottom.

Dangers.–Ship Island was cut into two parts by Hurricane Camille in August 1969. The water between the existing parts is shoal with depths of 2 to 5 feet.

The shoal off the W end of Ship Island at **West Point** is moving W. The channel is dredged frequently, and when shoal water occurs, the lighted buoy is moved W to mark the channel. Mariners should exercise caution to keep to the W of this buoy. Mariners are warned not to cut corners at the bends in the channel. Spoil banks are on either side of Gulfport Channel and W of the commercial small-craft harbor.

A 250-yard-long submerged breakwater is at the opening of the harbor basin, W of the channel in the vicinity of Gulfport Channel Light 77.

Tides and currents.–The diurnal range of tide is about 1.7 feet, but the tides are greatly affected by the winds. NE to S winds raise the level of the water, and SW to N winds lower the level. A continued norther makes a current on Ship Island Bar of as much as 3 knots. Current velocities up to 1.5 knots have been measured in Ship Island Pass during normal weather.

Weather.–Gulfport, located on Mississippi Sound, is sheltered somewhat from temperature extremes of winter and summer by these waters and the Gulf of Mexico. At the port, summer temperatures climb to 90°F or above on about 57 days, while winter readings fall to freezing or below on just 12 days, on average. Precipitation is frequent year round, but most likely during summer when showers and thunderstorms are numerous. Extreme winds, both sustained and gusts, are most often associated with tropical cyclones and thunderstorms. However, extratropical cyclones and fronts produce a greater frequency of windspeeds in the 17- to 33-knot range (3 to 5 percent) from February through April. Visibilities are restricted mainly in precipitation and fog. Fog is most likely during winter and spring; visibilities fall below 0.5 mile on about 4 to 7 days per month from November through April.

The hurricane season represents a serious threat to marine activities at Gulfport. Since 1942, there have been eight tropical cyclones that have generated winds of 50 knots or more at Gulfport. During this

century, tropical cyclone storm tides have exceeded 8 feet five times along this section of the coast; during Camille, a 21-foot storm tide was produced. The hurricane season extends from late May through early November, in general, while September is the major threat month. Most storms approach Gulfport from SE, S, and SW. Gulfport Harbor is not considered a hurricane haven. There is an absence of sheltered facilities and anchorages for deep-draft vessels, and there is the danger of severe shoaling in the narrow Gulfport Channel. It is recommended that deep-draft vessels, if unable to leave the region entirely, anchor in the shallow waters adjacent to the sand barrier islands about 10 miles offshore. Shallow-draft vessels, if not removed from the water, should seek shelter in the Back Bay of Biloxi and the creeks, bayous, and rivers leading inland.

Pilotage is compulsory for all foreign vessels and U.S. vessels over 250 tons under register in the foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. Pilots board vessels in the vicinity of Ship Island Pass Lighted Whistle Buoy SI (30°07.0'N., 88°55.8'W.). The pilot boat, a 46-foot motorboat with red hull, white superstructure, and the word PILOT on the stern. For boarding, the pilots request that the pilot ladder be rigged 3 feet above the water on the lee side and that the vessel maintain a dead slow speed. A 24-hour advance notice of time of arrival is requested. Pilots and the Port of Gulfport guard VHF-FM channel 16 (156.80 MHz) and use channel 10 (156.50 MHz) as a working frequency. Arrangements for pilots are made in advance through the ships' agents or through the Mississippi State Port Authority (telephone, 601-864-4471).

Towage.–Tugs to 2,000 hp are based at Gulfport. They monitor VHF-FM channel 16 (156.80 MHz), use channel 10 (156.50 MHz) as a working frequency, and have portable radiotelephone equipment to communicate with the pilots. Arrangements for tugs are usually made in advance by ships' agents (telephone, 601-864-0171) or through the Mississippi State Port Authority (telephone, 601-864-4471). Vessels usually enter or leave under their own power and use tugs only for docking, undocking, and shifting berths.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine laws are enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) There are hospitals and clinics in Gulfport.

Gulfport is a **customs port of entry.**

Coast Guard.–Coast Guard patrol boats moor on the N side of the Bert Jones Yacht Basin at Gulfport.

Harbor regulations.–Gulfport Harbor is administered and controlled by the Mississippi State Port Authority at Gulfport. The Port Director is in charge of all operations and assigns berths.

Speed limit.–The maximum speed for oceangoing vessels shall not exceed 8 m.p.h. through the channel between Ship Island Bar and the entrance to the Gulfport Harbor, and shall not exceed 5 m.p.h. while passing any wharf, dock, or moored craft.

All craft passing other vessels, boats, barges, scows, etc., in motion, moored or anchored, shall slow down and take every precaution to avoid damage.

Wharves.–The deep-draft facilities at Gulfport are on the E and W sides of Gulfport Harbor Basin and are owned by the Mississippi State Port Authority at Gulfport. For a complete description of the port facilities refer to Port Series No. 19, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths for the facilities described are reported; for information on latest depths contact local port authorities. Each of the facilities has rail and highway connections and water connections. All sheds and warehouses are equipped with sprinkler systems, and a fire and security watch is maintained. Cranes to 75 tons are available. An additional 30 acres of open storage is available.

East Pier Open Storage Wharf (30°21'25"N., 89°05'20"W.): 600-foot face; 30 feet alongside; deck height, 11 feet; 10 acres of open storage; receipt and shipment of general and containerized cargo, lumber, and steel products; shipment of wood chips; receipt of farm tractors; owned and operated by Mississippi State Port Authority at Gulfport.

Standard Fruit and Steamship Co. East Pier Terminal: immediately NW of East Pier Open Storage Wharf; 940-foot face; 29 feet alongside; deck height, 10 feet; 170,000 square feet covered storage; 10,000 square feet cold storage; shipment of general cargo, including paper, fertilizers, farm tractors, and frozen meats; receipt of canned fruits; operated by Mississippi State Port Authority at Gulfport and Standard Fruit and Steamship Co., Inc.

East Pier Banana Terminal: inner end of E side of Harbor Basin; 515-foot face; 24 feet alongside; deck height, 10 feet; four gantry banana unloaders with capacity of 4,200 boxes per hour each; receipt of fruit and vegetables; operated by Standard Fruit and Steamship Co., Inc.

West Pier Dry Bulk and Container Wharf; outer end of W side of Harbor Basin; 850-foot face; 30 feet alongside; deck height, 11 feet; 35-ton container crane and bulk unloader, unloading rate of 1,200 tons per hour for 140-pound-per-cubic-foot materials; covered storage for 50,000 tons of ilmenite; 10 acres open storage; receipt and shipment of general and containerized cargo, ilmenite ore, and other dry bulk commodities; operated by Mississippi State Port Authority at Gulfport.

West Pier Cold Storage Wharf: immediately NW of Dry Bulk and Container Wharf; 800-foot face; 30 feet alongside; deck height, 11 feet; 52,000 square feet covered storage; 40,000 square feet cold storage; receipt and shipment of general cargo, including frozen and refrigerated foodstuffs; operated by Mississippi State Port Authority at Gulfport.

West Pier, North Wharf: immediately NW of

Cold Storage Wharf; 1,760 feet of berthing space; 30 feet alongside; deck height, 11 feet; 211,000 square feet covered storage; receipt and shipment of general cargo including foodstuffs; operated by Mississippi State Port Authority at Gulfport.

Supplies.–Blended fuel is available by barge. Fuel oil is available at several commercial wharves by truck. Smaller vessels may be fueled at Commercial Small-craft Harbor East Wharf. Freshwater is piped to all berths. Marine supplies of all kinds are available.

Repairs.–Gulfport has no shipyard facilities. Above- and below-the-waterline repairs are available.

Small-craft facilities.–The Bert Jones Yacht Basin, in the yacht harbor close E of the Gulfport Harbor Basin, has facilities for yachts and party fishing vessels. Berths, electricity, diesel fuel, gasoline, ice, water, launching ramps, and marine supplies are available. There is a 30-ton mobile lift which can handle craft up to 60 feet for hull and engine repairs or storage. In June 1982, the reported controlling depth in the privately dredged channel to the basin was 7 feet. A channel **dockmaster** is on duty at the yacht basin.

Storm warning signals are displayed. (See chart.)

Communications.–Gulfport has regular steamer connections with Europe, South and Central America, and Far East ports. Banana ships call frequently at the port. The port is served by the Illinois Central Gulf and Seaboard System Railroads. Bus and motor freight lines connect the city with all points. The Gulfport Municipal Airport, about 3 miles NE of the port, has regular airline service.

Charts 11371, 11372.–Cat Island Channel and its extension **South Pass,** lying between Cat Island and Isle au Pitre, form the most W connection between the Gulf and Mississippi Sound. The marked channel has a depth of about 12 feet, but leads to lesser depths in the sound. The passage is little used, except by small local craft; the chart is the best guide. Cat Island is wooded nearly its whole length E and W. The E shore of the island extends in a SSW direction for 4.5 miles with Raccoon Spit off the northernmost point, and low and narrow South Spit and Phoenix Spit on the S. A light is off Phoenix Spit.

Isle au Pitre, on the S side of Cat Island Channel, is low and marshy with scattered clumps of bushes.

The Intracoastal Waterway leads through the shoals in the W part of Mississippi Sound about 2 miles NW of Cat Island. (See chapter 12 for Intracoastal Waterway.)

Pass Marianne is an alternate passage through the shoals extending across the W end of Mississippi Sound; natural depths are 7 to 18 feet. The pass is S of **Tail of the Square Handkerchief Shoal** and **Square Handkerchief Shoal,** and is frequently used by tugs and barges. The channel is marked by lights and buoys. Caution should be exercised when navigating this channel as it is subject to change. In 1966, a depth of 4 feet was reported about 0.3 mile WSW of Merrill Shell Bank Light. **Grand Pass,** about 7 miles S of Merrill Shell Bank Light, connects Mississippi Sound with Oyster Bay; the entrance to the pass is marked by a light.

Long Beach is a resort city on Mississippi Sound about 2.5 miles W of Gulfport Harbor. There is some industry in commercial fishing and candy making. **Gulf Park College,** at the E end of the city, has a 1,000-foot pier marked by a light. The buildings at the college and a white church near the waterfront are prominent. The Long Beach small-craft harbor, formed by a long mole and jetty W of the college pier, has limited berths with water and electricity, ice, and launching ramps. In June 1982, the reported controlling depth in the channel to the basin was 6 feet. U.S. Route 90 highway passes through the city. Clinics and medical service are available. Buses serve the city.

Pass Christian is a city and summer resort 8 miles W of Gulfport on the N shore of Mississippi Sound. A dredged entrance channel leads from Mississippi Sound to a harbor formed by two moles and protected from the S by two breakwaters extending from the moles. In March 1983, the controlling depth was 7 feet in the entrance channel with 6 to 7 feet in the harbor. A light marks the seaward end of the E breakwater. The harbor entrance can be approached from the E or SW; both approaches are marked by lights. Sunken wrecks are in the harbor approaches. A large white church just E of the harbor is prominent.

Pass Christian Yacht Club is at the outer end of the E mole. Fishing vessels unload at the bulkhead of the City Wharf on the E mole. Berths, gasoline, diesel fuel, water, electricity, ice, and launching ramps are available in the harbor. The **harbormaster** assigns berths in the harbor and has an office on the west mole.

There is some industry in fishing and garment making. U.S. Route 90 highway passes through the city. Clinics and medical services are available. Buses serve the city.

Henderson Point is at the W extremity of Pass Christian and on the E side of the entrance to St. Louis Bay. Just N of the point, and between the bridges over the bay, is a small bayou which is connected to Mallini Bayou. A marina is on the N side of the entrance. In June 1982, a reported depth of 4 feet could be carried to the marina. An obstruction covered about 3 feet was reported in about 30°18′46″N., 89°17′37″W.; caution is advised. Berths, gasoline, diesel fuel, ice, water, and some marine supplies are available at the marina. A forklift can haul out craft to 25 feet for hull and engine repairs, and a 3-ton mobile crane that can handle craft up to 30 feet is available on short notice. Above the marina the channel is crossed by several fixed highway bridges with a minimum width of 10 feet and clearance of 4 feet.

St. Louis Bay is an indentation in the N shore of Mississippi Sound, 11 miles W of Gulfport. Depths in the bay vary from 4 to 7 feet and decrease gradually toward the shore. The bottom is soft. An unmarked submerged wreck, covered 3 feet, is SE of

the entrance to the bay about 1.2 miles S of Henderson Point and about 0.4 mile N of Square Hankerchief Shoal. Two bridges cross St. Louis Bay, the first, the Seaboard System Railroad (L&N) bridge has a swing span with a clearance of 13 feet through the W draw, and the second, the four-lane U.S. Route 90 highway bridge, has a bascule span with a clearance of 17 feet at the center. An overhead power cable about 25 yards N of the highway bridge has a clearance of 60 feet except at the drawspan where the clearance is 80 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Bayou Portage, which empties into the E side of St. Louis Bay, is used by small craft as a harbor of refuge during minor storms. The Harrison County Development Commission has dredged a channel from the bay through Bayou Portage to a dredged slip that extends about 0.8 mile SSE to Pass Christian. An industrial area and port is under development on the slip. In June 1982, the reported controlling depth in the channel was 5 feet with greater depths available in the slip. Private lights and buoys mark the channel. In April 1979, four sunken wrecks were reported along the W side of the slip, extending 20 to 25 feet into the channel, between 30°20′11″N., 89°15′11″W., and 30°19′55″N., 89°15′05″W. The highway bridge about 1 mile above the mouth of the bayou has a bascule span with a clearance of 11 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable crossing just E of the bridge has a clearance of 48 feet.

Wolf River empties into the E side of St. Louis Bay just above Bayou Portage. A dredged entrance channel leads N from a junction with Bayou Portage Channel for 1.6 miles to the mouth of the river. In August 1983, the controlling depth was 4½ feet (5½ feet at midchannel). The channel is marked by a daybeacon and lights.

De Lisle, a small village on **De Lisle Bayou** about 1.4 miles above the mouth of the Wolf River, has a fish camp at which berths and ice are available. A natural launching ramp and gasoline are available nearby. The reported controlling depth from the Wolf River to the yard was about 5½ feet in June 1982; local knowledge is advised.

The highway bridge over Wolf River near De Lisle has a bascule span with a clearance of 13 feet. Overhead power cables at the bridge have a least clearance of 73 feet. The highway bridge crossing the river about 4.8 miles upstream has a swing span with a clearance of 9 feet. The channel is through the SE draw. An overhead power cable about 0.3 mile W of the bridge has a clearance of 84 feet. A fixed highway bridge about 6.8 miles above the river mouth has a clearance of 16 feet. (See 117.1b and 117.240, chapter 2, for regulations and opening signals for the drawbridges over Wolf River.)

The dome of a private school at **Shell Beach,** about 3 miles W of De Lisle, is prominent from seaward.

Jourdan River empties into the W side of St. Louis Bay. A dredged channel leads W in St. Louis Bay for 1.7 miles to the mouth of the river. In August 1983, the controlling depth was 5½ feet except for minor shoaling along the S edge. The channel is marked by a light and daybeacons. A small boatyard and marina on **Joes Bayou,** just inside the river entrance, has a marine railway that can haul out craft to 32 feet for hull and engine repairs. The channel leading to the yard had a reported controlling depth of about 2 feet in June 1982. Boats are also constructed at the yard; open and covered berths and a launching ramp are available.

Watts Bayou empties into Jourdan River about 1 mile above the latter's mouth. In June 1982, the reported controlling depth in the bayou was about 5 feet; local knowledge is advised. A boatyard on the bayou can handle craft to 50 feet for hull and engine repairs. Ice, water, open dry storage, and a launching ramp are available.

Edwards Bayou flows into Watts Bayou at the mouth. In June 1982, the unmarked channel leading to the marina about a mile above the mouth had a reported controlling depth of about 6 feet. Berths, gasoline, diesel fuel, water, ice, a launching ramp, and some marine supplies are available. Craft to 30 feet can be hauled out on a trailer for hull and engine repairs or covered storage.

Bayou La Croix enters Jourdan River from the W about 2.9 miles above the mouth. State Route 603 highway bridge crossing the bayou about 1.6 miles above the mouth has a 38-foot fixed span with a clearance of 12 feet. Overhead power cables on either side of the bridge have a clearance of 40 feet.

Bay St. Louis is a city and summer resort on the W side of St. Louis Bay. A depth of 7 feet can be carried to within 0.3 mile of the town. The city has a hospital and several clinics. The Seaboard System Railroad has freight service, and through bus service is available on U.S. Route 90 highway, which passes through the city.

The small-craft harbor of Bay and Waveland Yacht Club about 0.4 mile NW of U.S. Route 90 highway bridge is protected by two moles. In June 1982, a reported depth of 4 feet could be taken to the harbor. The harbor facilities, including berths and gasoline, are available to club members and friends.

Bayou Caddy (see also chart 11367) empties into Mississippi Sound 7 miles SW of St. Louis Bay. The bayou is approached from the sound through a channel marked by lights and daybeacons. In July 1983, the controlling depth was 4½ feet (6 feet at midchannel) from Mississippi Sound to the mouth of the bayou, thence 4 feet at midchannel to the spur channel on the N side of the bayou about 1.8 miles above the entrance. Diesel fuel, water, and ice are available at the fuel dock. Berths, gasoline, marine supplies, a launching ramp, and a 10-ton mobile hoist that can handle craft for hull and minor engine repairs are available at the marina.

Three Mile Pass and **Blind Pass** lead to Bay Boudreau from the S part of the extreme W end of Mississippi Sound. The channels are little used; each is marked by a light. **Bay Boudreau** is a shallow body

of water enclosed by irregularly shaped, low, swampy islands and other shallow bays.

Charts 11363, 11364, 11361.–Chandeleur Sound and **Breton Sound** lie S of Mississippi Sound and N of the Mississippi River Delta; no clear line of demarcation lies between them–Chandeleur is the N of the two sounds.

Chandeleur Islands, forming the E boundary of Chandeleur Sound, comprise a narrow, crescent-shaped chain of low islands starting 10 miles S of Ship Island and continuing in a general S-by-W direction for a distance of 20 miles. SW from these islands are **Curlew Island, Grand Gosier Islands,** and **Breton Islands.** The Breton Islands mark the E limit of Breton Sound. Chandeleur Sound offers smoother water than the passage E of the islands to shallow-draft vessels bound from Mississippi Sound to Mississippi River.

The Mississippi River-Gulf Outlet Canal, which enters Breton Sound from the Gulf between Breton Islands and Grand Gosier Islands, is described in chapter 8 with the Mississippi River Channels.

North Islands, Freemason Islands, New Harbor Islands, and **Old Harbor Island Shoal** are on the E side of Chandeleur Sound. Only fishermen and trappers frequent these, which are separated from each other by shallow unmarked channels. Protected anchorage for small boats in stormy weather can be found in **Shoalwater Bay, Smack Channel,** and other passages.

An unmarked sunken wreck is about 1.9 miles SSW of Old Harbor Island Shoal, in about 29°42.5′N., 89°03.0′W.

Chandeleur Islands, Curlew Island, Grand Gosier Islands, Breton Islands, North Islands, Freemason Islands, New Harbor Islands, and Old Harbor Island Shoal lie within the **Breton Island Wildlife Refuge** and are subject to the rules and regulations prescribed by the U.S. Department of Interior.

Ostrica Canal extends N from the Mississippi River at the village of **Ostrica** about 21.5 miles above Head of Passes. The canal, together with channels through **Bayou Tortillon** and **Quarantine Bay,** affords passage to Breton Sound. The lock at the S end of Ostrica Canal is 247 feet long and 40 feet wide with a depth of 10 feet over the sills. The lock operates 24 hours a day. Red and green traffic lights at each end of the lock should be obeyed by all vessels waiting to enter the lock. The lock foreman can be contacted on VHF-FM channel 16 (156.80 MHz) and uses channel 10 (156.50 MHz) as a working frequency. In December 1983, the controlling depth was 5 feet from the Mississippi River to the lock, thence 4 feet from the lock through Quarantine Bay. The channel through Quarantine Bay is marked by private lights and buoys. A cluster of partially submerged pilings is reported in 29°25′15″N., 89°27′00″W., about 1 mile E of the entrance to Quarantine Bay channel from Breton Sound.

The W shore of Breton Sound consists of a network of marshy islands separated by shallow bayous and bays. The land is so low that extremely high tides will submerge it in some sections nearly to the banks of the Mississippi River. Of the several shallow canals leading from the S part of Breton Sound to the river bank, only the Ostrica Canal and Baptiste Collette Bayou lead into the river. These canals are used by the large fleet of oyster boats operating in the sound to deliver their catch to canneries and packing houses on the river bank or to highways for trucking to New Orleans, and by oil companies for the development of oil fields. Oil drilling equipment will be found throughout the area. There are numerous unlighted oil well structures in Chandeleur and Breton Sounds and the waters to the W.

The waterways connecting Lake Borgne and Chandeleur Sound via Lake Eloi are discussed under Lake Borgne.

A light (29°37.0′N., 89°29.1′W.) off Mozambique Point marks the N side of the entrance to Black Bay from Breton Sound. A seasonal fog signal is at the light. Another light on the N side of Black Bay marks the entrance to **Bayou Terre aux Boeufs.** In June 1982, a reported depth of about 6 feet could be carried up the bayou to Delacroix; local knowledge is advised. Overhead power cables crossing the waterway have a minimum clearance of 30 feet. **Delacroix** is a small settlement on the waterway about 8 miles S of Lake Borgne. There is a marine lift at Delacroix that can handle craft up to 25 feet. Gasoline, diesel fuel, water, ice, and limited marine supplies may be obtained. From Delacroix, a highway extends to Poydras on the Mississippi, and thence to New Orleans. The marshlands about **Black Bay** are used extensively for hunting, trapping, and oil development. Private lights and buoys mark oil company channels in Black Bay.

Charts 11371, 11367.–Lake Borgne, the W extension of Mississippi Sound is partly separated from Mississippi Sound by **Grassy Island, Half Moon (Grand) Island,** and **Le Petit Pass Island** and their outlying shoals. Between the islands and shoals are several navigable passages including St. Joe and Le Petit Passes. On the NW shore, Lake Borgne is separated from Lake Pontchartrain by a low marsh through which the Rigolets and Chef Menteur Pass are the principal passages. Lake Borgne is about 23 miles in length, 5 to 10 miles in width, and 6 to 10 feet in depth. Charted and uncharted obstructions are in the lake; caution is advised. The shores of the lake are low, marshy, and sparsely populated. The lake is of importance chiefly as a connecting link for the Intracoastal Waterway. (See chapter 12 for Intracoastal Waterway.) Lake Borgne is tidal, but the tides are small and greatly modified by the winds. The tidal currents through St. Joe Pass have velocities exceeding 1.5 knots at times.

Vessels coming from the E generally enter Lake Borgne through **St. Joe (Grand Island) Pass,** which leads between Half Moon (Grand) Island and **Lighthouse Point (Lower Point Clear).** The channel is

marked and is a portion of the Intracoastal Waterway. (See chapter 12 for Intracoastal Waterway.)

Le Petit Pass, between Le Petit Pass Island and **Malheureux Point,** is little used.

Pearl River empties into Lake Borgne from the N. The river serves as a boundary between the States of Mississippi and Louisiana. Principal commerce on the river is in barge shipments of liquified oxygen and hydrogen and large structures for NASA. A dredged channel leads from N of the Intracoastal Waterway in Lake Borgne for 1.1 miles to the mouth of the Pearl River. In May 1980, the controlling depth from Lake Borgne to deeper water in the river was 6½ feet. The channel is marked by lights and daybeacons. The Seaboard System Railroad (L&N) swing bridge, with a clearance of 14 feet, crosses Pearl River at **Baldwin Lodge,** about a mile above the mouth; the channel is through the E draw. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

About 3.5 miles above the mouth, Pearl River joins with **Little Lake Pass,** which leads W to **Little Lake. East Pass,** at the W end of Little Lake, connects the lake and The Rigolets. A dredged channel extends from The Rigolets ENE through the East Pass, Little Lake, and Little Lake Pass, thence up the Pearl River to a turning basin and slip at the **NASA National Space Technology Laboratory** near Gainesville, about 14 miles above the mouth of Pearl River. In 1972, the controlling depth from East Pass to Pearl River was 7 feet except for shoaling along the edges, thence in 1976, 3 feet in Pearl River. The channel is marked by lights and daybeacons.

Port Bienville Industrial Park, a dredged slip and waterfront industrial park under development by the Hancock County Port and Harbor Commission, is entered through a privately dredged channel on the E side of the river about 1.5 miles above Little Lake Pass. The channel is marked by a light and daybeacons. Several shipyards at the park can perform complete repairs to barges to 150 tons and above-the-waterline repairs to ships at their berths using portable equipment.

U.S. Route 90 highway bridge across the Pearl River at **Pearlington,** 4 miles above the mouth, has a swing span with a clearance of 10 feet through the E draw. About 5.3 miles above this swing bridge, a bascule bridge with a clearance of 73 feet crosses the river; the bascule bridge is kept in a closed position. An overhead power cable just S of the bascule bridge has a clearance of 99 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals of bridges over Pearl River.)

A marina just above U.S. Route 90 highway bridge has berths, electricity, gasoline, water, ice, a launching ramp, and a 3-ton hoist that can haul out craft for covered dry storage.

From the N side of Little Lake, just W of Little Lake Pass, a marked channel leads to **North Pass** and a junction with **West Middle River.** From North Pass an unmarked channel leads W to **East Mouth,** which connects to the mouth of the West Pearl River, thence, through **West Mouth,** to The Rigolets; about 7 feet can be carried over this route to the mouth of West Pearl River, thence about 8 feet to The Rigolets.

A highway bridge crossing **East Middle River,** a tributary of **Old Pearl River,** about 3.4 miles above Pearl River has a 45-foot fixed span with a clearance of 11 feet; an overhead power cable is at the bridge. A highway bridge crossing **Middle River,** a tributary of Old Pearl River, about 3.9 miles above Pearl River has a fixed span with a clearance of 10 feet; an overhead power cable is at the bridge. A highway bridge crossing West Middle River about 5 miles above North Pass has a fixed span with a clearance of 10 feet; an overhead power cable is at the bridge.

West Pearl River empties through West Mouth into the E end of The Rigolets. A dredged channel leads from the mouth of West Pearl River to **Bogalusa,** La., a distance of about 50 miles; three locks are each 65 feet wide and 310 feet long, with 10 feet over the sill. In June 1982, the reported controlling depth was 4 feet. About 5 miles above the junction of East Mouth and West Mouth there is a vertical lift bridge with a clearance of 10 feet down and 50 feet up; the overhead cable 1.9 miles above this bridge has a clearance of 55 feet. At **Gauss Bluff,** about 11 miles above the mouth, the twin fixed spans of Interstate Route 10 highway bridges with clearances of 35 feet cross the river. Near the town of **Pearl River,** 19 miles above the mouth, there are three bridges; the first two are the twin fixed spans of the Interstate Route 59 highway bridge with clearance of 35 feet. About 200 yards farther upstream, the Southern Railroad bridge has a swing span with a clearance of 7 feet. (See 117.1b, 117.240, 117.245 (a) through (e) and (i)(21), and 117.540, chapter 2, for drawbridge regulations and opening signals.) The overhead power cables at the railroad bridge have clearances of 60 feet.

The Rigolets is a deep passage 7 miles long and about 0.4 mile wide connecting Lake Borgne and Lake Pontchartrain. Depths range from 20 to 60 feet in the passage bounded by low and marshy shores. The entrance from Lake Borgne is 8 miles W of St. Joe Pass. Two swing bridges cross The Rigolets. The first, the Seaboard System Railroad (L&N) bridge about 0.4 mile N of **Catfish Point** in Lake Borgne, has a clearance of 11 feet; navigation is through the E draw. The second, about a mile E of Lake Pontchartrain, is U.S. Route 90 highway bridge that has a clearance of 14 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Currents are very irregular and greatly influenced by winds. They set with great velocity through Rigolets at times, and especially through the draws of the bridges. Velocities of 2.5 knots off Rigolets Light 5 and 3.8 knots at the railroad bridge have been observed. At the railroad bridge westerly currents set WSW onto the fender on the SW side of the draw, and easterly currents set E by N onto the fender on the NE side. The current has an average velocity of 0.6 knot. The bridge should not be

approached closely until the draw is opened, and then only with caution.

Good anchorage for small craft is available in **Blind Rigolets** either N or S of the Intracoastal Waterway crossing. Depths of 12 feet or more are available for vessels entering Blind Rigolets via the Intracoastal Waterway. The Seaboard System Railroad (L&N) bridge over Blind Rigolets, N of the Intracoastal Waterway, has a fixed span with a clearance of 11 feet; the overhead power cable, 250 feet N of the bridge, has a clearance of 25 feet.

Fort Pike, an old circular brick fort with sodded top, is just inside the W entrance to The Rigolets.

Small-craft facilities on **Fort Pike Canal,** E of the fort, and on **Geoghegan Canal,** NE of the fort, can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, and hull, engine, and electronic repairs. The largest mobile hoist, on the NW side of Geoghegan Canal just above the entrance, can haul out craft to 63 feet.

In June 1982, the reported controlling depths were 4½ feet in Fort Pike Canal and 8 feet in Geoghegan Canal.

Lake St. Catherine can be reached through Fort Pike Canal or through a natural unmarked channel in **Sawmill Pass.** The lake has numerous oil well structures.

Chef Menteur Pass, a connecting passage between Lake Borgne and Lake Pontchartrain, is located about 10 miles SW of The Rigolets. The pass is about 6 miles long and 0.2 mile wide. There is a considerable range in depths in the pass with shallow water off the entrances. The pass, used by pleasure and fishing craft, is usually entered through the Intracoastal Waterway. A light marks the entrance from Lake Borgne, and another light marks the entrance from Lake Pontchartrain; two lights mark the Intracoastal Waterway crossing. A new Intracoastal Waterway alinement channel, completed in 1972, crosses Chef Menteur Pass 1 mile SE of the original Intracoastal Waterway crossing. A light and daybeacon mark the new crossing. In 1968, pilings were reported near the Lake Pontchartrain entrance to Chef Menteur Pass, about 400 yards and 600 yards NW of the entrance light. In 1980, an obstruction covered 1 foot was found in about 30°02′44″N., 89°46′13″W. at the intersection of Chef Menteur Pass and Lake Borgne. Two swing bridges cross Chef Menteur Pass. The Seaboard System Railroad (L&N) bridge has a clearance of 10 feet. The U.S. Route 90 highway bridge, crossing 0.3 mile NW of the railroad bridge, has a clearance of 11 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The town of **Chef Menteur** is between the bridges. A large spherical tank 0.4 mile NW of the highway bridge is conspicuous.

Several small-craft facilities are on both sides of the pass from the highway bridge N for about 1 mile. Berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, and marine supplies are available, and hull and engine repairs can be made. The largest mobile hoist, at a boatyard about 0.9 mile NE of the highway bridge, can handle craft to 20 tons.

Bayou Sauvage is an important waterway leading about 2.7 miles W from Chef Menteur Pass about 0.3 mile NW of the highway bridge. In June 1979, depths of 10 feet were reported in the bayou. There are fish camps, marinas, and a shipyard on the bayou. Several oil companies maintain marine bases on the bayou. The shipyard builds steel tugs and crew boats to 228 feet. Gasoline, diesel fuel, water, ice, launching ramps, and marine supplies are available.

Charts 11371, 11369, 11364.–Bayou Bienvenue empties into the W side of Lake Borgne about 5 miles SW of Chef Menteur Pass. The bayou connects Lake Borgne with the Mississippi River-Gulf Outlet Canal, and thence leads W for about 6.3 miles. In November 1983, the controlling depths were 3 feet across the lake bar, thence 6 feet to the Mississippi River-Gulf Outlet Canal, and thence 6 feet for about 2 miles to State Route 47 highway bridge. The bridge has a 17-foot fixed channel span with a clearance of 3 feet.

Bayou Dupre empties into the SW end of Lake Borgne at **Martello Castle,** about 3.5 miles SSE of Bayou Bienvenue. A dredged channel leads from Lake Borgne into and through Bayou Dupre and **Violet Canal** to **Violet.** In April 1983, the controlling depth was 5 feet over the bar in Lake Borgne and thence 4 feet through Bayou Dupre to the head of the canal at Violet. An overhead power cable with a clearance of 60 feet crosses the canal about 1.2 miles E of Violet. Twin fixed highway bridges with a clearance of 35 feet are about 0.4 mile E of Violet. Petroleum products and fish are the principal commerce on the bayou. Shrimp fishermen report that the canal is difficult to navigate during winter low water. A light and daybeacons mark the entrance to the bayou. A small marina at Violet provides gasoline, berths, water, electricity, ice, and a hoist that can handle small craft to 3 tons.

Bayou Yscloskey empties into the southernmost part of Lake Borgne. A dredged channel leads from Lake Borgne to the mouth of Bayou Yscloskey. In October 1983, the controlling depth was 5 feet. The channel is marked by a light and daybeacons. From the mouth of the bayou, the channel is privately maintained for 2 miles to Bayou la Loutre at the settlement of **Yscloskey.** In October 1983, the controlling depth was 7 feet to Yscloskey. Overhead power cables crossing Bayou Yscloskey have a minimum clearance of 30 feet. Gasoline, diesel fuel, water, ice, and limited marine supplies are available on the bayou. From Yscloskey, **Bayou la Loutre** flows SE for 25 miles to Eloi Bay (chart 11363). The dredged channel in the bayou is privately maintained from Yscloskey to Hopedale, a small settlement 3 miles SE. In April 1983, the controlling depth was 4 feet. The bridge over Bayou la Loutre at Yscloskey has a vertical lift span with a width of 45 feet and clearance of 2 feet down and 53 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations

and opening signals.) An overhead power cable crossing at Hopedale has a clearance of 68 feet. **Hopedale** has several wharves at which gasoline, diesel fuel, water, ice, and marine supplies are available. A small boatyard at Hopedale has a mobile hoist that can haul out craft to 45 tons. Repairs are normally made by the boat owners.

From Hopedale, Bayou la Loutre Channel is a Federal project. In April 1983, controlling depths were 5 feet to Bayou St. Malo, thence 4 feet through **Bayou Eloi** and the bar channel to deep water in **Lake Eloi.** Lights and daybeacons mark the entrance to Bayou Eloi in Lake Eloi.

Bayou St. Malo, a dredged channel, leaves Bayou la Loutre 5 miles E of Hopedale and flows NW for 5 miles to Lake Borgne. Principal traffic on the waterway consists of commercial fishing boats, oil well equipment, and support vessels. In April 1983, the controlling depth was 2 feet to Lake Borgne and in the channel across the bar. A light marks the bar channel.

Chart 11369.-Lake Pontchartrain, roughly elliptical in shape, is 36 miles long, 22 miles wide at the widest part, 10 to 16 feet deep, and lies N of the Mississippi River at New Orleans. The lake connects with the Mississippi River through the Inner Harbor Navigation Canal; with Lake Borgne through The Rigolets and Chef Menteur Pass; and with Lake Maurepas through Pass Manchac. Considerable commerce is carried on Lake Pontchartrain, the principal items being sand and gravel, shell, stone, petroleum products, lumber, cement, chemicals, steel products, and foodstuffs.

The periodic tide is negligible, but the variation in the water level due to winds has an extreme range of 3.5 to 4 feet. It is reported that the surface of the lake is lowered at least 2 feet during the winter when NW winds prevail.

There are numerous well platforms, piles, pipes, and other reported obstructions in Lake Pontchartrain. Caution is advised.

Three causeways cross the E end of Lake Pontchartrain. U.S. Interstate Route 10 highway causeway, about 3.5 miles W of The Rigolets and crossing between **Pointe aux Herbes** and **Howze Beach,** has a bridge with a fixed span over the navigation channel about 1.2 miles from its NE end with a clearance of 65 feet. U.S. Route 11 highway causeway, W of U.S. Interstate Route 10 highway causeway and crossing from Pointe aux Herbes to **North Shore,** has two bascule bridges; one, about 1 mile SW of North Shore, has a clearance of 13 feet; the other, about 0.4 mile NE of Pointe aux Herbes, has a clearance of 12 feet. The N span is equipped with a radiotelephone. The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, KMC-226. The overhead power cable just W of this bridge has a clearance of 94 feet. The Southern Railway causeway, W of U.S. Route 11 highway causeway and crossing between **South Point** and North Shore, has two swing span bridges; one, about 1 mile SW of North Shore, has a clearance of 2 feet; the other, about 1.2 miles NE of South Point, has a clearance of 1 foot. The N span is equipped with radiotelephone. The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign KA-5070. The overhead power cable just W of this bridge has a clearance of 12 feet but is submerged at the channels. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(23-a), chapter 2, for drawbridge regulations and opening signals.)

Small-craft facilities at the N and S ends of U.S. Interstate Route 10 highway causeway can provide berths, gasoline, water, ice, launching ramps and some marine supplies.

Lake Pontchartrain Causeway, twin toll highway bridges, extends 20.9 miles across Lake Pontchartrain from Indian Beach on the S shore to Lewisburg on the N shore. Five bridge openings, four twin fixed and one twin bascule, are at intervals of about 3.5 miles along the causeway. The first three openings N from Indian Beach are crossed by twin fixed bridges with clearances of 22 feet, 50 feet, and 22 feet, respectively. The next opening is crossed by twin bascule spans with clearances of 42 feet, and the northernmost opening is crossed by a twin fixed bridge with a clearance of 22 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(23-b), chapter 2, for drawbridge regulations and opening signals for the bascule span.)

Three pipelines, marked by private lights, cross the lake. The first extends from the E shore about 1 mile S of The Rigolets W to Pointe aux Herbes. The second begins at a point about 0.75 mile WSW of South Point and extends across the lake in a N direction. The third crosses the lake beginning at a point in the vicinity of **Bayou Piquant** and extends in a NE direction to Mandeville.

Middle Ground is the shoal portion of Lake Pontchartrain near The Rigolets. A dredged channel extends across the NE part of Middle Ground between The Rigolets and deeper water in the vicinity of U.S. Interstate Route 10 fixed bridge. In May 1983, the controlling depth was 9 feet. The channel is marked by lighted ranges and daybeacons.

Bayou Bonfouca, which empties into Lake Pontchartrain 3 miles NW of the Southern Railway causeway N swing bridge, is the approach to the town of Slidell. There is some waterborne commerce in shell, sand, and gravel. A dredged channel leads for about 6 miles from deep water in Lake Pontchartrain to Slidell. In January 1983, the controlling depth was 8 feet across the bar, thence 8 feet to the highway bridge at Slidell, thence 6 feet to about 0.5 mile above the highway bridge at Slidell. The channel across the bar is marked by lights, buoys, and daybeacons. The highway bridge at Slidell has a swing span with a clearance of 6 feet. The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, WXZ 390. The bridgetender lives near the bridge and will open on signal, but there may be a slight delay. The overhead power cable at the bridge has a clearance of 58 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

Slidell is a town on U.S. Route 11 highway and the Southern Railway leading to New Orleans. A well-equipped shipyard has facilities for construction or repair of steel or wooden vessels including a commercial graving dock 350 feet long, 70 feet wide, with 20 feet over the sill, two marine ways that can handle craft up to 225 feet, and a 60-ton gantry crane, and a 300-ton floating crane. Tugs, barges, and diving equipment are available for towing or salvage work. Other facilities at the yard include several loading slips and a railroad siding. Berths, gasoline, water, marine supplies, a launching ramp, and a 3-ton fixed lift that can haul out craft for hull and engine repairs are available at a marina on the W side of the river just below the highway bridge.

Bayou Liberty (Liberty Bayou) joins Bayou Bonfouca 0.5 mile above the mouth. In January 1983, the controlling depth was 6 feet for about 4.3 miles, thence in 1981-January 1983, 3 feet for about 1 mile to the railroad bridge at the head of the channel. A highway bridge with a 40-foot swing span and a clearance of 1 foot crosses the bayou about 1.5 miles above its junction with Bayou Bonfouca. In 1981, the bridge was being converted to a vertical lift bridge with design clearances of 1 foot down, 50 feet up, and 45 feet horizontal. A temporary pontoon bridge is just below the swing bridge. The bridge is operated by cables that are suspended near the water surface when the bridge is being opened or closed and dropped to the bottom when the bridge is not in motion. Caution is advised in the vicinity of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** An overhead power cable just below the swing bridge has a clearance of 75 feet. Small-craft facilities on the S side of the bayou below the highway bridge provide berths with water and electricity, ice, a launching ramp, and marine supplies. A 30-ton mobile hoist can haul out craft for complete repairs.

Lacombe Bayou empties into Lake Pontchartrain 4.5 miles W of Bayou Bonfouca. A dredged channel leads from the entrance bar in Lake Pontchartrain to a fish hatchery about 7.1 miles above the mouth of the bayou. In January 1983, the controlling depth was 5 feet across the bar, thence 6 feet for 5.9 miles to the highway bridge, thence in 1980, 7 feet to Mile 7.1. The entrance channel is marked by a light and a lighted **016°** range. The front range marker is lighted.

The Gulf, Mobile, and Ohio Railroad bridge about 4.5 miles above the mouth and U.S. Route 190 highway bridge at **Lacombe** have swing spans with a minimum channel width of 45 feet and clearances of 5 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (i)(23), chapter 2, for drawbridge regulations and opening signals.) Overhead power cables crossing at the bridges have a minimum clearance of 60 feet. Commerce on the bayou includes shipments of shell, sand and gravel, and drilling equipment. A boatyard on the E side of the bayou just below the railroad bridge builds steel and aluminum tugs, barges, and crew boats. A mobile crane at the yard can handle craft to 150 tons for complete above- and below-the-waterline repairs. The bayou has several fish camps and a seaplane base.

Mandeville is a summer resort on the N shore of Lake Pontchartrain 20 miles N of New Orleans. Many of the boat landings on the N shore are in ruins. A protected landing is in **Bayou Castine.** The entrance to the bayou is protected by jetties and a detached breakwater W of the channel. Daybeacons mark the channel, and a light marks the E end of the breakwater. In January 1983, the controlling depth was 6 feet across the bar and 5 feet in the bayou.

Launching ramps and a municipal wharf at which berths, water, and electricity are available are on the W side of the entrance. A marina and boatyard on the bayou has a 15-ton mobile hoist that can haul out craft for complete repairs. Berths, electricity, water, a sewage pump-out facility, and marine supplies are available. In 1982, the basin had reported depths of 5 feet.

Tchefuncta River flows into Lake Pontchartrain about 21 miles N of New Orleans. Commerce on the river is in shell and steel products. A dredged channel leads from the 10-foot depth in Lake Pontchartrain for about 12.2 miles up Tchefuncta River and its tributary, **Bogue Falaya,** to the town of **Covington, La.** In November 1983, the controlling depths were 7 feet across the bar, thence 10 feet for 2.2 miles to Madisonville, thence 6 feet for the next 8.4 miles, thence 3 feet for the next 0.7 mile. The entrance is marked by a light, a lighted range, and daybeacons. State Route 22 highway bridge crossing the river at Madisonville has a swing span with a clearance of 1 foot. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The overhead power cable at the bridge has a clearance of 106 feet. An overhead power cable with a clearance of 85 feet crosses the river about 6 miles above the bridge at Madisonville.

The twin fixed spans of Interstate Route 12 highway bridge with a clearance of 30 feet cross the river about 9.4 miles above the mouth.

Tows through the bridges are limited to one barge. The towing vessel must be made up rigid, astern of the barge, and the barge shall be pushed through the draw at dead slow speed and under full control.

Madisonville, a town 1.5 miles up Tchefuncta River, has berths at public landings above and below the W side of the bridge. Two shipyards build commercial vessels and barges, and another repairs company-owned dredging equipment. There are several marinas above the highway bridge. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and launching ramps are available.

An overhead power cable extends generally around the perimeter of the W and SW part of Lake Pontchartrain, from the shore near Madisonville to a point about 6.4 miles W of New Orleans. Clearance is 40 feet throughout except for 60 feet where the cable crosses over the entrance to the bar channel to

Tangipahoa River, and 90 feet over the entrance to Pass Manchac. Private lights partly mark the cable.

Tangipahoa River is a narrow stream flowing into Lake Pontchartrain 6 miles SW of Tchefuncta River. A dredged channel leads from Lake Pontchartrain across the bar to the river mouth. In January 1983, the controlling depths were 3 feet across the bar, thence 5 feet for 10 miles above the mouth. Trees obstruct the river above this point. Lights and daybeacons mark the entrance channel. Gasoline, berths, water, electricity, ice, and launching ramps are available at Lee Landing. There are numerous overhead power cables, with minimum clearance of 60 feet, over Tangipahoa River up to Lee Landing.

Pass Manchac is a passage 5.5 miles long connecting Lake Pontchartrain with Lake Maurepas. Principal commerce is in shell and petroleum products. Depths in the pass range from 26 to 54 feet, but the approaches in both lakes, across long bars, restrict navigation to drafts of about 4½ feet. From Lake Pontchartrain there are two approach channels, **North Channel** and **South Channel.** The E side of the entrance to each is marked by a light. Both lead to Pass Manchac Light on the N point at the E end of the pass. In January 1983, the controlling depth was 6 feet across the bars in North Channel and South Channel.

Once over the bar, midchannel courses should be followed through Pass Manchac.

At the W end of the pass, a marked northerly channel and an unmarked southerly channel separated by a shallow middle ground lead into Lake Maurepas. In January 1983, the controlling depth in the N channel was 8 feet, thence in 1972, the controlling depth in the S channel was 5 feet.

Overhead power cables crossing over the pass about 0.3 mile and 2 miles from the E entrance have clearances of 90 feet and 76 feet, respectively. Three bridges and the remains of two former bridges cross the W end of the pass. The easternmost bridge, the Illinois Central Railroad bridge, has a bascule span with a clearance of 56 feet and is equipped with a radiotelephone. The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, KC-9501. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable at the bridge has a clearance of 64 feet. Immediately W of the Illinois Central Railroad bridge are the remains of the former railroad and highway bridges (center portions removed), and U.S. Interstate Route 55 fixed highway bridge with a clearance of 51 feet. A fixed highway bridge immediately W of the U.S. Interstate Route 55 highway bridge has a clearance of 50 feet.

Note: Tows passing through Pass Manchac bridges are limited to no more than two barges, not to exceed a combined tow length of 400 feet, excluding the towboat. Operators wishing to pass tows exceeding these limits must request and receive permission from the Captain of the Port, New Orleans. (See 162.75(b)(5)(vi), chapter 2.)

Gasoline, diesel fuel by truck, water, ice, and some marine supplies are available at wharves just E of the N and S ends of the U.S. Interstate Route 55 highway bridge.

Lake Maurepas, lying W of Lake Pontchartrain, is 11.5 miles long in a NE and SW direction and from 4 to 8 miles wide. Depths range between 7 to 12 feet, but numerous submerged tree stumps are reported along the lake shore. Strangers are advised to keep at least a mile offshore and to approach the entrances to the tributaries with caution. No cities or towns are along the lake shores, which are low and thickly wooded. The lake is of little commercial importance except as the approach to Tickfaw and Amite Rivers, which have some trade to New Orleans.

Tickfaw River flows into the N end of Lake Maurepas about 3.5 miles NW of Pass Manchac. The entrance is marked by a light and a daybeacon on the W side of the mouth. A large shoal extends S of the light on the W side of the entrance, and stumps are on the E side. In January 1983, controlling depths were 5 feet across the bar, thence 12 feet for about 8.7 miles above the mouth, thence 5 feet for the next 5.2 miles. Above this point to the head of navigation, the river shoals to bare. State Route 22 highway bridge crossing the river about 6.2 miles above the mouth, just below the junction with Blood River, has a swing span with a channel width of 44 feet but no clearance. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Two overhead power cables, just W and parallel to the swing bridge and about 2 miles W of the bridge, have clearances of 70 feet. A marina just below the S side of the bridge has berths, gasoline, diesel fuel, electricity, water, ice, launching ramps, and marine supplies.

Natalbany River, a tributary of Tickfaw River, in January 1983, had a controlling depth of 8 feet for 5.2 miles, thence 4 feet for 3.5 miles to the head of the Federal project, about 1.3 miles above the highway bridge at **Springfield.**

Ponchatoula River, a tributary of Natalbany River, joins that river about 3.3 miles above the mouth. In January 1983, the controlling depth was 5 feet for 3.3 miles; the river is blocked by fallen trees at this point. State Route 22 highway bridge at **Wadesboro** has an 18-foot fixed span with a clearance of 4 feet.

Blood River, a tributary of Tickfaw River, joins that river 6.3 miles above the mouth. In January 1983, the controlling depths were 8 feet for 3 miles, thence in April 1982, 3 feet for another 0.4 mile. Blood River has several small marinas about 0.9 mile above its junction with the Tickfaw River at **Warsaw Landing.** Berths, water, electricity, gasoline, ice, limited marine supplies, and launching ramps are available.

Principal shipment on Tickfaw, Natalbany, Pontchatoula, and Blood Rivers is shell.

Amite River empties into Lake Maurepas 8 miles W of Pass Manchac. The entrance is marked by a light. Principal shipment on the river is shell.

In entering Amite River, pass well to the E of the light; submerged stumps are reported in an area

extending 0.4 mile S of the light and up to 0.4 mile offshore. In January 1983, the controlling depths were 4 feet across the bar, thence 7 feet to Port Vincent, thence 8 feet to the junction with its tributary Bayou Manchac about 31 miles above the mouth. Above a point about 12 miles above the mouth there are overhanging trees and snags. Overhead power cables crossing Amite River about 0.1 mile, 2.6 miles, and about 3.0 miles above the mouth have clearances of 70 feet, 60 feet, and 60 feet, respectively. Three highway bridges cross the river between the mouth and Port Vincent, about 27 miles above the mouth. The bridge at **Clio,** about 5 miles above the mouth, has a swing span with a clearance of 4½ feet. The bridge at **French Settlement,** about 19 miles above the mouth, has a swing span with a clearance of 15 feet. An overhead power cable at this bridge has a clearance of 60 feet. Another overhead power cable crosses the river about 27.6 miles above the mouth; clearance is 70 feet. The bridge at **Port Vincent** has a swing span with a clearance of 7 feet. (See 117.1b, 117.240, 117.245 (a) through (e) and (i)(25), and 117.540, chapter 2, for drawbridge regulations and opening signals for bridges crossing Amite River.)

Berths with water and electricity, gasoline, ice, a launching ramp, and some marine supplies are available at a small marina about 2.5 miles above the mouth of Amite River. Launching ramps are on either side of the river above the highway bridge.

Bayou Manchac joins Amite River about 4.2 miles above Port Vincent. In January 1983, the controlling depth in the bayou was 5 feet. Snags are reported above a point 2.5 miles above the entrance; caution is advised.

Bayou Manchac is crossed by two highway bridges and a railroad trestle. The bridge at **Hope Villa,** about 5.8 miles above the mouth of the bayou, has a fixed span with a clearance of 11 feet. The Airline Highway (U.S. Route 61) bridge, about 6.5 miles above the mouth, has a fixed span with a width of 30 feet and a clearance of 6 feet, and is at the head of navigation in the bayou. The Louisiana and Arkansas Railroad trestle is about a mile above the Airline highway bridge.

Blind River enters Lake Maurepas 5.7 miles S of Amite River. In August 1982, the controlling depths were 4 feet across the bar, thence 6 feet to the Airline Highway, the head of navigation. A light and a daybeacon mark the best water. Caution is advised when entering the river. Numerous overhead power cables with a least known clearance of 66 feet cross the river.

The **Bonnet Carre Floodway** is located on the SW side of Lake Pontchartrain. When the spillway is in operation, as a result of high stages of the Mississippi River, vessels in the vicinity of the discharge end are cautioned to be on the lookout for possible logs or stumps that may enter the lake and should give that end a wide berth.

The city limits of New Orleans extend from Lake Pontchartrain to the Mississippi River. Pleasure resorts and suburbs are on the lake front. A concrete seawall is along the S shore of the lake from the protected yacht harbor about 2 miles E of the Lake Pontchartrain Causeway to Lakefront Airport. The protected yacht harbor, which is entered from E, is just E of the New Orleans city limits.

The **Municipal Yacht Harbor** is the outer basin, which has direct access to the lake. The Southern and the New Orleans Yacht Clubs, and the New Orleans Power Squadron are in the Municipal Yacht Harbor. There are numerous private beach homes with covered boat slips on the breakwater. The **Orleans Marina,** owned and controlled by the Levee Board, is the inner basin which has access to the lake through **New Basin Canal.** In June 1982, the controlling depth in the canal and basins was reported to be about 8 feet. There are several boatyards in Orleans Marina and several marinas along the E bank of New Basin Canal. There are cranes and lifts that can handle craft to 35 tons for hull and engine repairs, or open or covered dry storage. Electronic repairs can be made. Berths for vessels up to 100 feet, electricity, gasoline, diesel fuel, water, ice, marine supplies, and launching ramps are available.

Lights mark the entrance to the harbor. **New Canal Light** (30°01.6'N., 90°06.8'W.), 52 feet above the water, is shown from a white square tower atop the Coast Guard station on the S side of the entrance; a fog signal is at the light. **Storm warning signals are displayed.** (See chart.)

Pontchartrain Beach, a pleasure resort, is about 3 miles E of the Municipal Yacht Harbor. Two 130-foot floodlighted towers are conspicuous landmarks.

Measured course.–A measured statute mile on the bearing **084°15'-264°15'** is off Pontchartrain Beach.

The Lake Pontchartrain entrance to the Inner Harbor Navigation Canal is just E of Pontchartrain Beach. The aerolight at the Lakefront Airport is E of the entrance. Floodlighted towers at **Lincoln Beach Park,** 4 miles NE from the airport, are good landmarks.

8. MISSISSIPPI RIVER

This chapter describes the Mississippi River from the delta passes at the Gulf of Mexico to Baton Rouge, 217 miles via Southwest Pass, 211 miles via South Pass, above the Gulf. Also described are the deepwater ports of New Orleans and Baton Rouge, as well as the facilities at the many small communities along the river.

Note: The following abbreviations are used in this chapter: (AHP) means above Head of Passes; and (ACS) means above Canal Street.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.820 and 80.825, chapter 2.

Charts 11360, 11340.–Mississippi River empties into the N central part of the Gulf of Mexico through a number of mouths or passes which, taken together, form the delta of the river. The river and its tributaries form the largest network of navigable waters in the world. The two principal passes, South Pass and Southwest Pass, are about 1,600 miles from New York, 500 miles from Key West, 300 miles E of Galveston, and 440 miles E of Corpus Christi. The river is the access to the Ports of New Orleans and Baton Rouge, and the numerous cities in the central part of the United States located in the Mississippi River Valley and along its tributaries, the Ohio, Missouri, Red, Tennessee, and other rivers flowing into it. From the mouth, at the entrance to Southwest Pass, it is about 1,600 miles to Minneapolis, Minn., 1,700 miles to Pittsburgh, Pa., 1,460 miles to Knoxville, Tenn., and 1,330 miles to Chicago via the Illinois Waterway. (See the publication "Distances Between United States Ports" for more detailed information.)

New Orleans can also be reached by the more direct deep-draft route through the Mississippi River-Gulf Outlet Canal, about 30 miles N of South Pass. The outlet canal extends from deepwater in the Gulf to the junction with the Inner Harbor Navigation Canal at New Orleans.

The shape of the delta is somewhat like the foot of a bird, with its four toelike extensions protruding into the Gulf. The passes consist of narrow-banked deposits of sand and clay brought down by the river current which continuously adds them to the seaward margins of the delta. In this manner the delta is being built seaward at an estimated average rate of 300 feet a year. Numerous bays between the passes are changing through wave and tidal action and filling up with the immense amounts of material carried down by the river. The upper half of **Garden Island Bay** has been filled in so that now it is a marsh.

Prominent features.–The most conspicuous objects, when approaching the passes, are the lights, which are easily recognized. **Southwest Pass Entrance Light** (28°54.3'N., 89°25.7'W.), 85 feet above the water is shown from a tower on a white dwelling on piles near the end of the E jetty. A radiobeacon, radar transponder beacon (Racon), and a fog signal are at the light. (See Racons, chapter 1, for additional information.) A special radio direction finder calibration station is at the light. (See Light List for details.) **Southwest Pass East Jetty End Light 4** (chart 11361), 50 feet above the water, is shown from a red skeleton tower on piles with a red triangular daymark. A fog signal is at the light. A lighted whistle buoy (Sea Buoy) is 1.6 miles S of the E jetty.

South Pass Light (29°00.9'N., 89°10.0'W.), 108 feet above the water, is shown from a skeleton tower painted white below the gallery and black above. The light is located on the W side of the pass about 2.2 miles from the outer end of the jetties and also serves as South Pass Range Rear Light. A radiobeacon and fog signal are at South Pass West Jetty Light, near the outer end of the W jetty at the mouth of the pass. This light serves as South Pass Range Front Light. A lighted bell buoy (Sea Buoy) is 1.5 miles SE of the jetty light.

The numerous oil well structures in **East Bay,** some of which extend about 3 miles SE of a line between the jetties at South and Southwest Passes, are also prominent. (See chart 11361.)

Anchorages.–Vessels should anchor in the South Pass Anchorage, NE of South Pass Light. (See 166.100 through 166.200, chapter 2.)

Mississippi River-Gulf Outlet Approach Lighted Whistle Buoy NO (29°26.4'N., 88°56.9'W.), about 2.5 miles ENE of the entrance to the Mississippi River-Gulf Outlet Canal, is equipped with a radar transponder (Racon). (See Racons, chapter 1, for additional information.) The buoy is about 29 miles NNE of South Pass and about 40 miles NE of Southwest Pass.

There are numerous oil well structures in the vicinity of the entrance to the canal, and the dredging ranges for the channel are prominent. (See chart 11363.)

Numerous oil well structures off the entrances to the Mississippi River Delta passes and in East Bay can be seen for some distance offshore. Smoke from burning gas from some of these wells is seen from far offshore.

The discolored water discharge from Mississippi River usually provides mariners with their first indication that they are approaching land. However, this is not a sure indication; during high river stages and with N winds the discolored water will be encountered in some directions 60 miles or more from land, and at times the water will appear broken from 15 to 20 miles from the passes. The land near

the entrances to the passes is low marsh covered with tall, coarse grass and weeds.

COLREGS Demarcation Lines.–The lines established for the Mississippi River and Mississippi Passes are described in 80.820 and 80.825, chapter 2.

Special Notices.–The Corps of Engineers, New Orleans District, have promulgated the following through navigation bulletins to all interested parties:

Mississippi River-Gulf Outlet Canal.–Use of the outlet canal by ships and other commercial and pleasure craft is continuing to increase. The hazards existing to a small-boat operator on this waterway cannot be over emphasized.

It is understood, however, that ships must maintain sufficient headway at all times in order that the vessel can be controlled. Consequently, small-craft operators should approach and pass ships with extreme caution and with one thought in mind, the safety of their own vessel and its occupants.

As a large ship moves in the waterway a wave is pushed ahead. As it comes abreast of a given point a suction effect is created that abruptly drops the water level in the channel and the water is drawn off the banks of the waterway. The violence of the reaction depends on the speed and draft of the ship.

As the ship passes, the displaced water rushes back toward the banks and could possibly capsize or throw a small boat onto the bank. Shortly after the ship has passed, waves cause severe agitation along the banks.

Locking Procedures for all locks in the New Orleans Engineer District.–When a sufficient backlog of vessels exists, and water differential and other conditions make such procedure advantageous, a maximum of four successive lockages will be made alternately from each direction. However, should the fourth lockage in either direction be a long tow requiring two lockages, a fifth lockage will be made for the second section of the long tow.

For the successive lockage procedure to be successful and in order to conserve lockage time, radios on vessels must be kept tuned to the lock frequency to receive instructions and move up promptly when called by the lock operator. The lockmaster will coordinate movement and arrangement of tows and other vessels and direct such procedures in the movement and lockings as conditions may warrant in order to obtain maximum and efficient usage of the lock.

Note: Special Notices affecting locking procedures in the New Orleans Corps of Engineers District are issued by the Corps as conditions warrant. These special regulations, in addition to those mentioned above and elsewhere in this chapter, announce new, and/or changes to existing regulations. Mariners are advised to contact the local office of the Corps of Engineers to obtain the latest information.

Shipping Safety Fairways.–Vessels should approach the Mississippi River-Gulf Outlet Canal, Southwest Pass and South Pass (Mississippi River) through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

Channels.—The improved ship channels into Mississippi River through Southwest Pass and South Pass. Several minor passes can be used only by small craft. A Federal project provides for a 40-foot channel over the bar and through Southwest Pass and a 17-foot channel over the bar and through South Pass, to Head of Passes. The project is under constant maintenance dredging. The project further provides for a 40-foot channel from Head of Passes to New Orleans; thence 40 feet from New Orleans to Baton Rouge. The channels are well marked. Contact the New Orleans District, Corps of Engineers, for controlling depths. The office is at the foot of Prytania Street, New Orleans; telephone (865-1121). (See appendix for mailing address.)

Note.–The Associated Branch Pilots, Port of New Orleans, advised that South Pass has a recommended draft limit of 15 feet. The pilots further advised that a recommended deadweight tonnage limit of 21,000 d.w.t. and/or 15 feet is in effect for ships using South Pass. The deadweight tonnage limit is recommended because ships of large tonnage do not steer well. The tonnage limit is subject to a larger limit as the draft limit deepens.

Southwest Pass has a recommended draft limit of 40 feet. There is no limit on deadweight tonnage for ships using Southwest Pass.

Mississippi River-Gulf Outlet Canal (see charts 11363 and 11364) is a 66-mile-long deepwater channel that extends NW from deep water in the Gulf of Mexico to the Inner Harbor Navigation Canal at New Orleans. The Federal project provides for an entrance channel 38 feet deep for 8.3 miles to the entrance to Breton Sound between Grand Gosier Islands and Breton Islands, thence 36 feet deep across Breton Sound NW for 20.3 miles where it enters a landcut, thence 36 feet through the landcut for 32.2 miles where it joins the Gulf Intracoastal Waterway at Mile 13.6E, thence through the waterway for about 5 miles to a turning basin at its junction with the Inner Harbor Navigation Canal at New Orleans. The approach to the landcut is protected by stone retention dikes on both sides of the channel; the NE dike is about 2.6 miles long, and the SW dike is about 5.5 miles long. The channel is well marked with aids. (See Notice to Mariners and latest editions of the charts for controlling depths.)

Unpredictable tidal currents may be encountered at places along the Mississippi River-Gulf Outlet Canal. Until such time as surveys are made to determine the actual tidal current conditions, exercise caution when transiting the waterway.

The Mississippi River-Gulf Outlet Canal is within a **safety zone.** (See 165.1 through 165.7, 165.20 through 165.25, and 165.801, chapter 2, for limits and regulations.)

Bridges.–There are no bridges across the Mississippi River below New Orleans. An overhead power cable with a clearance of 175 feet crosses the river 0.9 mile above the Algiers Lock at about 77.3 miles (AHP). One bridge and two cables cross the Mississippi River-Gulf Outlet Canal below the junction

with the Inner Harbor Navigation Canal at New Orleans. The **Paris Road Bridge** (State Route 47), a fixed bridge with a clearance of 135 feet, is about 4.3 miles E of the junction with Inner Harbor Navigation Canal. The overhead power cables across the canal, near the Paris Road Bridge, have a minimum clearance of 170 feet. (See 117.1b, 117.555, and 117.560, chapter 2, for general rules and regulations and openings signals for the operation of drawbridges over the Mississippi River and its navigable tributaries and outlets.)

Caution.–The Coast Guard advises that during high water stages mariners should carefully review and validate mast height data to assure adequate clearance under the bridges on the Lower Mississippi River. It is recommended that maximum mast height be determined for various drafts and trim of the vessel and be kept readily available on the bridge of the vessel. Bridge clearance data for various river stages can be obtained from the Coast Guard.

Anchorages.–Vessels should anchor in Southwest Pass Anchorage SE of the entrance to Southwest Pass, South Pass Anchorage NE of the entrance to South Pass, or in the Mississippi River-Gulf Outlet Canal Fairway Anchorages E and N of Mississippi River-Gulf Outlet Approach Lighted Whistle Buoy NO. (See 166.100 through 166.200, chapter 2.)

In heavy weather craft in the vicinity of South Pass seek refuge in the pass, and in emergencies boats may tie up to the Coast Guard wharf at South Pass Light.

Vessels may anchor off South Pass and Southwest Pass as appropriate, weather permitting.

There are numerous designated anchorages on both sides of the river below New Orleans, and temporary anchorages may be prescribed by the Commander, Eighth Coast Guard District and published in the Local Notice to Mariners. (See 110.1 and 110.195, chapter 2, for anchorage limits and regulations.)

Caution.–The Coast Guard advises that during high-water conditions mariners should give anchored vessels a particularly wide berth. Fast river currents may cause anchored vessels to swing in wide arcs. Under these conditions, it is important that the mariner be aware of the location of anchor chains.

Dangers.–An area bounded by latitude 28°20′N., to latitude 28°30′N., between longitude 88°50′W., and longitude 89°00′W., has been established as a dumping ground for ammunition and explosives.

A shoal with depths of 8 to 15 feet extends along the W side of the approach channel to Southwest Pass for about a mile beyond the end of the W jetty. The position of this shoal and its depths are rather constant except for changes during and after high-river stages in the spring.

A shoal with depths of 2 to 17 feet extends along the W side of the entrance to South Pass. Vessels should not close the passes before the pilot boards.

Flocculation, locally known as **Slush,** is a living mass of jellied material, or muck, deposited in the lower part of the Mississippi, during low stages of the river. It consists of the suspended material which, after being carried downstream by the current, comes into contact with the relatively still salt water which backs into the passes. This muck has been observed to be as much as 10 to 15 feet deep. It remains where deposited until flushed out during high-water stages of the river. Although slowed down by this muck, deep-draft vessels are able to pass through it. Accordingly, and because it will be flushed out during high-water stages, the Corps of Engineers do not consider it necessary to remove the material during low stages.

Sand waves, the material brought down during high stages, on the contrary, is of a sandy nature such that, if not removed, builds up bars and reduces controlling depths. These sand bars or waves are dredged out during high stages.

Mud lumps are the small oval-shaped mounds or islands no more than 8 feet high which are peculiar to the Mississippi River delta. They are caused by upward forces of the static pressure exerted by sedimentary deposits accumulating underneath; most of them never rise above the surface but remain as subsurface mounds. Their cores of plastic clay may arise from depths as much as 300 to 500 feet. Fissures or cracks develop in the islands, through which mud, gas, and salt water discharge and often build up low flat cones. In South and Southwest Passes, which have been jettied, there are arcs of mud lumps outside of and parallel with the peripheries of the bar deposits. In natural passes, the mud lumps are affected by submerged natural levees as well as by the bar deposits. Generally, the lumps appear within only a few weeks' time and, unless affected by succeeding periods of uplift, will wash away within a few years or be overrun by the encroaching marshland.

Tides.–In the passes the tide has generally but one high and one low water in 24 hours, the diurnal range varying from 0.9 to 1.4 feet. At New Orleans the range of tide during low-river stages averages about 0.8 foot. There is no periodic tide at high-river stages.

Current off the Passes.–Currents in the Gulf of Mexico are discussed in chapter 3. The currents are variable in direction and velocity depending to a great extent upon the velocity and direction of the wind, and near the entrance to the passes upon the stage of the river.

A vessel on the course from Dry Tortugas to the Mississippi River generally will encounter an opposing or SE current for a distance of about 300 miles after leaving Dry Tortugas. For the last 125 miles before reaching the mouth of the river the current will usually set between N and E.

During a light S wind a NE set of 2.2 knots has been observed 13 miles SE of South Pass entrance, and at the same time there was an E set of 0.5 knot at the lighted bell buoy off the entrance.

At Southwest Pass Entrance Lighted Whistle Buoy SW the current is due chiefly to the discharge of the river. In general it sets SW and its velocity varies from 0 to 4 knots, the average being about 1.7

knots. At times, however, there is said to be a SE current of nearly a knot at this location.

Currents in the river.–The current due to the tide is not strong at any point, and for purposes of navigation it is rarely taken into account. The average date of high-river stage occurs in April and of low-river stage in October. At New Orleans the extreme difference between high and low stages of the river is 20 feet, the mean difference is about 14 feet. Zero on the Carrollton gage is Mean Sea Level. The current velocity in the river varies greatly from time to time, depending upon the stage of the river; at New Orleans, the cross-sectional velocity may be as much as 5 knots at high stages and less than 1 knot at low stages.

At several places in the lower part of the river countercurrents or eddies often are found near the banks and, if taken advantage of, can greatly assist vessels bound up the river.

At South Pass outside the jetties the current from the river frequently has a W set. At Southwest Pass it sets straight out from between the jetties, thence spreading out fan shaped, with slightly greater velocity to W.

Weather.–The Gulf of Mexico moderates the climate of this region throughout the year. It reduces the range between extremes of temperature, increases humidity, and influences the windspeed and direction. E through S winds prevail for all months except January. These tempering Gulf winds carry warm, moist air which is favorable for sporadic, often quite localized, development of thunderstorms, particularly from May through October. From November through March, the area is subjected to fluctuations between tropical air and cool continental air. From December to June, the Mississippi River waters are usually colder than the air temperature, favoring the formation of river fogs, particularly with weak S winds. These fogs may be encountered anywhere from 60 miles off the delta passes to the city of New Orleans.

Polar air masses and their fronts penetrate the Gulf of Mexico from the North American continent each winter. About 15 to 20 of these systems bring strong N winds, cold temperatures, and adverse weather. Winds of 60 knots or more may occur in severe "northers". Northers are most likely from November to March and usually last about a day and a half; severe storms may endure for 3 or 4 days.

The tropical cyclone season runs from late May into early November. On average, hurricanes move through this region once every 4 years. In August 1969, Camille generated winds estimated at 175 knots. At Boothville, gusts climbed to 107 mph before the anemometer failed, and storm tides reached 15 feet. Surge heights varied at different locations because of the shape of the bays and inlets. Water levels reached 9 feet above mean sea level near the mouth of the Mississippi at Garden Island. In several places from the Empire Canal S to Buras, Boothville, and Venice, the surge poured over the E and W bank Mississippi River levees and was trapped by the back levee, leaving the built-up areas between the levees severely flooded. The highest actual wind measurement in Camille was a gust of 172 mph recorded on a Transworld Drilling Co. rig E of Boothville.

Routes.–Approaching the mouth of the river from Florida Straits, deep-draft vessels usually set a course direct for the entrance to the shipping safety fairways off the passes or the Mississippi River-Gulf Outlet Canal from a position 10 or 12 miles SW of Dry Tortugas Light on Loggerhead Key. Low-powered vessels of moderate draft sometimes pass N from Florida Straits through Rebecca Channel, to the W of Rebecca Shoal Light, and for 200 miles set a course 10° to 20° N of the course to the passes of the river, and then change course for the entrance to the safety fairways off the passes or the Gulf Outlet Canal. This keeps them out of the strongest part of the Gulf current.

Going to the Straits of Florida, a course usually is set for a point 10 or 12 miles SW of Dry Tortugas.

Since in either direction soundings are of little value in determining position, observations should be relied upon. The currents vary considerably, so that even with the closest navigation a vessel bound for South Pass may make a landfall at Pass a Loutre or Southwest Pass.

Vessels bound to Southwest Pass sometimes fall W of the Mississippi River delta, a situation which the mariner can quickly ascertain by soundings. The water shoals much more gradually along this part of the coast than off the delta.

Approaching South Pass, a vessel uncertain of her position can set a course so as to pick up the 20-fathom curve from 5 to 20 miles NE of the lighted bell buoy off South Pass and then follow the curve SW to the entrance to the safety fairway. During thick weather, vessels might ground NE of South Pass and N of Southwest Pass, because of infrequent sounding. Due consideration should be given to the possible occurrence of mud lumps.

Vessels approaching South Pass or Southwest Pass should become fairly certain of their positions in any weather by using radar or radio bearings in conjunction with soundings. A radiobeacon is at the entrance to each pass.

In thick or foggy weather, Southwest Pass is more accessible and more easily navigated than South Pass because the former's channel is marked better, has greater width, and is nearly straight. Furthermore, a vessel is not set off course to the same extent by currents at the entrance.

A **voluntary Vessel Traffic Service (New Orleans)**, operated by the U.S. Coast Guard to enhance the safety of navigation on the lower Mississippi River and the Mississippi River-Gulf Outlet Canal, consists of a communications network, vessel reporting points, and a **Vessel Traffic Center (VTC)**.

The Vessel Traffic Service (VTS) area encompasses the following:

(1) The entire Mississippi River from Southwest Pass Entrance Lighted Whistle Buoy SW to Devils Swamp Light, Mile 128.2 (ACS), Baton Rouge.

(2) The Mississippi River-Gulf Outlet Canal from

Mississippi River-Gulf Outlet Lighted Buoy 1 to the Intracoastal Waterway, thence W on the Intracoastal Waterway and the Inner Harbor Navigation Canal.

The Vessel Traffic Center, call sign, "New Orleans Traffic," is operated continuously by the Coast Guard and maintains radiotelephone communications with vessels in five Vessel Traffic Service sectors as follows: Sector 1, VHF-FM channel 12 (156.60 MHz), Mississippi River from Southwest Pass Entrance Lighted Whistle Buoy SW to Belle Chasse Ferry Landing, 65.6 miles (AHP); Sector II, VHF-FM channel 11 (156.55 MHz), Mississippi River from 65.6 miles (AHP) to Guy Mallory Light, 15.8 miles (ACS); Sector III, VHF-FM channel 12, Mississippi River from 15.8 miles (ACS) to Shell Pipe Line Corp. Dock Lights, 56.2 miles (ACS); Sector IV, VHF-FM channel 14 (156.70 MHz), Mississippi River from 56.2 miles (ACS) to Devils Swamp Light, 128.2 miles (ACS); Mississippi River-Gulf Outlet Canal VHF-FM channel 12, from Mississippi River-Gulf Outlet Lighted Buoy 1 to Mississippi River-Gulf Outlet Light 114, 52.5 miles above the entrance, then VHF-FM channel 11 from Light 114 to the Gulf Intracoastal Waterway and W along the Intracoastal Waterway and the Inner Harbor Navigation Canal.

Vessels underway or at anchor in other than a designated anchorage shall continuously monitor the appropriate sector frequency. Vessel movement data and other VTS related information will be transmitted on these designated frequencies. The Vessel Traffic Center maintains a continuous guard on VHF-FM channel 67 (156.375 MHz) and monitors channel 16 (156.80 MHz).

The mariner is cautioned that information provided by the Vessel Traffic Center is, to a large extent, generated from the reports of the participating vessels and the accuracy reflects the reports received. Additionally, the Coast Guard may not have firsthand knowledge of hazardous circumstances existing in the VTS area. Unreported hazards may confront the mariner at any time.

This service is intended in no way to relieve any person of complying with the applicable Navigation Rules, Vessel Bridge-to-Bridge Radiotelephone Regulations, the Federal Boating Safety Act of 1971, or any other laws or regulations. (See 161.401 and 161.402, chapter 2, for regulations affecting vessel operation in the New Orleans Vessel Traffic Service.)

For a complete detailed description of the service, mariners should obtain the latest edition of the U.S. Coast Guard's **Users Manual, New Orleans Vessel Traffic Service**, available from the Commanding Officer, Coast Guard Vessel Traffic Service, 4400 Dauphine Street, Bldg. 601-6-C, New Orleans, Louisiana 70146.

Pilotage is compulsory at the bar and on the river for all foreign vessels over 100 tons and U.S. vessels over 1,000 tons under register in foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. There are four pilot associations: the Associated Branch Pilots for the bar from sea to Pilottown; the Crescent River Port Pilots for the river between Pilottown and New Orleans; the New Orleans-Baton Rouge Steamship Pilots for the river between New Orleans and Baton Rouge; and the Associated Federal Coast Pilots of Louisiana, Inc., for public vessels and vessels in the coastwise trade from South and Southwest Passes to Baton Rouge. On the Mississippi River-Gulf Outlet Canal, the Associated Branch Pilots take vessels from the entrance to Light 78, about 33 miles above the entrance, where they are relieved by the Crescent River Port Pilots, who take vessels on to New Orleans.

Note.–The Associated Branch Pilots, Port of New Orleans, advised that South Pass has a recommended draft limit of 15 feet. The pilots further advised that a recommended deadweight tonnage limit of 21,000 d.w.t. and/or 15 feet is in effect for ships using South Pass. The deadweight tonnage limit is recommended because ships of large tonnage do not steer well. The tonnage limit is subject to a larger limit as the draft limit deepens.

Southwest Pass has a recommended draft limit of 40 feet. There is no limit on deadweight tonnage for ships using Southwest Pass.

Pilots for South Pass and Southwest Pass board vessels in areas up to 3 miles off the sea buoys at the passes, depending on the weather. Pilots for the Mississippi River-Gulf Outlet Canal board vessels in the vicinity of Mississippi River-Gulf Outlet Approach Lighted Horn Buoy N.O. (29°26.4'N., 88°56.9'W.). The **Associated Branch Pilots** have 65-foot diesel-powered tenders with red hulls and white housing. They fly the International Code flag "P" and are equipped to handle radio traffic on VHF-FM channels 6 (156.30 MHz), 9 (156.45 MHz), 16 (156.80 MHz), and 67 (156.375 MHz). VHF-FM channel 67 is the working channel. There is a pilot station at Southwest Pass off the West Jetty about 2 miles inside the entrance. There is a pilot station at South Pass at a small settlement on the W side about 0.5 mile above the ends of the jetties. Both pilot stations are equipped to handle radio traffic on the same VHF–FM channels as the pilot boats. They have radiotelephone communication with the pilot office in New Orleans. Pilots may be obtained by making a signal off the bar, as both pilot stations maintain lookouts, or on advance notice by telegraph (cable address: BARPI), radio, radiotelephone through the New Orleans Marine Operator, telephone (504-522-5233), or through the ships' agents. Vessels are boarded and taken in day or night. For boarding, the pilots request that the pilot ladder be rigged 6 feet above the water on the lee side of the vessel. All bar pilots carry portable radiotelephones. The pilots request a 24-hour advance notice of arrival.

The pilots for the river between Pilottown and New Orleans have an office in New Orleans that is manned 24 hours a day year round. It is requested that masters of vessels arriving at South Pass Lighted Bell Buoy 2, Southwest Pass Entrance Lighted

Whistle Buoy SW, or Mississippi River-Gulf Outlet Approach Lighted Whistle Buoy NO send their estimated time of arrival (ETA), draft, deadweight tonnage, and speed to CRESPILOTS, New Orleans, via radio station WNU or by telephone (504-525-2174) through New Orleans Marine Operator, 24 hours in advance of their arrival and with any change of 2 or more hours thereafter. The river pilots board vessels off Pilottown, about 2 miles above Head of Passes Light. The pilot station, on the E side of the river at Pilottown, maintains a lookout and is equipped to handle radio traffic on VHF-FM channels 9 (156.45 MHz) and 67 (156.375 MHz). The **Crescent River Port Pilots** have fast motorboats painted white with the names RIVER PILOT or CRESPILOT in black on the sides. The Crescent River Port Pilots take vessels from Pilottown upriver to New Orleans and from Light 78 on the Mississippi River-Gulf Outlet Canal to New Orleans. On the canal, pilots board vessels from a private launch at Light 78. The river pilots boarding vessels at Pilottown rarely have information from the vessel's agent pertaining to the vessel's destination or working schedule while in port. It is advised that vessel masters contact their agent via radio station WNU or preferably through the New Orleans Marine Operator to obtain information on the vessel's exact destination and to advise the agent of the vessel's ETA in order that the agent can arrange for tugs, line handlers, boarding party, or, if necessary, a New Orleans-Baton Rouge Pilot. All Crescent River Port Pilots carry portable radiotelephones for bridge-to-bridge communications with other vessels on the river and canal.

The **New Orleans-Baton Rouge Steamship Pilots** usually board vessels continuing upriver off **The Point.** The pilots board vessels from commercial launches. The launch station is at Arabi on the E side of the river about 1.4 miles below the Inner Harbor Navigation (Industrial) Canal. All the upriver pilots carry portable radiotelephones and communicate with other vessels on the river. Their working frequency is VHF-FM channel 67 (156.375 MHz). They can be obtained by notifying the Crescent River Port Pilots at Pilottown, by prior notice by telegraph, radio, radiotelephone through the New Orleans Marine Operator, telephone (504-466-7881 or 466-7882), or through ships' agents. The pilots request a 3-hour advance notice of time of sailing for all downriver bound vessels departing berths above Norco, about 27.1 miles (ACS).

The Associated Federal Coast Pilots of Louisiana provide service for public vessels and vessels in the coastwise trade from South and Southwest Passes to Baton Rouge. The pilots have two gray 34-foot boats, FEDERAL PILOT 1 and FEDERAL PILOT 2, and meet vessels at Southwest Pass Entrance Lighted Whistle Buoy SW. Vessels to be boarded should provide a ladder 6 feet above the water and maintain a slow speed. The pilot boats fly International Code flag H by day and monitor VHF-FM channels 9 (156.45 MHz) and 16 (156.80 MHz), with channels 9, 16, 6 (156.30 MHz), 67 (156.375 MHz), and 79A (156.975 MHz) used as working frequencies. The pilot station monitors VHF-FM channels 9 and 16. Arrangements for pilots are generally made in advance by telephone (504-279-6366), by telegraph (cable address: ACOPIL), or through ships' agents. A 12-hour ETA is requested.

Towage.–Tugs of about 2,400 hp are normally used for assisting in docking, undocking, towing in the harbor and canals, and towing to sea. Tugs of up to 4,000 hp are available. Two tugs must be employed on all towing to and from the drydocks and should be employed on all ships towed around Algiers Point when the traffic lights are operating, and by large vessels going through the Inner Harbor Navigation Canal. The tugs are equipped to handle radio traffic on VHF-FM channel 67 (156.375 MHz). There are two diesel-powered fireboats in the harbor.

Quarantine on the river is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A 4,000-foot **quarantine anchorage** is on the W side of the river at New Orleans, about 2 miles E of the Inner Harbor Navigation (Industrial) Canal. The upper end is marked by a quarantine anchorage sign. (See 110.1 and 110.195, chapter 2, for limits and regulations.) The quarantine station is at the New Orleans National Airport, and officials maintain regular service for marine inspections from 0600 to 1800. Outside of these hours, vessels may be boarded on request, but a charge is made for services. Quarantine clearance is granted by the New Orleans station for all vessels destined to all ports on the Mississippi River or to ports reached via the Mississippi River. Vessels are usually cleared either at anchor or at the dock.

Agricultural quarantine is enforced in accordance with regulations established by the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture. Officials making inspections for the ports on the Mississippi River, from the mouth to Gramercy, have an office at the U.S. Customhouse in New Orleans. (See appendix for address.) Vessels are inspected at anchor and alongside the docks. Arrangements are usually made through the ships' agents.

Customs.–New Orleans and Baton Rouge are ports of entry. Vessels are generally boarded at berth; however, arrangements can be made for boarding anywhere within the port limits.

Immigration and Naturalization.–The Immigration and Naturalization Service maintains a district office and a port of entry at New Orleans and serves the port facilities from the mouth of the Mississippi River to Remy, about 48.5 miles (ACS). The Baton Rouge office serves the port facilities above Remy. (See appendix for addresses.)

Coast Guard.–The **Captain of the Port** maintains an office in New Orleans. **Marine inspection and vessel documentation** offices are at New Orleans. (See appendix for addresses.)

Harbor regulations.–Federal regulations for navigation of the river are given in 161.402, 162.80, 165.1

through 165.25, 165.802, 165.803, and 207.200, chapter 2.

Supplies.–An unlimited supply of ships' stores, marine supplies, and provisions can be obtained at New Orleans. Water is available at all piers and wharves. Bunker C fuel oil and diesel fuel can be supplied at the oil terminals or from tank barges while vessels are alongside the wharves.

Repairs.–New Orleans has facilities for all types of above- and below-water hull and engine repairs. The largest floating drydock has a capacity of 81,000 tons for a length of 900 feet. Shipbuilding and ship repair plants are well equipped with machine shops and foundries. Floating cranes up to a capacity of 660 tons are available. There are smaller drydocks, marine railways, and boatyards for repair of medium and small craft.

Salvage facilities.–Equipment necessary for heavy salvage work at sea or in the port is available at New Orleans, including floating derricks, dredges, barges, pumps, diving equipment, and ground tackle. Oil salvage barges are at the shipyard at Avondale and Baton Rouge.

Chart 11361.–Southwest Pass, the westernmost of the passes of the Mississippi, is 18 miles WSW of South Pass entrance and 295 miles E of Galveston entrance. The pass has been improved by the construction of jetties on both sides at the entrance.

Near the ends of the jetties the depths are somewhat changeable, although there appears to be deep water in the Gulf from nearly every direction up to within 2 miles of the entrance.

The approach to Southwest Pass is marked by a lighted whistle buoy, 1.6 miles S from the jetty ends. From the buoy to abreast of Southwest Pass Entrance Light, the channel is marked by lighted buoys on the W side of the channel and by a lighted range. Other lighted ranges continue from the first range. Lights marking the channel are off some of the spur dikes extending channelward from along the inner bulkhead of the jetties.

A radar transponder beacon (Racon) is at the charted platform SSW of the entrance to Southwest Pass in about 28°50′01″N., 89°27′10″W. (See Racons, chapter 1, for additional information.)

Depths in Southwest Pass Entrance are subject to some change, but the current, so far as is known, can be depended upon to set nearly straight out from between the jetties. Spur dikes have been constructed channelward from the jetties.

Federal project depth is 40 feet. Contact the New Orleans District Office, Corps of Engineers, for controlling depths; the office is located at the foot of Prytania Street, New Orleans; telephone (504-865-1121).

Note.–The Associated Branch Pilots, Port of New Orleans, advise that Southwest Pass has a recommended draft limit of 40 feet.

In the pass the sides are a sufficient guide. Lights are on both sides, and a lighted range for entering the pass is at its head. There are numerous wharves, most of which are for transferring petroleum products from ship to barge, on both sides of the pass. Most of these wharves are marked by privately maintained lights. There is a Coast Guard light station with a wharf and helipad on the E side of the pass at the entrance.

Burrwood is on the SE bank 5 miles above the jetties.

South Pass, one of the three important commercial entrances to the Mississippi River from the Gulf, lies 425 miles NW of Dry Tortugas and 90 miles SW of Mobile Bay entrance. The pass has been improved by the construction of jetties on both sides of the entrance. Immediately outside the entrance the depths are subject to considerable change, due to the large amount of sediment brought down by the strong river currents; but at a distance of 2 miles out from the end of the jetties the depths are more dependable, and over 10 fathoms can be found in any E or S direction.

Federal project depth is 17 feet. Contact the New Orleans District Office, Corps of Engineers, for controlling depths; the office is at the foot of Prytania Street, New Orleans; telephone (504-865-1121).

Note.–The Associated Branch Pilots, Port of New Orleans, advise that South Pass has a recommended draft limit of 15 feet. They further advise that a recommended deadweight tonnage limit of 21,000 d.w.t. and/or 15 feet is in effect for ships using South Pass. The deadweight tonnage limit is recommended because ships of large tonnage do not steer well. The tonnage limit is subject to a larger limit as the draft limit deepens.

The entrance approach is marked by a lighted bell buoy, 1.5 miles SE of the end of the jetties, and by a lighted gong buoy marking the shoal ground lying between 0.2 and 0.5 mile off the end of the jetties on the W side of the channel. This dangerous shoal has depths of 2 to 17 feet over it. The lighted gong buoy marks the E portion of the shoal. Except for changes during and after high-river stages, the position of this shoal and depths on it are fairly constant. This shoal, coupled with strong river currents, makes navigation of South Pass difficult for strangers. A bend in the channel near Head of Passes also adds to the difficulty. Depths in the channel at the entrance to South Pass are subject to frequent change. Strangers are advised to take a pilot. The current has considerable velocity, which tends to carry a vessel upon the shoal on the W side of the channel.

A Coast Guard station with a small T-head wharf and protective jetties is on the SW side about 0.5 mile above the entrance. A larger Coast Guard wharf and a light station are on the SW side about 2.2 miles above the entrance.

Routes.–Stand in for the lighted bell buoy and bring the South Pass West Jetty Lighted Range on the bearing 297°. Steer this range, passing to the NE of the lighted gong buoy and about 250 to 300 feet to the W of the end of the E jetty which is marked by a light and fog signal. The current will strike the vessel on the starboard bow as the end of the E jetty

is approached. The vessel should be headed to meet the current, and by the time she is abreast the E jetty she should be heading fair between the jetties. The South Pass Range bearing **315°** marks the deep water between the ends of the jetties.

When in the pass the banks are a sufficient guide, care being taken to keep about midway between them. Several lights are on the E and W sides, and a lighted range for entering the pass is at its head.

The passes begin to converge at Head of Passes, a point 12 to 17 miles, respectively, above the mouths of South and Southwest Passes. The perimeter of the delta around the most widely divergent passes is about 35 miles.

Head Range Channel leading from the head of Southwest Pass into the river is part of the 40-foot Federal project for the pass and river. **Cypress Range Channel** leading from the head of South Pass into the river is part of the 17-foot Federal project for South Pass. Dredging is necessary to maintain both channels to near project depths. Contact the New Orleans District Office, Corps of Engineers, for controlling depths; the office is at the foot of Prytania Street, New Orleans; telephone (504-865-1121). Lighted ranges mark the two channels, and lights mark the jetties at the head of the passes.

At **Head of Passes,** three of the river's important passes come together; South Pass, Southwest Pass, and Pass a Loutre. This point of confluence is at **Head of Passes East Jetty Light** (29°09.1'N., 89°15.0'W.). From this point, measurement is made of all distances on the river S or below the mouth of the passes, and N or above Head of Passes (AHP) to Cairo, Ill. About 0.4 mile below the light on the W side of South Pass is Head of Passes Light Station Coast Guard wharf.

Pass a Loutre and its branches, **Southeast Pass, North Pass, Northeast Pass,** flow E into the Gulf. These passes are deep from the Head of Passes to within a short distance of the Gulf, but the mouths are obstructed by bars. Small local craft occasionally use these passes, but strangers should avoid them. Pass a Loutre and North Pass have depths of about 7 feet over the bars; the others are much shallower. North Pass is marked by a lighted bell buoy. Pass a Loutre is marked by a lighted bell buoy and Southeast Pass by a buoy.

An abandoned lighthouse, a 76-foot black and white spirally banded tower, is on the N side of Pass a Loutre, 2 miles inside the entrance. Another abandoned lighthouse, a grayish-white tower, is 1.5 miles W of the entrance to Northeast Pass.

The marsh lands from Main Pass southward are used extensively for hunting and oil operations; some oyster camps are located in the **Redfish Bay** area.

From Head of Passes to New Orleans, the river has a least width of 600 yards and a clear unobstructed channel with depths of from 31 to 194 feet. There are a few shoals along the river banks. The outer limits of a shoal on the E side of the river, 8.2 miles above Head of Passes, is marked by a lighted buoy. On both sides of the river the land is dry, and in the lower reaches it is covered mostly with coarse grass and willows.

Above Bohemia on the E side and The Jump on the W, levees prevent overflow at high water. Below Bohemia, a 10-mile break in the levee permits flood waters to move E into the Gulf. On both sides of this break are levees extending from the river to the Gulf, to prevent the flooding of adjacent land. Below this break the levee continues to Baptiste Collette Bayou.

The land back of the levees on the E side, formerly laid out in sugar and rice plantations, now is given over to pasturage and market gardens. Orange groves are back of the levees on the W side. New Orleans is reached by river boats and also by railroads and highways which extend down the W side to Venice (The Jump) and down the E side to Bohemia, 9 and 39.8 miles, respectively, above Head of Passes.

Caution during high stages of the river.–Vessels navigating the Mississippi River at flood stages, when passing habitations or other structures, partially or wholly submerged and subject to damage from wave action, shall proceed slowly and keep as far away from such structures as circumstances permit, and shall also proceed slowly when passing close to levees.

Under these conditions, between Baton Rouge and The Jump, mariners are directed to steer a course as close as possible to the center of the river and to proceed at a speed sufficiently slow so that levees and revetments will not be endangered by wave wash. Careful observation by mariners of the effects of the vessel's wash is a vital element in this control.

Strong currents and shifting eddies in the vicinity of Algiers Point will be encountered during high stages of the river. These conditions may make hazardous the operation of a tow which could normally be handled with ease. It is accordingly requested that operators and masters exercise every precaution when operating in the area controlled by the New Orleans Harbor traffic lights. Size of tows and tugs should be considered in view of conditions which may be expected.

The river is well marked with lights, and for the most part the banks are sufficient guides. The distance from Head of Passes to New Orleans is 82.5 miles.

Pilottown is a small village on the E side of the river 1.7 miles (AHP). Vessels, inbound from sea, drop the bar pilot and pick up the river pilot, and outbound in reverse. A wingdam about 1.4 miles above Head of Passes is marked by a light and seasonal fog signal. The pilots' wharf about 1.7 miles above Head of Passes and a wingdam inshore on the E side are marked by private lights. The Texas Pipeline Co. wharf, about 0.5 mile N of the pilot wharf, has berthing for 600-foot vessels and 38 feet alongside. Crude oil is shipped and received.

Cubits Gap is an opening on the E side of the river 3 miles above Head of Passes, at which **Raphael**

Pass, Main Pass, **Octave Pass,** and **Brant Bayou** meet and connect with the river. These passes are navigable for small craft, but Main Pass is the only one having a navigable connection with the Gulf. A sill of willow brush weighed down by rocks has been laid across the entrance to each of these passes. With local knowledge, certain spots along the sills may be crossed by drafts of 5 to 9 feet.

Cubits Gap Light 4, on the SE side of the gap, is shown from a skeleton tower with a red triangular daymark; a seasonal fog signal is at the light.

Main Pass, in May 1983, had a controlling depth of 8 feet over the sill at the river entrance at Cubits Gap, thence 3 feet for about 6 miles to Octave Pass North. This pass is used considerably by fishing vessels and oil companies operating in Chandeleur and Breton Sounds.

The buildings of the Department of Interior's Delta National Wildlife Refuge and a lookout tower at the old quarantine station on the E side just above the gap are conspicuous.

The Jump is an opening on the W side 9.2 miles above Head of Passes, where Grand Pass, Tiger Pass, and several smaller passes connect with the river. There is a sill across the entrance at a depth of about 15 feet and a depth of about 4 feet can be carried through Grand Pass into the Gulf.

Tiger Pass, close W of Grand Pass, connects the river via The Jump with the Gulf. In December 1983, the controlling depth was 7 feet to the junction with Grand Pass, thence 14 feet to the Mississippi River. The entrance from the Gulf is protected by jetties. Lights and daybeacons mark the entrance and the lower 5 miles of the pass. A Coast Guard Aids to Navigation Team is on the W side of the head of the pass at Venice.

Venice is a fishing and marine repair center on the W side of Grand Pass just inside The Jump. Oil companies have service and repair bases, and drilling mud, pipe, and equipment are loaded here for the offshore drilling rigs in the Gulf. Boatyards have a 150-ton lift and cranes to 100 tons; hull and engine repairs are made. Oil well platforms are built at Venice. Gasoline, diesel fuel, water, ice, provisions, marine supplies, berths, a 3-ton lift, and ramps are available at marinas. A Corps of Engineers wharf is on the W side just N of The Jump. Wharves and small-craft landings are at Venice on Grand Pass and on the W side of the river between Venice and Boothville. Bus service is available to New Orleans from Venice on State Route 23, which runs along the W side behind the levee.

Getty Oil Co. ships crude oil from a wharf on the W side of the river 1.4 miles above The Jump. The wharf has 40 feet reported alongside and berthing space for 785-foot vessels.

Baptiste Collette Bayou (see charts 11361 and 11363), on the E side of the river 10 miles above Head of Passes, connects the Mississippi River with Breton Sound. The entrance from Breton Sound is protected by jetties. In December 1983, the controlling depth was 9 feet across the bar in Breton Sound, thence in 1981-December 1983, 12 feet to the Mississippi River. The channel is marked by lights and daybeacons.

In March 1983, submerged obstructions were reported about 50 yards N of Bayou Baptiste Collette Light 1 in about 29°23′34″N., 89°18′20″W., and about 200 yards E of the light in about 29°23′32″N., 89°18′10″W. Extreme caution is advised in the area. In March 1983, shoaling to an unknown extent was reported in the channel between Light 2 and Light 8.

Boothville is a small town on the W side of the river about 14 miles (AHP). A public wharf 100 feet long is 12.8 miles (AHP).

Olga is a small town on the E side of the river, 14.1 miles (AHP). Some supplies may be obtained. From behind the levee, a canal leads to Grand Bay where there are numerous oyster camps.

Chart 11364.–Fort Jackson is on the W side of the river at the bend in the river about 17 miles (AHP). Here the river takes a SW trend for about 2 miles, then trends WNW.

Fort St. Philip, on the N bank of the bend opposite Fort Jackson, has a public wharf.

Ostrica is a small village on the N side of the river about 21.5 miles (AHP). The State-owned **Ostrica Canal,** which connects the river with Quarantine Bay, enters the river 21.7 miles (AHP). (See chapter 7 for a description of the canal and lock.)

Buras is a small town and fruit shipping center on the S side of the river about 22.3 miles (AHP). A fueling dock for small vessels is at Buras. A water tank is prominent.

Empire is a town on the W side of the river about 25.6 miles (AHP). A tank and a church spire are prominent. **Empire Canal** leads from the river at Empire to the Gulf W of the river. The canal, lock and dam, and the port facilities on the canal at Empire are described in chapter 9. A pile cluster mooring is at **Nairn** on Sixtymile Point about 28 miles (AHP).

Home Place, a town on the S side of the river 33.1 miles (AHP), has an oil transfer barge wharf.

Port Sulphur is on the W side of the river about 34.2 miles (AHP). The loading towers, two tanks, and conveyor galleries of the sulfur plant are very conspicuous. Two ship docks are operated by Freeport Sulphur Co. for the shipment of liquid and dry bulk sulfur. The docks are 458 and 800 feet long and have 50 feet reported alongside. The wharves are marked by privately maintained lights.

An oil transfer barge wharf is on the E side of the river at **Nestor** about 35 miles (AHP).

Bohemia is a small village on the E side of the river about 39.8 miles (AHP). State Route 39 leads along the E side of the river behind the levee from Bohemia to New Orleans.

Pointe a la Hache, 42.6 miles above Head of Passes and about 40 miles below New Orleans, is the seat of Plaquemine Parish which embraces most of the lower Mississippi River. Gasoline, water, and some marine supplies can be obtained in the town. The courthouse clock tower, a water tank, and several

radio and microwave towers are very prominent. A ferry crosses the river at Pointe a la Hache. Bass Enterprises Production Co. ships crude oil from a wharf 0.6 mile above the ferry landing. The wharf has 280 feet of berthing space with dolphins and 30 feet reported alongside. On the W side of the river, opposite Pointe a la Hache about 42.5 miles (AHP), there is an oil transfer barge wharf.

An oil transfer wharf operated by the Texas Pipeline Co. is at **Davant** on the N side of the river about 45 miles (AHP). The wharf, marked by a private light, has 280 feet of berthing space with dolphins and 25 feet reported alongside.

At **Bellevue,** on the N side of the river about 48 miles (AHP), Electro-Coal Transfer Corp. operates two bulk-material handling wharves marked by private lights. The lower wharf has 1,164 feet of berthing space with dolphins, 55 to 70 feet reported alongside, and a deck height of 15 feet. Four unloading towers with a combined capacity of 4,200 tons per hour can transfer bulk materials directly from oceangoing vessels to river barges berthed at the rear of the dock face. The upper wharf has 1,880 feet of berthing space with dolphins, 55 to 70 feet reported alongside, and a deck height of 16½ feet. Fixed and traveling loading towers on the wharf have capacities to 6,000 tons per hour. Principal commodities handled are coal and petroleum coke. The towers and conveyors on the wharves are conspicuous.

On the S side of the river about 49.5 miles (AHP), International Marine Terminals operates two bulk-material handling wharves marked by private lights. The lower wharf has 950 feet of berthing space with dolphins, 40 feet reported alongside, and a deck height of 15 feet. Two ship-loading towers can load vessels with coal at a combined rate of 11,500 tons per hour. The upper wharf has 750 feet of berthing space with dolphins, 40 feet reported alongside, a deck height of 15 feet, and is used for the direct transfer of dry bulk materials from river barges to oceangoing vessels.

A grain elevator and wharf operated by Mississippi River Grain Elevator, Inc., is on the S side of the river 53.7 miles (AHP). The wharf has a 536-foot face, 40 feet reported alongside, and a deck height of 23½ feet. Three gantry ship loaders have a combined loading rate of 50,000 bushels per hour. The wharf is marked by private lights.

An offshore barge wharf and an offshore oil transfer tanker wharf operated by Gulf Oil Co.-U.S. are at **Alliance** on the S side of the river at 54.3 and 54.7 miles (AHP). The barge wharf has 702 feet of berthing space with dolphins and a conveyor and loading tower for handling coke. The oil transfer tanker wharf with mooring dolphins allows 1,085 feet of berthing space with depths of 60 feet reported alongside. Transfer barges berth on the backside of the tanker wharf. The dolphins and wharf are marked by privately maintained lights.

On the W side of the river 62.3 miles (AHP), Dockside Elevators, Inc., operates two floating grain elevators used to transfer grain from river barges to oceangoing vessels. Vessels anchor in the river in depths of 80 feet with the grain elevators moored alongside. Cranes on the elevators transfer the grain from barges moored on the opposite side of the vessel at a rate of 300 to 500 tons per hour.

At **Oak Point,** on the W side of the river 62.8 miles (AHP), Chevron Chemical Co. ships and receives chemicals. The wharf has 675 feet of berthing space with dolphins, 44 feet reported alongside, and a deck height of 10 feet. The dolphins are marked by private lights.

Belle Chasse is on the W side of the river about 65.6 miles (AHP). A T-shaped molasses handling wharf operated by Red Star Yeast and Products Co. has 240 feet of berthing space with dolphins and depths of 25 feet reported alongside. The dolphins are marked by private lights. A ferry crosses the river from Belle Chasse to **Scarsdale** on the E side of the river. The ferry landings are marked by privately maintained lights.

Port Nickel is on the E side of the river about 66.5 miles (AHP). Amax Nickel Refining Co., Inc., has two wharves. The lower wharf has 774 feet of berthing space with dolphins, 37 feet reported alongside, a deck height of 20 feet, and is used to receive nickel ore and to ship ammonium sulphate and drummed nickel. The upper wharf has 440 feet of berthing space with dolphins, 37 feet reported alongside, a deck height of 20 feet and is used to receive fuel oil and ship sulfuric acid. The unloading conveyor galleries and the stack and buildings of the nickel plant are conspicuous.

Braithwaite, on the S side of the river about 69.3 miles (AHP) just above **English Turn Bend,** has a large shipyard that specializes in the construction of medium to large barges and the repair of commercial vessels. An 800-ton floating drydock and a marine railway that can haul out vessels to 300 feet are at the yard.

Meraux, on the N side of the river about 76 miles (AHP), has an oil refinery with facilities for receipt and shipment of crude oil and petroleum products by tanker and barge. The tall stacks and cracking towers of the refinery are prominent.

Algiers Alternate Route and **Algiers Lock,** on the S side of the river about 76.8 miles (AHP), connect the Mississippi River with an extensive network of inland waterways W of New Orleans. The route is an alternate route of the Intracoastal Waterway leading W of New Orleans. (See chapter 12 for description of canal and lock.)

Chalmette, on the N side of the river about 77.2 miles (AHP), has several large oil refineries and an aluminum plant. The stacks and cracking towers of the refineries and the aluminum plant are conspicuous. Several wharves between mile 76.7 and mile 77.4 (AHP) are used for the receipt and shipment of petroleum products and for bunkering vessels. (See Wharves under Port of New Orleans for descriptions.)

An overhead power cable with a clearance of 175 feet crosses the river at Chalmette about 77.3 miles (AHP).

A ferry crosses the river from Chalmette to Algiers on the S side.

Chalmette Slip indents the N side of the river at about 78.8 miles (AHP). Chalmette National Monument, a tall white obelisk, is conspicuous close E of the slip. Berthing for deep-draft cargo vessels is available on the E and W sides of the slip. (See Wharves under Port of New Orleans for description.)

The New Orleans general anchorage, about 2 miles long, is off the S side of the river opposite Chalmette Slip, and the quarantine anchorage, about 0.7 mile long, is just above it.

Arabi, a suburb of New Orleans, is on the N side of the river just W of Chalmette. A deep-draft wharf and a smaller wharf are at a large sugar refinery; one wharf is used by ship service boats and the other by the refinery company. (See Wharves under Port of New Orleans for description.)

Just W of the sugar refinery wharf, at the ship service boat wharf, is the landing for the pilot boat. The upriver pilots board vessels off the landing in the section of the river known as **The Point.** Here vessels bound for destinations above New Orleans discharge the river pilot and take on board the New Orleans–Baton Rouge Steamship Pilot, or upriver pilot.

On the S side of the river opposite Chalmette and Arabi at **Algiers** are barge moorings, towing company wharves, the large floating drydocks of a large ship repair firm, the U.S. Naval Station, and other towing company wharves and barge moorings.

The Inner Harbor Navigation Canal entrance is on the N side of the river about 80.5 miles (AHP). The Intracoastal Waterway enters the river through the canal. There are numerous industries along both sides of the Inner Harbor Navigation Canal, including shipbuilding and ship repair yards, cement and concrete mixing plants, chemical, fertilizer, steel fabrication, glass making, instant coffee, and drilling mud manufacturing plants, boatyards, shipwrecking and salvage yards, oil well and dredging company supply bases, and shell-handling wharves.

The vessel is now approaching the loop in the river that encompasses the city of New Orleans on three sides, and ahead are the numerous tall buildings in the main part of the city. Most of the commercial wharves of the Port of New Orleans are on both sides of the river in this section.

Charts 11369, 11368.-Port of New Orleans is one of the largest ports in the United States. It is located on both sides of the Mississippi River with its lower limit about 70 miles (AHP), and its upper limit about 100 miles (AHP). The limits of the port encompass the parish of Orleans and the river frontage of the parishes of St. Bernard and Jefferson. This includes the city of New Orleans, the towns and communities of Violet, Meraux, Chalmette, Arabi, Southport, Harahan, and Kenner on the N side, and Algiers, McDonoghville, Gretna, Harvey, Marrero, Westwego, Bridge City, and Avondale on the S side. The frontage for deep-draft vessels within the port limits includes approximately 50 miles along the river banks, about 10 miles on the Inner Harbor Navigation Canal, and the Mississippi River-Gulf Outlet Canal. The Intracoastal Waterway above the Inner Harbor Navigation Canal and below Harvey Lock offers frontage for barges and small vessels.

The city of **New Orleans** is the major commercial area within the port limits. It is one of the largest cities on the Gulf and is a natural gateway to and from the vast central and S portions of the nation, and particularly to the entire Mississippi Valley with which it is connected by numerous inland water routes. From New Orleans, main-route air and rail lines fan out to all parts of the country. Foreign and coastwise trade are extensive. The chief imports are crude petroleum, coffee, iron and steel products, metalliferrous ores and scrap, nonferrous metals, sugar, crude rubber, meat and meat products, and manufactures of metal. The chief exports are grain, machinery, oilseeds, animal feeds, nonferrous metals, organic chemicals, oils and fats, metal ores and scrap, iron and steel products, and coal.

New Orleans is a popular resort with many fine hotels, theaters, restaurants, parks, and places of historical interest. Among the latter is the famous French Quarter (Vieux Carre) which is kept in as near its original state as possible. For the convenience of representative citizens of foreign countries who arrive or depart via New Orleans, an international world trade center known as the **International House** is in a 10-story building at the corner of Gravier and Camp Streets.

The city proper is bounded on three sides by the Mississippi River. The city limits extend N to Lake Pontchartrain, which is connected to the river by the Inner Harbor Navigation Canal along the E side of the city. Strong levees protect the city from flood waters of the Mississippi River, which at times rise to a level higher than that of the city streets.

Abreast of New Orleans on the opposite bank of the river are **Algiers,** which is part of the city of New Orleans, **McDonoghville, Gretna, Harvey, Marrero,** and **Westwego.** Algiers and Gretna are connected with New Orleans by ferries operated by the Mississippi River Bridge Authority and the Greater New Orleans Highway Bridge.

The Port of New Orleans has over 25 miles of public and private wharves and other related facilities. The public docks can handle as many as 85 ships at a time. The port is mainly a general cargo port, and the first objective is to give shippers whatever facilities and services they need to handle any type of cargo. Modern handling devices suitable for the varied commodities entering the port are provided on the wharves and in the transit sheds. Almost all wharves have rail connections.

The port is the heart of the busiest grain export area in the world. The port's public grain elevator can store over 7.2 million bushels and transfer up to 1.9 million bushels of grain a day. A Public Bulk Terminal is on the N side of the Mississippi River-Gulf Outlet Canal about 1.5 miles E of the Inner Harbor Navigation Canal. Its three unloading tow-

ers each can discharge ore, bulk sugar, and other bulk commodities at the rate of 3,350 tons per hour. The port also has existing and developing facilities for handling containerized cargo.

Most of the wharves along the waterfront of the city of New Orleans are public facilities under the control of the Board of Commissioners (Dock Board) of the Port of New Orleans. Virtually all these wharves parallel the river bank, and for 9 miles along the bank there is an almost continuous quay. Transit sheds cover much of the wharf area. Depths at the wharves range from 6 to 42 feet, with about 35 feet alongside most wharves. It is the Dock Board's responsibility to keep sufficient depths alongside the wharves for ships to berth. The board controls the area from the faces of the wharves to 100 feet into the stream. The dock areas silt up rapidly and change from day to day. The Dock Board's dredge is working continually to keep the docks open.

The offices of the Dock Board are in the 33-story International Trade Mart building on the waterfront in Eads Plaza at the foot of Canal Street.

Channels.–The main deepwater channels leading to and in the Port of New Orleans are in the river, the Inner Harbor Navigation Canal, and the Mississippi River-Gulf Outlet Canal. (See Channels at the beginning of this chapter.) Secondary channels for shallow-draft vessels and barges are on Algiers, Harvey, and other canals and waterways that radiate from the river in all directions.

The **Inner Harbor Navigation Canal (Industrial Canal)** offers a deepwater connection between Mississippi River and Lake Pontchartrain, a distance of about 5 miles. The lock is 0.5 mile N of the Mississippi River Levee; inside dimensions are 640 feet long, 75 feet wide, and 31½ feet over the sills at low water in the Mississippi River. Approaching craft are directed by loudspeaker, lights, and radiotelephone. VHF-FM channels 14 (156.70 MHz) and 16 (156.80 MHz) are continuously monitored. N from the lock in March 1982, the controlling depths were 30 feet to the Seabrook highway and Southern Railway bridges at the N end of the canal, thence 12 feet across the bar into Lake Pontchartrain. A 900-foot-wide turning basin about 0.7 mile N of the lock has depths of 31 feet. A second turning basin at the junction with the Mississippi River-Gulf Outlet Canal has a 1,600-foot diameter with depths of 40 feet.

The Inner Harbor Navigation Canal is within a **safety zone.** (See 165.1 through 165.7, 165.20 through 165.25, and 165.801, chapter 2, for limits and regulations.)

Caution.–A submerged drainage line is reported crossing the Inner Harbor Navigation Canal just S of the Florida Avenue bridge; maximum permissible draft over the line is 30 feet.

A total of eight bridges cross the canal between the Mississippi River and Lake Pontchartrain. The St. Claude Avenue highway bridge at the S end of the navigation lock has a bascule span with a clearance of zero feet. The North Claiborne Avenue (Seeber) highway bridge, about 0.2 mile N of the lock, has a vertical lift span with a clearance of 40 feet down and 156 feet up. About 0.9 mile N of the lock, the combination Florida Avenue and Southern Railroad bridge has a bascule span with a clearance of zero feet. An overhead power cable crossing close N of the bridge has a clearance of 166 feet. The combination Gentilly Road highway and Seaboard System Railroad (L&N) bridge, 2.4 miles N of the lock, has a bascule span with a clearance of zero feet. The U.S. Interstate Route 10 highway bridge close N of Gentilly Road bridge has a fixed span with a clearance of 120 feet for the middle 200 feet and 115 feet elsewhere. An overhead power cable crossing close N of this bridge has a clearance of 136 feet. Chef Menteur Highway (U.S. Route 90) bridge, 2.6 miles N of the lock, has a bascule span with a clearance of 9 feet at the center. In December 1982, a vertical lift highway bridge with design clearances of 50 feet down and 120 feet up was under construction immediately S of the bascule bridge; upon completion, the bascule bridge will be removed. The combination Seabrook Highway and Southern Railroad Bridge across the N entrance of the canal, about 4.1 miles N of the lock, has a bascule span with a clearance of 1 foot. A highway bascule bridge with a clearance of 46 feet at the center crosses the canal close N of the Seabrook Highway and Southern Railroad Bridge. (See 117.1b, 117.535, and 117.555, chapter 2, for drawspan regulations and opening signals for the bridges crossing the Inner Harbor Navigation Canal.)

The river entrance to the canal is marked by lights on both sides and by a **333°** lighted range.

A Coast Guard station is on the W side of the Inner Harbor Navigation Canal, just N of the lock.

Harvey Canal is opposite New Orleans about 85.3 miles (AHP). The canal and locks connect the Mississippi River with an extensive network of inland waterways SW of New Orleans. The canal is the route of the Intracoastal Waterway. (See chapter 12 for description of canal and locks.)

Anchorages.–General and quarantine anchorages are on the W side of the river at New Orleans. (See 110.1 and 110.195, chapter 2, for limits and regulations.) Vessels may also take anchorage as directed by the Coast Guard District Commander.

Dangers.–Submerged revetments are located on the river bottom on both sides in the port area; anchorage is prohibited in these areas. (See 207.200, chapter 2, and chart 11368 for revetment areas and regulations.)

Bridges.–Greater New Orleans Highway Fixed Bridge, a high-level bridge connecting Algiers and New Orleans, 0.6 mile above Canal Street, has a clearance of 150 feet over a central 750-foot width. In September 1980, another span with a design clearance of 150 feet was under construction immediately downstream. The Huey P. Long Bridge, a combined highway and railroad bridge crossing the river 9.6 miles above Canal Street, has a clearance of 133 feet through the W span for a channel span width of 750 feet. These are the only bridges over the Mississippi in the New Orleans vicinity. The

other bridges and tunnels in the port are covered in the description of the respective waterways which they cross.

Aerial Tram.–In March 1984, an aerial tram with a design clearance of 155 feet was under construction about 0.3 mile below the Greater New Orleans Highway Fixed Bridges.

Cables.–An overhead power cable with a clearance of 155 feet crosses the river 0.4 mile below Nine Mile Point, about 90 miles (AHP).

Tides and Currents.–A description of tides and currents is given under the general discussion of the Mississippi River at the beginning of this chapter.

Regulated Navigation Areas.–The Mississippi River from Miles 88 to 127 (AHP) is a regulated navigation area. (See 165.1 through 165.13 and 165.803, chapter 2, for limits and regulations.)

Weather.–The climate at New Orleans and the surrounding suburbs is influenced, in a large degree, by the many water surfaces provided by lakes and streams, and by the proximity to the Gulf of Mexico. Throughout the year, these water areas modify the relative humidity and temperature conditions, decreasing the range between the extremes; when S winds prevail, these effects are increased, imparting the characteristics of a marine climate. Relative humidities of less than 50 percent occur in each month of the year; however, they are less frequent in the summer months than in other seasons. During mid-June to mid-September, the prevailing SE to SW winds carry inland warm, moist air favorable for sporadic, often quite localized, development of thundershowers. In the New Orleans area, these showers tend to occur most frequently around 1300-1400, and keep the temperature from rising much above 90°F. At times, a thunderstorm will develop over Lake Pontchartrain in the early evening, and move over the city. Occasionally the pressure distribution changes to bring in a flow of hotter and drier air. However, there is only an average of about 7 days per year when the temperature rises to 95°F. or higher, from about mid-November to mid-March, the area is subjected alternately to tropical air and cold continental air in periods of varying length. About 80 percent of the December-February hourly temperatures range from 41°F. to 69°F. The mean date of the first occurrence of 32°F. or lower is about December 12, while the mean date of the last occurrence is about February 13. Between those dates, there is, on the average, more than 6 days out of 7 entirely above freezing, with some afternoons having temperatures in the seventies and eighties. The mean length of the freeze-free period is about 302 days. The latest freeze date in spring was March 27, 1955, with 30°F. reported at the airport and Audubon Park. The earliest freeze date in the fall was November 11, 1894, with 32°F. observed at Audubon Park. The usual track of winterstorms is to the N of New Orleans, but occasionally one moves into the area, bringing large and rather sudden drops in temperature, but the cold spells seldom last over 3 or 4 days. In about two-thirds of the years, one can expect the annual lowest temperature to be 24°F. or warmer, with some years entirely above freezing. The lowest recorded temperature was 7°F. on February 13, 1899, at Audubon Park. From December to May, the water of the Mississippi River is usually colder than the air temperature, favoring the formation of river fogs, particularly with weak S winds. The nearby lakes also serve to modify the extremes of temperature and to increase fogginess over narrow strips along the shores. From April through October, the occurrence of fog is not frequent enough to ordinarily consider them operationally significant. In other months, particularly in winter (December through February), the occurrences increase, with the greatest frequency in February. Visibility at times is reduced by smoke from the industrial plants along the river. Smoke, particularly during the fall and winter, also occurs when marshland areas are burned.

A fairly definite rainy period is from mid-December to mid-March. Measurable precipitation occurs on about one-third of the days, periodically, to the N of a warm front or a cold front which has stalled over the N Gulf of Mexico. It is as apt to fall in one hour as another, generally slow, steady, and relatively continuous, often lasting for several days. Snowfall amounts are generally small, with the snow usually melting as it falls. The pattern of spring rains is similar to that of winter, while fall rains are distributed in much the same manner as summer rains. April, May, October, and November are generally dry, but there have been some extremely heavy showers in those months.

While thunder usually accompanies summer showers, thunderstorms with damaging winds are relatively infrequent. The most damaging thunderstorms are those which move over the city from Lake Pontchartrain, usually in connection with cold fronts and line squalls. Hail of a damaging nature seldom occurs, and tornadoes are extremely rare. Since 1900, the centers of three hurricanes have passed over the city. The area has been affected by several other hurricanes and also by a number of tropical storms which did not attain hurricane intensity. New Orleans is in the belt where a mean recurrence interval of 50 years gives an extreme wind speed of 95 to 100 m.p.h. or more.

The lower Mississippi River floods result from runoff upstream. Rainfall within the State of Louisiana has little influence on these stages. The levees at New Orleans have not been overtopped in more than 100 years. If the water level in the river becomes dangerously high, the Bonnet Carre Spillway, some 33 miles above the city, may be opened to divert the floodwaters.

The National Weather Service maintains an office in the Federal Building; **barometers** may be compared there or checked by telephone. (See appendix for address.)

(See page T-7 for **New Orleans climatological table.**)

Pilotage is discussed under the general description of the river at the beginning of this chapter.

Towage.–Tugs up to 4,000 hp are available at New

Orleans for towing and docking. (See detailed description at the beginning of this chapter.)

Quarantine procedures are discussed at the beginning of this chapter. Numerous public and private hospitals are in New Orleans.

Agricultural quarantine procedures are discussed at the beginning of this chapter.

Customs.–New Orleans is a customs port of entry with a customhouse on Canal Street. Vessels are generally boarded by customs officers at berth; however, arrangements can be made for the officers to board vessels at any point within the port limits. The customhouse serves the area from the Mississippi River entrance to Reserve, a small town about 120 miles (AHP).

Immigration.–The U.S. Immigration and Naturalization Service maintains a district office at New Orleans. (See appendix for address.) Inspectors board vessels at anchor or alongside the wharves. Arrangements should be made through ships' agents.

Coast Guard.–The **Captain of the Port** maintains an office in New Orleans. **Marine inspection** and **vessel documentation** offices are at New Orleans. (See appendix for addresses.) A Coast Guard air station is at the Naval air station about 2.4 miles SW of Belle Chasse.

Harbor regulations.–The navigation of vessels in the Mississippi River, the Inner Harbor Navigation Canal to its junction with the Mississippi River-Gulf Outlet Canal, and the Mississippi River-Gulf Outlet Canal are under the jurisdiction of the U.S. Coast Guard. The development, operation, and control of the Port of New Orleans is regulated by The Board of Commissioners of the Port of New Orleans.

Movement of vessels in vicinity of Algiers Point: Traffic control in the river in the vicinity of Algiers Point is subject to regulations stated in 161.402, 165.1 through 165.13, and 165.803, chapter 2. In addition to the traffic lights at Governor Nicolls Street Wharf and at Gretna, described in that regulation, there is a traffic light at **Westwego,** 5.7 miles above Canal Street, which indicates to downbound traffic whether the Gretna traffic control light, 1.5 miles above Canal Street, is red or green.

At a conference of representatives of navigation interests in New Orleans, it was agreed that high stages on the Mississippi River require special precautionary measures in the operation of vessels in New Orleans Harbor, particularly in the vicinity of Algiers Point where high river stages produce strong currents and powerful shifting eddies.

The following recommendations were made for the operation of vessels and other craft when the stage of the river is 10 feet or above on the Carrollton Gage. All underpowered vessels should be assisted by a tug around Algiers Point; and further, underpowered vessels should not leave the harbor unless they can clear Algiers Point during daylight. Terminal operators and fleet owners should observe extra precaution in the mooring of barges to prevent the possible breaking loose of such craft to the danger of all installations downstream.

The attention of all navigation interests, masters, pilots, and operators is invited to the urgent necessity for observance of these policies and meticulous adherence to good seamanship and sound operating practice in order to minimize navigational hazards during the period of high stages of the river.

Note: When emergency conditions exist due to the velocity of the flow of the Mississippi River in the vicinity of New Orleans, the Commander, Eighth Coast Guard District, will issue special orders and notices restricting the size and make up of tows, movement of vessels, and the use of anchorages.

Control of the Port of New Orleans:

The **Board of Commissioners of the Port of New Orleans,** generally known as the **Dock Board**, has full control of the port except for matters pertaining to the levees and the yacht harbor on Lake Pontchartrain, which are under control of the **Levee Board,** and the **New Orleans Public Belt Railroad,** which is a terminal railroad owned and operated by the city of New Orleans through the **Public Belt Railroad Commission.**

The Dock Board consists of members selected by the Governor of the State of Louisiana from a list of nominees compiled by eighteen business and civic associations. The board is charged with the development, operation, and control of the Port of New Orleans and establishes rules and regulations for the various terminals and the part of the Inner Harbor Navigation Canal under its control.

The Executive Port Director and General Manager is in charge of operations and is assisted by three Assistant Executive Port Directors and three Deputy Assistant Port Directors. About two-thirds of the improved wharf frontage is owned by the State of Louisiana and operated by the board. The office of the Dock Board and Superintendent of Docks is on Canal Street near the river, in the International Trade Mart Building.

Fire prevention.–Smokestacks of vessels moored to the wharves and landings must be equipped with spark arrestors, and every precaution must be taken to avoid an issue of sparks. Smoking in the holds or on the decks of vessels, while loading or discharging cargo while alongside the wharves, is prohibited.

Extracts from the rules and regulations for the Inner Harbor Navigation Canal are as follows:

General.–No vessels shall berth at any wharf, landing or mooring, or move from one point to another in the canal, or load or unload cargo elsewhere than at a regularly established wharf, except by authority of the Superintendent.

Obstructing Navigation–Anchoring and Mooring.–No vessel shall anchor in the channel of the canal or in the approaches thereto, except in case of distress or emergency or while waiting the opening of a drawbridge, and such stoppages shall be only for such periods as may be absolutely necessary by reason of such causes. Vessels moored at wharves, landings, clusters, etc., shall be so placed and tied up as not to interfere with safe passage of other vessels navigating the canal. No warp line shall be passed across the channel, wharf, or landing, so as to

obstruct passage or to cause interference with the discharging of cargoes.

Vessels shall not be berthed two abreast alongside any wharves, bulkheads, or clusters, except that small barges or other small craft may be moored two or more abreast when necessary clearances for proper operation of the canal can be maintained, and permission of the Superintendent shall have been obtained.

Vessels, lighters, barges, launches, other watercraft, timbers, rafts, or similar floating objects moored or tied to and alongside vessels, wharves, bulkheads, or clusters, shall be placed so as not to obstruct the channel, and shall be made fast securely at both ends to prevent swinging out or breaking loose, and shall display conspicuously suitable lights at night.

Under no circumstances shall vessels or other watercraft be anchored or moored within 100 feet of the centerline of the Inner Harbor Navigation Canal channel as determined by the Engineering Department of the Board.

In the event any vessel or other floating equipment, including any logs or lumber assembled in rafts or separated therefrom, or any large sinkable object on any such vessel shall sink, or in any manner obstruct navigation in the canal, the owner or agent of said vessel shall promptly remove same. In case the owner or agent fails for any cause to remove any such obstruction promptly upon demand, the Board may remove it or cause it to be removed at the cost, risk, and expense of said vessel, its owner, or agent.

Responsibility for Vessel.–Masters of vessels in Canal waters shall be responsible for safe handling and proper navigation of vessels under their charge. Masters of vessels shall abide by the rules and regulations of the canal, as interpreted by the Superintendent.

No vessel, even if moored and tied up, shall be left without sufficient crew to care for it properly. Lights shall be displayed at all times, both when tied up and navigating the canal, in accordance with the provisions of the Inland Rules.

The dropping of anchors, weights, or other ground tackle, within the areas occupied by submarine cables or pipe crossings, is prohibited. Such crossings will be marked ordinarily by signboards on each bank.

The master or other party in charge of the movement of an oceangoing vessel or craft of unusual height, including piledrivers, derricks, etc., shall before passing through the canal bridge openings, make certain that such craft and every part of the superstructure or any equipment or cargo beyond the gunwales will clear all parts of the bridge structure.

As it may see fit, the Board reserves the right to place its own pilot on any vessel passing through the canal. The canal pilot will serve only in an advisory capacity.

Vessels shall exercise due care in navigating the canal, as to speed and otherwise, in order to avoid damage to the canal structures or equipment, or to other vessels.

The making of trial runs in the canal by speed boats and other such motorcraft is prohibited. Under no circumstances shall any watercraft navigate in the canal at a **speed exceeding 10 m.p.h.**

Vessels shall be liable for any damage to canal structures, equipment, and/or appurtenances while passing through the canal.

The Board has noted that some masters ground their vessels bow-on while waiting lockage in the forebay of the lock. As such contact endangers the levees, mariners are directed to discontinue the practice.

Steel-pile dolphins and other facilities are on the E and W banks downstream from the lock forebay to provide "ready" mooring areas for barges and tows awaiting lockage. These crafts are under the direction and control of the lockmaster.

A port-wide radiotelephone system using VHF-FM channel 16 (156.80 MHz) and 67 (156.375 MHz) connects all terminals, bridges, tugs, pilots, and the yacht harbor with the Harbor Police.

Wharves.–The Port of New Orleans has more than 100 berths and wharves located on both sides of the Mississippi River, the Inner Harbor Navigation Canal, and the Mississippi River-Gulf Outlet Canal. More than 100 additional facilities for small vessels and barges are on Harvey Canal, Algiers Canal, Michoud Canal, and Bayou Barataria. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 20, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact port authorities or the private operators. All the facilities described have direct highway connections, and most have plant trackage with direct railroad connections. Water is available at most of the wharves, but electrical shore power connections are available at only about 25 percent of the wharves. General cargo at the port is usually handled to and from vessels by ships' tackle. Cargo on the wharves, particularly the public facilities, is handled by a wide range of equipment furnished by various stevedoring companies. Special handling equipment, if available, is mentioned in the description of the particular facility. Shore-based hoisting equipment with capacity up to 300 tons is available to the public at New Orleans; floating cranes and derricks up to 700-ton capacity are available.

Of the facilities described, about one-half are for public use operated by the Board of Commissioners of the Port of New Orleans. They operate general and containerized cargo wharves, heavy lift and bulk material handling wharves, and a grain elevator. Nearly half of the private facilities are for handling petroleum and chemical products. Most of the rest are for handling general, bulk, and liquid cargo.

Facilities on N side of river from Meraux to Inner Harbor Navigation Canal:

Murphy Oil Corp. Wharf (29°55'33"N.,

89°56′45″W.): 757 feet of berthing space at the face of six offshore breasting platforms; 40 feet alongside; 205 feet of barge berthing space at the rear of the lower platforms; 35 feet alongside; deck height, 24 feet; receipt and shipment of crude oil and petroleum products by tanker and barge; bunkering tankers; fueling towboats; owned and operated by Murphy Oil Corp.

Tenneco Crude Terminal Wharf (29°55′33″N., 89°57′54″W.): 580 feet of berthing space with dolphins; 35 feet alongside; deck height, 21 feet; receipt of crude oil by tanker; owned and operated by Tenneco Oil Co.

Exxon Co. U.S.A., Chalmette Terminal, Tanker Dock (29°55′38″N., 89°58′12″W.): 310 feet of berthing space with dolphins; 25 feet alongside; deck height, 20 feet; receipt and shipment of petroleum by barge; bunkering vessels; owned and operated by Exxon Co. U.S.A.

Tenneco Wharf No. 4 (29°55′45″N., 89°58′40″W.): 390 feet of berthing space with dolphins; 42 to 50 feet alongside; deck height, 27 feet; shipment of petroleum products and petrochemicals by tanker and barge; receipt of crude oil; owned and operated by Tenneco Oil Co.

Chalmette Slip, Dock No. 2 (29°56′33″N., 89°59′17″W.): E side of slip; 1,600 feet of berthing space; 30 feet alongside; deck height, 20 feet; 75,000 square feet of covered storage; 120,000 square feet open storage; receipt and shipment of general cargo; receipt of aluminum ingots; shipment of coke and machinery; owned by Southern Railway System and operated by Kaiser Aluminum and Chemical Corp.

Chalmette Slip, Dock No. 1: W side of slip; 1,280 feet of berthing space; 30 feet alongside; deck height, 20 feet; 84,400 square feet of covered storage; receipt and shipment of lumber; receipt of green coke and shipment of calcined coke; owned by Southern Railway System and operated by Robinson Lumber Co. and Bulk Material Transfer, Inc.

Amstar Corp. Wharf (29°56′37″N., 90°00′05″W.): 1,115 feet of berthing space; 45 feet alongside; deck height 22 feet; two 10-ton electric gantry cranes, 36-inch electric belt-conveyor system, with bulk sugar unloading rate of 500 tons per hour; 5-ton electric grantry hoist for loading vessels; 60,000 square feet covered storage; receipt of raw sugar and shipment of refined sugar; owned and operated by Amstar Corporation.

Alabo Street Wharf (29°57′10″N., 90°01′06″W.): 1,316-foot face; 36 feet alongside; deck height, 20 feet; 126,000 square feet covered storage at wharf, 15 acres open storage; receipt and shipment of general cargo; owned and operated by Board of Commissioners.

Facilities on E side of Inner Harbor Navigation Canal:

Southern Scrap Material Co. Wharf (29°59′00″N., 90°01′13″W.): 451-foot face; 32 feet alongside; deck height, 7 feet; one 50-ton and two 45-ton electric gantry cranes; receipt of scrap metal by barge, shipment of scrap metal and heavy machinery by ship and barge; owned by Board of Commissioners and operated by Southern Scrap Material Co., Ltd.

Dwyer Road Wharf (30°01′14″N., 90°01′49″W.): 340 feet of berthing space with dolphins; 22 feet alongside; deck height, 7 feet; 20,000 square feet covered storage, open storage for 210 containers; receipt and shipment of general and roll-on/roll-off cargo; owned by Board of Commissioners and operated by Armasal Lines.

United States Gypsum Co. Wharf (30°01′18″N., 90°01′50″W.): 362-foot face, 25 feet alongside; 240 feet of barge berthing space at rear of face, 12 feet alongside; deck height, 7½ feet; 54-inch, electric, belt-conveyor system leads from wharf to gypsum storage bins having a capacity of 60,000 tons; 24-inch, radial, belt-conveyor system leads from barge berths to open storage area for 16,000 tons of shell; receipt of gypsum rock by vessel, receipt of shell by barge; owned by Board of Commissioners and operated by United States Gypsum Co.

Morrison Yard Lower Wharf (30°01′30″N., 90°01′54″W.): 550 feet of berthing space with dolphins; 28 to 30 feet alongside; deck height, 7 feet; 24,000 square feet covered storage, 6 acres open storage; receipt and shipment of roll-on/roll-off cargo; owned by Board of Commissioners and operated by Coordinated Caribbean Transport, Inc.

NL Baroid Industrial Canal, Ship Wharf (30°01′47″N., 90°01′58″W.): 490 feet of berthing space with dolphins; 23 feet alongside; deck height, 6 feet; 30-inch, electric, belt-conveyor system leads from wharf to open storage area for 60,000 tons of barite ore; receipt of barite; owned by Board of Commissioners and operated by NL Baroid, NL Industries, Inc.

Facilities on W side of Inner Harbor Navigation Canal:

Magcobar Minerals Unloading Dock (30°01′34″N., 90°01′59″W.): 500 feet of berthing space; 30 feet alongside; deck height, 6 feet; floating crane furnished by stevedoring company unloads vessels; open storage for 80,000 tons of barite ores; receipt of barite; owned by Board of Commissioners and operated by Magcobar Minerals, Division of Dresser Industries, Inc.

France Road Terminal, Berth No. 6 Roll-on/Roll-off Ramp (29°59′36″N., 90°01′24″W.): 300 feet of berthing space with dolphins on N side; 30 feet alongside; S side of ramp contiguous with France Road Terminal, Berth No. 6; deck height, 4 to 10 feet; 100,000 square feet covered storage; 30-ton mobile crane; receipt and shipment of roll-on/roll-off cargo; owned by Board of Commissioners and operated by New Orleans Marine Contractors.

France Road Terminal, Berths Nos. 5 and 6: adjacent S of Roll-on/Roll-off Ramp; 1,585-foot face; 30 to 36 feet alongside; deck height, 10 feet; 31,000 square feet covered storage, 85 acres open storage; two 40-ton container cranes; receipt and shipment of containerized cargo; owned by Board of Commissioners and operated by New Orleans Marine Contractors.

France Road Terminal, Berth No. 4: adjacent S of

Berth No. 5; 700-foot face; 30 to 36 feet alongside; deck height, 10 feet; 60,000 square feet covered storage, open storage for 739 containers; use of containers from Berths Nos. 5 and 6; receipt and shipment of containerized cargo; owned by Board of Commissioners and operated by Puerto Rico Marine Management, Inc.

France Road Terminal, Berth No. 1 (29°58′58″N., 90°01′19″W.): 830 feet of berthing space; 35 to 38 feet alongside; deck height, 11 feet; two 30-ton container cranes; open storages for 1,100 containers; receipt and shipment of containerized cargo; owned by Board of Commissioners and operated by Sea-Land Service, Inc.

Florida Avenue Wharf (29°58′45″N., 90°01′30″W.): 482-foot face; 30 feet alongside; deck height, 9 feet; 57,600 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Uiterwyk Corp.

Florida Avenue, Roll-on Roll-off Facility Wharf (29°58′47″N., 90°01′25″W.): 482-foot face, 20 feet alongside; deck height, 5 feet; 5 acres open storage; vessels dock at Florida Avenue Wharf and load and unload roll-on roll-off general cargo by stern ramps; owned and operated by Board of Commissioners.

Galvez Street Wharf (29°58′24″N., 90°01′29″W.): 2,380-foot face; 2,470 feet with dolphins; 35 feet alongside; 265-foot N side, 30-20 feet alongside; deck height, 9 feet; 357,000 square feet of covered storage; receipt and shipment of general and containerized cargo; owned by board of Commissioners and operated by several companies.

Facilities on the Mississippi River-Gulf Outlet Canal:

Jourdan Road Terminal, Berths Nos. 4 and 5 (29°59′45″N., 90°00′55″W.): 1,400-foot face; 36 feet alongside; deck height, 10 feet; 144,000 square feet covered storage, 10 acres open storage; receipt and shipment of general and containerized cargo; owned and operated by Board of Commissioners; under construction in 1981.

Public Bulk Terminal Wharf: N side of canal, 1.4 miles E of junction with Inner Harbor Navigation (Industrial) Canal; face 2,235 feet of berthing space with dolphins; 36 feet alongside; 1,808 feet of barge berthing space at rear of face, 20 feet alongside; deck height, 13 feet; covered storage tanks for 30,000 tons of bulk materials, 236,000 square feet of open storage for bulk materials; one electric, traveling, combination vessel and barge-loading bridge tower served by electric, belt-conveyor system with 2,000 to 3,000 tons per hour loading rate; three electric, traveling, unloading towers serving one 42-inch and two 60-inch electric belt conveyors with a combined unloading rate of 3,350 tons per hour; receipt and shipment of various dry bulk commodities including: coke, alumina, manganese, sugar, barites, salt, phosphate, ammonium sulphate, iron ore, zinc, petroleum pitch, gypsum, coal, fluorspar, urea, steel, ferrochrome, pig iron, bauxite, copper, and potash; owned by Board of Commissioners, and operated by Ryan-Walsh Stevedoring Co., Inc.

Facilities on Michoud Canal:

Dundee Unloading Dock: E side of the canal 0.5 mile above the entrance; 175-foot face; 30 feet alongside; deck height, 2 feet; receipt of bulk cement; owned and operated by Dundee Cement Co.

Lone Star Industries Dry Bulk Materials Wharf: E side of the canal 0.75 mile above the entrance; 840 feet of berthing space with dolphins; 34 feet alongside; deck height, 10 feet; gantry crane with unloading rate of 3,000 tons per hour; receipt of dry bulk materials including coal and aragonite; owned and operated by Lone Star Industries, Inc.

Air Products and Chemicals Ammonia Loading Dock: E side of the canal 1.1 miles above the entrance; 200 feet of berthing space with dolphins; 35 feet alongside; deck height, 10 feet; shipment of anhydrous ammonia; owned and operated by Air Products and Chemicals, Inc.

Facilities on the N side of river from Inner Harbor Navigation Canal W to Southport:

Poland Avenue Wharf, Berths Nos. 4 and 5 (29°57′32″N., 90°02′07″W.): 932-foot face; 40 to 42 feet alongside; deck height, 22 feet; 57,000 square feet of covered storage; receipt and shipment of general cargo; owned by U.S. Government and operated by Waterman Steamship Corp.

Pauline Street Wharf (29°57′34″N., 90°02′17″W.): 581-foot face; 40 to 42 feet alongside; deck height, 22 feet; 63,500 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Waterman Steamship Corp.

Congress Street Wharf: adjacent W of Pauline Street Wharf; 968 feet of berthing space; 40 to 42 feet alongside; deck height, 22 feet; 90,800 square feet of covered storage, 50,000 square feet of paved open storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Waterman Steamship Corp. and Atlantic and Gulf Stevedores, Inc.

Desire Street Wharf: adjacent W of Congress Street Wharf; 440-foot face; 35 feet alongside; deck height, 22 feet; 100,760 square feet of covered storage; two floating cranes to 75 tons; three floating cranes, each with grab bucket; receipt and shipment of general cargo and heavy-lift items; owned by Board of Commissioners and operated by Atlantic and Gulf Stevedores, Inc., Waterfront Transportation Corp., and Board of Commissioners.

Piety Street Wharf: adjacent W of Desire Street Wharf; 523-foot face; 35 feet alongside; deck height, 21 feet; 46,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Valor Stevedoring Co.

Louisa Street Wharf: adjacent W of Piety Street Wharf; 1,061 feet of berthing space; 34 feet alongside; deck height, 21 feet; 31,000 square feet of covered storage; 58,000 square feet of paved open storage; molasses storage tanks with capacity of 4,200,000 gallons; receipt and shipment of general and containerized cargo and heavy items, receipt of

molasses; owned by Board of Commissioners and operated by several companies.

Press Street Wharf: adjacent W of Louisa Street Wharf; 947 feet of berthing space; 40 feet alongside; deck height, 21 feet; 48,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by American Oceanic Shipping Corp.

Mandeville Street Wharf: adjacent W of Press Street Wharf; 1,121-foot face; 35 feet alongside; deck height, 22 feet; 97,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Hellenic Line, Ltd.

Esplande Avenue Wharf: adjacent W of Mandeville Street Wharf; 584-foot face; 35 feet alongside; deck height, 22 feet; 66,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Sanko-Kisen (U.S.A.) Corp.

Governor Nicholls Street Wharf: adjacent SW of Esplanade Street Wharf; 1,211-foot face; 40 feet alongside; deck height, 22 feet; 100,000 square feet of covered storage, 14,400 square feet of paved open storage; receipt and shipment of general and containerized cargo; owned by Board of Commissioners and operated by several companies.

Bienville Street Wharf (29°57′08″N., 90°03′46″W.): 1,624 feet of berthing space; 35 feet alongside; deck height, 22 feet; 145,000 square feet of covered storage, 50,000 square feet of paved open storage; receipt and shipment of general and containerized cargo; owned by Board of Commissioners and operated by TTT Stevedores of Louisiana, Inc., and Compania Anonima Venezolana De Navegacion.

International Rivercenter, Cruise Ship Terminal Wharf (29°56′48″N., 90°03′43″W.): 840 feet of berthing space; 35 feet alongside; deck height, 22 feet; cruise ship passenger terminal; owned by Board of Commissioners and operated by International Rivercenter.

Poydras Street Wharf (29°56′42″N., 90°03′43″W.): 530-foot face; 35 feet alongside; deck height, 22 feet; receipt and shipment of general cargo; owned and operated by Board of Commissioners.

Julia Street Wharf: adjacent S of Poydras Street Wharf; 1,189-foot face; 35 feet alongside; deck height, 22 feet; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Board of Commissioners and Cooper Stevedoring Co., Inc.

Erato Street Wharf: adjacent S of Julia Street Wharf; 1,067-foot face; 35 feet alongside; deck height, 22 feet; 54,000 square feet open storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Board of Commissioners and Gulf Coast Shipping Corp.

Thalia Street Wharf: adjacent S of Erato Street Wharf; 860-foot face; 35 feet alongside; deck height, 22 feet; 109,000 square feet of covered storage; 72,000 square feet of open storage; receipt and shipment of general cargo; owned by Board of Commissioners, operated by Coast-Wide Terminals, Inc.

Robin Street Wharf: adjacent S of Thalia Street Wharf; 1,216-foot face; 35 feet alongside; deck height, 22 feet; 157,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Coast-Wide Terminals, Inc.

Orange Street Wharf: adjacent S of Robin Street Wharf; 1,020 feet of berthing space; 30 feet alongside; deck height, 22 feet; 133,300 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Board of Commissioners and Coast-Wide Terminals, Inc.

Market Street Wharf (29°55′44″N., 90°03′47″W.): 1,015 feet of berthing space; 30 feet alongside; deck height, 22 feet; 119,000 square feet of covered storage; receipt and shipment of general cargo and soybean meal; owned by Board of Commissioners and operated by Board of Commissioners and Ryan-Walsh Stevedoring Co., Inc.

Celeste Street Wharf: adjacent SW of Market Street Wharf; 1,200 feet of berthing space; 35 feet alongside; deck height, 22 feet; 129,600 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Board of Commissioners and Hansen and Tidemann, Inc.

St. Andrew Street Wharf: adjacent SW of Celeste Street Wharf; 1,598-foot face; 35 feet alongside; deck height, 22 feet; 146,000 square feet of covered storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by various companies.

First Street Wharf (29°55′18″N., 90°04′21″W.): 1,275 feet of berthing space; 35 feet alongside; deck height, 22 feet; 105,000 square feet of covered storage, 1 acre paved open storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by E.S. Binnings, Inc.

Third Street Wharf: adjacent SW of First Street Wharf; 360-foot face; 35 feet alongside; deck height, 21 feet; 49,000 square feet of covered storage; receipt and shipment of general cargo; owned and operated by Board of Commissioners.

Washington Avenue Wharf: adjacent SW of Third Street Wharf; 871-foot face; 32 feet alongside; deck height, 22 feet; 122,000 square feet of covered storage; receipt and shipment of general cargo; shipment of fertilizer; owned by Board of Commissioners and operated by Board of Commissioners and Atlantic and Gulf Stevedores, Inc.

Seventh Street Wharf: adjacent SW of Washington Avenue Wharf; 1,200 feet long; 32 feet alongside; deck height, 20½ feet; 121,000 square feet of covered storage; receipt and shipment of general, roll-on/roll-off, LASH/SEABEE, and containerized cargo; owned by Board of Commissioners and operated by Gulf and Southern Terminal Corp.

Harmony Street Wharf: adjacent SW of Seventh Street Wharf; 1,089 feet of berthing space; 32 feet alongside; deck height, 20½ feet; 91,000 square feet

of covered storage, 3 acres of open storage; receipt and shipment of general cargo; owned by Board of Commissioners and operated by T. Smith and Son, Inc.

Louisiana Avenue, Wharves E, F, and G (29°54'58"N., 90°05'18"W.): 1,590 feet of berthing space; 30 feet alongside; deck height, 24 feet; 36,000 square feet covered storage, 6 acres open storage; receipt and shipment of general and containerized cargo; owned by Board of Commissioners and operated by Daiichi Chuo Kisen Kaisha Tokyo.

Milan Street Wharf (29°54'49"N., 90°05'52"W.): 1,270 feet of berthing space; 30 feet alongside; deck height, 24 feet; 80,300 square feet covered storage; receipt and shipment of general and heavy-lift cargoes; owned by Board of Commissioners and operated by Delta Steamship Lines, Inc.

Napoleon Avenue Open Wharf (29°54'45"N., 90°06'04"W.): 375-foot face; 665 feet with dolphins; 30 feet alongside; deck height, 24 feet; 75,500 square feet open storage; receipt and shipment of general and containerized cargo, heavy items, and bulk and packaged soybean oil; owned by Board of Commissioners and operated by Delta Steamship Lines, Inc.

Napoleon Avenue Wharf C: adjacent W of Open Wharf; 1,000-foot face; 30 feet alongside; deck height, 24 feet; 150,000 square feet of covered storage; warehouse building, vacuum fumigation plant, lumber drying kiln; open storage area and other facilities of Foreign Trade Zone No. 2 located in rear of transit shed; receipt and shipment of general cargo; owned by Board of Commissioners and operated by Delta Steamship Lines, Inc.

Napoleon Avenue Wharves B and A: adjacent W of Wharf C; 775 and 1,101 feet of berthing space; 30 to 35 feet alongside; deck height, 24 feet; 164,000 square feet of covered storage, 7 acres open storage; receipt and shipment of general and containerized cargo, receipt of steel products; owned by Board of Commissioners and operated by Board of Commissioners and Strachan Shipping Co.

Public Grain Elevator of New Orleans Terminal: adjacent W of Napoleon Avenue Wharf A; 1,863 feet of ship berthing space, 35 feet alongside; 778 feet of barge berthing space, 20 feet alongside; deck height, 24 feet; grain elevator has a capacity of over 7 million bushels; thirty-two 18-inch loading spouts having a combined vessel loading rate of 80,000 bushels per hour; three marine legs serving electric belt-conveyor system having a barge unloading rate, for each marine leg, of 30,000 bushels per hour; receipt of grain, meal, and pellets by barge; shipment of grain, meals, and pellets by vessel and barge; owned by Board of Commissioners and operated by Public Grain Elevator of New Orleans, Inc.

Nashville Avenue Wharf (29°54'48"N., 90°07'30"W.): 2,759 feet of berthing space; 35 feet alongside; deck height, 22 feet; 567,000 square feet of covered storage, 3½ acres open storage; receipt and shipment of general and containerized cargo and heavy-lift items; owned by Board of Commissioners and operated by Lykes Brothers Steamship Co., Inc., and J. Young and Co., Inc.

Henry Clay Avenue Wharf: adjacent W of Nashville Avenue Wharf; 842 feet of berthing space; 35 feet alongside; deck height, 22 feet; 63,000 square feet of covered storage, about 5 acres open storage; receipt and shipment of general and containerized cargo and heavy items; owned by Board of Commissioners and operated by Lykes Brothers Steamship Co., Inc.

Facilities on S side of river from Algiers Alternate Route W to Avondale:

Perry Street Wharf (29°56'02"N., 90°03'19"W.): 1,100 feet of berthing space with dolphins; 50 feet alongside; deck height, 24½ feet; 120,000 square feet of covered storage; receipt and shipment of general and containerized cargo, mooring LASH and SEABEE vessels; owned by Board of Commissioners and operated by TTT Stevedores of Louisiana, Inc.

Southern Pacific Transportation Co. Molasses Wharf (29°55'21"N., 90°03'43"W.): 500 feet of berthing space; 28 to 29 feet alongside; deck height, 20 feet; pipelines lead from wharf to molasses storage tanks in rear; receipt and shipment of molasses; owned by Southern Pacific Transportation Co., and operated by various molasses companies.

Publicker Chemical Corp. Wharf (29°55'15"N., 90°03'49"W.): 87-foot face, 180 feet with dolphins; 30 feet alongside; deck height, 20 feet; pipelines lead from wharf to alcohol storage tanks in rear; receipt and shipment of alcohol; owned and operated by Publicker Chemical Corp.

BP North America Trading Wharf (29°54'59"N., 90°04'15"W.): 900 feet of berthing space with platforms; 45 to 55 feet alongside; deck height, 3 feet; receipt and shipment of petroleum products; bunkering vessels; owned and operated by BP North America Trading Inc.

Delta Commodities Terminal, Wharf No. 3 (29°54'39"N., 90°05'15"W.): 270 feet of berthing space with dolphins; 38 feet alongside; deck height, 24 feet; receipt and shipment of miscellaneous bulk liquids; owned and operated by Delta Commodities, Inc.

Delta Commodities Terminal, Wharf No. 2 (29°54'37"N., 90°05'21"W.): 450 feet of berthing space with dolphins; 38 feet alongside; deck height, 24 feet; pipelines lead from wharf to storage tanks; receipt and shipment of miscellaneous bulk liquids; owned and operated by Delta Commodities, Inc.

Delta Commodities Terminal, Wharf No. 1 (29°54'36"N., 90°05'27"W.): 370 feet of berthing space with dolphins; 32 feet alongside; deck height, 20 feet; pipelines lead from wharf to storage tanks in rear; receipt and shipment of bulk liquids including methanol and petrochemicals; owned and operated by Delta Commodities, Inc.

Texaco Wharf (29°54'22"N., 90°06'08"W.): 746 feet of berthing space with dolphins; 34 feet alongside; deck height, 18 feet; receipt and shipment of petroleum products; loading midstream fueling barges and barges for bunkering vessels at berth, fueling tugs; owned and operated by Texaco, Inc.

Amerada Hess Corp., No. 1 Wharf (29°54'20"N., 90°06'18"W.): 320 feet of berthing space with dol-

phins; 40 feet alongside; receipt and shipment of petroleum products by barge; bunkering vessels and loading barges for bunkering vessels at berth; owned and operated by Amerada Hess Corp.

Gold Bond Building Products Wharf (29°55'15"N., 90°08'31"W.): 700 feet of berthing space with dolphins; 29 feet alongside; deck height, 23 feet; open storage area for 75,000 tons of gypsum rock; self-unloading vessels discharge into a hopper serving a covered 36-inch, electric, belt-conveyor system with unloading rate of 800 tons per hour; receipt of gypsum rock; receipt and shipment of bulk liquids; owned by Gold Bond Building Products and operated by Gold Bond Building Products and Paktank Louisiana, Inc.

Continental Grain Co. Westwego Elevator Wharf (29°56'18"N., 90°08'32"W.): 1,800-foot face; 40 feet alongside; deck height, 22 feet; 3¼-million-bushel grain elevator; six vessel-loading spouts can load two vessels at about 100,000 bushels per hour each; receipt and shipment of grain; owned by Board of Commissioners and operated by Continental Grain Co.

International-Matex Tank Terminals, Docks No. 2 and No. 1 (29°55.3'N., 90°12.0'W.)(chart 11370): 250 feet of berthing space with dolphins at Dock No. 2; 300 feet of berthing space with dolphins at Dock No. 1; 40 feet alongside each dock; deck heights, 6 feet at Dock No. 2 and 7 feet at Dock No. 1; receipt and shipment of petroleum products, liquid chemicals and petrochemicals, lard, and vegetable, fish, and tung oils; owned and operated by International-Matex Tank Terminals, Ltd.

Point Landing Fuel Corp. Wharf (29°55.3'N., 90°12.1'W.) (chart 11370): 215 feet of berthing space with dolphins; 60 feet alongside; deck height, 8 feet; receipt and shipment of petroleum products, fueling various types of vessels; mooring mid-stream fueling barge; owned and operated by Point Landing Fuel Corp.

Foreign-Trade Zone No. 2 is in New Orleans. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.-An unlimited supply of purified river water is available at nearly all piers and wharves. This water, while excellent for drinking purposes, contains a small percentage of sulfate which causes some scale when used in stationary boilers. Several concerns furnish bunker oil from tank barges to vessels alongside the wharves. The bunkering capacity ranges from 1,000 to 3,500 barrels per hour. Bunker C and diesel oil can be obtained at a number of oil terminals on both sides of the river. Marine supplies of all kinds are obtainable, and ice and provisions are plentiful.

Repairs.-New Orleans has numerous commercial plants which can handle vessels for underwater repairs. Most plants have equipment at wharves for making repairs above the waterline, or portable equipment for working on vessels anywhere in the harbor. The largest floating drydock, on the E side of the river about 1.3 miles above Huey P. Long Bridge, has a capacity of 81,000 tons, a length of 900 feet over the keel blocks, and a maximum clear width of 220 feet. It can lift vessels up to 906 feet long. Also available are numerous other floating drydocks, small graving docks, and marine railways. The largest marine railway, at Braithwaite, about 70.1 miles (AHP), has a capacity of 2,000 tons and can handle vessels up to 300 feet long. Marine repair plants are operated in connection with drydocks, the larger plants having well-equipped shops and other facilities necessary for complete repairs to wooden or steel vessels. A large shipbuilding plant at Avondale builds all types of vessels up to 900 feet long.

Salvage facilities.-Practically any equipment necessary for heavy salvage work at sea or in port is procurable at New Orleans. This includes floating derricks, dredges, barges, pumps, deep-sea divers and diving equipment, and ground tackle.

Communications.-New Orleans is the terminus for six trunkline railroads including the Illinois Central Gulf Railroad, the Seaboard System Railroad, the Missouri Pacific Railroad, the Southern Railway System, Southern Pacific Lines, and Kansas City Southern Lines. The New Orleans Public Belt Railroad is a city-owned switching railroad that expedites the handling of rail freight in the port. About 100 steamship lines operate on regular schedules out of the port. Coastwise service and intracoastal service reaches all important Gulf, Atlantic, and Pacific coast ports, and foreign service includes all world ports, particularly West Indian, Caribbean, the Panama Canal, Central and South American, European, West, South, and East African, and Far Eastern ports.

Inland barge lines operate on the Mississippi River and its tributaries as far as Minneapolis and St. Paul on the Mississippi, and Chicago on the Illinois River, Kansas City on the Missouri River, and Pittsburgh on the Ohio River. There is also barge-line service to Mobile and to Port Birmingham, the port for Birmingham, Ala., on Black Warrior River. The barge-line terminals are on the Inner Harbor Navigation Canal, just above the locks and on both banks of the river above and below the city. There are inside freight routes on the Intracoastal Waterway out of New Orleans E to Mobile, Pensacola, Panama City, and Apalachicola, and W to New Iberia, Port Arthur, Galveston, Houston, Texas City, Port Lavaca, Corpus Christi, Port Mansfield, and Brownsville.

New Orleans International Airport (Moisant Field) about 11 miles NW of the center of the city is served by several airlines, which offer scheduled service to all parts of the country and overseas destinations. New Orleans Lakefront Airport is on Lake Pontchartrain on the E side of the N end of the Inner Harbor Navigation Canal. Alvin Callender Field is a naval reserve training facility on the S side of the river E of Algiers.

Paved highways give access to all terminals and wharves in the port and lead in all directions along the Gulf coast and to the interior.

Radio and radiotelephone service is available through the New Orleans Marine Operator.

Small-craft facilities.-Most small-craft facilities

are on the canals inside the locks from the river, at Chef Menteur, or at the Municipal Yacht Basin and Orleans Marina at the yacht harbor, about 4 miles W of the Inner Harbor Navigation Canal, on Lake Pontchartrain. Covered and open berths with electricity for over 800 craft up to 100 feet long are available at the yacht harbor. Two yacht clubs, several boatyards, and service wharves in the yacht harbor have gasoline, diesel fuel, water, ice, provisions, marine supplies, and ramps. Marine lifts and cranes can lift out craft to 35 tons for hull and engine repairs, or dry open or covered storage. Electronic repairs can be made. Fuel, water, and supplies are also available on the Inner Harbor Navigation Canal, Harvey Canal, and on the Algiers Alternate Route of the Intracoastal Waterway.

Charts 11369, 11352, 11370, 11354.-Above New Orleans, the Mississippi River is used by oceangoing vessels to Baton Rouge, 117 miles above Canal Street.

COLREGS Demarcation Lines.-Pilot rules for Western Rivers are used in the Mississippi River and its tributaries above the Huey P. Long Bridge. (See 80.820, chapter 2.)

Channels.-The river channel between New Orleans and Baton Rouge is for the most part deep and clear. However, at low river stages, there are sections of the river that have been improved by dredging to accommodate deep-draft vessels. These sections called crossings number 11 in all and are at Fairview, 18.2 miles; Belmont, Lower 49.4 miles, Upper 50.7 miles; Smoke Bend, 68.7 miles; Philadelphia, 76.4 miles; Alhambra, 82.5 miles; Bayou Goula, 88.6 miles; Granada, 94.7 miles; Medora, 101.6 miles; Red Eye, 112 miles; and Baton Rouge, 117.7 miles, respectively, above Canal Street, New Orleans. Federal project depth for the crossings is 40 feet. In 1980, the U.S. Army Corps of Engineers reported that the Upper and Lower Belmont crossings are maintained yearly, on an alternating basis, according to the flow of the river currents. Deep-draft vessels are advised to contact the New Orleans District Office, Corps of Engineers, for the preferred Belmont crossing and for the latest controlling depths of all the crossings; the office is at the foot of Prytania Street, New Orleans; telephone (504-865-1121). Lighted ranges mark the centerline of the channel at the crossings. In some cases the channel edges are marked by lighted and unlighted buoys which are maintained only at low river stages.

Buoys are also maintained at low river stages at Bonnet Carre Point Bend, Caliborne Island Bend, Plaquemine Bend, Manhac Bend, and Missouri Bend. Both river banks are marked by lights at critical places on the river and at the bends.

Bulletin boards showing the river stage above normal low river are maintained at New Orleans on the Corps of Engineers Wharf-6.6 miles, at College Point-54.1 miles, and on the W bank at the entrance to Port Allen Lock-115.8 miles, respectively, above Canal Street, New Orleans.

River gages are maintained at Bonnet Carre-30 miles, Reserve-37.8 miles, College Point-54.1 miles, Donaldsonville-69.8 miles, and Port Allen Lock-115.8 miles, respectively, above Canal Street, New Orleans.

Anchorages.-There are numerous designated anchorages on both sides of the river between New Orleans and Baton Rouge. Temporary anchorages may be prescribed by the Commander, Eighth Coast Guard District and published in the Local Notice to Mariners. (See 110.1 and 110.195, chapter 2, for anchorage limits and regulations.)

Dangers.-Logs and other floating debris are likely to be encountered in the river at all times. Operators of small craft are advised to maintain a sharp lookout. Night travel by small craft is not recommended because of the hazard of floating obstructions.

Ferries.-Vehicular ferries cross the river at Destrehan-22.3 miles, at Reserve-37.5 miles, at Lutcher-45.7 miles, at White Castle-83.8 miles, and at Plaquemine-97.4 miles, respectively, above Canal Street. A passenger ferry crosses the river at Norco-27.1 miles above Canal Street.

Bridges.-High-level highway bridges with a minimum clearance of 133 feet cross the river above New Orleans at Union-63 miles, and at Baton Rouge-116.6 miles, respectively, above Canal Street.

In 1974, a fixed highway bridge with design clearances of 133 feet for the center 1,200-foot span and 117 feet for the 460-foot span was under construction across the Mississippi River between Destrehan and Luling about 23.4 miles above Canal Street.

In 1981, a fixed highway bridge with a design clearance of 139 feet was under construction across the river, 44.5 miles (ACS).

Cables.-Overhead power cables with a minimum clearance of 149 feet cross the river at Ninemile Point-7.6 miles, one mile above the Huey P. Long Bridge at Bridge City-10.7 miles,, at Montz-29.3 miles at Point Pleasant-92.3 miles, at Lukeville-112.2 miles, and at Baton Rouge-119.7 miles, respectively, above Canal Street.

Pilotage.-Pilots to destinations above New Orleans are obtainable at New Orleans. (See information on pilotage at the beginning of this chapter.)

Towage.-Tugs are available at Gramercy, Burnsides, and Baton Rouge to assist vessels in docking and undocking.

Facilities on the Mississippi River above New Orleans to Baton Rouge.-Private and public terminals for handling oil and other products are on both sides of the river; most places have only bankside landings. **All mileage referred to on the upper river is in nautical miles above Canal Street (ACS).** Canal Street is 82.4 miles above Head of Passes (AHP).

At **Avondale** on the S side of the river 11.2 miles (ACS) are the ways and fitting out wharves of a large shipyard that is equipped to build, convert, or repair vessels up to 900 feet long. The yard has machine and fabricating shops, thermite welding facilities, and can turn out shafts and steel forgings

up to 20,000 pounds. The yard has a floating drydock that can accommodate vessels up to 81,000 tons displacement, 220-foot beam, and 35-foot draft. The yard has a marine railway that can handle vessels up to 300 feet. The yard has barges and facilities for gas freeing and tank cleaning.

On the S side of the river 11.9 miles (ACS), a wharf is operated by an oil-handling facility, and 11.4 miles (ACS) two wharves and storage facilities are operated by a tank terminal company. (See Wharves under Port of New Orleans for descriptions.)

Harahan is on the N side of the river at 12.2 miles (ACS).

At **Fortier,** on the S side of the river 17.2 miles (ACS), a chemical plant and barge wharf are operated by the American Cyanamid Co.

At **Ama,** on the S side of the river 19.9 miles (ACS), Farmers Export Co. operates a 5-million-bushel grain elevator with a wharf having berthing space for 1,000-foot vessels, 50 feet reported alongside, and a deck height of 28 feet. Four vessel-loading spouts have a combined rate of 60,000 bushels per hour, and a marine leg has an unloading rate of 37,500 bushels per hour.

St. Rose, on the N side of the river 20.4 miles (ACS), has a bulk liquids terminal and is operated by International-Matex Tank Terminals, Ltd. The terminal has 2,540 feet of berthing space with depths of 45 to 55 feet reported alongside.

E of **Luling,** on the S side of the river 21.9 miles (ACS), a large chemical plant and three barge wharves are operated by the Monsanto Co. A conveyor system is at the upper wharf for loading bulk material.

Destrehan, on the N side of the river opposite Luling, is the site of two large grain elevators. The Bunge Corp. grain elevator, 22.0 miles (ACS), has berthing space for 1,000-foot vessels with 42 feet reported alongside. The facility, with a storage capacity of 8½ million bushels, can load vessels at a rate of 120,000 bushels per hour. The St. Charles grain elevator, 22.4 miles (ACS), has berthing space for 1,000-foot vessels with 40 feet reported alongside. The facility has storage for 5 million bushels of grain and can load vessels at a rate of 60,000 bushels per hour. A vehicular ferry crosses the river between Luling and Destrehan.

In 1974, a fixed highway bridge with design clearances of 133 feet for the center 1,200-foot span and 117 feet for the 460-foot span was under construction across the Mississippi River between Destrehan and Luling about 23.4 miles (ACS).

On the W side about a mile below the tank at **Hahnville,** there is a prominent brick courthouse with clock tower. A shipyard at Hahnville has marine railways that can handle barges up to 340 feet for general repairs.

Good Hope, on the E side of the river 26.5 miles (ACS), is the site of a large oil storage area. GATX Terminals Corp. operates four wharves for the receipt and shipment of crude oil, petroleum products, and vegetable oil. Each of the wharves has 380 feet of berthing space with dolphins, with the lower three allowing for berthing of 1,000-foot vessels, and depths of 45 to 50 feet reported alongside.

At **Norco,** on the N side of the river 27.1 miles (ACS), an oil-transfer wharf is operated by the Shell Oil Co. The wharf has berthing space for 900-foot vessels with 45 to 90 feet reported alongside. Barges can berth at the rear of the upper face. About 1 mile above the oil wharf, the large Shell Oil chemical plant has a barge wharf.

The **Bonnet Carre Floodway** is on the N side of the river 28.7 miles (ACS). When the spillway is in operation due to high stages of the river, all vessels and particularly heavily loaded tows passing the site are directed to steer a course sufficiently close to the S bank to avoid possible crosscurrents or draw resulting from water being diverted through the spillway and flowing toward and into Lake Pontchartrain.

Taft, on the S side of the river about 28 miles (ACS), is the site of the Union Carbide Corp. petroleum products and petrochemical wharf. The wharf has berthing space for 700-foot vessels and 50 feet reported alongside.

On the S side of the river 29.4 miles (ACS), Beker Industries Corp. receives phosphate rock and ammonia and ships diammonium phosphate and phosphoric acid from a wharf that has berthing space for 700-foot vessels and 50 feet reported alongside. Close W, Hooker Chemicals & Plastics Corp. receives ammonia and ships caustic soda from a wharf that has berthing space for 750-foot vessels and 50 feet reported alongside.

Two overhead power cables about 0.5 mile apart cross the river just below Montz about 29.6 miles (ACS). The minimum clearance of the cables is 160 feet.

On the E side of the river 32.6 miles (ACS), Bayou Steel Corp. receives scrap metal and ships steel products from a wharf that has berthing space for 600-foot vessels and depths of 40 feet reported alongside. A 16-ton crane is available.

Laplace, on the N side of the river 34 miles (ACS), is a truck-farming center and prosperous sugar section. About 1.3 miles above Laplace on the N side at 35.3 miles (ACS) is the large DuPont refinery and chemical plant. A 321-foot barge wharf at the plant has pipelines for handling caustic soda and fuel oil. The cracking towers and tanks at the refinery and chemical plant are prominent.

Edgard, on the S side of the river about 37.4 miles (ACS), has a large brick church with twin towers and a tank, and about 0.7 mile W is a large sugarmill with a tall white stack.

Reserve, 38 Miles (ACS), has a large sugar refinery with two tall stacks, and a grain elevator. The town is the trading center and shipping point for a very productive sugarcane region. A wharf operated by Godchaux-Henderson Sugar Co., Inc., has 769 feet of berthing space with dolphins and 45 feet reported alongside. Two gantry unloaders can unload sugar from vessels at a rate of 340 tons per

hour. A ferry crosses the river from Reserve to Edgard.

A fireboat is moored adjacent to the ferry landing at Reserve. The fireboat is on call 24 hours and can be contacted on VHF-FM channels 16 (156.80 MHz) or 67 (156.375 MHz).

Several wharves are on the N side of the river from 38.6 miles (ACS) to 39.4 miles (ACS). At the lower end, LaPlace Elevator Co. operates a 4-million-bushel grain elevator with a wharf providing 800 feet of berthing space with dolphins and 50 feet reported alongside. Three vessel-loading spouts operate at a rate of 35,000 bushels per hour, and a marine leg can discharge barges at the rear of the wharf face at 40,000 bushels per hour. Close W, Cargill, Inc., receives and ships grain from a wharf that provides 1,485 feet of berthing space with dolphins and 39 feet reported alongside. The grain elevator has a capacity of 5½ million bushels. Four vessel-loading spouts have a maximum rate of 100,000 bushels per hour, and a bucket elevator can discharge vessels at 120,000 bushels per hour. Cargill, Inc., also receives and ships molasses, vegetable oils, and tallow from a wharf that has 486 feet of berthing space with dolphins and 48 feet reported alongside. At the upper end of this stretch, Marathon Oil Co. operates two wharves for the receipt and shipment of crude oil, asphalt, and petroleum products. Each wharf has berthing space for 1,000-foot vessels and 65 feet reported alongside.

A tank is prominent in **Garyville,** 42.4 miles (ACS).

In 1981, a fixed highway bridge with a design clearance of 139 feet was under construction across the river, 44.5 miles (ACS).

Gramercy, 45 miles (ACS), has a large aluminum reduction and chemical plant and a sugar refinery. An ore-handling wharf at the Kaiser Aluminum and Chemical Corp. plant has 875 feet of ship berthing space with 40 feet reported alongside. Bulk bauxite and fluorspar ore can be unloaded at a rate of 1,000 tons per hour. Colonial Sugars, Inc. ships packaged refined sugar from a wharf that has 498 feet of berthing space with dolphins and 30 feet reported alongside, and raw sugar is received at a wharf that has berthing space for 800-foot vessels and 45 feet reported alongside. The unloading gantries on the ore wharf, a tall stack at the mill, and two tanks are prominent.

Gramercy is a **customs port of entry.**

Lutcher, 46 miles (ACS), has a lumber mill and a factory for processing perique tobacco. A vehicular ferry crosses the river from Lutcher to Cresent Landing.

Vacherie, on the S side of the river 48 miles (ACS), has a sugarmill with four stacks and a water tank.

At **Remy,** on the N side of the river about 48.5 miles (ACS), Peavey Co. receives and ships grain from a wharf that has berthing space for 900-foot vessels and 45 feet reported alongside. A vessel-loading spout has a rate of 55,000 bushels per hour, and a marine leg can discharge vessels at 60,000 bushels per hour.

College Point, 53.2 miles (ACS), is the site of Jefferson College. A bulletin board and a river gage are at 54.1 miles (ACS) on the E side. A large sugarmill with a tall stack is across the river.

Several crude oil wharves are on the W side of the river from 55 miles (ACS) to 57.2 miles (ACS). At the lower end, Dravo Utilities Constructors, Inc., receives crude oil at two wharves each having berthing space for 875-foot vessels and 50 feet reported alongside. Shell Pipe Line Corp. operates four ship wharves for the receipt of crude oil in this stretch. The two largest, close N of Dravo Utilities Constructors wharves, have berthing space for 1,000-foot vessels with depths of 42 feet reported alongside. About 56.5 miles (ACS), Matador Pipelines, Inc., and LaJet, Inc. receive and ship crude oil at two wharves. The upper wharf has berthing space for 850-foot vessels and 35 feet reported alongside. At the upper end of this stretch, LaJet, Inc. receives and ships crude oil from a wharf with berthing space for 825-foot vessels and 46 feet reported alongside.

At **Uncle Sam,** on the E side 57.0 miles (ACS), a wharf for handling bulk and liquid cargo is operated by the Freeport Chemical Co. The wharf has 625 feet of berthing space with 40 feet reported alongside.

At **Romeville,** on the E side of the river 57.9 miles (ACS), Convent Chemical Corp. receives and ships chlorine and ships caustic soda from a wharf that has 795 feet of berthing space with dolphins and 40 feet reported alongside.

At **Central,** on the N side of the river 59.9 miles (ACS), Zen-Noh Grain Corp. receives and ships grain from a wharf that has 1,200 feet of berthing space with dolphins and 50 feet reported alongside. Four vessel-loading spouts have a rate of 80,000 to 120,000 bushels per hour, and a marine leg can discharge barges at 100,000 bushels per hour.

At **Salsburg,** on the W side of the river 62.7 miles (ACS), Agrico Chemical Co. receives phosphate rock, liquid sulfur, and ammonia and ships phosphates, urea, and ammonia from a wharf that has berthing space for 800-foot vessels and 40 feet reported alongside. A gantry shiploader can load vessels at 1,000 tons per hour.

Sunshine Bridge, a fixed cantilever bridge with a clearance of 133 feet crosses the river just below Union about 63 miles (ACS). The lower limit of the Port of Baton Rouge is about 0.7 mile above the bridge. Texaco U.S.A. has a refinery and two wharves on the E side of the river 63.7 miles (ACS). The upper wharf has berthing space for 900-foot vessels and 40 feet reported alongside.

Burnside, on the E side of the river 65 miles (ACS), has a bulk-handling terminal owned by the Greater Baton Rouge Port Commission and operated by International Terminal Operating Co. of Louisiana, Inc., and a liquid chemical-handling barge wharf operated by E. I. dupont de Nemours and Co. The bulk-handling terminal's main deepwater wharf has 858 feet of ship berthing space with 40

feet reported alongside. A 190-foot barge wharf, just N of the ship wharf, has 2,575 feet of berthing space with dolphins with 12 feet reported alongside. The ship wharf has two unloader gantries, each with a capacity of 1,000 tons per hour, and a vessel-barge loader with a capacity of 1,500 tons per hour. Loading spouts at the barge wharf have a capacity of 1,500 tons per hour. Bulk material handled at the terminal include bauxite, alumina, raw sugar, coal, phosphate, iron ore, manganese and chrome ores, zinc, salt, and coke. Liquid caustic soda is transferred by pipeline from barges to storage tanks at rear of ship wharf. A tug is available for docking and undocking vessels.

A cement dock, owned and operated by River Cement Co., is just N of the barge wharf at Burnside. The cement dock has 370 feet of berthing space with dolphins, a reported depth of 25 feet alongside, and a deck height of 29 feet. Bulk cement is transferred by two 10-inch pneumatic pipelines from the dock to three silos having a total capacity of 10,000 tons. The unloading rate is 250 tons per hour.

Donaldsonville, on the S side of the river 70 miles (ACS), is a town at the former junction of the river and Bayou Lafourche. A river gage is at Donaldsonville. Three chemical wharves are at Donaldsonville. The first, operated by Triad Chemical 68.4 miles (ACS), has 650 feet of berthing space with dolphins and reported depths of 40 to 50 feet alongside. The wharf is used for receipt and shipment of liquid ammonia, and shipment of dry bulk urea. Conveyor and pipelines extend from wharf to storage facilities. CF Industries Ship Dock, 68.5 miles (ACS), has 720 feet of berthing space with dolphins and a reported depth of 40 feet alongside. The dock is used for shipment of liquid ammonia and dry bulk urea. Conveyor and pipelines extend from wharf to storage facilities. CF Industries Barge Dock, 68.6 miles (ACS), has 843 feet of berthing space with dolphins and a depth of 20 feet alongside. The dock is used for receipt and shipment of ammonia and urea ammonia hydrate, and receipt of fuel oil for plant consumption. Pipelines extend from wharf to storage facilities. A rice mill is in the town. A church with twin spires and a tank are prominent.

Geismar, on the N side of the river 78 miles (ACS), has several chemical plants with wharves for handling liquid chemicals, two petroleum wharves used to receive petroleum products and ship petrochemicals, and one floating offshore wharf used to receive shell and limestone and to ship fertilizer. The floating wharf, operated by Hall-Buck Marine Services Co. 76.6 miles (ACS), has 250 feet of berthing space with a reported depth of 25 feet alongside. The floating wharf has a revolving crane with clamshell bucket and conveyor belt equipment. The petroleum wharf, operated by the Shell Chemical Co. 76.8 miles (ACS), has 940 feet of berthing space at the face with dolphins with 38 feet reported alongside and 450 feet of berthing space at rear of face with 34 feet reported alongside. Pipelines at the wharf lead to storage tanks. The Wyandotte Chemical Corp. Wharf, 77.4 miles (ACS), has 615 feet of berthing space with dolphins with 50 feet reported alongside. The Borden Chemical Wharf, 78.3 miles (ACS), has 350 feet of berthing space with dolphins and a reported depth of 20 feet alongside. Pipelines lead from the wharf to storage tanks in the rear. Liquid anhydrous ammonia and methanol are shipped. The petroleum barge wharf, operated by the Mobil Oil Co. 79.2 miles (ACS), has a 225-foot face with 80 feet reported alongside. The wharf has facilities for loading barges with gasoline and liquid propane gas. The Allied Chemical Corp. Wharf, 80.1 miles (ACS), has 1,175 feet of ship berthing space with dolphins at the face with 50 feet reported alongside and 700 feet of barge berthing space at rear of face with 10 to 15 feet reported alongside. Pipelines and bulk material handling equipment at the wharf are used for handling receipts of phosphate, ammonia, sulfuric acid, and liquid sulfur, and for loading shipments of liquid fertilizer, ammonia, sulfuric acid, and petrochemicals. The industrial chemical handling wharf, operated by Cosden Oil and Chemical Co. 80.9 miles (ACS), has 802 feet of berthing space with dolphins with 45 feet reported alongside. Pipelines lead from the wharf to storage tanks at plant in rear.

The **White Castle** ferry crosses the river to **Carville** about 83.7 miles (ACS). The U.S. Public Health Service Leper Colony and hospital are on the N side of the river at Carville.

St. Gabriel, on the E side 92 miles (ACS), has a chemical plant with a large wharf used for receipt of bulk salt and shipment of chlorine and caustic soda and a small floating petroleum wharf used for receipt of crude oil by barge. The chemical wharf, operated by Stauffer Chemical Co. 91.3 miles (ACS), has 1,205 feet of berthing space with dolphins with 35 feet reported alongside.

The Gulf States Utilities Co. is at **Sunshine,** on the N side of the river 92.5 miles (ACS). The plant has a wharf with 1,225 feet of berthing space with dolphins and a reported depth of 39 feet alongside. The wharf is used for receipt of fuel oil for plant consumption. Pipelines lead from wharf to storage tanks of about 2½-million-barrel total capacity. A chemical company wharf on the N side of the river 94.3 miles (ACS), owned and operated by PetroUnited Terminals, Inc., has 960 feet of berthing space with dolphins at the face and a reported depth of 42 feet alongside. The wharf is used for receipt and shipment of chemicals, petroleum products, and petrochemicals; occasional receipt of crude oil. Pipelines lead from wharf to storage tanks in the rear.

Plaquemine, on the W side of the river about 99 miles (ACS), is at the junction of the Mississippi and Bayou Plaquemine. A vehicular ferry crosses the river just below Plaquemine. The town has a foundry, and several sugarmills are in the vicinity. A petrochemical wharf is operated by Hercofina on the W side 95.6 miles (ACS). The wharf has 700 feet of berthing space with dolphins with 60 feet reported alongside. Georgia Pacific Corporation has two

wharves on the W side 96.3 and 96.4 miles (ACS). The downstream wharf has 840 feet of berthing space with dolphins and a depth of 40 feet alongside. The wharf is used for receipt and shipment of petrochemicals and shipment of caustic soda. Pipelines extend from the wharf to storage tanks. The upstream wharf has 400 feet of berthing space at the face. A reported depth of 25 feet is alongside. The wharf is used for receipt of vinyl chloride. A pipeline extends from the wharf to storage tanks. Dow Chemical Co. has a large chemical plant and wharf on the W side about 100 miles (ACS). The wharf has 730 feet of berthing space with dolphins with 35 to 40 feet reported alongside. Pipelines at the wharf lead to bulk liquid storage tanks at the plant. A second wharf, owned and operated by Dow Chemical Co., is on the W side about 110.5 miles (ACS). The wharf has 900 feet of berthing space with dolphins and a reported depth of 40 feet alongside. It is used for receipt and shipment of petroleum products and receipt of naphtha and fuel oil for plant consumption.

An overhead power cable crossing the river at Lukeville, 112.2 miles (ACS), has a clearance of 150 feet.

Chart 11370.–Baton Rouge, the capital of Louisiana on the E side of the river 117 miles above Canal Street, New Orleans, is a river port of considerable importance. The **Port of Baton Rouge** limits extend from Union, 63.7 miles (ACS), to Point Menoir, 139.2 miles (ACS). The Greater Baton Rouge Port Commission owns and controls the public port facilities which include the Bulk Marine Terminal at Burnside, the grain elevator and general cargo terminal on the W side of the river at Port Allen, and the Port of Baton Rouge Terminal at the head of **Baton Rouge Harbor** on the E side of the river about 6.5 miles above Baton Rouge.

The principal industries in the city are petrochemical and petroleum, synthetic rubber, chemical, lumber and wood products, stone, gravel, clay, and cement, steel fabricating, aluminum, food and staples, machinery, and transportation equipment. The principal shipments from the port include wheat, corn, sorghum, soybeans, animal feeds, petroleum products, scrap iron, aluminum, lumber, steel products, rubber, chemicals, and sulphuric acids. The principal receipts are sugar, molasses, coffee, vegetable oil, iron, manganese, chrome and zinc ores, bauxite, phosphate rock, caustic soda, sulfur, sodium hydroxide, alcohol, sulfuric acid, and newsprint.

At **Port Allen,** the N end of the Intracoastal Waterway (Port Allen to Morgan City Alternate Route) connects with the Mississippi River at Port Allen Lock about 115.8 miles (ACS). (See chapter 12.) Baton Rouge is the site of Louisiana State University and is the cultural center of the State.

Prominent features.–The most conspicuous object in the city is the State Capitol Building, a 520-foot white structure that dominates the area. Several tall buildings and the State University and stadium are prominent. The Interstate Route 10 fixed highway bridge, with a clearance of 135 feet at the center and 125 feet elsewhere, crosses the river between Baton Rouge and Port Allen about 116.6 miles (ACS).

Channels.–Federal project depth for the river is 40 feet to 119.5 miles (ACS), about 1.3 miles below the Baton Rouge Railroad and Highway Bridge. This bridge is the limit of deepwater navigation on the river. Federal project depth for the Baton Rouge Harbor is 12 feet for 2.5 miles. The channels are maintained and well marked.

Anchorages.–Anchorages are at Baton Rouge on the W side of the river and in midriver. Temporary anchorages may be prescribed by the Commander, Eighth Coast Guard District and published in the Local Notice to Mariners. (See 110.1 and 110.195, chapter 2, for anchorage limits and regulations.)

Dangers.–Mariners departing Greater Baton Rouge Port Commission Dock No. 2, are advised to use extreme caution when turning vessels downstream. Strong currents associated with high water have caused vessels departing this facility to be set down upon the fender system of the Interstate Route 10 fixed highway bridge causing extensive damages. The New Orleans-Baton Rouge Steamship Pilots report that currents in excess of 7 knots have been observed. Mariners should consider moving vessels well above or below the bridge before turning downstream.

Bridges.–Besides the Interstate Route 10 fixed highway bridge crossing the river between Baton Rouge and Port Allen, the combination Airline Highway (U.S. Route 190) and Kansas City Southern Railroad bridge crosses the river 120.7 miles (ACS), about 4 miles above Baton Rouge. The bridge, known as the Baton Rouge Railroad and Highway Bridge, has a 748-foot fixed span over the channel with a a clearance of 65 feet. Strong river currents and a bend upstream render the bridge susceptible to collision by overburdened downbound tows. Vessel owners and operators should ensure that sufficent horsepower is available for the size of the tow and the river conditions. Special precaution should be taken during high water stages. Mariners are urged to use extreme care when passing the bridge, particularly downbound tows.

Cables.–An overhead power cable, with a clearance of 150 feet, crosses the river about 119.7 miles (ACS).

Tides and currents.–Tidal effects are felt in the river to some extent to 148 miles (ACS), about 31 miles above Baton Rouge. The highest stage of the river ever recorded was 47 feet in 1927. A bulletin board showing the river stage and a river gage are on the W side of the river at the entrance to Port Allen Lock.

Weather.–Located on the E side of the Mississippi River, the area is near the first evident relief N of the deltaic coastal plain. Marsh and swamp terrain stretch S to the Gulf of Mexico. The general climate is humid subtropical, but the city is subject to significant polar influences during winter, as masses of cold air periodically move S across the plains and the Mississippi Valley. The prevailing winds are

from a S direction during much of the year. These breezes help to temper the extremes of summer heat and shorten winter cold spells. They also provide a source of abundant moisture and rainfall. Winds are usually light; 80 percent of the hourly observations during the year are less than 10 knots. Rainfall is plentiful year round, with a slight minimum in September and October. Most is of the showery type, except occasionally during winter, when steady rain is produced by a stalled cold front.

The winter months are normally mild, with cold spells of short duration. The typical pattern is weather turning cold with rain one day, reaching the lowest temperatures after the sky clears on the second day, and warming on the third day. Temperatures fall below freezing on about 26 days annually. This ranges from fewer than 10 days to more than 30 days in individual years.

Summers are warm but maximums rarely exceed 100°F because of the high humidity, cloudiness, and scattered showers and thunderstorms, which are primary features of the weather during these months. Showers and thunderstorms are present in the area on about one-half of the days during June, July, and August. Severe local storms, including hailstorms, tornadoes, and local windstorms have occurred in all seasons, but are most frequent in spring. Large hail of a damaging nature very rarely occurs, and tornadoes in this section of Louisiana are unusual. Since 1900, the centers of five hurricanes have passed close to Baton Rouge, while several other tropical storms and hurricanes have passed close enough to affect the weather. The area can expect 75-knot winds about once every 50 years, on average.

Pilotage is compulsory on the river between Baton Rouge and the Gulf of Mexico. (See Pilotage information at the beginning of this chapter.)

Towage.–Tugs up to 2,400 hp are available at the Port of Baton Rouge to assist during docking.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Baton Rouge is a **customs port of entry.**

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

A general hospital and several private hospitals are in the city.

Harbor regulations.–Federal regulations for the navigation of the Mississippi River are given in 161.402, 162.80, and 207.200, chapter 2. The Greater Baton Rouge Port Commission, consisting of members appointed by the governor of the State, establishes rules and regulations for the Port of Baton Rouge. The Executive Director of the commission is the Port Director who is in charge of the management and operation of the port facilities under control of the commission, and the Superintendent of Operations assigns berths at the various public terminals.

Wharves.–The Port of Baton Rouge has over 70 piers and wharves located on both sides of the Mississippi River and in Baton Rouge Harbor. More than half of these facilities are for barges with depths less than 15 feet alongside. Only the deep-draft facilities and the larger barge facilities are described. For a complete description of the port facilities refer to Port Series No. 21, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information of the latest depths contact port authorities or the private operators. All the facilities described have direct highway and railroad connections. Water and electrical shore power connections are available at most piers and wharves.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Cranes up to 150 tons, warehouses, and open storage facilities are adjacent to the waterfront.

Facilities on the E side of the river:

Exxon Co., U.S.A. Wharf: about 1.5 miles below Baton Rouge Railroad and State Route 190 highway bridge; 2,760-foot face, 40 to 50 feet alongside; 1,250 feet of barge berthing space at rear of face, 12 feet alongside; deck height, 50 feet; a ballast line, a steam line, compressed air lines, high-pressure river water lines, and drain lines are at the wharf; receipt and shipment of petroleum products; shipment of petrochemicals; bunkering tankers berthed at wharf; loading barges for fueling tugs in midstream; operated by Exxon Co., U.S.A.

Formosa Plastics Corp. Wharf: about 0.3 mile below Baton Rouge Railroad and State Route 190 highway bridge; offshore wharf, 770 feet of berthing space with dolphins; 40 feet alongside; deck height, 50 feet; storage tanks with 50,000-ton capacity; receipt of caustic liquor; shipment of caustic and ethylene dichloride liquors; owned and operated by Formosa Plastics Corp., La.

Kaiser Aluminum and Chemical Corp. Lower Wharf: about 400 feet below Baton Rouge Railroad and State Route 190 highway bridge; 829 feet of berthing space with dolphins; 40 feet alongside; deck height, 47 feet; two electric, traveling unloading towers on wharf serve a 54-inch, covered, electric, belt-conveyor system having an unloading rate of 800 tons per hour; one electric, traveling loading tower on wharf served by a 42-inch, covered, electric, belt-conveyor system with a loading rate of 1,000 tons per hour; one 15-ton electric crane on each unloading tower; one 6-inch, steam-traced pipeline extends from wharf to two steel storage tanks; receipt of bauxite by vessel, and shell, hydrogen sulfide, and liquid caustic soda by barge; shipment of alumina and plant equipment by vessel and barge; owned and operated by Kaiser Aluminum and Chemical Corp.

Facilities in Baton Rouge Harbor:

United States Steel Chemical Wharf: E side of Baton Rouge Harbor about 1.5 miles above the entrance; 233 feet of berthing space with dolphins; 17 feet alongside; deck height, 6 feet; receipt of petrochemicals and petroleum products by barge;

owned and operated by United States Steel Chemical.

Greater Baton Rouge Port Commission, Baton Rouge Harbor Barge Terminal Pier: head of Baton Rouge Harbor, about 2.1 miles above entrance; 90-foot face, 399-foot E side, 430-foot W side; 12 feet alongside; deck height, 47 feet at face and on E side, 50 feet on W side; mobile cranes up to 90 tons; about 10 acres of open storage area available on pier approach and in rear; receipt and shipment of general cargo by barge; owned and operated by Greater Baton Rouge Port Commission and Agway Systems, Inc.

Facilities on W side of river at Port Allen:

Placid Refining Co. Tanker Wharf: about 2.0 miles above Interstate Route 10 fixed highway bridge; 900 feet of berthing space with dolphins; 50 feet alongside; receipt and shipment of petroleum products and petrochemicals, receipt of crude oil; pipelines lead from wharf to storage facility with capacity of over 2 million barrels.

Greater Baton Rouge Port Commission Fuel Dock: about 0.2 mile above Interstate Route 10 fixed highway bridge; floating offshore wharf; 265 feet of berthing space with dolphins; 50 feet alongside; receipt and shipment of petroleum products; pipelines lead from wharf to storage facilities with capacity of over 1¼ million barrels. Owned by Greater Baton Rouge Port Commission, and operated by Petroleum Fuel and Terminals Co.

Greater Baton Rouge Port Commission, Dock No. 2: about 400 feet above Interstate Route 10 highway bridge; marginal wharf, 931-foot face; 50 feet alongside; deck height, 50 feet; 84,000 square feet of covered storage; receipt and shipment of general cargo; owned and operated by Greater Baton Rouge Port Commission.

Greater Baton Rouge Port Commission, Dock No. 1: adjacent to lower side of Interstate Route 10 highway bridge; marginal wharf, 1,358-foot face; 50 feet alongside; 400 feet of barge berthing space at rear of face on lower end; deck height, 50 feet; 110,000 square feet of covered storage; commodity warehouse in rear of wharf with 42,000 square feet of storage space; 30-ton portable gantry crane; portable bagging machine in transit shed; pipelines extend from wharf to molasses storage tanks having a capacity of 11-million gallons; receipt and shipment of general cargo; shipment of scrap metal; receipt and shipment of molasses; owned by Greater Baton Rouge Port Commission and operated by Greater Baton Rouge Port Commission and Manard Molasses Corp.

Greater Baton Rouge Port Commission, Grain Wharf: about 0.3 mile below Interstate Route 10 highway bridge; 510 feet of berthing space with dolphins at face and same at rear of face; 40 feet alongside; deck height, 115 feet; five vessel-loading spouts along face having a combined loading rate of 60,000 bushels per hour; two marine legs at rear of face having a combined unloading rate of 30,000 bushels per hour; grain elevators having a storage capacity of over 7½ million bushels; receipt of grain by barge; shipment of grain by vessel; owned by Greater Baton Rouge Port Commission, and operated by Cargill, Inc.

Supplies.–Gasoline, diesel fuel, provisions, and marine supplies are available. Vessels can receive bunker fuel from tank barges while alongside the wharves or at the Exxon Co. U.S.A. Wharf, about 1.5 miles below the Baton Rouge Railroad and State Route 190 highway bridge. Water is piped to many of the wharves.

Repairs.–Baton Rouge has no facilities for making major repairs or for drydocking large, deep-draft vessels; the nearest facilities are at New Orleans. Several above-the-waterline repair wharves are equipped to make repairs to tugs, fishing boats, barges, and other small vessels. Above-the-waterline hull and engine repairs can be made. Cargo hold cleaning, gas freeing, and tank cleaning facilities are available in the port.

A shipyard on the Port Allen Canal, about 8 miles above its junction with the Mississippi River, has two floating drydocks; the largest drydock can handle vessels up to 2,500 tons.

Small-craft facilities are limited to temporary berthage at some of the barge docks and floating docks along the river bank.

Communications.–The port is served by the numerous steamship lines to all domestic and overseas ports of the Caribbean, West Indies, Central and South America, Europe, Africa, and the Far East. Three main line railroads offer direct service to the port and a fourth by reciprocal switching. The Illinois Central, the Kansas City Southern, Missouri Pacific, and the Texas and Pacific Railroads serve the area. Numerous truck lines serve the port. Local and interstate bus service is available. Several airlines offer service at the Ryan Airport about 5 miles N of the city.

In 1978, depths of 9 feet were being maintained between Baton Rouge and the junction with the Illinois River at Grafton, Ill., about 937 miles (ACS). Greater depths are available during high river stages. Limiting clearances between Baton Rouge and Grafton are: fixed bridges, 50 feet above extreme (record) high water; swing bridge at Alton, Ill., 36 feet above normal pool level closed, 96 feet above normal pool level open; overhead cables, 62 feet above extreme (record) high water; locks, 600 feet long, 110 feet wide.

The Illinois Waterway from Grafton to Chicago is described in United States Coast Pilot 6, Great Lakes, Lakes Ontario, Erie, Huron, Michigan, and Superior and St. Lawrence River.

Navigation maps of the Mississippi River and its tributaries are published by the Corps of Engineers. (See appendix.)

Chart 11354.–Old River, about 64 miles above Baton Rouge and 181 miles above Canal Street, New Orleans, is a 6-mile-long stream that formerly connected the Mississippi River with the Red and Atchafalaya Rivers. In 1963, a dam was constructed about a mile from its E entrance to prevent the

Mississippi from flowing uncontrolled into the Atchafalaya Basin. An outflow channel with a control structure was built on the W side of the Mississippi about 9.5 miles upriver to regulate and control the flow into the Red River.

Caution: The outflow channel is not a navigation channel. A flashing amber light on the S point of the channel indicates that the control structure is in operation. Very dangerous currents exist in the area, especially during the high water season. When in the vicinity of the structure, mariners are advised to steer as close to the E bank as safety permits to avoid dangerous crosscurrents and being drawn into the structure.

The Old River control structure is within a **safety zone.** (See 165.1 through 165.7, 165.20 through 165.25, and 165.802, chapter 2, for limits and regulations.)

Old River Navigation Canal and Lock was built to bypass the dam and permit navigation between the three rivers. The Federal project provides for a dredged channel 12 feet deep and about 2 miles long from the Mississippi to Old River about 1.4 miles W of the dam, thence 12 feet to the junction at Barbre Landing with the Red and Atchafalaya Rivers at A.R. Mile 0.0. The lock is 1,200 feet long (1,190 feet usable), 75 feet wide, and 11 feet over the sill. Red and green combination traffic lights and daybeacons are at each end of the lock. The lockmaster monitors VHF-FM channels 12 (156.60 MHz) and 14 (156.70 MHz). State Route 15 highway vertical lift bridge over the lock has a clearance of zero feet down and 53 feet up.

Atchafalaya River flows S into the Gulf of Mexico from its confluence with Red and Old Rivers. The 101.5-mile section, the confluence to Morgan City, has a Federal project depth of 12 feet. In 1982, the deepest draft carried on the river was 12 feet, and with average drafts between 9 and 11 feet. There is considerable commerce on the river in shell, logs, sand and gravel, petroleum products, liquid sulfur, alcohol, industrial chemicals, fertilizer, sugar, and molasses.

The minimum clearance of the overhead power cables and pipelines is 51 feet. The minimum clearance of the drawbridges crossing the river is 3 feet. The minimum clearance of the fixed highway bridges is 40 feet.

9. MISSISSIPPI RIVER TO SABINE PASS

This chapter describes the coast of Louisiana from the delta of the Mississippi River to Sabine Pass, Tex. Also discussed are Barataria, Timbalier, Terrebonne, Atchafalaya, East and West Cote Blanche, and Vermilion Bays, and the interconnecting rivers and bayous which form a network of waterways in this section of Louisiana. The deepwater port of Lake Charles as well as many smaller ports and cities are described.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.830 and 80.835, chapter 2.

Charts 11330, 11340.–From the delta of the Mississippi River to Sabine Pass, a distance of 250 miles, the coast has a general W trend with several deep indentations or bays somewhat separated from the Gulf by chains of long narrow islands. It is characterized by a fringe of low sandy beaches backed for many miles by vast streches of marshy ground.

The off-lying water is shoal for long distances from the beach and, except for the first 50 miles W of Southwest Pass, the 10-fathom curve is 25 to 40 miles offshore. Numerous shallow areas, irregular in outline and well out of sight of land, are serious menaces to navigation of vessels of even moderate draft.

With the exception of Barataria Pass, the numerous shallow passes E of Atchafalaya Bay are dangerous to enter except during fair weather. The channels change frequently because of storms, and local knowledge is generally necessary.

Calcasieu Pass is the only deep-draft channel from the Mississippi River W to Sabine Pass. An extensive network of bayous and canals with depths of 2 to 9 feet covers the country up to about 75 miles back from the coast. The waterways from Empire and Venice to the Gulf are the only canals entering the Mississippi between New Orleans and Southwest Pass.

The low swampy coastal country is sparsely settled and is frequented principally by fishermen and muskrat trappers. Through the canals and bayous the bottom is deep mud, usually so soft that it is often possible to push through with drafts of about 1 foot in excess of the depths.

Between Atchafalaya Bay and Vermilion River are several mounds, or islands, from which commercial salt is produced.

Extensive oil exploration is going on along the coast, inland in the lakes and swamps as well as to seaward. The offshore development is expanding rapidly. The offshore derricks and structures are required to be well marked and lighted. They extend up to 125 miles offshore.

Inside the 100-fathom curve from Southwest Pass to Sabine Pass the currents sets W with an average velocity of about 0.2 knot. A clockwise eddy having a velocity of about 0.2 knot covers most of the bay formed by the curving coastline between Southwest Pass and Timbalier Bay.

Weather.–The climate along this stretch of coast is a mixture of tropical and temperate zone conditions. The area receives abundant rainfall and moderate temperatures, with only a few short periods where temperatures fall to freezing or below. The Gulf of Mexico helps modify the relative humidity and temperature conditions, decreasing the range between extremes. When S winds prevail these marine effects are increased. However, continental heat and cold waves penetrate the area at times. Port Arthur has recorded temperature extremes of 11°F and 107°F. This range narrows rapidly to seaward. During summer, prevailing southeasterlies help cool the air and produce showers.

Navigation is hampered at times by extratropical or winter systems, fog, thunderstorms, and tropical cyclones. This area is located S of the mean track of continental extratropical cyclones. During winter, this track reaches its S limit, and some 15 to 20 associated fronts reach the Gulf of Mexico. These "northers" are common from October through February. The mixing of cold and warm air may also trigger the formation of an extratropical cyclone in the Gulf. The cold fronts and winter storms result in gale-force winds blowing 1 percent of the time and winds of 22 knots or more occurring 7 to 12 percent of the time. Waves of 10 feet or more are common, while 20-foot seas have been encountered. Tropical cyclones are a threat to navigation from late May into early November. On average, a tropical cyclone (winds 34 knots or more) will move through the region every 1 to 2 years, while a hurricane (winds 64 knots or more) can be expected every 4 to 5 years. Winds can be expected to reach 100 knots about every 25 years. These systems can also generate rough seas. Carla and Audrey produced 28- to 30-foot seas. On average, maximum significant wave heights of about 40 feet can be expected once every 25 years in deep waters.

While fog occurs throughout the year, it is much more likely in winter and early spring; February is often the foggiest month. Port Arthur averages 42 days annually when visibilities fall below 0.4 mile. These monthly averages range from less than 1 day in the summer months to 8 days in January. Offshore visibilities fall below 2 miles about 2 to 3 percent of the time from December through April. On average, fog signals operate more than 100 hours per month in December and January. Visibilities may also be restricted by precipitation and smoke.

Charts 11364, 11361, 11358.–From Southwest Pass to Barataria Pass, at the entrance of Barataria Bay,

the shoreline is broken by numerous small passes and shallow bays, frequented only by small craft and shallow-draft vessels, and never approached by seagoing vessels.

Grand Pass, 10 miles N of Southwest Pass, permits craft drawing up to 4 feet to proceed from West Bay via The Jump (see chapter 8) and Ostrica Canal (see chapter 7) to Quarantine Bay and Breton Sound.

Buras, a town on the Mississippi River 21.5 miles above Head of Passes, has a boat harbor at the N end of **Bay Pomme d'Or** where open and covered berths, water, gasoline, diesel fuel, and a launching ramp are available. Ice and some marine supplies are available in the town. Numerous fishing boats operate in the waters to the W of the river. Rail, highway, and bus communications extend to New Orleans.

Scofield Bayou, about 23 miles N of Southwest Pass, provides an entrance from the Gulf to the lakes and bayous to the S of and through the Fasterling Canal to Buras. An entrance channel was dredged in 1957. A schooner wreck is just W of the channel. Local knowledge is required.

Empire is a small town on Doullut Canal and Empire Waterway, about 3.5 miles NW of Buras and 25.6 miles above Head of Passes. There are a number of bases for the offshore oil wells in the vicinity. A church spire N of the lock and a microwave tower S of it are prominent. Empire has several marinas. Berths, gasoline, diesel fuel, marine supplies, and launching ramps are available. A 60-ton mobile hoist is available to handle vessels for hull and engine repairs.

The State-owned Empire Waterway Lock through the Mississippi River levee at Empire is 197 feet long and 40 feet wide, and has a depth of 10 feet over the sill. Red and green traffic lights at each end of the lock should be obeyed by all vessels waiting to enter the lock. The lock foreman can be contacted on VHF-FM channel 16 (156.80 MHz) and uses channel 10 (156.50 MHz) as a working frequency. Overhead power cables at either end of the lock have reported clearances of about 80 feet.

The **Empire Waterway** provides for a passage from the Mississippi River at Empire to the Gulf of Mexico. The waterway leads from the W end of **Doullut Canal,** which extends W from Empire Lock to **Adams Bay,** thence through **Bayou Long** and **Bayou Fontanelle,** and thence through a cut in Pelican Island to the Gulf. Passage is made directly from Doullut Canal to Bayou Long through floodgates across Bayou Long, about 1 mile below Doullut Canal. Controlling depths in the Empire Waterway were: in May 1982, 6 feet in Doullut Canal, thence in December 1983, 6 feet in Bayou Long and Bayou Fontanelle, thence 9 feet across the bar at the Gulf entrance. The Gulf entrance is marked by a light off each jetty and a lighted bell buoy about 1.7 miles S of the jetties.

Vessels should approach the Empire Waterway from the Gulf through the Empire Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for the Empire Waterway are described in 80.830, chapter 2.

Doullut Canal is crossed by a railroad swing bridge with a 41-foot span and a clearance of 1 foot about 0.1 mile W of its E entrance, and by a highway bascule bridge with a clearance of 3 feet immediately W of the railroad bridge. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) A fixed highway bridge with a clearance of 53 feet (55 feet for a midwidth of 100 feet) crosses the canal about 0.4 mile W of the highway bascule bridge. In 1982, it was reported that the railroad bridge was being permanently maintained in the open position.

Considerable commerce in seafood, shell, petroleum products, oil well supplies, clay, drilling mud, and industrial chemicals moves on the waterway between the Gulf and Mississippi River.

The waterway, in conjunction with the Ostrica Canal, offers a water route for craft across the Mississippi River Delta between Barataria Bay and Breton Sound.

Another route to the Gulf from Doullut Canal with depths of about 3 feet is across Adams Bay, marked by private lights, thence through **Meyers Canal** and **Grand Bayou.** Somewhat less draft can be carried via Bayou Cook and Bastian Bay. Barataria Bay, W of Adams Bay, can also be reached from Doullut Canal by following Grand Bayou N to its junction with the Freeport Sulphur Company Canal, which connects with Lake Grande Ecaille, and then with Barataria Bay. Depths of about 3 feet can be carried to Barataria Bay.

Port Sulphur is a small town about 11 miles above Buras on the W bank of the river. **Freeport Sulphur Company Canal** extends from the river levee to **Lake Grande Ecaille,** a distance of about 8 miles. Craft drawing up to 3 feet can pass through the lake into Barataria Bay and adjacent waters, but there is no connection with the Mississippi River. The canal is marked by private buoys. In 1979, several unlighted pile clusters were reported in the canal near the junction with Rattlesnake Bayou, in about 29°24.0'N., 89°46.3'W.

Several other canals, having depths of about 3 feet, lead from behind the levees to adjacent waters and to the canneries and the highway on each side of the river, but do not connect with the river. **Socola Canal** at **Fosters Canal** (chart 11364) leads to Grand Bayou, and thence either to the Gulf or to Barataria Bay. **Wilkinson Canal** at **Myrtle Grove** (chart 11364) leads to Barataria Bay.

Vessels should approach Bastian Bay and Grand Bayou from the Gulf through Grand Bayou Pass Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Grand Bayou Pass are described in 80.830, chapter 2.

Bastian Bay, 26 miles NW of Southwest Pass, is 1 to 3 feet deep. The bay is separated from the Gulf by **Bastian Island. Bastian Pass,** E of the island, is not navigable. **Grand Bayou Pass,** W of the island, is the

main entrance to Bastian Bay and also to Grand Bayou. Controlling depth in the dredged channel over the bar in the pass was 6 feet in 1961.

Grand Bayou, is used considerably by local fishing boats. On a favorable tide, about 3 feet can be carried through Grand Bayou and Meyers Canal and thence across Adams Bay to the Doullut Canal connecting with the Mississippi River at Empire, a distance of 9 miles. A depth of 3 feet can be carried to the canals along the E side of Adams Bay NW of Empire which lead to the river levee and the New Orleans-Buras Highway. This depth likewise can be taken to Barataria Bay via the Freeport Sulphur Company Canal and Lake Grande Ecaille.

Bayou Cook, emptying into the N end of Bastian Bay, leads to Adams Bay and thence through Doullut Canal, which connects with the Mississippi River. The shallow depths across the S portion of Bastian Bay limit this route to about 2 feet on a favorable tide.

Chaland Pass is a shallow, unfrequented pass 3 miles W of Bastian Bay.

Quatre Bayou Pass, 5.5 miles E of Barataria Bay Light, is the approach to **Bay Ronquille, Cat Bay,** and **Lake Grande Ecaille.** The approach is marked by a lighted buoy, and the pass is marked by buoys and a light. This pass, Grand Bayou Pass to Grand Bayou, and the pass to the Empire Waterway are the only passes E of Barataria Bay used extensively by local fishermen. Bay Ronquille is separated from Cat Bay by a group of islands through which is a pass known as **Four Bayous Cutoff** about 1.3 miles NW of the light at the entrance. A light is on the W side at the N end of the cutoff. Bay Ronquille and Cat Bay are shallow. On a favorable tide, a depth of about 3 feet can be carried to Barataria Bay through Four Bayous Cutoff and Cat Bay. This same depth can also be taken across Bay Ronquille to Lake Grande Ecaille and thence to the Freeport Sulphur Company Canal which leads to the Mississippi River via the Doullut Canal.

To enter Quatre Bayou Pass, approach the light from SE. Barataria Bay is entered by passing close E of the light and following the SW shore of Bay Ronquille for 1.3 miles to Four Bayous Cutoff. Go through this cutoff into Cat Bay, leaving the light and some small reefs to W. The passage from Cat Bay into Barataria Bay is about 0.7 mile NW of the cutoff light. The **tidal currents** in Quatre Bayou Pass average 1.3 knots and in Pass Abel average 0.9 knot on the flood and 1.6 knots on the ebb.

Barataria Bay, is a large marsh-fringed, shallow lake, separated from the Gulf by two low, narrow sand islands known as **Grand Terre Islands.** The bay has general depths of 4 to 6 feet and is frequented chiefly by oilmen, fishermen, and oystermen, who use launches of 3 to 4 feet in draft. Except for fishing camps, the only settlement on the bay is Grand Isle.

Charts 11358, 11352, 11367.-Barataria Waterway, extends in a N direction from the Gulf for about 34 miles through Barataria Bay to an intersection with the Intracoastal Waterway at the towns of Barataria and Lafitte.

Vessels should approach Barataria Waterway and Bay through Barataria Pass Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.-The lines established for Barataria Pass are described in 80.830, chapter 2.

Channels.-A dredged channel leads across the bar at Barataria Pass into Barataria Bay, thence in landcuts through Beauregard, Mendicant and other islands on the W side of Barataria Bay, thence through **Mud Lake, Bayou St. Denis,** and **Bayou Cutler,** thence through a landcut known as **Dupre Cut,** and thence through **Bayou Barataria** to the Intracoastal Waterway. In May 1983, the controlling depth was 10 feet across the bar, thence 8 feet to the junction with the Intracoastal Waterway.

Barataria Pass is the main entrance to Barataria Bay. A jetty, marked off its outer end by a private light, extends SE from the E tip of **Grand Isle** on the W side of the pass.

Oil derricks are conspicuous in the general vicinity of Barataria Pass, in 5 to 10 fathoms of water. A lighted whistle buoy, 2.7 miles SE of the end of the jetty, marks the approach to the dredged channel across the bar.

In 1976, a 4-inch pipe, covered 15 feet and marked by a buoy, was reported SE of the sea buoy in about 29°13.8'N., 89°53.4'W. In 1968, a fishing boat reported striking an unidentified submerged object about 0.6 mile NW of the 4-inch pipe. A large submerged object, covered from 4 to 5 feet, was also reported about 0.5 mile west of the sea buoy; in 1969, however, a search of the area failed to reveal its existence. Mariners are advised to exercise extreme caution in this area and the surrounding area. In June 1983, a submerged piling was reported in Bayou St. Denis about 100 feet S of Daybeacon 48 in about 29°29'22"N., 90°01'00"W.

Hard sandbars with from 2 to 5 feet over them extend for about 1 mile offshore on each side of the channel. The bar off the entrance channel shows in extremely heavy winds. Inside the bar, depths up to 12 feet extend N as far as **Queen Bess Island.** The tidal currents in Barataria Pass average about 1.4 knots.

In June 1981, strong eddies were reported in the pass in the vicinity of 29°16.3'N., 90°57.0'W. It was reported that the eddies were more pronounced and hazardous at times of tide change.

Bayou Rigaud, on the N side of Grand Isle, is the approach to the town of Grand Isle, 4 miles W of Barataria Pass. A dredged channel leads SW from just inside the pass for about 3.7 miles through Bayou Rigaud to the town of Grand Isle. In February 1983, the controlling depths were 11 feet for about 1.6 miles to Daybeacon 10, thence 7 feet to the head of the project at the town of Grand Isle. In 1981, it was reported that the entrance is subject to shoaling; caution is advised. A lighted range, buoys, daybeacons, and a light mark the channel.

A privately marked channel leads N through

Barataria Bay, E of Queen Bess Island and the light marking Shell Reef to a point SW of Big Island, thence E to Rattlesnake Bayou and the Freeport Sulphur Company Canal. About 3 feet can be carried in the channel.

Former routes N through **Grand Bayou, Little Lake, Turtle Bay, Harvey Cutoff** and **Bayou Rigolettes** (see chart 11352) are little used as shoaling has occurred. The S entrance to Grand Bayou is marked by a light on the E side of the entrance. Both Grand Bayou and Bayou St. Denis lead into Little Lake with depths of about 5 feet reported in 1982. This depth reportedly can also be carried across the lake.

Passage to the E is possible from the junction of Dupre Cut with Bayou Cutler across **Round Lake** and **Lake Laurier** into **Lake Judge Perez.** Local knowledge is advised.

Wilkinson Canal enters Barataria Bay about 1.5 miles E of Bayou St. Denis. The canal, 11 miles long, leads to Myrtle Grove on the Mississippi River, but does not enter the river. The canal depth is about 3 feet. Other similar canals N of Port Sulphur can be reached via Grand Bayou.

From Barataria Bay the islands separating the bays from the Gulf, as well as the entrance channels between the islands, are undergoing continual changes. There are few aids to navigation, and local knowledge is necessary.

Considerable commerce moves on Barataria Waterway in seafood, shell, lumber and piles, clays and drilling mud, liquid sulfur, oil well pipe and supplies, petroleum products, cement, sand and gravel, and machinery.

Grand Isle, the only town on Barataria Bay, is in the center of a long, narrow island of the same name. Its residents, most of whom speak French, either work for the oil industry or engage in fishing. A Coast Guard station is on the NE corner of the island. **Storm warning signals are displayed.** (See chart.) Several oil companies have marine repair bases at which oil well structures and barges are built or repaired, a shipyard, and several service wharves. Many shrimp, oil well supply, and crewboats operate from Grand Isle. There is a 20-ton mobile hoist at the shipyard that can handle craft to 55 feet for hull repairs. Berths, gasoline, water, ice, marine supplies, launching ramps, and a 5-ton hoist are available at marinas near the bridge. These facilities are on Bayou Rigaud.

A paved highway connects Grand Isle with the main coastal road and New Orleans via Bayou Lafourche. The local heliport is owned by an oil company. Passengers are transported to New Orleans, the offshore oil wells, or nearby oil company bases.

Pilots.–There are no licensed pilots at Grand Isle, but local fishermen may be engaged as guides for fishing and hunting parties. Charter boat captains act as pilots on request.

Note.–In the Barataria Bay area the name Grand Bayou appears on two bodies of water. The first is to the W of Bastian Bay, and the second is off the NW side of Barataria Bay.

Lafitte, along the E bank of the waterway about 29 miles above the entrance at the junction of Bayous Rigolettes, Dupont, and Barataria, is a small settlement which borders the waterway for about 6 miles. Several small marinas and an oil company supply base and wharf are at Lafitte. Berths, gasoline, and diesel fuel are available. A paved highway along the E bank of the waterway connects with Lafitte, Crown Point, and New Orleans.

Bayou des Oies, locally known as **Goose Bayou,** enters Barataria Waterway about 3.5 miles S of Lafitte. State Route 45 highway bridge crossing the entrance to Bayou des Oies has a 45-foot fixed span with a clearance of 10 feet. A large marina at the bridge and in a slip close E of the bridge has a marine lift that can handle craft to 10 tons for hull and engine repairs, or storage. Berths, electricity, gasoline, diesel fuel, water, ice, launching ramp, and marine supplies are available at the marina.

Oil and gas terminals, shrimp docks, and service wharves are on both banks of the waterways between Lafitte Village and the head of the waterway at its junction with the Intracoastal Waterway and Bayou Villars.

There are several shipyards that build commercial vessels and repair commercial and pleasure craft along the E bank of the waterway at Lafitte. Boats up to about 70 feet are hauled out using marine railways or a marine lift for general repairs. Machine, wood and metal shops, and welding equipment are available.

Barataria, on the W bank, and **Lafitte,** on the E bank, are fishing and agricultural communities at the head of Barataria Waterway. A highway bridge crossing the waterway between Lafitte and Barataria has a swing span with a clearance of 7 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) There are shrimp and oil company docks and service wharves. Gasoline, diesel fuel, water, ice, marine supplies, and berthage are available at the shipyard and at the service wharves.

Bay des Ilettes, Bay Joyeux, Bay Tambour, and **Caminada Bay** are on the W side of Barataria Bay from which they are partially separated by low, marshy islands. These are shallow bodies of water 2 to 4 feet in depth and of the same characteristics as Barataria Bay. These bays provide approaches to the Southwestern Louisiana Canal, which connects Barataria Bay with Bayou Lafourche and Timbalier Bay. The channel through the bays is marked by privately maintained buoys.

Caminada Pass, about 7 miles SW of Barataria Bay, connects Caminada Bay with the Gulf. The pass is little used, as every storm shifts the entrance channel. Usually a depth of 4 to 5 feet can be taken into the pass, but only 2 or 3 feet into the bay. A private light marks the jetty on the N side of the entrance. Just inside the pass, an old highway bridge with its midsection removed is used as fishing piers. A fixed highway bridge on the NE side of the fishing piers has a clearance of 14 feet for a channel width of 30 feet. An overhead power cable crossing

at the bridge has a clearance of 23 feet. Another overhead power cable about 0.3 mile SW of the bridge has a clearance of 37 feet. The tidal current in Caminada Pass averages 1.5 knots with higher velocities reported. The pass is not recommended for strangers.

Charts 11340, 11358, 11359.–The **Louisiana Offshore Oil Port (LOOP)** is a deepwater marine terminal in the Gulf of Mexico about 19 miles S of Caminada Pass. The terminal comprises an offshore pumping platform complex (PPC) and three single-point moorings (SPMs) about 1.3 miles E, SE, and S of the pumping platform complex. The pumping platform complex, marked by private lights and equipped with two fog signals, consists of a control platform connected by a walkway bridge to a pumping platform. A radar transponder beacon (Racon) is at the pumping platform. (See Racons, chapter 1, for additional information.)

The LOOP site is within a **deepwater port safety zone** approached through a 78-mile-long **safety fairway.** The entrance to the safety zone from the safety fairway is marked by private lighted buoys. The PPC and each SPM is within an **area to be avoided.** An anchorage area, marked by private lighted buoys, is in the NE part of the safety zone E of the PPC and SPMs. (See 150.301 through 150.345 and Annex A, chapter 2, for limits and regulations.) The LOOP Vessel Traffic Supervisor, in addition to VHF-FM channel 10 (156.50 MHz), monitors channel 16 (156.80 MHz); call, LOOP RADAR.

Caution.–Heavy runoff from the Mississippi River may cause strong W currents, often in excess of 2 knots, in the vicinity of LOOP. These currents may sometimes be recognized by the difference in color caused by the sediment in the runoff water.

Charts 11352, 11357.–Belle Pass (29°05.1′N., 90°13.5′W.), about 12 miles SW of Caminada Pass, is the entrance from the Gulf of Mexico to Bayou Lafourche and Pass Fourchon. The dredged channel through the pass is marked by a **012°** lighted range, buoys, and lights, and the approach by a lighted bell buoy. The old entrance channel between the jetties close E of the dredged channel is closed by a dam.

Vessels should approach Bayou Lafourche and Pass Fourchon through the Belle Pass Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Belle Pass are described in 80.830, chapter 2.

Pass Fourchon empties into the E side of Bayou Lafourche about 2 miles above the entrance to Belle Pass.

Port Fourchon encompasses Pass Fourchon, Belle Pass, and Bayou Lafourche for about 2 miles above its entrance. In 1982, the port was under development by the Greater Lafourche Port Commission and was reported to have been dredged to 20 feet. The area is the center of a large fishing fleet and numerous vessels serving the Louisiana Offshore Oil Port (LOOP).

Bayou Lafourche, formerly an outlet of the Mississippi River at Donaldsonville, 70 miles above Canal Street, New Orleans, is blocked off from the river by a levee. The bayou extends from Donaldsonville in a SE direction for 93 miles, and empties into the Gulf at Belle Pass, 19 miles SW of Barataria Bay Light. The Intracoastal Waterway crosses the bayou at Larose.

Bayou Lafourche is navigable to Thibodaux, about 63 miles above Belle Pass entrance. The bayou above this point is closed by a dam. In May 1983, the controlling depths were 12 feet in the channel through Belle Pass to Leeville, thence 6 feet to the junction with the Intracoastal Waterway, thence 5 feet to Raceland, thence in May 1980, 4 feet to Thibodaux. In August 1983, shoaling to an unknown extent was reported in the vicinity of Belle Pass Entrance Buoy 3 in about 29°04′24″N., 90°13′45″W.

In March 1983, a floodgate was under construction about 2.5 miles S of Golden Meadow. A temporary bypass channel around the construction site has a depth of 10 feet; the entrances are marked by lights. Barge traffic is limited to one way at a time. Extreme caution is advised when transiting the area.

Numerous shrimp boats base at Leeville, Golden Meadow, Galliano, and Larose. Crew boats based at Leeville operate out of the bayou to the offshore oil wells. There are seafood canneries and shipyards along the bayou and oil company terminals and wharves at Leeville. There is considerable commerce on the bayou in seafood products, sugar, petroleum products, cement, lumber and piles, clays and drilling mud, liquid sulfur, sand and gravel, oil well pipe, machinery and supplies, caustic soda, chemicals, and general cargo.

There are numerous private warehouses, wharves, and marine railways along the bayou. The banks of Bayou Lafourche are thickly settled throughout the greater part of its length. Larose, Lockport, **Raceland,** and **Thibodaux** are principally agricultural towns. On the lower part of the bayou there is considerable commerce in oil barges.

Many bridges and overhead power cables cross Bayou Lafourche and are described in order of ascension. (See 117.1b, 117.240, and 117.245 (a) through (e), and (j)(3), (j)(4), and (j)(4-a), chapter 2, for drawbridge regulations and opening signals.)

A slip, locally known as **Floatation Canal** and constructed by the Greater Lafourche Port Commission, is on the E side of Bayou Lafourche, about 2.3 miles above the entrance. A berthing area at the head of the slip used by commercial fishing vessels had depths of about 9 feet reported alongside in 1982.

A wharf of an oil company supply vessel base is on the E side of the bayou, about 2.5 miles above the entrance; depths of about 20 feet were reported alongside the wharf in September 1982. Diesel fuel is available.

At **Leeville,** on the W side of the bayou about 11 miles above the entrance, a highway vertical lift bridge with a clearance of 73 feet up and 40 feet

down crosses the bayou. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) There are shrimp docks, seafood packing plants, and oil company terminals and bases. Gasoline, diesel fuel, water, ice, launching ramps, and limited marine supplies are available. The Southwestern Louisiana Canal crosses the bayou at Leeville.

An overhead power cable with unknown clearance crosses the bayou about 3.3 miles N of Leeville.

Golden Meadow, 20 miles above the entrance, is the principal fishing settlement on Bayou Lafourche. A highway vertical lift bridge with a clearance of 73 feet up and 2 feet down crosses the bayou at Golden Meadow. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) A boatyard, on the W side about 0.6 mile below the bridge, has marine railways that can handle craft up to 35 feet for general repairs. A shipyard, on the W side about 2 miles below the bridge, has a marine railway that can handle craft to 145 feet for hull repairs. Gasoline, diesel fuel, water, ice, and marine supplies are available at Golden Meadow.

Two overhead power cables cross the bayou between Golden Meadow and Galliano; minimum clearance is 65 feet.

At **Galliano,** about 23.5 miles above the entrance, a highway pontoon bridge crosses the bayou. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Gasoline, diesel fuel, and supplies are available at Galliano. Galliano is a **customs station.**

A highway vertical lift bridge with a clearance of 73 feet up and 3 feet down and a pontoon bridge cross the bayou about 3 miles and 5.5 miles, respectively, above the pontoon bridge at Galliano. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

At **Cut Off,** about 30.5 miles above the entrance, a highway pontoon bridge crosses the bayou. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) On the W side of the bayou at Cut Off are several shipyards with marine railways that can handle craft up to 60 feet for repairs. An overhead power cable with a clearance of 91 feet crosses the bayou just above the pontoon bridge.

At **Larose,** about 34 miles above the entrance to Bayou Lafourche, the Intracoastal Waterway crosses the bayou. Two pontoon bridges cross the bayou at Larose; one just E and the other about 0.5 mile W of the junction with the Intracoastal Waterway. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) There are two wharves on the SW side of the intersection. Larose has several shipyards and boatyards. One shipyard with a 1,500-ton floating drydock is on the Intracoastal Waterway just SW of its junction with Bayou Lafourche; general repairs can be made. Marine railways that can handle craft up to 60 feet for general repairs are available at the boatyards. Machine shops and radio repair facilities are also available. Fuel, water, ice, and marine supplies can be obtained. A shipyard builds barges on the N side of the bayou just above the intersection.

Mooring to the bulkheads in the vicinity of the intersection of Bayou Lafourche and the Intracoastal Waterway is **prohibited.**

Two overhead power cables cross the bayou between Larose and Valentine; minimum clearance is 68 feet.

At **Valentine,** about 39 miles above the entrance, a highway pontoon bridge crosses the bayou. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Valentine has a large sugar mill and a paper mill. A shipyard that builds commercial vessels to 180 feet is on the E side of the bayou about 2 miles above Valentine. Marine railways at the yard can handle vessels to 170 feet for hull and engine repairs.

Pontoon bridges.–The pontoon bridges that cross Bayou Lafourche at Galliano, 5.5 miles above Galliano, at Cut Off, at Larose 0.5 mile W of the junction with the Intracoastal Waterway, and at Valentine are operated by cables that are suspended just above the water when the bridges are being opened or closed. The cables are dropped to the bottom when the bridges are in the fully opened or closed position. The pontoon bridge at Larose just E of the junction with the Intracoastal Waterway is operated by cables that are suspended just above or below the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. Extreme caution is advised in the area of these bridges. **Do not attempt to pass through the bridges until they are fully opened and the cables are dropped to the bottom.**

Lockport, about 44 miles above the entrance, is a town at the intersection of Company Canal with Bayou Lafourche. A highway swing bridge with a clearance of 6 feet crosses the bayou just below the intersection. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable with a clearance of 90 feet crosses the bayou just below the swing bridge. A vertical lift highway bridge with clearances of 50 feet up and 5 feet down crosses Company Canal about 0.2 mile SW of the intersection. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Lockport has a large shipyard and a boatyard. The shipyard builds boats, tugs, and barges to 176 feet. Gasoline, diesel fuel, water, ice, and marine supplies are available. The Southern Pacific Railroad connects Lockport with Valentine and New Orleans.

Several overhead power cables cross the bayou between Lockport and Mathews; minimum clearance is 60 feet. Twin fixed highway bridges with clearances of 42 feet cross the bayou about 1.6 miles above the pontoon highway bridge at Mathews.

At **Mathews,** about 47 miles above the entrance, a pontoon highway bridge crosses the bayou. The bridge is operated by cables that are suspended just above the water when the bridge is being opened or

closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. Extreme caution is advised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Several overhead power cables cross Bayou Lafourche between Mathews and Raceland; minimum clearance is 60 feet. Twin fixed highway bridges with clearances of 42 feet cross the bayou about 1.6 miles above the pontoon highway bridge at Mathews.

At **Raceland,** about 51 miles above the entrance, Bayou Lafourche is crossed by two vertical lift bridges about 0.5 mile apart. The more southerly bridge has a clearance of 59 feet up and 7 feet down, and the northerly bridge has a clearance of 50 feet up and 7 feet down. (See 117.1b and 117.240, and 117.245 (a) through (e), and (j)(4–a), chapter 2, for drawbridge regulations and opening signals.)

Several overhead power cables cross the bayou between Raceland and Lafourche; minimum clearance is 60 feet.

At **Lafourche,** a highway swing bridge with a clearance of 10 feet and a railroad swing bridge with a clearance of 19 feet cross the bayou about 57.4 and 59.9 miles, respectively, above the mouth. (See 117.1b, 117.240, and 117.245 (a) through (e), (j)(3), and (j)(4–a), chapter 2, for drawbridge regulations and opening signals.) Several overhead power cables cross the bayou between Lafourche and Thibodaux; minimum clearance is 60 feet.

At **Thibodaux,** about 63 miles above the entrance, a vertical lift bridge, kept in a closed position and with a clearance of 11 feet, crosses the bayou. (See 117.245 (a), and (j)(4), chapter 2, for drawbridge regulations.)

Charts 11358, 11357.–Southwestern Louisiana Canal connects Barataria Bay with Timbalier Bay and affords a protected inside passage for small boats. The canal crosses Bayou Lafourche at Leeville, about 11 miles above the bayou mouth. The canal is about 10 miles long with depths of 6 feet reported in September 1982, except for shoaling at the W approach. The E entrance to the canal is marked by a private light.

In July 1982, it was reported that with a favorable tide about 6 feet can be carried through both Caminada Bay, the E approach, and Little Lake, the W approach. A privately marked channel leads across **Little Lake** to **Bayou Rosa,** thence through **Rosa Bay** to Lake Raccourci. **Deep Bayou** and **Bayou Blue** also connect Little Lake with **Lake Raccourci.** These approaches sometimes are staked, but generally are difficult for a stranger. The main route to the canal from Barataria Bay is through **Bayou Fifi, Bay des Ilettes, Bayou Andre,** or **Bay Joyeux,** and **Caminada Bay.** The channel is marked by privately maintained buoys. Another route is through **East Champagne Bay,** Bay des Ilettes, and **Bay Tambour** via a cut between the last named bays. Because this channel is not marked, strangers should hire fishermen as pilots.

State Route 1 fixed highway bridge crosses the middle of the Southwest Louisiana Canal, making it necessary to enter the canal from Bayou Lafourche through a short cutoff.

Chart 11357.–Greys Canal, 3 miles S of Leeville, with a connecting channel through Bayou Blue, offers the deepest and most used route from Bayou Lafourche to Lake Raccourci and Timbalier Bay. On a favorable tide, about 8 feet can be taken through the channel; the best water is reportedly found in midchannel. Bayou Blue also joins Little Lake.

Havoline Canal, 6 miles S of Leeville, is a privately dredged canal that extends from Bayou Lafourche into Timbalier Bay. In July 1982, the canal had a reported controlling depth of 7 feet. The approach channel leading through Timbalier Bay to the canal is marked by lights and private buoys which reportedly should be followed closely. Havoline Canal is open to the public without charge.

Timbalier Bay and **Terrebonne Bay** are large shoal-water bays separated from the Gulf by a chain of low sand islands. These waters are accessible from the Gulf through several passes having depths of 4 to 14 feet; however, the depths in Timbalier and Terrebonne Bays range from 4 to 9 feet. There are no settlements of importance in the area, but the bays are frequented by large numbers of fishing and oystering craft which carry their catch through the inside passages to New Orleans and Houma. This area has numerous oil well structures.

Lake Barre, N of Terrebonne Bay, has general depths of 4 to 6 feet. **Seabreeze (Lake Barre) Pass** provides a passage marked by a light into Bayou Terrebonne and to **Lake la Graisse** at the NW end of Terrebonne Bay. **Pass Barre** connects with Terrebonne Bay, and several passages at the NW corner of the bay lead to Lake Felicity.

Old Lady Lake is a shoal body of water between Lake Raccourci and Lake Barre and S of Lake Felicity. Numerous passages connect with these lakes and with Timbalier Bay. The lake has depths of 3 to 4 feet, but the passes are very shallow and restrict entry to boats drawing 1 or 2 feet.

Lake Felicity, with depths of 5 to 6 feet, is N of Old Lady Lake. Many bayous and passes connect with adjacent bays and lakes. Most of the bayous to the E and N of Lake Felicity are used as oyster bedding grounds and, accordingly, contain numerous oyster reefs. The water in the bayous shoals rapidly where the bayous widen, and the channels are difficult to follow without local knowledge. An inside route between Bayou Terrebonne and Bayou Lafourche passes through Lake Felicity; thence through Bayou Jean Lacroix, Cutoff Canal, Grand Bayou Canal, and Canal Blue. The entrance to Lake Felicity is marked by a light.

Lake Raccourci is a shoal body of water lying N of Timbalier Bay. The general depths are 4 to 5 feet. The area around **Philo Brice Islands** and **Jacko Camp**

Bay contains many oyster beds and fish traps. The oyster beds are marked by iron or brush stakes. Deep Bayou and Bayou Blue lead to Little Lake, and **Grand Pass Felicity** leads to Lake Felicity.

Dangers.-There are numerous oil well structures in and about Timbalier and Terrebonne Bays. Privately marked channels lead from Cat Island Pass to Bayou Terrebonne and Bayou Lafourche. Drilling operations are in progress near Caillou Island, **Brush Island,** and East Timbalier Island. Mariners should use the waters in this area only with local knowledge.

Secondary channels in Timbalier Bay and Terrebonne Bay.-An unmarked channel leads W across Timbalier and Terrebonne Bays to Troiscent Piquets Bay and into Bayou Petit Caillou, S to Cat Island Pass, or W into Lake Pelto.

From the E and W channel crossing Terrebonne and Timbalier Bays, a channel extends NE into Lake Raccourci passing through Philo Brice Islands NW of the light and thence continuing E to the entrance to Bayou Blue leading to Bayou Lafourche. On a favorable tide a depth of about 5 feet can be carried into Lake Raccourci and about 4 feet into Bayou Blue.

From inside Cat Island Pass, a channel extends N across the central portion of Terrebonne Bay to **Pass Barre,** which connects with Lake Barre. Depths of 7 feet can be carried into Lake Barre. A group of small low islands exists about 2.5 miles S of Pass Barre with shoaling to 5 feet close W.

The route to Bayou Terrebonne is through the S entrance to Lake la Graisse. The channel through the lake is marked by lights, and a depth of about 3 feet can be carried into the bayou. A second route to Bayou Terrebonne from Lake Barre through Seabreeze Pass is good for 3 feet.

A route leads from Seabreeze Pass across Lake Barre into Lake Felicity, thence to Grand Pass Felicity and across Lake Raccourci to Bayou Blue or Deep Bayou, and thence through either Southwestern Louisiana Canal or Greys Canal to Bayou Lafourche. An unmarked channel leads through Lake Chien, N of Lake Felicity, to Bayou Jean Lacroix. A light marks the E side of the entrance to Lake Chien.

Timbalier Island and **East Timbalier Island** are the two largest islands in the chain separating Timbalier and Terrebonne Bays from the Gulf. In recent times the E end of Timbalier Island has been washed away and the W end built up to the W a like amount. East Timbalier Island has built up especially to the W, all but closing Grand Pass Timbalier. Several fish camps are reported on Timbalier Island and East Timbalier Island.

Grand Pass Timbalier, at the W end of East Timbalier Island, has been filling up and is little used. The channel is narrow, winding, and difficult to navigate; with local knowledge about 4 feet can be taken through the pass into Timbalier Bay.

The structures of two abandoned lighthouses are off the SW end of East Timbalier Island.

Little Pass Timbalier, 2 miles W from Grand Pass Timbalier, is a wider and straighter channel used to enter Timbalier Bay. The pass has a depth of 6 feet on the outer bar and 4 feet on the inner bar. The channel branches at the inner end, the W branch being considered the safer and more generally used. It is reported that this pass is working W.

Caillou Pass is a shallow passage between the N side of Timbalier Island and Caillou Island; local knowledge is advised.

Vessels should enter Terrebonne Bay through Cat Island Pass Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.-The lines established for Cat Island Pass are described in 80.830, chapter 2.

Cat Island Pass, 60 miles W of Southwest Pass, connects the deepest part of Terrebonne Bay with the Gulf and is the principal entrance into Terrebonne Bay. The pass is marked by several lighted and unlighted buoys. In December 1983, the controlling depth through the pass was 18 feet. Anchorage area inside the bay has depths of 12 to 16 feet. Farther inside, the depth gradually shoals to the general bay depth of 7 feet or less. The current in Cat Island Pass averages about 1.1 knots on the flood and 1.5 knots on the ebb, however, greater velocities have been reported.

Charts 11357, 11352, 11355.-Houma Navigation Canal extends in a NW direction from Cat Island Pass for about 8 miles across Terrebonne Bay, thence in a landcut in a N direction for about 23 miles to an intersection with the Intracoastal Waterway about 1 mile below Houma. The canal is maintained by the Corps of Engineers. In December 1983, the controlling depth was 14 feet. The channel is well marked with aids.

Bayou Petit Caillou crosses the canal about 9.8 miles above the entrance, and Bayou Grand Caillou crosses about 17.5 miles above the entrance. No other major waterways cross the canal. A pontoon bridge crosses the canal about 20 miles above the entrance. The bridge is operated by cables that are suspended just above the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. Extreme caution is advised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz). State Route 661 highway bridge crossing the canal about 0.2 mile below the Intracoastal Waterway has a swing span with a clearance of 1 foot. (See 117.1b, 117.240, and 117.537, chapter 2, for drawbridge regulations and opening signals.) The bridge is equipped with a radiotelephone and the bridgetenders can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, WDT-573.

There is considerable commerce on the navigation canal in seafood products, shell, lumber and piles, oil well drilling equipment, machinery and supplies,

petroleum products, cement, sand and gravel, and chemicals.

Bayou Pelton joins the canal about 5.5 miles below Houma and extends SE to Bayou Grand Caillou, described later in this chapter. In December 1982, the controlling depth through Bayou Pelton and Bayou Grand Caillou to Dulac was 5 feet. Overhead power cables crossing Bayou Pelton about 0.2 mile SE of its junction with Houma Navigation Canal have a least clearance of 62 feet.

Bayou la Carpe joins the canal about 2.3 miles below Houma and connects with the Intracoastal Waterway at about **Mile 59W,** opposite Bayou Black. In November 1983, the controlling depth was 5 feet.

A highway bridge crossing the bayou about 0.5 mile S of the Intracoastal Waterway has a vertical lift span with clearances of 3 feet down and 73 feet up. (See 117.1b, 117.240, and 117.537, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable about 0.3 mile S of the bridge has a clearance of 60 feet. In August 1979, a sunken wreck, marked by a buoy, was reported 2.8 miles S of the bridge at the junction of Bayou la Carpe and Houma Navigation Canal, in about 29°31′24″N., 92°42′25″W. There is considerable commerce on the bayou in petroleum products, shell, clay, shellfish and seafood, oil well pipe, and building cement. The bayou has a large shipyard.

Houma, the parish seat of Terrebonne Parish, is at the head of the Navigation Canal, about 32 miles above the entrance. The principal industries are seafood, petroleum, natural gas, sulphur, and sugar and molasses. The area is important in agriculture and cattle raising. The area has numerous offshore oil company supply bases and shipyards. A large shipyard on Bayou la Carpe builds steel vessels and barges to 300 feet. A 4,000-ton floating drydock at the yard can handle vessels to 200 feet long, 92 feet wide, and 16-foot draft. A 1,000-ton marine lift can haul out craft to 310 feet long. Marine railways at the yard can handle craft to 225 feet for hull and engine repairs; a 150-ton crawler crane is available. The city has seafood canneries, a sugar mill, and cold storage facilities.

U.S. Route 90, the main coastal highway, passes through the town, and the Southern Pacific Lines offer railway freight service. Southern Pacific Railroad bridge over the Intracoastal Waterway at the junction with Bayou la Carpe has a vertical lift span with clearances of 70 feet up and 4 feet down. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable with a clearance of 90 feet is close S of the bridge. The Houma airport and an industrial park are SE of the city. Berths, gasoline, diesel fuel, water, ice, and marine supplies of all kinds are available.

Bayou Terrebonne is navigable to the town of Houma, 33 miles above its S mouth. For the lower 4 miles of its course, the bayou flows through a long, narrow delta separating Lake Barre and **Lake Jean Pierre** and **Lake Saint Jean Baptiste.** At its S end, Bayou Terrebonne empties into Pass Barre. From each of these are several entrances into the bayou. **Seabreeze (Lake Barre) Pass,** connecting Lake Barre and Lake la Graisse, crosses the N end of the delta and provides the main entrance into the bayou from both Lake Barre and Terrebonne Bay. A dredged channel in the bayou leads from Bush Canal to Houma. In November 1983, the controlling depth was 2 feet from Lake Barre through Seabreeze Pass to the bayou, thence 5 feet to the junction with Bush Canal, thence 3 feet through Bourg Canal to the Intracoastal Waterway, thence through the Intracoastal Waterway to the junction with Bayou Terrebonne at Houma. W of Bourg Canal, Bayou Terrebonne was bare at mean low water to the junction with Bayou Petite Caillou in 1975, thence in November 1983, the controlling depth was 3 feet to the Intracoastal Waterway, thence in 1975, 1 foot for about 0.4 mile to the Barrow Street bridge at Houma.

In May 1978, the controlling depth was 3 feet through Seabreeze Pass and Lake la Graisse to Terrebonne Bay. Between Seabreeze Pass and Pass Barre, **Bayou Jose** and another opening form a connection between Lake Barre and Lake Jean Pierre which can be used by boats drawing up to 2½ feet.

Lights mark the entrances to the bayou from Lake la Graisse and from Lake Barre.

Bayou Terrebonne has considerable barge traffic in shell, seafood, sugar, petroleum products, building cement, clays and drilling mud, oil well pipe, machinery and supplies, and general cargo.

Tides.–The diurnal range of tide is 1.3 feet at the mouth of Bayou Terrebonne. Wind will vary the tide 1 to 3 feet at the mouth, and floods may raise the water level 3 to 4 feet in the upper section.

The banks of Bayou Terrebonne are thickly settled throughout the upper half, in which section mariners may find numerous settlements selling gasoline, oil, and provisions. State highway 55 extends along the E bank of the bayou for 6 miles below Montegut to Lapeyrouse.

Bayou Terrebonne crosses the Intracoastal Waterway at Houma and is joined by Bayou Petit Caillou 3 miles below Houma. At Bourg, 7 miles below Houma, a section of the **Company Canal,** known as **Bourg Canal,** furnishes a cutoff between the bayou and the Intracoastal Waterway. In November 1983, the controlling depth was 3 feet. Another section of Company Canal extends N to connect with Bayou Lafourche at Lockport. In November 1983, the controlling depth was 6 feet. Several other canals enter Bayou Terrebonne and are used by small boats. **Bush Canal,** with a reported controlling depth of 4 feet in June 1982, connects Bayou Terrebonne with Bayou Petit Caillou about 12 miles above the entrance.

Bayou Terrebonne is crossed by several highway bridges with swing and lift spans with ample openings, and by numerous overhead cables with minimum clearance of 57 feet.

Lapeyrouse, about 14 miles above the entrance,

has a fish wharf with a service wharf at which diesel fuel, gasoline, and ice are available, and a grocery store with a service wharf at which gasoline is available.

Point Barre, about 16 miles above the entrance, has facilities for launching outboard motor boats and a commercial fish wharf.

Montegut, about 20 miles above the entrance, has a boatyard with marine railways capable of handling craft to 50 feet for general repairs; the yard has a machine shop. Diesel fuel, water, and limited marine supplies are available. A highway bridge at Montegut has a 45-foot vertical lift span with clearances of 3 feet down and 48 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) A road connects Montegut with Bayou Petit Caillou.

A highway bridge crossing the bayou at **Klondyke,** about a mile below Bourg, has a swing span with a channel width of 47 feet and a clearance of 7 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) In December 1980, a vertical lift bridge with design clearances of 47 feet up, 3½ feet down, and 45 feet horizontal was under construction just above the swing bridge. Upon completion, it will replace the existing bridge. Gasoline in cans and some groceries can be obtained just above the bridge.

A highway bridge with a 40-foot swing span and a clearance of 5 feet crosses Bayou Terrebonne at **Bourg,** about 25 miles above the entrance and just above the Bourg (Company) Canal. Bourg Canal is crossed at Bourg by a highway vertical lift bridge with clearances of 5 feet down and 50 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Several overhead power cables cross Bourg Canal in the vicinity of this bridge; least clearance is 80 feet.

Several overhead power cables with a least clearance of 60 feet cross Bayou Terrebonne between Bourg and Presquille.

At **Presquille,** about 27 miles above the entrance to Bayou Terrebonne, a highway bridge with a 45-foot vertical lift span and a clearance of 3 feet crosses the bayou. The bridge is in a permanently closed position. (See 117.245 (a) and (j)(2), chapter 2, for drawbridge regulations.) A least clearance of 60 feet is available for the overhead power cables crossing the bayou between Presquille and Houma.

At **Mechanicville,** about 29 miles above the entrance, a highway bridge with a 40-foot vertical lift span and clearances of 3 feet down and 47 feet up crosses Terrebonne Bayou. The highway bridge just E of Houma has a 40-foot swing span and a clearance of 3 feet. (See 117.1b, 117.240, 117.537, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

Bayou Petit Caillou empties into **Troiscent Piquents Bay** on the W side of Terrebonne Bay, about 5 miles N of Wine Island Pass. A private light marks the S side of the passage between Terrebonne and Troiscent Piquets Bays.

Bayou Petit Caillou is 29 miles long to its junction with Bayou Terrebonne 4 miles E of Houma. Several canals enter the bayou: Bush Canal leading to Bayou Terrebonne, and Boudreaux Canal and **Robinson Canal** connecting with Bayou Grand Caillou. Two miles above Cocodrie is a connecting route to Bayou Terrebonne through **Sevin Canal, Bay Negresse,** and Lake la Graisse, good for 3 feet on a favorable tide. About 5 miles above the entrance the bayou crosses the Houma Navigation Canal. The controlling depth from the mouth of the bayou to the junction with Houma Navigation Canal was about 1 foot, thence in November 1983, 5 feet to Chauvin, thence 1 foot to the junction with Bayou Terrebonne.

The lower portion of Bayou Petit Caillou is used considerably by local oystermen and fishermen. The bayou has considerable commerce in petroleum products, and oil well pipe casing, machinery, and supplies.

A highway extends S along the W shore to **Cocodrie,** 6 miles above the mouth of the bayou. There are several oil company bases and fish wharves. Gasoline, diesel fuel, and ice are available. A marina on a bayou about 0.2 mile W of Bayou Petit Caillou, at Cocodrie, has open and covered berths, gasoline, diesel fuel, a paved launching ramp, a 6½-ton fixed lift for handling boats up to 30 feet, ice, water, and marine supplies. The marina is accessible with Bayou Petit Caillou through a channel with a reported controlling depth of 10 feet in July 1982.

Robinson Canal enters the bayou from W about 11 miles above the entrance. There is a shipyard on the bayou here, and an oil refinery about 0.5 mile above it. **Bush Canal** enters the bayou from E about 3 miles above Robinson Canal. At **Boudreaux Canal,** 15 miles above the mouth, is a shrimp and oyster cannery.

Several boatyards near **Chauvin** have marine railways that can haul out craft to 60 feet for general repairs; one has a machine shop. Gasoline, diesel fuel, lubricants, water, ice, and marine supplies can be obtained at several places along the bayou.

Six drawbridges cross the waterway between the mouth and the junction with Bayou Terrebonne. The bridges with swing spans have a minimum width of 40 feet and a minimum clearance of 3 feet, and the limiting clearances at the lift bridges are 3 feet down and 47 feet up. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) Overhead power cables crossing the waterway have a minimum clearance of 50 feet.

A channel from Bayou Petit Caillou through Boudreaux Canal, **Lake Boudreaux** and **Bayou Dulac** to Bayou Grand Caillou is marked with lights, buoys, and daybeacons. In 1975, controlling depths were 8 feet in Boudreaux Canal, 5 feet through Lake Boudreaux, and 4 feet through Bayou Dulac.

Wine Island Pass is 3.5 miles W of Cat Island Pass, and forms a passage between Wine Island and Isles Dernieres from the Gulf to Lake Pelto and Terrebonne Bay. The pass has depths of 5 to 9 feet over the bar and 7 to 8 feet inside where good anchorage

is available. The channel lies close to Isles Dernieres, and, when any sea is running, breakers clearly outline the edges of the channel. The pass is unmarked.

The diurnal range of **tide** at Wine Island Pass is 1.3 feet. The **tidal current** at strength averages 1.7 knots on the flood and 1.9 knots on the ebb. At **Caillou Boca** at the W end of Lake Pelto the diurnal range of tide is 1.4 feet and the tidal current strength averages 1.3 knots on the flood and 0.7 knot on the ebb. The flood flows E and the ebb W.

Whiskey Pass forms another passage from the Gulf to Lake Pelto through Isles Dernieres. The depths are 4 to 5 feet at the N end of the unmarked pass. In 1969, a small concrete pyramid marker was reported to mark the W side of the pass.

The main passage from Terrebonne Bay to Lake Pelto, marked by buoys, lies between **Wine Island** and **Point Mast** and has a general depth of 6 to 7 feet. Another passage through Pass la Poule, which is good for a draft of 3 to 4 feet, is marked by private buoys.

Lake Pelto, W of Terrebonne Bay and N of **Isles Dernieres,** has general depths of 5 to 7 feet. A protected inside route is afforded small craft drawing 4 to 5 feet from Timbalier and Terrebonne Bays W through Lake Pelto and **Caillou Boca** to Caillou Bay. The channel is marked by lights, buoys, and a daybeacon.

Charts 11352, 11357, 11356.–An extensive network of lakes, bayous, and canals extends inland between Terrebonne Bay and Atchafalaya Bay. Though sparsely populated, this area is frequented by local fishermen, trappers, and oil development personnel. The principal entrances from the Gulf are described as follows:

Caillou Bay, a large bight with general depths of 5 feet, is N and E of **Raccoon Point** at the W end of Isles Dernieres. An anchorage site with a depth of 7 to 8 feet is close inside Raccoon Point.

Coupe Colin, 3 miles E of Raccoon Point, is shallow, changeable, difficult to follow, and is not used even by local fishermen.

Vessels should approach Bayou Grand Caillou through the Bayou Grand Caillou Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Bayou Grand Caillou empties into Caillou Bay 6.5 miles N of Raccoon Point. The entrance is marked by lights. In July 1982, the controlling depth in the bayou was reported to be 5 feet from the entrance to **Dulac,** about 20 miles above the mouth. The bayou channels are marked by daybeacons and buoys for about 15 miles above the mouth.

Bayou Grand Caillou crosses Houma Navigation Canal about 2.3 miles below Dulac and is joined by Bayou Dulac at Dulac.

A dredged channel in Bayou Grand Caillou leads from Dulac to Bayou Pelton, thence through Bayou Pelton to Houma Navigation Canal. In December 1982, the controlling depth was 5 feet from the bridge at Dulac to Houma Navigation Canal.

State Route 57 extends S along the E bank of Bayou Grand Caillou to below Dulac and connects with State Route 56 along Bayou Petit Caillou about 1.7 miles below Robinson Canal. A vertical lift highway bridge with clearances of 10 feet down and 73 feet up crosses the bayou at Dulac. A highway bridge at Boudreaux has a swing span with a channel width of 46 feet and a clearance of 2 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

An overhead cable, 3 miles above the highway bridge at Boudreaux, has a clearance of 60 feet.

The highway bridge over Bayou Dulac, at Dulac, has a swing span with a clearance of 7 feet. Fixed bridges crossing Bayou Grand Caillou above the highway bridge have a minimum horizontal clearance of 15 feet and a vertical clearance of 1 foot.

Bayou Grand Caillou has considerable commerce in seafood products, shell, petroleum products, clays and drilling mud, oil well pipe casing, machinery, and industrial chemicals.

Dulac has several oil company bases and wharves. A boatyard has marine railways, one of which is capable of handling craft up to 70 feet for hull repairs. On the bayou between Dulac and Boudreaux are numerous shrimp docks, seafood packing plants, and ice plants. Gasoline, diesel fuel, water, ice, and some marine supplies are available at the docks. A boatyard at **Boudreaux,** about 23 miles above the mouth, has four marine railways that can handle craft up to 50 feet for hull repairs. A machine shop is close by.

Grand Bayou du Large extends between **Caillou Lake** and Caillou Bay. Depths of 5 to 6 feet are off the S entrance, and 3 to 4 feet through a buoyed channel across Caillou Lake to **Grand Pass** connecting with **Bayou du Large** and with **Lake Mechant.** A draft of 3 to 4 feet can be carried up Bayou du Large to **Falgout Canal** and thence into **Lake de Cade.** Lesser drafts can go to **Theriot** and thence to **Lake Theriot** through **Marmande Canal.**

Bayou du Large is not navigable N of the public ramp at Theriot. Several overhead power cables cross the bayou S of Theriot; the clearance is 35 feet. Any of the cables can be removed, upon advance notice of 24 hours, for vessels requiring greater clearance. State Route 315 extends S along the E side of the bayou for several miles below Falgout Canal. This section of the bayou is heavily populated, and at several places gasoline and provisions are available. A boatyard on Bayou du Large, about 5 miles below Falgout Canal, has marine railways that can haul out craft to 65 feet for hull and engine repairs. A marina on the N side of Falgout Canal just W of its junction with Bayou du Large has gasoline, diesel fuel, open and covered berths, ice, launching ramps, and marine supplies.

The highway drawbridges in the Theriot area have a minimum channel width of 27 feet and a minimum clearance of 3 feet. Above Theriot, the bayou narrows and is crossed by fixed bridges with little or no clearance. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

Bayou du Large empties into **Taylors Bayou** which flows into the Gulf 4 miles W of Bayou Grand Caillou entrance. A privately maintained light marks the mouth of Taylors Bayou.

Oyster Bayou, 13 miles NW of Raccoon Point, connects the Gulf with Fourleague Bay, an arm of Atchafalaya Bay. This bayou affords a protected route for craft 3 to 3½ feet in draft going to Atchafalaya Bay from Caillou Bay or waters to the E. The bayou has several oyster reefs, which are usually marked by poles.

Oyster Bayou Light (29°12.7'N., 91°07.7'W.), 30 feet above the water, is shown from a skeleton tower on piles with a red and white diamond-shaped daymark on the E side of the entrance.

The route across the S end of Fourleague Bay is marked by lights and daybeacons. Boats follow close along the E side of the daybeacons in a channel slightly deeper than the general bay depths. A light off Halters Island Point marks the entrance to Fourleague Bay from Atchafalaya Bay. **Blue Hammock Bayou** on the E side of Fourleague Bay is another entrance to the network of shallow inside waters in this vicinity. Boats drawing 3 to 4 feet can reach the Intracoastal Waterway on a favorable tide by way of **Lost Lake, Bayou de Cade,** Lake de Cade, and **Minors Canal.** Blue Hammock Bayou also connects with Lake Mechant.

Charts 11357, 11356.-Ship Shoal, lying about 9 miles S of Raccoon Point, is about 7 miles long in a general E-W direction, about 1.5 miles wide at the W end, and has depths ranging from 9 to 12 feet. Depths of 13 to 30 feet and wrecks with a least depth of 5 feet over them extend about 23.5 miles E of the E end of Ship Shoal. In stormy weather the shoal may be distinguished at some distance off by a choppy or breaking sea. In calm weather its position is not indicated by natural phenomena and can best be avoided by using the lead or fathometer. Heavy rips have been reported about 15 miles SW of Ship Shoal.

Oil drilling structures, marked by lights, are located on all sides of Ship Shoal and up to 60 miles offshore as well as throughout the delta section. Wrecks and other obstructions, covered and unmarked, may exist on the shoal and in the surrounding areas; mariners are advised to exercise extreme caution.

Ship Shoal Daybeacon (28°54.8'N., 91°04.3'W.), a brown skeleton structure on piles, formerly the structure of discontinued Ship Shoal Light, is in 14 feet of water on the NW part of Ship Shoal and about 86 miles W of Southwest Pass. The structure is marked by four quick flashing white obstruction lights, displayed at a height of 17 feet above water from the perimeter of the lower platform.

Currents.-Current predictions for four passes into Barataria Bay, two passes into Terrebonne Bay and several inside stations may be obtained from the Tidal Current Tables. Weather conditions often modify considerably the tidal currents in these passes.

Chart 11351, 11354.-Atchafalaya Bay is a large indentation in the coast of Louisiana 112 miles W of Southwest Pass, Mississippi River. The bay is about 28 miles long in nearly an E-W direction, averages 7 miles in width, is full of shoals and oyster reefs, and has general depths ranging from 3 to 9 feet. A fringe of reefs partially separates the bay from the Gulf, the E end being known as Point au Fer Shell Reef. The bay is the approach to Lower Atchafalaya River and the Port of Morgan City, with depths of 25 feet or less extending 25 miles off the channel entrance. Vessels navigating the bay usually draw 3 to 10 feet.

Prominent features.-Point au Fer Reef Light 33 (29°22.3'N., 91°23.1'W.), 44 feet above the water and shown from a skeleton tower on a concrete platform with a square green daymark on **Eugene Island** on the W side of the dredged channel, and an abandoned lighthouse on Southwest Reef are the only conspicuous objects in the **Point au Fer Shell Reef** area. A seasonal fog signal is at the light.

The abandoned lighthouse, 6.5 miles W of Point au Fer Reef Light 33, is a black, square, pyramidal tower connected to a square house on piles with a pyramidal tower on the roof and prominent when approaching close inshore from the W. **Belle Isle,** on the N shore of the bay N of Point au Fer Reef Light 33, is 75 feet high and conspicuous for some distance offshore. Oil well structures and obstructions are throughout the area.

COLREGS Demarcation Lines.-The lines established for Atchafalaya Bay are described in 80.835, chapter 2.

Vessels should enter Atchafalaya Bay through the Atchafalaya Pass Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Channels.-Atchafalaya Bay Ship Channel extends in a NE direction from the Gulf to near the mouth of the Lower Atchafalaya River. A Federal project provides for a 20-foot dredged channel from the 20-foot contour in the Gulf to the 20-foot contour in Atchafalaya Bay. (See Local Notice to Mariners and latest editions of the charts for controlling depths.) Depths in the river are about 21 feet or more to Morgan City.

Lights and buoys mark Atchafalaya Bay ship channel. Point au Fer Reef Light 33 marks the cut through Point au Fer Shell Reef. Strong currents will be encountered in the channel through Point au Fer Shell Reef, especially during N winds and extreme low tides.

A cutoff channel from the mouth of Lower Atchafalaya River W through the bay, to the entrance to East Cote Blanche Bay, has been abandoned. Some of the pile daybeacons marking it have been broken off, are covered at high water, and accordingly constitute a danger to navigation.

Deer Island, on the E side of the Lower Atchafalaya River entrance, can be approached through a short dredged channel just SW of the island. The channel has a depth of 7 feet.

Fog is most frequent during January, February, and March. S winds bring it in, and N winds clear it away.

Tides, currents, and freshets.-The level of the water surface and the velocity of the current depend to a considerable extent upon the force and direction of the wind. At Eugene Island the diurnal range of tide is 1.9 feet. Normal tide action is not perceptible at Morgan City. N winds lower the water surface at Morgan City as much as 1 foot, and SE winds raise it 1.5 to 2 feet.

Freshets occur frequently during May and June, at which times the river overflows its banks and the current has considerable velocity, making it difficult to keep in the channel. During ordinary stages of the river, the current has a velocity of about 0.5 knot. When there are freshets in the rivers, the water in Atchafalaya Bay is quite fresh and that in the Cote Blanche Bays is nearly so. The discolored water coming out of the mouth of the river will be encountered well offshore, the distance depending much upon the direction of the wind.

Lower Atchafalaya River flows S into the NE corner of Atchafalaya Bay; it is the outlet for an extensive system of S Louisiana lakes and bayous known as the Atchafalaya navigation system, an inside passage to the Mississippi River about 180 miles above New Orleans.

The Lower Atchafalaya River leads N from Atchafalaya Bay through Berwick Bay, thence W through Berwick Lock, and joins Bayou Teche 8 miles above the Berwick Lock near Patterson. The section of the river from Atchafalaya Bay to Berwick Lock has a crooked channel with depths from 21 to 113 feet over widths from 300 to 600 yards; the deepest water is generally in midstream. In August 1981, the controlling depth in the river from Berwick to its junction with Bayou Teche was 8 feet.

That part of Lower Atchafalaya River from Berwick Lock to 1 mile above Berwick Lock is within the area of the Berwick Bay Vessel Traffic Service (VTS). (Berwick Bay VTS is discussed later in this chapter.)

Bayou Shaffer is a passage branching NE to Bayou Boeuf from Sweetbay Lake in the Lower Atchafalaya. An overhead power cable with a clearance of 130 feet crosses Bayou Shaffer near the junction with Bayou Boeuf. The bayou serves as a cutoff for vessels bound E from Atchafalaya Bay to the Intracoastal Waterway. In January 1983, the controlling depth was 8 feet.

That part of Bayou Shaffer for 1 mile below the junction with Bayou Boeuf is within the area of the Berwick Bay Vessel Traffic Service (VTS). (Berwick Bay VTS is discussed later in this chapter.)

Avoca Island Cutoff is a narrow channel joining Lower Atchafalaya River with Bayou Chene. The cutoff enters the E side of the river about 4 miles above the mouth. In October 1983, the controlling depth was 18 feet.

Bayou Chene extends NE from Avoca Island Cutoff to join and become part of the Intracoastal Waterway. In October 1983, the controlling depth was 18 feet from the cutoff to the Intracoastal Waterway.

Little Wax Bayou, which branches W from the Lower Atchafalaya about 13.5 miles above the mouth, is part of the Intracoastal Waterway and is described later in this chapter.

Bayou Boeuf, also part of the Intracoastal Waterway and described in chapter 12, joins the Lower Atchafalaya from E at Morgan City. The Intracoastal Waterway follows Lower Atchafalaya S for 2.5 miles to Little Wax Bayou.

An alternate route of the Intracoastal Waterway, from Morgan City N to Port Allen on the Mississippi River and Bayou Grosse Tete, is described in chapter 12.

Charts 11355, 11354.-Berwick Bay is the section of the Lower Atchafalaya from Bayou Boeuf N to Sixmile Lake. Morgan City is on the E side of the bay and Berwick on the W side.

Three bridges across Berwick Bay link Morgan City and Berwick. The Southern Pacific railroad vertical lift bridge has a clearance of 4 feet down and 73 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) U.S. 90 fixed highway bridges, about 400 and 500 yards above the railroad bridge, have clearances of 73 feet and 50 feet, respectively. A lighted approach danger range is shown from the W abutments of the fixed bridges. The range is visible only to downbound vessels and is designed to mark the W boundary of the suggested downbound course for approaching the bridges. **The range is not designed to be steered on. Mariners are cautioned not to rely solely on the range to safely navigate through the bridges.**

In order to advise mariners on southbound vessels that special navigation orders are in effect, Berwick Bay Bridges Warning Lights have been established on the railroad bridge in about 29°41.5'N., 91°12.8'W. The private lights, two quick flashing white lights with orange balls as day signals, are shown from a skeleton tower atop the lift span. The lights operate 24 hours a day when special navigation orders are in effect.

Vessel Traffic Service (Berwick Bay) is operated by the U.S. Coast Guard to enhance the safety of navigation in the Berwick Bay area and consists of a communications network, vessel reporting points, and a Vessel Traffic Center (VTC).

When high-water conditions exist in this area, limitations as to the size and makeup of tows, and of certain types of cargo carried, are put into effect.

Based upon information provided by masters of vessels and the bridgetender of the Southern Pacific Railroad Bridge over Berwick Bay, the VTC may make recommendations to coordinate the flow of traffic in the vicinity of and through the bridges across Berwick Bay. While the recommendations of the VTC to coordinate the traffic flow are advisory in nature, compliance with reporting requirements, operating procedures, and high-water vessel and traffic limitations is mandatory for those vessels which must participate in the VTS.

Navigation safety information will be relayed by the VTC. Mutual planning by vessels using the bridge-to-bridge radiotelephone is encouraged. The

purpose of the Berwick Bay Vessel Traffic Service is not to attempt to maneuver or navigate from shore, but to coordinate the flow of traffic through the Vessel Traffic Service area. The rules governing vessels operating in the Vessel Traffic Service are given in **161.701 through 161.783,** chapter 2. In addition, the proper operating procedures are contained in the Berwick Bay Vessel Traffic Service Operating Manual, available free from Commander, Eighth Coast Guard District (m), Hale Boggs Federal Building, 500 Camp Street, New Orleans, La. 70130, or from the Commanding Officer, Berwick Bay Vessel Traffic Service, 800 David Drive, Room 255, Morgan City, La. 70380.

Port of Morgan City is at the confluence of Atchafalaya River and the Intracoastal Waterway about 35 miles from deep water in the Gulf of Mexico. The port limits include the E quarter of the Parish of St. Marys from 91°17.4'W. to Bayous Boeuf and Chene, and from Sixmile Lake to the mouth of Atchafalaya River. Numerous inland waterways that radiate from the port make it a center for offshore oil exploration and development. There is considerable commerce in seafood, shell, petroleum products, building cement, sand and gravel, oil-well pipe casing, machinery, and supplies, and chemicals. The Port of Morgan City Harbor and Terminal District has jurisdiction over the port under a Board of Commissioners appointed by the governor of the State. The board establishes rules and regulations for the port.

Morgan City, on the E side of Berwick Bay, has several landings with ample depths for river boats; vessels generally go alongside, because of the depths and currents in the river. The principal industries are fishing, ship building, cement, petroleum, carbon black, chemicals, sulfur, salt, menhaden, and some agriculture in the raising of rice and sugar. The city has ice and cold storage plants. Tugs up to 4,500 hp operate from Morgan City.

The Young Memorial Vocational Training Center, a school for navigation, seamanship, and marine and electrical engineering, is located in Morgan City.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

There is a hospital at Morgan City.

Morgan City is a **customs port of entry.**

A 1,300-foot-long public wharf with 12 feet reported alongside is on the E side of Berwick Bay between the railroad lift bridge and the U.S. 90 highway bridge. The wharf has water and electrical shore-power connections. A Coast Guard patrol boat moors at the wharf.

Repairs.-Several shipbuilding and repair yards are at Morgan City and on Bayou Boeuf. There are also yards on Bayou Black at West Gibson and on Bayou Teche at Avalon. These yards have floating drydocks, marine railways, and machine and other repair shops, and build barges, tugs, crew boats, oil well structures, and shrimp boats. The largest floating drydock, at one of the yards on Bayou Boeuf, has a 6,200-ton lifting capacity and can handle vessels to 250 feet long, 110-foot beam, and 20-foot draft for complete repairs; a 750-ton floating crane is also available at this yard. The smaller yards build and repair tugs, shrimp boats, and other fishing craft. A 500-ton floating crane and many smaller cranes are available at these yards. Gasoline, diesel fuel, water, ice, and marine supplies are available.

There are no marinas at Morgan City, and dockage is limited to the fueling piers, and fishing company and oil company piers.

Berwick, opposite Morgan City on the W side of Berwick Bay, has several seafood, fertilizer, and chemical plants, a shipyard, and several oil company bases. The shipyard has several floating drydocks, the largest of which can handle vessels to 2,000 tons, 200 feet long, 79-foot beam, and 16-foot draft for general repairs; a 25-ton crane is available. Gasoline, diesel fuel, water, ice, and marine supplies are available.

Communications.-The port is served by the Southern Pacific Railroad which has connections with other trunk railroads. U.S. Route 90 passes through the city. A State-owned airport is 14 miles W of the city at Patterson. Numerous truck lines operate out of the port.

Charts 11355, 11354, 11350, 11352, 11345.-Bayou Teche is a navigable waterway in S Louisiana parallel to and 35 miles W of the Mississippi River, meandering NW for about 93 miles from its junction with Lower Atchafalaya River, about 8 miles W of **Berwick Lock,** to its sources in St. Landrys Parish. The lock has a length of 300 feet, width of 45 feet, and depth over the sill of 9 feet at mean low water. The lockmaster monitors VHF-FM channel 13 (156.65 MHz). The lock operates from 0600 to 2200 daily.

There is considerable commerce on Bayou Teche, and that part of Lower Atchafalaya River W of Berwick Lock, in seafood, shell, sugar, molasses, petroleum products, building cement, sand and gravel, oil-well pipe casing, machinery and supplies, fertilizer, and chemicals. There are shipyards and sugar mills along the bayou. Shell barges are the principal users; shrimp boats operate to Patterson.

The main State highway between New Orleans and Lake Charles follows the bayou through the principal towns.

A dredged channel leads from Berwick Lock W through the Lower Atchafalaya River and Bayou Teche to Arnaudville, a distance of about 92 miles. In April 1982, the controlling depths were 8 feet to the floodgates at the junction with Wax Lake Outlet, thence shoaling to bare through the floodgates, thence in 1981-April 1982, 3 feet to Breaux Bridge, about 79 miles above Berwick Lock. Depths are not available from Breaux Bridge to Arnaudville.

A highway bridge about 7 miles above Berwick Lock at **Patterson** has a swing span with a clearance

of 6 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable at the bridge has a clearance of 68 feet. An overhead power cable crossing the bayou about 8.5 miles above Berwick Lock has a clearance of 66 feet.

A highway swing bridge with a clearance of 5 feet is at **Avalon** about 10.6 miles above the lock. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

A shipyard at Avalon has a 125-foot marine railway and a 250-ton drydock that can handle vessels to 125 feet long, 30-foot beam, and 8-foot draft. Hull repairs can be made to steel and aluminum vessels.

Bayou Teche crosses the Wax Lake Outlet channel at **Calumet,** about 12 miles above Berwick Lock. There are floodgates, which are usually open, across both sides of Bayou Teche at its junction with Wax Lake Outlet. During high-water stages, the E gate remains closed. The W gate is manned from 0500 to 1900 and is opened upon request. The floodgates are used by small craft only. The opened widths through the floodgates are 45 feet. The overhead power cable just E of the E floodgate has a clearance of 60 feet. Local information should be obtained before attempting the alternate route through Sixmile Lake.

At **Centerville,** about 17 miles above the lock, an overhead power cable with a clearance of 60 feet crosses the bayou. A highway swing bridge with a clearance of 5 feet crosses the bayou about 0.5 mile W of Centerville. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

Garden City, 18.5 miles above Berwick Lock, is the site of a large lumber mill. An overhead power cable about 20 miles above the lock has a clearance of 66 feet.

Hanson Canal is 20.2 miles above Berwick Lock; little used for navigation, it leads S from Bayou Teche at Garden City, turns W, and enters and follows Bayou Portage to the Intracoastal Waterway in Bayou Bartholomew. In July 1982, it was reported that the canal was used only by small outboard boats and local knowledge was recommended. Near the junction of Hanson Canal and Bayou Teche are the remains of an abandoned lock; seven fixed bridges with minimum widths of 18 feet and clearances of 6 feet; overhead pipelines with clearances of 7 feet, and overhead power cables with clearances of 35 feet. Traffic between the Intracoastal Waterway and Bayou Teche is via the Charenton Canal discussed later in this chapter and in chapter 12.

Franklin, about 22 miles above Berwick Lock, is an agricultural center that has several industries, and is the seat of St. Mary Parish. **Franklin Canal,** SW of Franklin, leads into **Bayou Portage** and connects with the Intracoastal Waterway at Bayou Bartholomew. In June 1983, the controlling depth through Franklin Canal and Bayou Portage to Bayou Bartholomew was 4 feet. Near its N end, the canal is crossed by three overhead power cables with a least clearance of 60 feet, twin fixed highway bridges with a clearance of 50 feet, and a highway swing bridge with a clearance of 7 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) In November 1983, a highway swing bridge with a design clearance of 7 feet was under construction adjacent to the existing swing bridge.

An overhead power cable with a clearance of 60 feet crosses Bayou Teche just below Franklin.

At the town of Franklin a highway bridge with a swing span has a clearance of 2 feet. An overhead power cable about 0.1 mile N of the bridge has a clearance of 60 feet. Another highway bridge with a swing span with a clearance of 4 feet is about 23 miles above Berwick Lock. An overhead television cable about 0.1 mile W of the highway bridge has a clearance of 60 feet. The railroad bridge that crosses the bayou 26.5 miles above the lock, with a width of 49 feet, was not being used in 1982, and its span was left in an open position. A highway bridge with a swing span having a clearance of 6 feet crosses the bayou 27 miles above the lock. Several more bridges with swing spans cross the bayou between 31.1 and 48.1 miles above the lock; minimum clearance is 3 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) Between Franklin and Jeanerette several overhead power cables cross the bayou; least clearance is 60 feet.

Launching ramps are available at Franklin on the W side of Bayou Teche and near the head of Franklin Canal.

Jeanerette is 44 miles above Berwick Lock and is chiefly a market town; its principal products are sugar, oil, pecans, and peppers. There is a large foundry in the town.

About 1 mile NW of **Hope,** 46.5 miles above Berwick Lock, a highway swing bridge with a clearance of 5 feet crosses Bayou Teche. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

The highway bridge which crosses the bayou at **Olivier,** about 50 miles above Berwick Lock, has a swing span with a clearance of 4 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

A highway swing bridge with a clearance of 5 feet crosses the bayou about 1.5 miles above Oliver. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Between Jeanerette and New Iberia are several overhead power cables that cross the bayou; least clearance is 60 feet.

New Iberia, the seat of Iberia Parish, lies on the banks of Bayou Teche, 54 miles above Berwick Lock. The town is the center of an extensive agricultural area and has food processing plants, dairies, condiment factories, and several small manufacturing industries, and is a supply center for the oil development of the surrounding area. New Iberia has two hospitals.

Several highway bridges with swing spans and one with a bascule span cross the bayou at New Iberia; least clearance is 4 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

The**Port of Iberia (Port of New Iberia)** is located 5 miles S of New Iberia, on **Commercial Canal,** which connects with the Intracoastal Waterway through **New Iberia Southern Drainage Canal** and Bayou Carlin. From the Intracoastal Waterway, a channel leads SW and across the bar into Weeks Bay at the NE corner of Vermilion Bay. In June 1983, the controlling depths were 4 feet across the bar to the Intracoastal Waterway, thence 11 feet to the head of the canal at the Port of Iberia.

The port is 7 miles N of the Intracoastal Waterway, about 8.5 miles from Weeks Bay, and about 35 miles from deep water in the Gulf. The port has several slips and a small turning basin, all of which are reported to have a controlling depth of 14 feet in July 1982. The principal industries located in the port area are sugar, chemicals, fertilizer, shell, grain, oil-well rig and machinery construction and repair, pipe coating, and shipbuilding. Loading and docking facilities are available at the public dock and at the public boat slip about 0.5 mile S of the public dock. Open and covered berths, gasoline, diesel fuel, water, and ice are available. A shipyard in the port has two floating drydocks, the largest of which has a 3,300-ton lifting capacity and can handle vessels to 180 feet long, 79-foot beam, and 16-foot draft for complete repairs.

The canal and port are governed by the Board of Directors of the Port Commission, Port of Iberia District.

There are highway and railroad connections to the port area.

Several highway bridges with swing spans cross Bayou Teche between New Iberia and Loreauville; minimum channel width 50 feet and minimum clearance 4 feet. The highway bridge at Loreauville 61.9 miles above Berwick Lock has a vertical-lift span with a clearance of 3 feet down and 50 feet up. (See 117.1b, 117.240 and 117.540, chapter 2, for drawbridge regulations and opening signals.) Overhead power cables crossing the bayou between New Iberia and Loreauville have a least clearance of 60 feet.

A shipbuilding plant on the W bank above **Loreauville,** about 8 miles above New Iberia, constructs aluminum boats to 135 feet long. In an emergency, they can handle boats to 80 feet long and with 7-foot draft for complete repairs. Marine supplies can be obtained at the yard.

A highway bridge about 4.5 miles above Loreauville has a swing span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable crosses the bayou between Loreauville and Keystone Lock; clearance is 60 feet.

Keystone Lock, 160 feet long and 36 feet wide with a depth of 9½ feet over the sill, is 16 miles above New Iberia and 69.8 miles above Berwick Lock, and halfway, by highway, between New Iberia and St. Martinville. Traffic lights are at each end of the lock. Vessels should wait for the green light before entering the lock.

The least clearance of overhead power cables between Keystone Lock and Ruth is 50 feet.

In September 1982, a highway swing bridge with a design clearance of 6½ feet was under construction about 71.5 miles above Berwick Lock.

St. Martinville is a town on Bayou Teche about 20 miles above New Iberia, of interest because of the early French settlers and Evangeline, the heroine of Longfellow's famous poem. An overhead power cable crossing the bayou at St. Martinville has a clearance of 67 feet. A highway bridge over the bayou 73.1 miles above Berwick Lock has a swing span with a width of 40 feet and a clearance of 4 feet. A combination railroad-and-highway bridge at **Levert,** 75.2 miles above the lock, has a swing span with a clearance of 8 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(10), chapter 2, for drawbridge regulations and opening signals.)

A highway bridge at **Parks,** 78.8 miles above Berwick Lock, has a vertical lift span with a width of 41 feet and a clearance of 5 feet down and 50 feet up. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(10), chapter 2, for drawbridge regulations and opening signals.)

A highway bridge crossing the bayou at **Ruth,** 83.6 miles above Berwick Lock, has a swing span with a width of 42 feet and a clearance of 8 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(10), chapter 2, for drawbridge regulations and opening signals.)

Several bridges and overhead power cables cross the bayou between Ruth and Arnaudville. Least clearances are: swing spans, 15 feet; vertical-lift spans, 1 foot down, 51 feet up; removable spans, 5 feet; fixed spans, 7 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(10), chapter 2, for drawbridge regulations and opening signals.) Overhead power cables between Ruth and Arnaudville have a least known clearance of 40 feet.

The Lower Atchafalaya River leads N from Berwick Bay through Stouts Pass to Sixmile Lake. The marked channel N through **Sixmile Lake** and **Grand Lake** is part of the Atchafalaya River navigation system discussed in chapter 12.

Wax Lake Outlet, the deep drainage canal that leads SSW from Sixmile Lake to Atchafalaya Bay, crosses Bayou Teche near Calumet, the Intracoastal Waterway in the vicinity of Possum Point Bayou, thence through Wax Lake into the bay. An overhead pipeline bridge with a clearance of 33 feet crosses the canal 0.8 mile N of Bayou Teche. Three bridges with fixed channel spans and a minimum clearance of 2 feet control navigation in the canal S of Bayou Teche. An overhead power cable about 150 yards S of the bridges has a clearance of 60 feet. Three overhead pipeline bridges about 0.3 mile S of the bridges have a least clearance of 73 feet. An overhead pipeline bridge 0.4 mile S of the bridge has a clearance of 75 feet. In 1969, the entrance to Wax

Lake Outlet from Sixmile Lake was reported to be marked by private buoys; also reported was an old sugarmill and stack on the E side of the entrance.

Chart 11351.-Little Wax Bayou, branching W from Lower Atchafalaya River 2.5 miles below Morgan City, empties into **Wax Lake** and through **Wax Lake Pass** and **New Pass** into Atchafalaya Bay. The N end of the bayou has been straightened by dredged cuts to form the route of the Intracoastal Waterway W from Lower Atchafalaya River. **Big Wax Bayou** flows into Wax Lake Pass and through New Pass into Atchafalaya Bay. These bayous form an inside route from Morgan City to the W part of the bay. In 1969, shoaling to 2 feet, and numerous uncharted stumps, snags, and logs were reported in the approach to New Pass from Atchafalaya Bay extending about 4 miles S from a point in about 29°31.5'N., 91°26.5'W.

Charts 11350, 11345, 11351, 11349.-Marsh Island, on the S side of Vermilion Bay and W of Atchafalaya Bay, is low and marshy. The entire Gulf shore of the island is foul; numerous oyster reefs, some of which uncover at low water, extend for about 4.5 miles off the S point of the island. The foul area should not be entered without local knowledge. **Shell Keys,** a low group of small islands 3 miles SSW of **Mound Point,** the southernmost point of Marsh Island, are only about 2 feet high.

Trinity Shoal lies about 25 miles S of Southwest Pass, Vermilion Bay, and 60 miles 285° from Ship Shoal Abandoned Lighthouse. The shoal is about 20 miles long in a WSW and ENE direction, and has depths of 11 to 18 feet. It is fairly steep-to on its S side, the 5- and 10-fathom curves being distant only about 1 and 5 miles, respectively. In calm weather Trinity Shoal is discernible by a difference in the color of the water, and in stormy weather by a choppy sea. Because of its greater depth, the sea does not break as heavily on Trinity Shoal as it does on Ship Shoal.

Vessels should approach Southwest Pass through the prescribed Safety Fairway. (See 166.100 through 166.200, chapter 2.)

Sunken wrecks have been reported in the safety fairway in about 29°32'N., 92°05'W. and in the vicinity of Southwest Pass-Vermilion Bay Approach Light C in about 29°28.5'N., 92°06.7'W. Caution is advised in these areas.

COLREGS Demarcation Lines.-The lines established for Southwest Pass are described in 80.835, chapter 2.

Southwest Pass extends between the W end of Marsh Island and the mainland and is the entrance to Vermilion Bay from the Gulf. The pass is marked by lights and daybeacons. An approach channel, with a depth of 11 feet reported in July 1982, leads across the bar just E of the Safety Fairway. In May 1983, shoaling to an unknown extent was reported between Southwest Pass-Vermilion Bay Light 1 and Southwest Pass-Vermilion Bay Daybeacon 3. Although not difficult to enter, the pass may be difficult to recognize and local assistance is advised.

East Cote Blanche Bay, West Cote Blanche Bay, and **Vermilion Bay** together make up a large body of water extending WNW from the NW side of Atchafalaya Bay, and are separated from the Gulf by Marsh Island. This water area is about 32 miles long and 5 to 15 miles wide, and depths averaging of 5 to 9 feet. With the exception of Cote Blanche Island, Week's Island, and Avery Island, the shores of these bays and Marsh Island are low and marshy. In recent years there has been extensive oil exploration in the bays offshore from **Burns** off **South Bend** in East Cote Blanche Bay, along the NW shore in West Cote Blanche Bay, and on Dry Reef.

Boats bound from Atchafalaya Bay to East Cote Blanche Bay generally use **Morrison Cutoff,** which is between **Point Chevreuil** on the E and **Rabbit Island** on the W. Under favorable conditions a draft of 4 to 5 feet can be carried through the cutoff into East Cote Blanche Bay and thence through West Cote Blanche Bay to Vermilion Bay. Local knowledge is needed to carry the best water.

The Jaws, at the NE corner of West Cote Blanche Bay is a passage connecting the bay with the Intracoastal Waterway and with **Charenton Canal.** In June 1983, the controlling depth was 6 feet through the passage; knowledge of local existing conditions is advised. The entrance from the bay is marked by a light. In July 1982, it was reported that a line of private buoys marked a passage from the bay into The Jaws.

Cote Blanche Island, 97 feet high, is on the N side of West Cote Blanche Bay. From the bay side, the island appears as a reddish-yellow steep bluff. **Ivanhoe Canal,** W of the island, connects West Cote Blanche Bay with the Intracoastal Waterway. The canal is marked by private aids.

A seaplane dock, marked by a private light, is about 3.8 miles SW of the entrance to Ivanhoe Canal in about 29°42'16"N., 91°47'27"W.

Cypremort Point, on the E side of Vermilion Bay and NW side of West Cote Blanche Bay, is the site of a summer resort. A private light marks the W extremity of the point. Several private canals, on which are homes and private docks, have been dredged into the banks on the N side of the point. Gasoline, diesel fuel, ice, and a launching ramp are available at a fuel facility on the point. The canals and the channel leading to the fuel facility had reported controlling depths of about 3 feet in July 1982. Private mooring slips are available. State Route 319 connects the point with the town of **Cypremort.**

Weeks Island, 171 feet high, is E of **Weeks Bay,** the NE extension of Vermilion Bay. The Intracoastal Waterway passes close along the W side of the island. Several storage tanks and the mine buildings make prominent landmarks from the bays; salt is mined on the island. There are rail and highway connections to **Balwin** on Bayou Teche. A large oil field is on the N side of Weeks Island.

Avery Canal leads NW from Vermilion Bay to a

junction with Bayou Petite Anse at the Intracoastal Waterway. A dredged approach channel leads from Vermilion Bay to the canal. In June 1983, the controlling depths were 4 feet in the entrance channel and 7 feet in Avery Canal. Lights mark the entrance channel.

A dredged channel in **Bayou Petite Anse** leads from the Intracoastal Waterway N for about 5.3 miles to a fixed highway bridge at the N end of Avery Island. In June 1983, the controlling depth was 8 feet to the junction with Bayou Carlin, thence 6 feet to the highway bridge. Daybeacons mark the channel.

Avery Island, E of Bayou Petite Anse, has several mine buildings that show prominently from Vermilion Bay. A canal 9 feet deep leads from Bayou Petite Anse to a salt mine on the island. A railroad and a highway from New Iberia extend as far S as Avery Island.

About 2.8 miles above the Intracoastal Waterway, a dredged channel in **Bayou Carlin** branches NW from Bayou Petite Anse for about 2.5 miles to a junction with Bayou Tigre and Delcambre Canal. The dredged channel in **Delcambre Canal** continues N to **Lake Peigneur.** In June 1983, the controlling depth was 8 feet in Bayou Carlin and Delcambre Canal.

Delcambre is on Delcambre Canal, 2 miles S of Lake Peigneur, and is the fishing center for Iberia Parish. The town has several seafood processing plants, public wharves, and a shipyard with a marine railway capable of handling vessels to 65 feet. General hull and electronic repairs can be made. There is a marina where covered berthage can be obtained. Numerous shrimp boats base at the port. Gasoline, diesel fuel, water, ice, and marine supplies are available. Highway and railroad bridges with vertical lift spans cross the canal at Delcambre. Each bridge has a channel width of 40 feet; the Southern Pacific railroad bridge has a clearance of zero feet down and 46 feet up, and State Route 14 highway bridge has a clearance of 2 feet down and 44 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable at the highway bridge has a clearance of 51 feet.

Jefferson Island, on Lake Peigneur, is the site of a large salt mine. It is the head of navigation on the canal. The lake is cluttered with old piling and other obstructions.

Bayou Tigre, navigated only by small craft at high tide, is a tortuous waterway extending from Bayou Carlin to **Erath.** Seven bridges cross the bayou; minimum width is 9 feet, and minimum clearance of fixed spans is 1 foot. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) A shipyard at Erath has a marine lift that can haul out craft to 60 feet for hull repairs.

A private light and daybeacons in Vermilion Bay mark the entrance channel into **Boston Bayou,** about 7.3 miles SW of Avery Canal. In June 1980, the reported controlling depths were 5 feet in the entrance channel, thence 4 feet to the Intracoastal Waterway.

Vermilion River, also known as **Bayou Vermilion** and so marked at the bridge crossings, flows from the N and crosses the Intracoastal Waterway and enters Vermilion Bay through **Four Mile Cutoff (Vermilion River Cutoff).**

A dredged channel leads from Vermilion Bay through Four Mile Cutoff, across the Intracoastal Waterway, and N in the Vermilion River to Lafayette. In June 1983, the controlling depths were 7 feet across the bar in Vermilion Bay to the Intracoastal Waterway, thence 9 feet to Woodlawn, thence 7 feet to Broussard Highway Bridge, thence 4 feet to Pinhook Highway Bridge about 2 miles below Lafayette. Lights mark the entrance channel. A channel, marked by lights and daybeacons, leads across Vermilion Bay from Southwest Pass to the entrance channel to Four Mile Cutoff. The entrance shoals rapidly after dredging and may be difficult to enter during the winter when strong winds from the N lower the water in the bay. In February 1983, it was reported that the river channel is subject to shoaling at its junction with a small stream about 0.8 mile below the Pinhook Highway Bridge. Mariners are advised that strong currents may be encountered in the river. In July 1982, several sunken barges were reported to be along the E bank of the river about 1 mile N of the junction with the Intracoastal Waterway. Caution is advised while navigating in the area.

The limiting clearances of the numerous overhead power cables crossing the river are as follows: Intracoastal Waterway to Perry, 65 feet (at Rose Hill); Perry to Abbeville, 60 feet (just SW of Abbeville); and Abbeville to Lafayette, 54 feet (at Milton). The least clearance of the three swing bridges across the river is 8 feet; of the six vertical lift bridges, 4 feet down and 50 feet up; and of the two fixed bridges, on railroad and one highway, at Lafayette, 5½ feet vertical and 25 feet horizontal. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Waterborne commerce on the Vermilion River is in petroleum products, shell, oil-well pipe casing, machinery, cement, sand and gravel, and crushed rock.

Intracoastal City, on the Vermilion River just N of the Intracoastal Waterway, has several offshore oil-well terminals and bases, a fish packing plant and wharf, boat club, and several marinas and boatyards. The largest marine railway in the area can handle craft up to 50 feet for hull and engine repairs; lifts are also available. Floating cranes up to 250 tons, lifts, and marine railways are available for hauling out barges for repairs at the oil company bases. Gasoline, diesel fuel, water, ice, marine supplies, a surfaced launching ramp, and open and covered berthage are available. Depths of 4 to 14 feet were reported alongside the berths in July 1982.

Cable ferry.–A cable ferry crosses Vermilion River at **Bancker,** a small village about halfway between the Intracoastal Waterway and Abbeville. Unlighted

white signs, labeled "Caution Cable Ferry", mark the E and W approaches about 500 to 1,000 feet on either side of the ferry crossing. The ferry is equipped with navigational lights and operates between the hours of 0500 and 2100 daily. When the ferry is underway, the unmarked cables extend about 1 to 2 feet above the water's surface, and are dropped to the bottom when not underway. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

A shipyard that builds and repairs tugs, party boats, and barges is on the E side of the river at Bancker. The largest floating drydock at the yard has a capacity of 2,000 tons and can handle vessels to 200 feet long with 90-foot beam and 14-foot draft. Machine and welding shops, supplies, and a 60-ton crane are available; fuel is available by truck.

The **Port of Vermilion,** on the W side of the river just above Bancker, is the site of oilfield equipment fabrication companies. In 1982, the reported controlling depth in the port was 16 feet. A public dock at the port can provide gasoline and water.

Perry is a small village about 16 miles above the Intracoastal Waterway. State Route 82 highway verticle lift bridge at Perry has a clearance of 10 feet down and 55 feet up. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) A shipyard on the W side just below the bridge has marine ways capable of handling crew boats up to 65 feet long and 7 feet in draft for general repairs. Gasoline and diesel fuel can be trucked in. There are metal, joiner, and welding shops at the yard and hull and engine repairs can be made.

A service wharf for tugs and crew boats is on the W side of the Vermilion River about 18 miles above the Intracoastal Waterway. Gasoline, diesel fuel, water, and some marine supplies are available. A shipyard on the W side of the river at Abbeville, about 18.5 miles above the Intracoastal Waterway, builds and hauls out for repairs wooden and steel crew boats to 75 feet and steel barges to 120 feet long and 5 feet in draft. A 30-ton crane is available. Just above the yard, the Southern Pacific Railroad swing bridge with a clearance of 8 feet crosses the river. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.)

Abbeville, about 19 miles above the Intracoastal Waterway, is the seat of Vermilion Parish. There are grain elevators, grain driers, warehouses, and a rice mill. The principal industries are oil and natural gas production, shell and cement, rice, cotton, wool, sugar, molasses, and syrup, dairy products, poultry, and cattle raising, and light industry in manufacture of consumer goods. The city has a hospital and a municipal airport, and is served by freight service of the Southern Pacific Railroad and bus lines. Two highway bridges crossing the river at Abbeville have lift spans with minimum clearances of 6 feet down and 55 feet up. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) U.S. Route 167 and State Routes 14 and 82 pass through the city.

Woodlawn Highway Bridge crossing the river about 27 miles above the Intracoastal Waterway has a swing span with a clearance of 13 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable with a clearance of 77 feet crosses the river about 0.3 mile below the bridge. Gasoline is available at a dock near the bridge. State Route 92 highway bridge at **Milton** about 29.7 miles above the waterway has a vertical lift span with clearances of 4 feet down and 50 feet up. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.) Overhead power and television cables just below the bridge have a least clearance of 28 feet.

State Route 733 highway bridge at **Broussard Store** about 32.2 miles above the waterway has a vertical lift span with clearances of 6 feet down and 52 feet up. **Flanders** Highway Bridge about 36 miles above the waterway has a swing span with a clearance of 16 feet. (See 117.1b, 117.240, and 117.540, chapter 2, for drawbridge regulations and opening signals.)

Pinhook Highway Bridge at Lafayette and about 39.5 miles above the Intracoastal Waterway has a 40-foot vertical lift span with clearances of 10 feet down and 50 feet up. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(14), chapter 2, for drawbridge regulations and opening signals.) In February 1983, it was reported that during periods of high water, primarily during winter and spring, severe turbulence may be experienced at the bridge.

Lafayette, about 42 miles above the Intracoastal Waterway, is the seat of Lafayette Parish. Lafayette is referred to as the administrative oil capital of the world and is the headquarters of over 600 major and associated oil companies. It is the historical and cultural center of the Acadian country and Cajun people. The University of Southwestern Louisiana is in the city. The principal industries are oil, natural gas, and salt production, but the area is primarily agricultural with production of rice, cotton, soybeans, sugar, molasses, dairy products, livestock, wool, and poultry. Shell is manufactured into cement, and sand, gravel, and timber are important products. There are four large hospitals, two medical centers, and a municipal auditorium in the city. The city is served by passenger and freight service of Amtrak and the Southern Pacific Railroad, bus lines, and airlines. The Lafayette Municipal Airport is on the E side of the city. State Route 729 highway bridge at Lafayette has a 25-foot fixed span with a clearance of 5½ feet. Southern Pacific fixed railroad bridge, about 200 yards above the highway bridge, has a clearance of 21 feet. The bridges are the head of navigation for all but small shallow-draft vessels. In February 1983, it was reported that during periods of high water, primarily winter and spring, severe turbulence may be encountered at the railroad bridge. A small-craft facility is on the E side of the river just above the railroad bridge, and a launching ramp is about 0.5 mile above the bridge.

Fuel and supplies can be trucked to several locations in the city.

Charts 11345, 11349, 11350, 11348.–A dredged channel leads from the Gulf through **Freshwater Bayou Canal** to the Intracoastal Waterway about 1 mile W of Intracoastal City. In January 1984, the controlling depth was 12 feet. A lighted bell buoy marks the approach, and lights mark the entrance channel and the channel to the Intracoastal Waterway. A saltwater barrier lock is about 1.3 miles above the entrance. The lock is 600 feet long and 84 feet wide, and has depths of 16 feet over the sills. Each end of the lock on the W side of the channel has 300-foot-long timber guidewall approaches. The lock is in operation continuously.

Vessels should approach Freshwater Bayou from the Gulf through Freshwater Bayou Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Freshwater Bayou are described in 80.835, chapter 2.

Schooner Bayou empties into the extreme W extension of Vermilion Bay and forms a part of the former inside route of Mermentau River through White and Grand Lakes and connecting passages. The best approach to Schooner Bayou is through Freshwater Bayou Canal, the dredged canal which takes off from the Intracoastal Waterway near Intracoastal City. In January 1984, the controlling depth was 12 feet from the Intracoastal Waterway through Freshwater Bayou Canal; thence 5 feet in Schooner Bayou to Schooner Bayou Control Structure. **Warren Canal, Isle Marrone Canal,** and **North Prong-Schooner Bayou** connect Schooner Bayou with the Intracoastal Waterway to the W of Vermilion Lock. In January 1984, the controlling depth was 6 feet in North Prong. **Schooner Bayou Canal** is crossed by a highway bridge 3.3 miles E of White Lake. The bridge has a swing span with a clearance of 6 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable E of the bridge has a clearance of 95 feet.

The entrance channel to the bayou from Vermilion Bay via Mud Point is no longer maintained and has a depth of about 2 feet. To enter by this route, follow the privately marked channel in the old Vermilion River entrance to the mouth of the bayou which is marked by a light.

Schooner Bayou Control Structure, 4 miles inside the bayou, prevents saltwater from flowing through Schooner Bayou Canal into White Lake; the floodgates are 75 feet wide and 12 feet deep over the sill at mean low water. During high water the gates will be opened to permit passage of any vessel that can navigate against the current that attains velocities up to 5 knots. Vessels coming from E or W can bypass the floodgates by going through North Prong-Schooner Bayou into the Intracoastal Waterway SE of Forked Island.

From Schooner Bayou Canal, the route crosses White, Turtle, Collicon, and Grand Lakes. Several lights and daybeacons mark this route. During the dry summer months, when farmers pump water to irrigate their rice fields, water in the lakes lowers enough to hamper navigation. In June 1983, the controlling depth was 4 feet from Schooner Bayou Control Structure through the lakes and connecting canals to Mermentau River.

White Lake is 12 miles long and 6 miles wide, and has depths of 4 feet or more over a mud bottom. The E and W entrances to the lake are marked by lights, both aids being on the N side of the channel. The course across the lake passes about 0.5 mile off the point in the middle of the N shore of the lake. The channel is not marked.

Approach the E entrance with the line of the Schooner Bayou Canal in range ahead. The channel is narrow, and the spoil bank on the S side is marked by stakes. At the W end of the lake, pass about 10 to 15 yards S of the light just off the canal entrance.

Turtle Lake is nearly round, with a diameter of about 0.75 mile, and is shallow. **Alligator Lake** is about the same size and depth. **Collicon Lake** is 3 miles long, 1 mile wide, and from 2 to 3 feet deep. On the W side of this lake an earth dike extends along the N side of the channel. Keep close to this dike, within 5 to 10 yards of it.

Grand Lake is from 5 to 7 feet deep, but the entrances are subject to shoaling. At the SE end of the lake, the entrance from Collicon Lake leads within 5 to 10 yards along the S side of an earthen dike. A light marks the outer end of the dike. There are lights on Umbrella Point and **Grassy Point** and on the E point at the entrance to the Mermentau River. From the Collicon Lake canal entrance, steer to pass about 0.5 mile off Short Point, the first point to the N, and about the same distance off **Umbrella Point,** the second point to N. From Umbrella Point, pass about 0.25 mile E of Grassy Point, and when beyond this point haul to W and pass well off the E point at the entrance to the Mermentau River, which is marked by a light. About 0.5 mile up the Mermentau River, the Intracoastal Waterway enters from E, follows the river for about 1 mile, and exits to W. The river channel is deep.

A network of canals S from Schooner Bayou to Cheniere au Tigre and W to Pecan Island has been dredged through the marsh. **Sixmile Canal,** a 1.5-mile passage, leaves Schooner Bayou about 1.5 miles E of Schooner Bayou Control Structure and extends S to Freshwater Bayou Canal. **Belle Isle Bayou** enters Freshwater Bayou Canal about 5.3 miles S of Schooner Bayou.

Freshwater Bayou and **Louisiana Fur Company Canal** enter Freshwater Bayou Canal from the W about 10 miles S of Schooner Bayou. Louisiana Fur Company Canal leads NW for about 1.7 miles thence W and N for about 5 miles to the private facilities at a large oil field S of Pecan Island. There is a fish camp near the oil company base at which gasoline, diesel fuel, ice, groceries, and a launching ramp are available.

Other accesses to this network of canals is through **Deepwater Bayou** which enters Vermilion

Bay about 1.5 miles S of Schooner Bayou, or through **Fearman Lake** with outlets to Vermilion Bay on either side of **Redfish Point.** Fearman Lake is shallow, and local knowledge is necessary to carry the best water.

Belle Isle, W of Vermilion Bay, is a low ridge with most of the area under cultivation. The elevation is only slightly above that of the marsh. The headquarters of the Audubon Society Game Preserve is at **Audubon** on **McIlhenny Canal** at its junction with Belle Isle Bayou at the W end of Belle Isle Lake.

Cheniere au Tigre, 4 miles S of Belle Isle, is a wooded ridge about 3 miles long with its E end on the Gulf Coast. The 12-foot elevation on the ridge is the highest natural elevation in the locality.

Pecan Island, S of White Lake, is a long, wooded ridge about 10 feet high. **Pecan Island,** a village on the S end of **Pecan Island Canal,** has a few stores with limited supplies. Gasoline may be obtained by portage.

Pecan Island Canal, a dredged channel, leads S from White Lake to Pecan Island. In July 1982, the reported controlling depth across the bar was 1 foot. A light shown from a dolphin with a square green daymark marks the N entrance of the canal.

Charts 11348, 11345, 11344.-Mermentau River empties into the Gulf of Mexico 86 miles W of Atchafalaya Bay Entrance E of Calcasieu Pass. The entrance channel shifts frequently and should be approached with caution. From the Gulf, the Mermentau leads E through Lower Mud Lake and Upper Mud Lake, thence N into the SW side of Grand Lake, out of the N end of Grand Lake to the Intracoastal Waterway and continuing on 32 miles through **Lake Arthur** to the head of navigation at the junction of **Bayou Nezpique** and **Bayou des Cannes,** where the river is formed.

COLREGS Demarcation Lines.-The lines established for the Mermentau River are described in 80.835, chapter 2.

The preferred entrance to Mermentau River is through a jettied entrance and landcut about 6 miles SSE of the natural entrance. The channel leads N to join the natural channel at the upper end of Lower Mud Lake.

In 1968-1976, the controlling depth was 3 feet through the natural entrance to the upper end of Lower Mud Lake. In September 1983, the controlling depths were 8 feet through the jettied entrance to Grand Cheniere about 6 miles above the mouth of the river, thence 4 feet to the Intracoastal Waterway, thence in May 1983, 8 feet through Lake Arthur to the junction of Bayous Nezpique and des Cannes.

Numerous aids mark the channel in the Mermentau River N of the Intracoastal Waterway. Near the center of Lake Arthur the channel passes through a constriction known as **The Narrows.**

The control structure across Mermentau River at Catfish Point, just below Grand Lake, has dikes and three gates to prevent the inflow of saltwater. The gates are opened for passing boats. Each gate opening is 56 feet wide; the depths over the sills are 15 feet for the two SE gates and 10 feet for the NW gate.

The principal commodities carried by barge on the river are petroleum products, oil-well pipe casing, machinery, clays and drilling mud, sand, gravel, and crushed rock.

Mermentau River is crossed by the following bridges and cables: 2.3 miles W of Grand Chenier, overhead power cables with a least clearance of 46 feet, are on the S side of State Route 82 highway bridge, which has a swing span having a clearance of 13 feet; about 1 mile W of Grand Chenier, an overhead power cable with a clearance of 68 feet; at Lake Arthur, State Route 14 highway bridge with a fixed span having a clearance of 50 feet. A public launch ramp is just N of the bridge on the W side of the channel. Overhead power cables crossing the river above Lake Arthur have a least clearance of 50 feet.

At Mermentau, the Southern Pacific railroad bridge with a swing span has a clearance of 10 feet and the U.S. Route 90 fixed highway bridge has a clearance of 44 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Mariners should exercise extreme caution to prevent collision when approaching and navigating through the drawspan. Tows navigating through the drawspan shall not exceed one barge, and the towing vessels shall be made rigid abreast or astern of the barge.

Creole Canal leads NW from the Mermentau River, about 1.3 miles above its entrance. A launching ramp, ice, and gasoline are available at a grocery store at the head of the canal. A reported depth of 3 feet could be carried to the facility in September 1972. Several oil company supply bases are near the State Route 82 highway bridge. Diesel fuel is available at a fuel dock on the E side of the canal about 0.3 mile below the bridge.

Grand Chenier, a small settlement on the E side of the river between Lower and Upper Mud Lakes, has a highway connection to Lake Charles. Gasoline, water, and limited quantities of provisions are available in the village.

Lake Arthur, a town on the NW side of Lake Arthur 13 miles above the Intracoastal Waterway, has highway and rail connections to Lake Charles. A depth of about 6 feet can be taken to the city pier at Lake Arthur. Gasoline, diesel fuel, lubricants, water, ice, and supplies are available in the town. A marina is on the S side of Lake Arthur, near **Laurents Point.** Gasoline, water, ice, camping, a launching ramp, and supplies are available at the marina.

Mermentau, 16 miles above Lake Arthur, is a rice milling center that has railroad and highway connections with New Orleans and Lake Charles.

Port of Jennings, on the W side of Mermentau River just below the railroad bridge, has slips with barge loading facilities, open storage areas for oil-well pipe casings and supplies, and rail facilities.

Two shipyards in the port build tugs, crew boats, and barges. A marine railway at one of the yards can handle craft up to 250 feet for general repairs. Mobile cranes up to 60 tons, machine, metal, welding, and joiner shops are available.

The town of **Jennings,** about 4 miles W of the port, is the center of natural gas production in SW Louisiana. It is also an important agriculture center in raising of rice and livestock, and in the production of fertilizer and cement from sea shells. Jennings has a hospital and is served by the Southern Pacific Railroad and several bus lines.

From the head of Mermentau River, **Bayou Nezpique** and **Bayou des Cannes** were navigable for depths and distances as follows: Bayou Nezpique, 12 feet for about 6.1 miles to Interstate Route 10 highway bridge in May 1983, thence in 1963, 14 feet for 5.2 miles, thence 4 feet for about 11 miles; Bayou des Cannes, 11 feet for about 4 miles to the Interstate Route 10 bridge in May 1983, thence in 1963, 4½ feet for about 2.6 miles.

Crossing Bayou Nezpique NE of Jennings are Interstate Route 10 twin fixed highway bridges with channel widths of 40 feet and clearances of 28 feet and State Route 97 highway bridge, which has a swing span with a channel width of 40 feet and a clearance of 8 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(17), chapter 2, for drawbridge regulations and opening signals.) Overhead cables at the swing bridge have a clearance of 39 feet, and an overhead power cable S of the twin bridges has a clearance of 61 feet.

Bayou des Cannes is crossed at **Evangeline** by the twin fixed spans of Interstate Route 10, about 4 miles above the mouth with a 35-foot span and a clearance of 14 feet, and about 7.4 miles above the mouth by State Route 97 highway bridge with a 45-foot span with a clearance of 1 foot.

Bayou Plaquemine Brule empties into Bayou des Cannes about 1 mile above Mermentau River. A dredged channel leads from the mouth of the bayou E for about 16 miles to near the town of **Crowley**. In 1982-May 1983, the controlling depth was 6 feet. The principal commodities carried on the bayou are shell and rice. Crowley has a large rice mill and elevator.

A ferry crosses the bayou SW of **Egan.** The Southern Pacific railroad bridge crossing the bayou N of **Midland** has a swing span with a clearance of 5 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(16), chapter 2, for drawbridge regulations and opening signals.) A pontoon bridge crosses the bayou N of **Estherwood.** The bridge is operated by cables that are suspended just above the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. Extreme caution is advised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(16), chapter 2, for drawbridge regulations and opening signals.) Overhead cables crossing the bayou have a least clearance of 50 feet.

Charts 11347, 11345, 11330.–Calcasieu Pass, the outlet of Calcasieu Lake, is about 98 miles W of Atchafalaya Bay entrance and 78 miles E of Galveston entrance. It is the first and only deep-draft channel W of the Mississippi River and E of Sabine Pass.

Prominent features.–In the vicinity of Calcasieu Pass are the range and jetties and, at night, the occulting red obstruction lights on the many radio towers in the area. A silver elevated water tank in Cameron and three tall microwave towers 1.5 miles E of Cameron are very conspicuous from seaward.

Vessels should approach Calcasieu Pass through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Calcasieu Pass are described in 80.835, chapter 2.

Vessel Traffic Service (Lake Charles), operated by the Lake Charles Pilots, has been established for the Port of Lake Charles and the Calcasieu Ship Channel. The service extends from Calcasieu Channel Lighted Whistle Buoy CC (29°27.3'N., 93°13.4'W.) to Interstate Route 10 bridge at Lake Charles.

This **voluntary** Vessel Traffic Service (VTS) is designed to enhance navigational safety in the port and ship channel and provides vessels with information regarding the movements and intentions of other vessels within the VTS area at the time. Nothing in these rules will prevent owners or agents of vessels from making mutual agreements on the priority of certain vessels. This service is not intended in any way to supersede or alter applicable Navigation Rules.

The working channels for the VTS are VHF-FM channels 66A (156.325 MHz) and VHF-FM International radio channel 66 (156.30 MHz). Vessels calling "VTS Lake Charles" shall give their name, length, beam, draft, destination, and ETA. Vessels entering the VTS area will be advised by VTS Lake Charles of the other traffic navigating within the area. All vessels shall advise VTS Lake Charles 2 hours before entering the system inbound, outbound, or maneuvering between points within the VTS. Movement of all vessels in the system will be on a first come, first served basis as vessels check into the VTS.

Vessels shall report to VTS Lake Charles at the following positions:

1. When entering or leaving the Calcasieu Bar Channel, time and buoy number are reported.
2. Crossing the intersection of the Calcasieu Ship Channel and the Gulf Intracoastal Waterway (GIWW), time is reported.
3. Upon arrival or departure at the Port of Lake Charles, a terminal, or other destination, time is reported.
4. Dredges or other vessels working on the waterway will report to VTS Lake Charles daily and at any time they change location within the VTS area.

5. Vessels traveling in the Intracoastal Waterway and intending to cross or enter the ship channel should give a security call on VHF-FM channel 13 (156.65 MHz) 30 minutes prior to crossing or entry and adjust speed so as to enter the river when the channel is clear.

The following special conditions exist within the VTS area:

1. LNG, LPG, and vessels subject to special regulations shall navigate the system in accordance with the rules of the Captain of the Port's Office of the U.S. Coast Guard.

2. Vessels over 32 feet in draft shall not meet opposing traffic within the system above the jetties if their combined beam exceeds 50% of the channel project width.

3. Vessels awaiting the use of the channel because of fog, heavy weather, or any other cause restricting the channel will proceed inbound or outbound after the channel clears in the order they are listed with the system. Those waiting longest will clear first.

4. No vessel will be required to meet another vessel within the VTS area if, in the opinion of the master or pilot of either vessel, it would be hazardous to do so because of some special circumstance or condition.

5. Drilling rigs, submersibles, and other floating heavy equipment which must moor within the system and obstruct traffic to transfer, repair, or operate in any fashion shall obtain permission from the Captain of the Port's Office and advise "VTS Lake Charles" 24 hours in advance of their intentions, the procedures to be followed, and the amount of time the channel will be closed.

6. The Cameron Ferry monitors VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz). Vessels transiting this area should contact the ferry for information as necessary.

Calcasieu River Navigational Guidelines.-In recent years a substantial number of oceangoing vessels of increased size and draft have been entering the Calcasieu River Channel and proceeding to and from berths as far up the channel as the Port of Lake Charles. The channel, however, has not been appreciably widened in recent years. Based upon reported marine casualties to vessels and upon reports of navigational problems arising from the increased oceangoing traffic, and after consultation with local marine interests, the Coast Guard Captain of the Port (COTP) has developed certain guidelines to enhance safe navigation.

It is recommended that all vessels, particularly those which must navigate in the channel because of draft constraints, hereafter referred to as **deep-draft vessels**, strictly adhere to these guidelines. Nothing in them shall supersede nor alter any applicable laws or regulations.

For purposes of these guidelines, **low-powered vessels** are those which are unable to maintain a speed of at least 8 knots through the water; **full-powered vessels** are those which are able to maintain 8 knots or more through the water. **Poor-handling vessels** are those which, because of steering characteristics, are unable to consistently navigate within the channel half-width. In all cases, vessels towed on a hawser are considered to be poor-handling vessels if the overall length of the tow exceeds 500 feet from the stern of the towing vessel to the stern of the tow. **Tandem tows**, except for small scows and nondescript vessels which operate outside the main channel, are unmanageable and should not be attempted.

The entrance channel between the jetties is marked by Range A. Tides and currents should be obtained from the appropriate Tide and Tidal Current Tables. Vessels arriving at the bar should give a Security call on VHF-FM channel 13 (156.65 MHz) 30 minutes before entering the jetties. So as not to delay river traffic, low-powered or poor-handling vessels intending to enter the river should be prepared to delay up to 45 minutes, if necessary, to allow full-powered and more maneuverable vessels to precede them through the jetties.

During liquified natural gas (LNG)/liquid propane gas (LPG) movements in the Calcasieu River, special restrictions may be placed on this waterway by the local Coast Guard Captain of the Port. Copies of the local LNG/LPG Operations Plan may be obtained from the Port Arthur Coast Guard Marine Safety Office.

Areas of Particular Concern.-Two areas in the Calcasieu River are considered to be particularly troublesome. These areas are listed in order of ascension when proceeding from sea.

(1) **Monkey Island** (29°47.0'N., 93°20.8'W.). This area is used extensively by the fishing and offshore exploration industries. Numerous fishing and offshore exploration boats are homeported in this area. Vessels transiting this area may require speed reduction to reduce wake.

(2) **Intracoastal Waterway** (30°05.5'N., 93°19.5'W.). This represents the point at which this waterway crosses the Calcasieu River Channel. This water is extensively used by tows. The situation is further complicated by an LNG facility located on the Industrial Canal which is serviced by deep-draft vessels. Tows intending to cross or enter the main river channel from the Intracoastal Waterway should give a Security call on VHF-FM channel 13 (156.65 MHz) 30 minutes prior to entry and adjust speed so as to enter the river when the channel is clear. Every effort, including holding, should be made to avoid unduly restricting full-powered vessels, and allow them to clear this area when either inbound or outbound.

In November 1981, the Captain of the Port, Port Arthur, Texas, under the authority of 33 CFR 160.111, ordered that all vessels transiting Calcasieu River between the Calcasieu jetties and the Port of Lake Charles with a tow on a hawser are to have an additional tug made up to the tow in such a way and with sufficient horsepower to control the tow at all times. If a second tug is not provided, then the towing vessel must be made fast to the tow in such a way that complete control of the tow is maintained throughout the transit. Any deviation from this order must be requested, in advance, from the

Captain of the Port, Port Arthur, Texas, and must contain a complete description of the operation as well as its necessity.

The Trunkline liquified natural gas facility on Industrial Canal is within a **safety zone.** Additionally, the waters surrounding non-gasfree LNG carriers transiting Calcasieu River are a **safety zone.** (See 165.805, chapter 2, for limits and regulations.)

Channels.–The Calcasieu entrance has been improved by jetties and a deepwater channel. The jetties extend seaward from the shoreline for about 1.1 miles and are mostly above normal high tide. A Federal project provides for a channel 42 feet deep across the outer bar from that depth in the Gulf to the entrance jetties, thence 40–42 feet through the jetties, thence 40 feet to and in the Industrial Canal and turning basin N of Choupique Island, thence to the Port of Lake Charles wharves, and thence 35 feet to the Interstate Route 10/U.S. Route 90 highway bridge. (See Notice to Mariners and latest editions of charts for controlling depths.)

The channel is marked by lights, lighted buoys, and a lighted midchannel whistle buoy at the entrance. A lighted **351° 49.5′** range leads across the bar between the jetties and into the pass. A radiobeacon is on the E side of Calcasieu Channel in 29°46.7′N., 93°20.5′W.

Caution.–The sea buoy, **(Calcasieu Channel Lighted Whistle Buoy CC),** is in 29°27′19″N., 93°13′25″W. Shipmasters are cautioned against mistaking the sea buoy for Sabine Bank East End Lighted Gong Buoy 1, which is 4.3 miles to the W. The sea buoy is equipped with a strobe light and a radar transponder beacon (Racon). (See Racons, chapter 1, for additional information.)

Anchorages.–Large vessels should anchor in Calcasieu Pass Fairway Anchorage, E of the safety fairway. (See 166.100 through 166.200, chapter 2.) Vessels up to 12 feet in draft can obtain excellent anchorage in the bend in the river at Cameron. While waiting for daylight or fog to lift, ships can anchor out of the fairway anywhere in Calcasieu River. No anchorages exist in the landcuts, and ships entering cuts are expected to complete passage. In fog, deep-draft vessels should anchor 2 to 3 miles E of the pilot boarding station.

Dangers.–Seaward of the jetties, a moderate to strong current sweeps across the channel, normally setting in a W direction; however, strong W winds will cause a current reversal; mariners should exercise caution and be on the alert. A mud slush lying on the bottom, approximately 6 feet above the hard surface, frequently will be found in the channel seaward of the jetties and at various places above the pass. This material can hardly be detected by the leadline. A 1- to 4-foot layer of soupy material, some 8 to 10 feet above the hard bottom and 20 to 23 feet below the surface, occasionally is encountered in the same localities.

Spoil banks of undetermined depth exist on the W side of the entrance channel and outer channel except within a mile N and S of Calcasieu Channel Lighted Buoy 29, which area, the Lake Charles Pilots report, has been left clear for Pilot Station No. 1. Mariners are advised to avoid navigating across the spoil banks, because the actual depths may be considerably less than the charted depths.

In 1981, a submerged obstruction was reported in the fairway anchorage W of the safety fairway in about 29°37.3′N., 93°27.7′W., and in February 1982, a sunken wreck covered 38 feet was reported in the safety fairway in about 29°16′N., 93°13′W.

Tides and currents.–Diurnal range of tide in Calcasieu Pass is 2.0 feet. Flood waters may increase the normal river level at Lake Charles 1.5 feet. There is little current in the river except during freshets.

Weather.–The climate is humid subtropical with a strong maritime character. The climate is influenced to a large degree by the amount of water surface provided by lakes, bayous, flooded rice fields, and the proximity of the Gulf of Mexico. These areas modify relative humidity and temperature by decreasing the range of the extremes throughout the year. When S winds prevail, these effects are increased. When wind gradients are weak, a sea breeze is evident during the warmer part of the day. The area is also subject to occasional cold air masses during winter. In general, however, winters are mild, and cold spells are usually of short duration. Temperatures drop to freezing or below on about 15 days annually. This ranges from 3 to 32 days in individual years. Snow is negligible most of the time. However, in February 1895, a record snowstorm dumped 22 inches of snow at Lake Charles. Visibilities fall below 0.25 mile on about 50 days annually; October through March are the foggiest months.

The summer months are warm, although temperatures rarely exceed 100°F due to the marine influences and the assistance of afternoon showers and thunderstorms. While thunderstorms occur in every month, they are most frequent in July and August, when on one-half of the days in each month thunder is heard. Temperatures reach 90°F or above on an average of 70 days each season.

Severe local windstorms, hailstorms, and tornadoes can occur in any season, but are most frequent in spring. Tornadoes and large damaging hail are unusual. Only one major tornado has been reported in Lake Charles, causing widespread damage but no fatalities. During the warmer months, small funnel clouds may be sighted at times. Some of these may reach the ground or water as twisters or waterspouts, but usually cause little or no damage. Since 1900, the centers of four hurricanes have passed very near Lake Charles. Other less intense tropical storms have also affected weather in the area. Since 1940, the strongest sustained wind was 69 mph. However, a wind of 90 mph can be expected about every 50 years, on average.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for U.S. vessels of over 100 tons in coastwise trade that have on board a pilot licensed by the Federal Government. Arrangements for pilot service are usually handled through the ships' agents, by telephone (318-436-0372), or by radiotele-

phone on VHF-FM channel 66A (156.325 MHz). The pilot station on Monkey Island maintains a 24-hour lookout and monitors VHF-FM channels 16 (156.80 MHz), 12 (156.60 MHz), and 66A. The pilots carry portable radiotelephones and use VHF-FM channel 66A as working frequency. The pilot office in Lake Charles monitors VHF-FM channels 12 (156.60 MHz) and 16 (156.80 MHz) and maintains a 24-hour guard on 4419.4 kHz single side band (SSB). The pilot office stands by for pilot orders and for the Vessel Traffic Service. Traffic information can be obtained by any vessel using the traffic service. A 4-hour notice of time of arrival at one of the following designated pilot stations, where pilots will board, is requested.

Station No. 1, for vessels drawing 30 feet or less.–In the entrance channel within 1 mile of 29°38.8'N., 93°19.5'W., and thence an area 1 mile wide extending 2.7 miles NNW on the E side of the channel to about 29°42.6'N. Small vessels should await the pilot in the NE corner of the boarding area.

Station No. 2, for vessels drawing between 30 and 35 feet.–An area on the E side of the outer approach channel 1 mile wide and extending 2.5 miles NW and SE from 29°34'N., 93°16'W.

Station No. 3, for vessels drawing over 35 feet.–Within 1 mile of Calcasieu Channel Lighted Whistle Buoy CC (29°27.3'N., 93°13.4'W.), and thence an area 1 mile wide extending 2.7 miles N on the E side of the channel to about 29°31.1'N.

Note.–Vessels requesting a pilot to board at Stations 2 or 3 will be charged an additional pilotage fee.

Vessels are taken to and from Lake Charles day or night. The Lake Charles Pilots have two boats, CALCASIEU PILOT and CALCASIEU PILOT II, each 55 feet long and white with gray trim and the word PILOT on the cabin. The boats fly the International Code flag "P" by day and show the standard pilot lights at night.

Vessels to be boarded should provide a safe lee and have a pilot ladder rigged amidships, 4 feet above the water.

Cameron, the seat of Cameron Parish, is a fishing village on the E shore of Calcasieu Pass 2.5 miles above its entrance. The village has numerous oil-well supply bases, shrimp-packing houses, and a menhaden processing plant. Gasoline, diesel fuel, water, ice, and marine supplies are available; electrical and engine repairs can be made.

Small craft may find berthing space or can anchor in the bend of the river near Cameron in depths of 12 to 30 feet. An auto ferry crosses the ship channel NW of Cameron. Another smaller auto ferry crosses the river at Cameron and connects Cameron with Monkey Island, which was formed by the river and ship channel. Overhead power cables with a least clearance of 54 feet cross the river at Cameron.

Calcasieu Lake, at the head of Calcasieu Pass, 6 miles from the Gulf, is 15 miles long, 3 to 5 miles wide, and 5 to 7 feet deep. The controlling depth off the entrance at the S end was reported to be 6 feet in July 1982. The controlling depth at West Pass, at the N end, was about 3 feet, but the lake bottom is so soft that slightly greater drafts can drag through. A row of piles marks the W side of the channel across the lake. Along the S end of the lake is an old revetment, partly submerged, extending about 1.5 miles E. The shore areas on the S and W sides of the lake are part of the **Sabine National Wildlife Refuge.**

Grand Lake, a summer resort on the NE side of Calcasieu Lake, has numerous private piers.

Hackberry, on the NW side of the lake, is an oil drilling center. Both towns have highway connections to Lake Charles.

Chart 11347.–Calcasieu River and **Ship Channel.** N of Calcasieu Pass, the ship channel cuts across points of land along the W side of Calcasieu Lake to a junction with the Calcasieu River at **Choupique Island.** The channel is straight and well marked by lights and lighted ranges.

The Intracoastal Waterway crosses the ship channel at the N end of Choupique Island, at the mouth of the **Calcasieu River,** and continues W through **Choupique Cutoff.** N of the intersection with the Intracoastal Waterway, **Industrial Canal** leads NE to a turning basin. From the junction with Industrial Canal, the ship channel follows the natural channel of Calcasieu River to the N side of **Moss Lake,** thence bypassing the river through a landcut about 1 mile long to the W bend of the river just above Haymark Terminal, thence in the natural channel to Rose Bluff, thence through **Rose Bluff Cutoff** and continuing on the same course through a cut across the S end of **Coon Island;** thence, the E or right fork for about 1.5 miles to the port wharves at Port of Lake Charles. Deep water is along midchannel but, unlike most rivers, the deeper water often favors the points rather than the bends.

Calcasieu Landing is on the W bank of the Calcasieu River just N of its junction with Choupique Cutoff. A shipyard here has two 2,000-ton floating drydocks which can handle ships up to 200 feet and barges up to 300 feet long and 55 feet wide with drafts of 14 feet for general repairs. A marine railway at the shipyard can handle vessels up to 200 feet. The yard builds tugs, crew boats, and barges up to 200 feet. There are metal, joiner, machine, and welding shops, a floating crane that can handle craft to 60 tons, and tank cleaning facilities. A fuel dock adjoins the shipyard. Diesel fuel is available on a 24-hour basis at the dock or in midstream by barge. The fuel facility monitors VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz) continuously.

Haymark Terminal, Vincent Landing, and **Rose Bluff** are sites of extensive oil refining, storage, and shipping facilities on the Calcasieu River below Port of Lake Charles. They are discussed later in this chapter under wharves at Port Charles. An overhead power cable with a clearance of 170 feet crosses the river 0.7 mile above Vincent Landing.

A highway bridge at the N end of Rose Bluff Cutoff, about 1.5 miles below Port of Lake Charles, has a fixed channel span with a clearance of 135 feet.

Note.–Considerable damage, including bank erosion, is being suffered by properties along the river,

particularly in the vicinity of Vincent Landing and the S or lower portion of Moss Lake. The damage results principally from wave action of light tugs and light or partially loaded ships. (See 162.75 and 207.180, chapter 2, for navigation regulations.) Mariners are directed to exercise every caution and to proceed at slow speed.

Bayou d'Inde, branching W from Rose Bluff Cutoff, is crossed by State Route 108 highway bridge 3.7 miles above the cutoff. The bridge has a 38-foot removable span with a clearance of 8 feet. Just above it, the Kansas City Southern railroad bridge has a 33-foot removable span with a clearance of 6 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(22), chapter 2, for drawbridge regulations and opening signals.) Overhead power cables cross the bayou at all three bridges. The head of navigation on the bayou is 6.3 miles above the cutoff, which is 0.3 mile below Sulphur. In April 1983, the centerline controlling depth was 9 feet to the highway bridge.

Contraband Bayou branches E from Calcasieu River just S of Port of Lake Charles deepwater terminals. An overhead power cable with a clearance of 48 feet crosses the bayou about 1.1 miles above the mouth. A highway bridge crossing the bayou about 1.6 miles above the mouth has a fixed span with a clearance of 15 feet. The twin fixed spans of another highway bridge with a clearance of 15 feet are 0.1 mile above the first bridge.

A boatyard on the E side of the bayou just NW of the first highway bridge has a marine railway that can handle vessels to 100 feet for hull and engine repairs. A marina on the E side of the bayou about 0.3 mile N of the boatyard has a mobile hoist that can handle vessels to 50 tons for hull and engine repairs. Berths with electricity, gasoline, diesel fuel, and water are available. In March 1983, the controlling depth was 7 feet from the cargo wharves to the first bridge.

A cut made across a narrow neck of land left a channel that forms a complete loop around **Clooney Island,** enabling vessels to turn around and head downstream. A dredged channel leads W off the NW side of the loop to a large alkali plant. A depth of about 18 feet can be carried to the first wharf in the channel, thence about 7 feet beyond the wharf.

The **Port of Lake Charles,** about 32 miles from the Gulf, is opposite Clooney Island on the E bank of Calcasieu River and the N bank of Contraband Bayou. It is the only major port in W Louisiana. The principal imports are petroleum products, barite ores, creosote, and steel products. The principal exports are petroleum coke, petroleum products, chemicals, bulk and bagged grains, linerboard, plywood and other wood products, and urea. Other commodities handled at the port are canned foods, caustic soda, synthetic rubber, plastics, paper products, and other general cargo.

Lake Charles, the seat of Calcasieu Parish, is located around the E side of the lake about 34 miles from the Gulf. It is the center of large chemical, petroleum, natural gas, fish oil, synthetic rubber, salt, seafood, and rice industries. There is a large municipal airport S of the city and two private airports. McNeese State University is here. Interstate Route 10 and U.S. Route 90, the main E-W highways, pass through the city, and U.S. Routes 165 and 171 lead N out of the city.

Towage.–Several towing companies maintain offices at the Port of Lake Charles. Tugs up to 3,900 hp are available. Divers can be obtained.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See U.S. Public Health Service, chapter 1.)

There are several hospitals in Lake Charles.

Lake Charles is a **customs port of entry.**

Harbor regulations.–Federal regulations applicable to Lake Charles are those usually in force at most seaports of the United States. Local rules and regulations are enforced by a Port Director acting for the Board of Harbor Commissioners for the Port of Lake Charles, an agency of the State of Louisiana. The authority of the Commission extends from the N end of Calcasieu Lake N to Westlake.

Wharves.–Lake Charles has more than 70 piers and wharves. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 21, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths for the facilities described are reported; for information on the latest depths contact the operator. Most of the facilities have highway and railroad connections, water, and electrical shore power.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility.

More than 935,000 square feet of covered storage and about 22 acres of open storage are available in the port. Mobile cranes up to 150 tons are available at the port.

N side of Industrial Canal:

Consolidated Aluminum Corp. Wharf (30°06.6'N., 93°17.8'W.): 532-foot face, 940 feet with dolphins; 40 feet alongside; deck height, 15 feet; loading tower and conveyor, loading rate 800 tons per hour, 100-ton crawler crane with clamshell bucket, unloading rate 125 tons per hour; receipt of green coke and alumina, shipment of calcined petroleum coke and molded carbon anode blocks; owned and operated by Consolidated Aluminum Corp.

Trunkline LNG Co. Wharf (30°06.6'N., 93°17.4'W.): 1,300 feet of berthing space with dolphins and unloading, service, and bunkering platforms; 43 feet alongside; deck height, 16 feet; receipt of liquified natural gas, unloading rate 55,000 gallons per minute of LNG; owned by Lake Charles Harbor and Terminal District and operated by Trunkline LNG Co.

Haymark Terminal:

CPI Oil and Refining Wharf (30°08.1'N.,

93°19.3'W.): 380 feet of berthing space with dolphins; 20 feet alongside; deck height, 15 feet; receipt of crude oil, shipment of petroleum products; owned and operated by CPI Oil and Refining.

Shell Oil Co. Wharf (30°08.1'N., 93°19.1'W.): 480 feet of berthing space with dolphins; 20 feet alongside; additional 200 feet of berthing space with 15 feet alongside at rear of dolphins on upper side; deck height, 6 feet; shipment of crude oil; owned and operated by Shell Oil Co.

W side of Calcasieu River:

Lake Charles Gulf Calcining Plant Wharf (30°07.9'N., 93°19.9'W.): 100-foot face, 458 feet of berthing space with platforms; 38 feet alongside; deck height, 8 feet; shipment of petroleum coke; owned and operated by Gulf Oil Co.

CONOCO Inc., Clifton Ridge Marine Terminal Wharf (30°09.4'N., 93°19.8'W.): 340 feet of berthing space with dolphins; 42 feet alongside; deck height, 12 feet; receipt and shipment of crude oil; owned and operated by CONOCO, Inc.

Cities Service Pipe Line Co., Clifton Ridge Terminal, Tanker Wharf (30°09.5'N., 93°19.5'W.): 1,061 feet of berthing space with dolphins; 38 feet alongside; deck height, 11 feet; receipt and shipment of crude oil; owned by Cities Service Oil Co. and operated by Cities Service Pipeline Co.

Dock B (30°10.5'N., 93°19.1'W.): 700-foot face, 900 feet with dolphins; 36 feet alongside; deck height, 12 feet; receipt of crude oil, shipment of petroleum products, bunkering vessels; owned and operated by Cities Service Co.

Dock C: 300 yards N of Dock B; 660-foot face; 36 feet alongside; deck height, 12 feet; receipt of crude oil, shipment of petroleum products, bunkering vessels; owned and operated by Cities Service Co.

Cities Service Co. Petrochemical PCD Dock (30°10.9'N., 93°18.8'W.): 280-foot face, 400 feet of berthing space with dolphins; 25 feet alongside; deck height, 10 feet; shipment of propylene and ethylene glycol; owned and operated by Cities Service Co.

Dock D (30°11.0'N., 93°18.7'W.): 835-foot face; 36 feet alongside; deck height, 11 feet; shipment of petroleum products, liquid wax, lubricating oils, and ethylene glycol; owned by Cities Service Co., operated by Cities Service Co. and Cit-Con Oil Corp.

Lake Charles Harbor and Terminal District, Bulk Terminal No. 1, Wharf No. 14 (30°11.5'N., 93°17.9'W.): 600-foot face, 960 feet with dolphins; 40 feet alongside; deck height, 14 feet; electric loading tower with chute and conveyor system, loading rate 1,000 tons per hour; ship/barge unloader, unloading rate 800 tons per hour of barite or 600 tons per hour raw coke; receipt of raw coke and barites; shipment of raw and calcined petroleum coke; owned and operated by Lake Charles Harbor and Terminal District.

Old River:

PPG A Dock (30°12.9'N., 93°16.9'W.): 125-foot face, 600 feet of berthing space with dolphins; 40 feet alongside; deck height, 8 feet; shipment of vinyl chloride and ethylene dichloride; owned and operated by PPG Industries, Inc.

PPG B Dock (30°13.4'N., 93°16.8'W.): 390 feet of berthing space along upper and lower sides; 5 to 40 feet alongside; deck height, 5 feet; receipt and shipment of liquid chlorine; owned and operated by PPG Industries, Inc.

PPG C Dock (30°13.4'N., 93°16.7'W.): 680 feet of berthing space with platforms; 40 feet alongside; deck height, 7½ feet; adjacent barge platform; 180 feet with platforms; 12 feet alongside; deck height, 7½ feet; receipt and shipment of liquid caustic soda, shipment of ethylene dichloride and chlorinated solvents; owned and operated by PPG Industries, Inc.

N side of Contraband Bayou, all facilities owned by Lake Charles Harbor and Terminal District.

Berth 10: 0.4 mile from Calcasieu River; 400-foot face, 900 feet with dolphins; 35 feet alongside; deck height, 14 feet; loading tower and traveling gantry shiploader, combined loading rate 25,000 bushels per hour from storage; shipment of grain; operated by Continental Grain, Inc.

Bulk Terminal No. 3 Wharf: 0.25 mile from Calcasieu River; 350 feet with dolphins; 35 feet alongside; deck height, 7½ feet; loading tower and conveyor system; shipment of rice and other grain; operated by Pyramid Feeds, Inc.

Berths 8 and 9: junction of Calcasieu River and Contraband Bayou; 1,011-foot face; 35 feet alongside; deck height, 14 feet; 133,000 square feet covered storage; receipt and shipment of general cargo; operated by Lake Charles Harbor and Terminal District.

Port of Lake Charles, all facilities owned and operated by Lake Charles Harbor and Terminal District.

Berth 7: on Calcasieu River at junction of Contraband Bayou; 577-foot face; 35 feet alongside; deck height, 14 feet; 138,000 square feet covered storage; receipt and shipment of general cargo.

Berths 4, 5, and 6: 100 yards N of Berth 7; 1,600-foot face; 35 feet alongside; deck height, 14 feet; 256,000 square feet covered storage; receipt and shipment of general cargo, receipt of creosote.

Berths 1, 2, and 3: 100 yards NE of Berth 4; 1,600-foot face; 35 feet alongside; deck height, 14 feet; 214,000 square feet covered storage; receipt and shipment of general cargo and bulk liquids.

Forest Products Wharf: 0.1 mile SE of Berth 1; 597-foot face, 850 feet with dolphins; 40 feet alongside; deck height, 16 feet; 194,000 square feet covered storage; receipt and shipment of general cargo, shipment of linerboard and other paper products.

W side of Lake Charles:

West Lake Terminal, Bulk Terminal No. 4, Wharf No. 13: 0.3 mile below Interstate Route 10 highway bridge; 250-foot face, 355 feet with dolphins; 35 feet alongside; deck height, 12 feet; two 60-ton cranes; receipt and shipment of calcined petroleum coke, receipt of barite ore, shipment of bulk and bagged ground barite by barge; owned by Lake Charles Harbor and Terminal District, operated by Lake Charles Harbor and Terminal District and Dresser Industries, Inc.

Ideal Basic Industries Docks: 500 yards S of Bulk Terminal No. 4; two offshore parallel wharves with 950 feet of berthing space with dolphins; 21 feet alongside; deck height, 11 feet; receipt of bulk cement; owned and operated by Ideal Basic Industries.

Cooney Island Loop:

Continental Oil Co. Dock No. 3 (30°13.8'N., 93°15.2'W.): 535-foot face, 640 feet with dolphins; 40 feet alongside; deck height, 14 feet; receipt of crude oil, shipment of petrochemicals and petroleum products; owned and operated by Continental Oil Co.

Continental Oil Co. Dock: 0.2 mile NW of Dock No. 3; 570-foot face; 40 feet alongside; deck height, 15 feet; receipt of crude oil, shipment of petroleum products; owned and operated by Continental Oil Co.

ABC Wharf: 0.25 mile W of Continental Oil Co. Dock; 32-foot face, 600 feet with dolphins; 30 feet alongside; deck height, 7½ feet; receipt and shipment of liquid caustic soda, shipment of ammonia; owned and operated by Olin Corp.

Calcasieu River above Interstate Route 10 bridge:

Louisiana Limestone Aggregates Mooring: 700 yards N of Interstate Route 10 bridge; 400-foot natural bank face; 18 feet alongside; bank height, 5 feet; receipt of limestone; owned by Lake Charles Harbor and Terminal District, operated by Louisiana Limestone Aggregates, Inc.

Port of Lake Charles Mooring: 0.5 mile N of Interstate Route 10 bridge; 449-foot natural bank face; 18 feet alongside; bank height, 3 feet; receipt of limestone; owned by Lake Charles Harbor and Terminal District, operated by Gifford Hill and Co., Inc.

Cameron Offshore Services, Westlake Terminal Wharf: 0.8 mile N of Interstate Route 10 bridge; 200-foot face; 22 feet alongside; deck height, 5 feet; receipt and shipment of steel pipe; owned by Lake Charles Harbor and Terminal District, operated by Cameron Offshore Services, Inc.

Foreign-Trade Zone No. 87 is in Lake Charles. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–Marine supplies are available. Fresh water is available at most deep-draft wharves. Bunker fuels are available at several of the oil terminals and by barge from Port Arthur by prior arrangements.

Repairs.–Lake Charles has no facilities for making major repairs or drydocking deep-draft vessels, the nearest such facilities are at Beaumont, Tex. Shipyards at Calcasieu Landing and on Contraband Bayou are available for making minor above-the-waterline repairs to vessels and hull and engine repairs to smaller vessels.

Communications.–The Southern Pacific, Missouri Pacific, and Kansas City Southern Railroads serve the city. Texas International Airline has scheduled service from the Municipal Airport. Several buslines and motor freight lines serve the city. Numerous steamship lines have scheduled service to all ports of the world. Several barge lines operate from the port.

About 1 mile above the port docks, the river widens into **Lake Charles.** The lake is fairly circular and more than a mile in diameter. The city of Lake Charles fronts on the E shore. The river channel extends along the W side of the lake.

Facilities are limited for small boats. Limited berthage is available at facilities on Contraband Bayou, and gasoline and diesel fuel are available at a small pier on the N side of the lake. Good anchorage is available in the lake in depths of 8 to 10 feet.

Westlake is an industrial suburb of the city of Lake Charles on the W side of the Calcasieu River about 2 miles above the Port of Lake Charles wharves. U.S. Route 90 highway bridge that crosses the river and the N part of Lake Charles near Westlake has a fixed cantilever center span with clearance of 95 feet for a width of 380 feet and a clearance of 135 feet for the middle 200 feet of span. Just N of the highway bridge, the Southern Pacific railroad swing bridge has a clearance of 1 foot. The W opening is protected by a fender system and is the prescribed draw; any craft navigating the E opening does so at its own risk. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) About 0.2 mile above these bridges there is an overhead power cable with clearance of 110 feet.

Calcasieu River Salt Water Barrier, about 2.1 miles above the Kansas City Southern railroad bridge at Westlake, prevents salt water from flowing upriver and interfering with irrigation of the rice lands during the growing season.

The barrier consists of a 56-foot-wide navigation structure with a depth of 13 feet over the sill; a floodway control structure parallel to and immediately S of the navigation structure; and a dam on a loop of the river at Two O'Clock Point, about 3.9 miles above the floodway control structure.

The dam prevents navigation upriver via the old river route. All traffic upriver is via the navigation structure. Mariners are cautioned not to pass through the floodway control structure under any conditions.

The entrance channels to the navigation and floodway control structures are marked with large signs for the aid of navigation. Yellow rope barriers hang from the center of each flood control structure gate to the water surface.

The navigation and flood control structures are operated from 0600 to 2200 hours, 7 days a week. The control structure can be contacted on VHF-FM channels 14 (156.70 MHz), 12 (156.60 MHz), 13 (156.65 MHz), and 16 (156.80 MHz). Red and green lights and daybeacons are at each end of the navigation structure. Vessels should await the green signal before entering the navigation structure.

An overhead power cable with a clearance of 136 feet crosses the river about 0.8 mile above the navigation structure.

West Fork of Calcasieu River branches W about 0.9 mile above the navigation structure. In September 1983, the controlling depths in West Fork were 19 feet for 7 miles to the junction with Houston River, thence 12 feet for another 5 miles to the U.S. Route 90 fixed highway bridge at West Lake.

Overhead power cables cross the fork about 3 miles above Calcasieu River, and a vertical lift bridge with a clearance of 14 feet down and 50 feet up crosses the fork about 4 miles above the river. (See 117.1b, 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable is at the bridge. The U.S. Route 90 highway bridge, about 12 miles above Calcasieu River, has an 18-foot fixed span with a clearance of 10 feet.

Houston River branches W from the West Fork of Calcasieu River. In September 1983, the controlling depth was 9 feet to the fixed highway bridge at **Anthony,** about 4.4 miles above the mouth. Overhead power cables with a least clearance of 61 feet cross the river about 1 mile above the mouth. The highway bridge at Anthony has a 17-foot fixed span with a clearance of 10 feet. The Kansas City Southern railroad bridge about 5 miles above the mouth has a swing span with a channel width of 27 feet and clearance of 6 feet. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(24), chapter 2, for drawbridge regulations and opening signals.)

English Bayou branches E from Calcasieu River about 1.9 miles above the navigation structure. U.S. Route 171 fixed highway bridge with a clearance of 14 feet crosses the bayou about 0.7 mile above its mouth. An overhead power cable with a clearance of 45 feet crosses the bayou just above the bridge.

U.S. Route 171 fixed highway bridge with a clearance of 35 feet crosses Calcasieu River about 4.6 miles above the navigation structure.

In September 1983, the controlling depth in the Calcasieu River was 12 feet from Interstate Route 10/U.S. Route 90 bridge to the junction with West Fork, thence 7 feet to **Point Fing** (30°18.8'N., 93°07.0'W.), thence 7 feet to Hecker; above this point, the river is not navigable because of snags and trees.

Chart 11341.–Sabine Bank is a succession of detached shoal spots parallel with and distant about 17 miles from the mainland. From the vicinity of Calcasieu Pass, the bank extends about 38 miles W to the vicinity of Sabine Pass and has several passages between the detached shoals. Depths on the shoals range from 16 to 30 feet and are subject to change.

Sabine Bank Light (29°28.3'N., 93°43.4'W.), 72 feet above the water, is shown from a red conical tower on a cylindrical pier about midway of the bank. A lighted gong buoy, about 19 miles S of Calcasieu Pass, marks the E end of Sabine Bank.

Sabine Bank Channel leads through Sabine Bank through a passage locally known as **Hole in the Wall.** This is the most used passage and is marked by lighted buoys. Sabine Bank Channel Lighted Whistle Buoy SB (29°25.0'N., 93°40.0'W.) is equipped with a radar transponder beacon (Racon). (See Racons, chapter 1, for additional information.) The depth in the channel may be reduced as much as 3 feet during northers. The E part of the bank has a number of oil well platforms. They are lighted.

To the S of Sabine Bank and about 6 miles inside the 10-fathom curve, the bottom is somewhat irregular and broken, and several spots with depths of 35 feet or less are surrounded by depths 10 to 20 feet greater. There is an unmarked 28-foot shoal about 12 miles SE of Sabine Bank Light. These shoals lie near the track line of vessels making the passage through Hole in the Wall from the SE.

N of Sabine Bank, general depths are 33 to 40 feet. In July 1982, shoaling from 3 to 6 feet less than charted depths was reported within 6 miles of the beach between Calcasieu Pass and Sabine Pass.

Vessels approaching the passes and entrances to the ports, or bound along the Gulf Coast between Calcasieu Pass and Brazos Santiago, should proceed in the charted shipping Safety Fairways. (See 166.100 through 166.200, chapter 2.)

10. SABINE PASS TO SAN LUIS PASS

This chapter describes the 77-mile-long Texas Gulf Coast from Sabine Pass to San Luis Pass, and Port Arthur Canal, Sabine-Neches Canal, Neches River, Galveston Bay, East and West Bays, Houston Ship Channel and their tributary waterways. Also discussed are the deepwater ports of Port Arthur, Beaumont, Orange, Galveston, Texas City, and Houston.

COLREGS Demarcation Lines.–The lines established for this part of the coast are described in 80.840 and 80.845, chapter 2.

Weather.–The climate of this coast ranges from warm and humid in summer to moderately subtropical in winter. During the warmer months, warm humid air from the Gulf brings showers and thunderstorms and an occasional tropical cyclone. There are periods of modified continental influence during the colder months when extratropical systems to N occasionally penetrate the Gulf region of Texas. These systems and their fronts produce low temperatures and "northers", strong, cold winds from N. Cold fronts reaching this area are seldom severe. Temperatures drop to freezing or below only four times a year in Galveston, on average. Spring days are typically mild, with brisk winds and frequent showers. Early autumn is essentially an extension of summer. November brings an increase in N winds and cold spells.

Navigational hazards in winter include strong winds, rough seas, and poor visibilities. Winds from extratropical cyclones and their associated fronts are often "northers" and reach 40 knots or more. Gales (winds of 34 knots or more) blow about 1 percent of the time from November through March. These winds usually pose little problem to vessels lying close to the Gulf coastline, as they blow offshore. Seaward, with an increasing fetch, waves become higher. Wave heights of 12 feet or more are encountered 1 to 2 percent of the time, and waves greater than 20 feet have been reported. On average, a 32-foot significant wave height from December through April can be expected every 10 years. Visibilities drop below 2 miles 2 to 3 percent of the time during this period. Precipitation also restricts visibilities.

The tropical cyclone season extends from late May into early November. There is about a 30 percent chance of a tropical cyclone (tropical storm and hurricane) and a 20 percent chance of a hurricane along this coast in any given year. The 1900 hurricane completely destroyed the city of Galveston, but the building of a 17-foot seawall on the Gulf side of the island has reduced the danger of sea and swell action. Tropical cyclones are dangerous to shipping near the coast, because the winds often blow onshore. Based on statistics, it is estimated that every 10 years, on average, sustained winds will reach 85 knots while maximum significant wave heights build to 32 feet.

Charts 11330, 11340.–Sabine Pass and its connecting channels form an extensive system of deepwater routes leading inland as far as Beaumont and Orange, Texas. From Sabine Pass the coast follows a general WSW direction for 50 miles to Galveston Entrance. Except in the E part, deep water extends fairly close inshore. The coast is low and devoid of prominent features, with the exception of High Island. Heald Bank, off the coast, has depths of 25 to 35 feet and is a danger to deep-draft vessels.

Galveston Entrance is the approach to the cities of Galveston, Texas City, and Houston. Galveston Bay and tributaries form one of the larger commercial ports in the United States, and have extensive foreign and coastwise trade.

Shipping Safety Fairways and Fairway Anchorages.– A system of shipping safety fairways has been established along the Gulf Coast to provide safe lanes for shipping that are free of oil well structures. Vessels approaching the passes and entrances to ports, or bound along the Gulf Coast between Sabine Pass and San Luis Pass should proceed in the charted shipping safety fairways. Caution should be exercised when approaching or navigating in these fairways as they are unmarked.

Fairway anchorages have been established off the entrances to the ports, which will be generally free of oil well structures. (See 166.100 through 166.200, chapter 2, for regulations governing the **fairways** and **anchorages.**)

Charts 11342, 11341, 11330.–Sabine Pass, 244 miles W of Southwest Pass, Mississippi River, and 50 miles ENE of Galveston Entrance, is the approach from the Gulf to Sabine Lake, Sabine and Neches Rivers, and the cities of Port Arthur, Beaumont, and Orange.

Sabine Pass, Lake, and River together form the boundary between the States of Louisiana and Texas for a distance of 275 miles N from the Gulf.

Prominent features.–The most prominent objects seen when approaching Sabine Pass are the E jetty light, an abandoned lighthouse, a white 81-foot tower on the E side of the pass, and the dredging range towers. Also prominent are the entrance range lights, the oil and water tanks W of Sabine Pass, and the tall hotel buildings and a stack at Port Arthur.

Sabine Pass East Jetty Light (29°38.7'N., 93°49.4'W.), 54 feet above the water, is shown from a skeleton tower on steel piles at the S end of the jetty. A fog signal is at the light.

Sabine Pass Radiobeacon is on the W side of the pass at the Sabine Pass Coast Guard Station, about 3.5 miles above the jetty.

Vessels should approach Sabine Pass through the prescribed Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Sabine Pass are described in 80.840, chapter 2.

Channels.–The entrance, obstructed by a bar, has been improved by the construction of two nearly parallel jetties about 550 yards apart extending about 3.5 miles in a S direction from shore. The general depths between jetties, outside the channel, are 8 to 16 feet. Federal project depths are 42 feet in the outer bar channel, thence 40 feet through the jetty channel to and through Port Arthur Canal, with 40 feet in the E and W turning basins and Taylor Bayou turning basin at Port Arthur. (See Notice to Mariners and latest editions of charts for controlling depths.)

In March 1983, shoaling to 38 feet was reported in the safety fairway in the approach to Sabine Bank Channel about 5.6 miles S of Sabine Bank Channel Lighted Whistle Buoy SB in about 29°19′20″N., 93°39′26″W. In 1980-March 1983, shoaling to 37 feet was reported about 9 miles S of the buoy, extending WSW from about 29°16.0′N., 93°40.2′W. for about 0.9 mile. In 1975, a submerged obstruction covered 27 feet was found to exist in 29°32′09″N., 93°43′15″W., about 0.2 mile E of the dredged outer bar channel that leads through the Sabine Pass Safety Fairway.

The bar channel is marked by a **337°18′** lighted range and lighted buoys, and the channel through the jetties by a **347°** lighted range and lighted and unlighted buoys. Unlighted dredging ranges, maintained by the Corps of Engineers, mark the sides of the outer bar and jetty channels.

Inside the jetties, the pass extends NW about 6 miles to Sabine Lake. The bottom outside the channel for the most part is soft, and vessels can touch without damage. Lighted ranges and other lighted aids mark the channel through Sabine Pass and Port Arthur Canal to Port Arthur.

Sabine-Neches Waterway Navigation Guidelines.–The Sabine Pilots provide a coordination service to traffic in Sabine Bank Channel, Sabine Pass, Port Arthur Canal, Sabine-Neches Canal, and Neches River. They have adopted the following procedures regarding meeting situations as discussed below. The procedures are not Coast Guard regulations, but are guidelines that the Sabine Pilots have established and use to ensure that vessels meet safely.

(1) Vessels with a combined beam that equals or exceeds one-half the channel width will not meet, day or night.

(2) Above the Texaco Island intersection (29°49.5′N., 93°57.5′W.), vessels 85,000 deadweight tons or more will not meet vessels of either 30,000 deadweight tons or greater, or vessels with drafts of 25 feet or greater.

(3) Above Buoys 29 and 30, vessels of 85,000 deadweight tons or greater will not meet any vessel of 30,000 deadweight tons or more with a draft of 30 feet or greater.

(4) Vessels of 48,000 deadweight tons or more with a draft of 30 feet or greater will not meet above Buoys 29 and 30.

(5) Vessels with a combined draft of 65 feet or more will not meet in the Neches River at night.

(6) The Fina turning basin (29°59.2′N., 93°54.4′W.) and Sun Oil turning basin (30°00.6′N., 93°59.0′W.) are not used for anchorages, but for meeting situations in which the size of the two vessels or other surrounding circumstances preclude their meeting in the channel. The inbound or outbound vessel, as appropriate, should vacate turning basins as soon as possible.

(7) The project depth of the Sabine-Neches Waterway is 40 feet. This depth coupled with tidal fluctuations and weather conditions will govern policy on maximum draft limitations. Meeting situations in channel bends should be avoided whenever possible.

The Sabine Pilots request that vessels transiting the waterway check in with the Sabine Pilots Dispatcher on VHF-FM channel 20 at the following locations:

(1) Sabine Bank Channel Lighted Gong Buoy 29 and Lighted Buoy 30 (29°36′N., 93°48′W.).

(2) Port Arthur Canal Light 40 (Mesquite Point).

(3) Port Arthur turning basin, Taylor Bayou.

(4) Sabine-Neches Canal Light 65 (Neches River Intersection).

(5) Neches River Light 40 (McFadden Bend Cutoff).

Nothing in these coordination guidelines should be construed as limiting a pilot in his good judgment.

Captain of the Port Order.–The Captain of the Port, Port Arthur, Texas, has ordered that: "All vessels with tows on a hawser transiting the Sabine Neches Waterway (Sabine Pass Channel, Port Arthur Canal, Sabine-Neches Canal, Neches River, Sabine River and all navigable waterways tributary thereto) are to have an additional tug of sufficient horsepower made up to the tow in such a manner as to provide complete and effective control of the tow at all times. If a second tug is not provided, the towing vessel must be made fast to the tow in such a way that complete and effective control is maintained at all times through the transit." The complete text of the order is published in the Eighth Coast Guard District Local Notice to Mariners Number 34, dated August 18, 1982.

Anchorages.–Deep-draft vessels usually anchor in the Sabine Fairway Anchorages outside of the pass entrance. (See 166.100 through 166.200, chapter 2.) Vessels of light draft can find good holding ground 7 to 8 miles W of the jetties as close inshore as drafts will permit. The pass affords excellent anchorage for small craft, and is used by coasting vessels as a wintertime harbor of refuge.

An anchorage basin, Federal project depth 40 feet, is on the E side of Sabine Pass Channel opposite the town of Sabine Pass. (See 110.196, chapter 2, for limits and regulations, and Notice to Mariners and

latest editions of charts for controlling depths.) The portion of the pass off the town of Sabine Pass and SW of the ship channel is used as an anchorage by small light-draft vessels and was reported dredged to 21 feet in 1982.

Dangers.-The offshore oil well structures, Sabine Bank, and the spoil and dumping grounds on either side of the entrance channel are the principal dangers encountered when approaching Sabine Pass. Vessels should not approach the entrance too closely before the pilot boards.

Tides and currents.-The diurnal range of tide at the jettied entrance to Sabine Pass is 2.5 feet. The currents off the entrance of Sabine Pass are dependent upon the direction and velocity of the wind. Following continued N to E winds, a SW to W current will be found off the entrance, frequently with a velocity of 1 knot and sometimes as much as 2 knots. Following S and SW winds, the currents will be in the opposite direction, but with less velocity. The tidal current between the jetties at strength averages 1.1 knots on the flood and 1.6 knots on the ebb, but velocities up to 2.5 knots have been observed in Sabine Pass. Tidal current predictions for Sabine Pass may be found in the Tidal Current Tables, Atlantic Coast.

Weather.-Port Arthur's climate is a mixture of tropical and temperate zone conditions. Sea breezes help prevent extremely high summer temperatures, except on rare occasions, and the area lies far enough S so that cold air usually moderates before reaching the area. Summer temperatures climb to 90°F or more on about 83 days each season while winter readings fall to 32°F and below on about 18 days annually.

Rain occurs year round, with minimums usually in March and October. Winter precipitation is often steady, while in summer, showers and thunderstorms are more likely. Snow and sleet are infrequent; the greatest snowfall in a single storm was 4.4 inches. Thunderstorms are most likely in July and August, when they are observed on 12 to 13 days per month, on average. They are most violent in spring and can produce strong, gusty winds. A local windstorm generated 64-knot winds in May 1971.

Tropical cyclones are most likely in September, although the season runs from late May into early November. During Audrey, in June 1957, the Coast Guard station at Sabine Pass recorded sustained winds to 85 mph with gusts to 100 mph. Storm tides reached 9 feet above mean sea level. Carla, in September 1961, generated 5- to 9-foot tides in the Port Arthur area.

Fog is most frequent in midwinter and rare in summer. It usually dissipates before noon, but occasionally, under stagnant conditons, it lasts into the afternoon. Along the coast, it may not develop until daybreak, but inland, where radiation is more effective, it may form before midnight. At Sabine Pass, the fog signals operate an average of 90 to 120 hours per month from December through March. At Port Arthur, visibilities drop to 0.25 mile or below on 6 to 8 days per month during this period. (See page T-8 for **Port Arthur climatological table.**)

The National Weather Service maintains an office in Port Arthur; barometers may be compared there or by telephone. (See appendix for address.)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. The Sabine Pilots have an office in Groves, Texas, and a pilot station at Sabine, Texas, at the inner end of the W jetty at Sabine Pass.

The three pilot boats, SABINE PILOT and SABINE PILOT II, each 65 feet long, and SABINE BANK PILOT, 45 feet long, each have a black hull and a white house with green trim. The International Code flag "P" is flown. The boats are equipped with radiotelephone and monitor VHF-FM channels 12 (156.60 MHz), 13 (156.65 MHz), 16 (156.80 MHz), and 65A (156.275 MHz) and use channel 65A as a working channel. The pilot office at Groves monitors VHF-FM channel 20 (157.00 MHz). All the pilots carry portable radiotelephones. The pilot boats meet vessels, day or night, at the sea buoy or at Sabine Bank Channel Lighted Gong Buoy 29, according to the preference of the vessel. For boarding, the pilots request that the pilot ladder is rigged 8 feet above the water. Pilots can be obtained on a minimum of 4 hours advance notice which should include the vessel's length, beam, DWT, freshwater deep draft, berth assignment, and ETA. Notice may be given by telephone (409-722-1141, 962-8580, 962-8589) through the Port Arthur Marine Operator, by telex (TWX SABPILOT GVXS 910-886-5333), or through ships' agents.

Towage.-Vessels usually proceed without assistance through the pass to Port Arthur. Radiotelephone equipped tugs up to 3,900 hp are available at Port Arthur. The tug companies are equipped to perform wrecking and salvage operations.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) The city has three hospitals.

Port Arthur is a **customs port of entry.**

Coast Guard.-A **marine safety office** is in Port Arthur. (See appendix for address.)

Texas Bayou, on the W side opposite the abandoned Sabine Pass lighthouse, has facilities for small craft to dock and a launching ramp. Water, ice, and some provisions are available from a nearby store. Gasoline is available at a dock about 0.5 mile SSE of the bayou's entrance on Sabine Pass.

Sabine is a village on the W side of the pass, about 5 miles above the outer end of the jetties. The S of the two old slips is used as a small-boat harbor where gasoline, diesel fuel, water, and ice are available. There is a menhaden plant and wharf, and many shrimp boats base here. Several oil companies have bases for supplying offshore oil wells.

Sabine is a **customs port of entry.**

Sabine Pass is a village on the W side of the pass about 1.5 miles N of Sabine. Shrimp boats base here.

Sabine Lake has an average depth of about 6 feet in its 15-mile length. At the S end, where it empties into Sabine Pass, the depth is 1 to 4 feet. A highway bridge over the S end has a swing span with a clearance of 9 feet. (See 117.1b, 117.240, and 117.548, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable close NW of the bridge has a clearance of 75 feet. Numerous gas and oil well structures, pipes, piles, stakes, and wrecks, some submerged, exist within Sabine Lake. In addition to the S entrance from Sabine Pass, the lake can be entered also from the Sabine-Neches Canal or through Sabine River. The depth through **East Pass** is about 3 feet.

Off Sabine Lake waterfront at Port Arthur is a bulkhead 1.5 miles long through which a narrow opening leads to a yacht basin for small boats of 3 to 4 feet in draft.

Johnson Bayou, in the extreme SW part of Louisiana, empties into the SE part of Sabine Lake, directly E of Port Arthur. The dredged channel leading to the entrance has filled to the lake bottom level. In July 1982, the reported depth was 2 feet into the mouth of the bayou. The entrance is marked by private stakes and buoys. Inside the entrance, the bayou is deeper and navigable for about 4.5 miles to the settlement of **Johnson Bayou;** a highway connects the settlement with **Sulphur.** A channel, marked by a private light and buoys, leads NNW across Sabine Lake from Johnson Bayou to the Sabine-Neches Canal.

Port Arthur Canal extends for about 6 miles from Sabine Pass to the entrance to Taylor Bayou. A narrow strip of land separates the canal from the W shore of Sabine Lake. Lights and lighted ranges mark the channel to Taylor Bayou.

Port Arthur, an important shipping center, is on the W shore of the Sabine Lake, 17 miles above the Sabine Pass entrance. There are several large oil refineries and chemical plants, two shipyards, a grain elevator, and numerous small industrial firms at Port Arthur.

The principal industrial development is on Taylor Bayou, at the SW outskirts of the city, sometimes known as **West Port Arthur.** The port has extensive domestic and foreign trade in chemicals and crude petroleum and its refined products. There is some commerce in grain, lumber, iron and steel products, cotton, scrap iron, glass and clay products, shell, paper products, alcohol, caustic soda, menhaden, vegetable and fish oils, lead, and general merchandise.

Harbor regulations.–The port is under the control of the Port of Port Arthur Navigation District. A Port Commission, under a Port Director, is responsible for the development and operation of the port and establishes regulations.

Wharves.–Port Arthur has more than 75 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 22, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the private operator. All of the facilities have direct highway and railroad connections. Water and electrical shore power connections are available at most piers and wharves. General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Cranes up to 150 tons are available at Port Arthur. Floating cranes with capacities up to 125 tons are also available.

Scurlock Oil Co. Wharf (29°44.4′N., 93°53.3′N.): 30-foot face, 300 feet with dolphins; 27 feet alongside; deck height, 6 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Scurlock Oil Co.

Gulf Oil Refining and Marketing Co., Upper Wharf, berth O: N end of Taylor Bayou Turning Basin; about 300-foot face; 17 feet alongside; deck height, 7 feet; receipt of liquid caustic soda, shipment of spent liquid caustic soda; owned and operated by Gulf Oil Refining and Marketing Co.

Gulf Oil Refining and Marketing Co. Wharf, Berths 1-6: E side of Taylor Bayou Turning Basin; 3,000-foot face; 38 feet alongside; deck height, 7 feet; receipt and shipment of crude oil, petrochemicals, and petroleum products; bunkering vessels and loading barges for bunkering at other piers; owned and operated by Gulf Oil Refining and Marketing Co.

Great Lakes Carbon Corp. Wharf (29°50.1′N., 93°57.9′N.): 680-foot face, 980 feet with dolphins; 36 feet alongside; deck height, 8 feet; two fixed electric coke-loading towers with conveyors, gravity spout, and mechanical trimmers, maximum loading rate 360 tons per hour each; receipt and shipment of raw and calcined petroleum coke; owned by Port Arthur Canal and Dock Co. (Kansas City Southern Railway Co.), and operated by Great Lakes Carbon Corp.

Hall-Buck Marine Services Coastwise Dock (29°50.2′N., 93°57.5′W.): 512-foot face, 1,025 feet with dolphins; 32 feet alongside; deck height, 6 feet; tower with vessel-loading spout; shipment of soda ash and potash; owned by Port Arthur Canal and Dock Co. (Kansas City Southern Railway Co.), and operated by Hall-Buck Marine Services Co.

Kansas City Southern Railway Co., Grain Shipping Wharf: N of Hall-Buck Marine Services Coastwise Dock; 575-foot face, 600 feet with dolphins; 34 feet alongside; deck height, 6 feet; four grain galleries with loading spouts, conveyors, loading rate 40,000 bushels per hour; owned by Port Arthur Canal and Dock Co. (Kansas City Southern Railway Co.), and operated by Cargill, Inc.

Texaco Wharf No. 3, Berths 8, 9, 10, and 11: across slip from Hall-Buck Marine Services Coastwise Dock; 2,288-foot face; 34-35 feet alongside; deck height, 12 feet; 88,000 square feet covered storage; shipment of bulk and packaged petroleum products; bunkering vessels and loading barges for bunkering vessels; owned and operated by Texaco, Inc.

Texaco Wharf No. 1, Berths 6 and 7 (29°50.0'N., 93°57.4'W.): 1,072-foot face; 39 feet alongside; deck height, 10 feet; 31,000 square feet covered storage; shipment of bulk petroleum products; bunkering vessels and loading barges for bunkering vessels; owned and operated by Texaco, Inc.

Texaco Wharf No. 4, Berth 4: SW of Texaco Wharf No. 1; 653-foot face; 39 feet alongside; deck height, 12 feet; 27,000 square feet covered storage; shipment of bulk and packaged petroleum products; bunkering vessels and loading barges for bunkering vessels; owned and operated by Texaco, Inc.

Texaco Wharf No. 2, Berths 1 and 2: S of Texaco Wharf No. 4; 1,289-foot face; 39 feet alongside; deck height, 12 feet; shipment of bulk petroleum products; bunkering vessels and loading barges for bunkering vessels; owned and operated by Texaco, Inc.

Port of Greater Port Arthur, Public Ocean Terminal Wharf (29°51.7'N., 93°56.2'W.): on W side of Sabine-Neches Canal; 1,200-foot face; 40 feet alongside; deck height, 15 feet; 108,000 square feet covered storage, 75-ton traveling crane, 40-ton container forklifts; receipt and shipment of general and container cargo; owned and operated by Port of Port Arthur Navigation District of Jefferson County.

Atlantic Shippers Wharf (29°55.6'N., 93°52.7'W.): 500-foot face; 36 feet alongside; deck height, 12 feet; conveyor system and 70-ton crane, loading rates 100 tons per hour; receipt and shipment of fish meal; owned and operated by Atlantic Shippers of Texas, Inc.

Texas Oklahoma Port Co. Wharf (29°55.8'N., 93°52.5'W.): on W side of Sabine-Neches Canal; 760-foot face; 40 feet alongside; deck height 15½ feet; traveling coke loading tower with conveyor and telescoping loading chute, loading rate 3,000 tons per hour; shipment of coke and coal; owned by PIAMCO, Inc. and Rice-Carden Corp., operated by Texas Oklahoma Port Co.

Supplies.–Provisions and marine supplies can be obtained in Port Arthur. Water of good quality is available alongside the wharves or can be delivered in barges. Bunker fuels can be obtained from Gulf Oil Refining and Marketing Co. and Texaco, Inc., or elsewhere in the harbor by barge. Small boats can obtain gasoline, oil, water, and supplies along the city waterfront of the Sabine-Neches Canal.

Repairs.–Port Arthur has two shipyards on the W side of the Sabine-Neches Canal. The yard about 2.5 miles above Taylor Bayou builds drilling rigs, has three floating drydocks with a maximum capacity of 4,200 tons, and can handle vessels up to 350 feet. The second yard, about 7 miles above Taylor Bayou, has a 3,000-ton floating drydock and two marine railways; vessels up to 125 feet can be handled. Both yards have machine, electrical welding, and carpenter shops, and make general repairs. Floating cranes up to 125 tons are available in the port.

Communications.–Radio station WPA provides ship-to-shore radiotelephone service. The port is served by the Kansas City Southern and Southern Pacific Railroads, buslines, and an airline. The Jefferson County Airport is NW of the city.

Taylor Bayou, 6 miles above Sabine Pass, is the site of many of the deep-draft facilities at Port Arthur. Federal project depth for the basins and connecting channels in the bayou is 40 feet. (See Notices to Mariners and latest editions of the charts for controlling depths.) Barriers, 1.6 miles and 2.3 miles above the entrance, obstruct through navigation on Taylor Bayou. The upper reach of Taylor Bayou, navigable for about 29 miles, is accessible through Taylor Bayou Outfall Canal, which is entered from the Intracoastal Waterway at Mile 290.3W. Taylor Bayou Outfall Canal and the upper reach of Taylor Bayou are discussed in chapter 12.

The **Sabine-Neches Canal** is a continuation of the Port Arthur Canal above the mouth of Taylor Bayou. It extends parallel with the shores of Sabine Lake, from which it is separated by a narrow strip of land, NE to the mouth of Neches River, thence E through the open water of the N part of Sabine Lake to the mouth of Sabine River. The Federal project depths are 40 feet to the mouth of Neches River, thence 30 feet to the mouth of Sabine River. (See Notice to Mariners and latest editions of charts for controlling depths.) Lights, lighted ranges, and buoys mark the channel.

A fixed highway bridge with a clearance of 136 feet crosses the Sabine-Neches Canal at Port Arthur 1.8 miles above the entrance to Taylor Bayou.

During high-river stages on Neches River, usually from January to the last of April, a vessel may encounter an athwartship current crossing Neches River along the canal route, which may prove dangerous if not guarded against.

Chart 11343.–Neches River empties into Sabine Lake from the NW and extends in a ship canal 18.5 miles to Beaumont. A Federal project provides for a 40-foot channel to a 34-foot turning basin at Beaumont, thence 30 feet to the Bethlehem Shipyards. (See Notice to Mariners and latest editions of charts for controlling depths.) Lights, lighted ranges, and buoys mark the river.

State Route 87 highway bridge (Rainbow Bridge) over the river, about 1.5 miles above its mouth, has a fixed channel span with a clearance of 172 feet. This bridge and the one at Port Arthur are the only bridges crossing the channel between the Gulf and the turning basin at Beaumont. Overhead power cables with clearances of 164 feet cross the river 50 yards E of State Route 87 highway bridge and just E of McFadden Bend Cutoff. These are the least overhead clearances between Port Arthur and the turning basin at Beaumont.

On the W side, at the turn from the Sabine-Neches Canal into the Neches River, there are several basins in which are a marine service wharf, a small-vessel fueling wharf, and a boat club. The marine service wharf repairs small vessels and barges and operates a tank cleaning service.

A marina is on the long canal just W of the S end of State Route 87 highway bridge. Gasoline and

berths are available. In July 1982, reported depths of about 5 feet could be carried to the marina.

Port Neches, on the Neches River 5 miles above the mouth, is an important oil refining and chemical center. Petroleum products, asphalt, and roofing material are exported. Port Neches has several private oil handling terminals, a layup berth maintained by a ship repair firm that does above-the-waterline hull and engine repairs, and a wharf and ramp at which gasoline and water are available. The private oil handling terminals are discussed later in this chapter under Wharves, Beaumont.

The marsh island N of McFadden Bend Cutoff has been dredged away except for a strip 300 feet wide. The dredged area forms an anchorage for decommissioned ships under jurisdiction of the U.S. Maritime Administration and has a controlling depth of 18 feet. (See 162.270, chapter 2, for **regulations restricting navigation** in the vicinity.)

Above Beaumont, a depth of about 10 feet can be carried for about 12 miles upriver, but there is no commerce in this section and probably many snags obstruct the channel.

Beaumont, on Neches River 18.5 miles above Sabine Lake and 43 miles from the Gulf, is the largest city in E Texas, and the home of Lamar University. Petroleum, petrochemical, and shipbuilding and repair are the principal industries. Commerce is principally in petroleum products, chemicals, molasses, wheat, flour, rice, synthetic rubber, shell, paper pulp, cement, dry and liquid sulfur, iron and steel products, scrap iron, and lumber and wood products.

Anchorages.–There are no anchorages at Beaumont and only emergency anchorage is permitted in Neches River. Vessels may tie up to the banks of the river for a limited period provided permission is obtained from the Corps of Engineers. There is temporary anchorage in 29 feet in the bends of the old river below Port Neches and W of the cutoff about a mile above McFadden Bend Cutoff. There is little swinging room.

A barge assembly basin, 2,200 feet long and 350 feet wide for the temporary mooring of barges of tows, is in the bend of the former channel close N of Deer Bayou. Moorings spaced about 175 feet apart on concrete deadmen are on the NE side of the basin.

The channel is clear, and all bends of less than 5,000-foot radius have been eliminated by cutoffs between the mouth of Neches River and Beaumont; there are a few places where a vessel may turn around.

Two bridges cross the improved channel above the turning basin at Beaumont. The first, the Kansas City Southern vertical lift railroad bridge, about 0.4 mile above the turning basin, has a clearance of 13 feet down and 147 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The second, Interstate 10-U.S. 90 highway bridge, about 1 mile above the railroad bridge, has a fixed span with a clearance of 48 feet.

Tides and currents.–Periodic tides are practically negligible in Neches River. The rise and fall of the water depends upon meteorological conditions.

Pilotage is covered at the beginning of the chapter.

Towage.–Tugs to 3,950 hp are available at Beaumont.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Beaumont has several public and private hospitals, and several clinics and infirmaries.

Beaumont is a **customs port of entry**.

Harbor regulations.–The Board of Commissioners of the Port of Beaumont Navigation District, known as the Port Authority, has jurisdiction over and controls all terminals, wharves, sheds, warehouses, and equipment owned and operated by it. The Port Authority establishes rules, regulations, and tariffs governing the port. The Port Director is in charge of operations; the Superintendent of Docks assigns berths.

Wharves.–Beaumont has more than 70 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 22, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the private operator. The port's waterfront facilities extend along the S bank of the Neches River for about 19 miles. Most of the facilities have direct highway and railroad connections, and most of the piers and wharves have water and electrical shore power connections. General cargo at the port is usually handled by ship's tackle; special handling equipment, if any, is mentioned in the description of the particular facility. Cranes up to 220 tons and a 500-ton floating derrick are available at Beaumont.

S side Neches River:

Fina Supply, Inc., No. 1 Dock: 0.3 mile W of bridge; 512-foot face, 550 feet with dolphins; 40 feet alongside; deck height, 14 feet; receipt and shipment of crude oil, petroleum products, and petrochemicals; bunkering vessels; owned and operated by Fina Supply, Inc.

Fina Supply, Inc., Dock A: 0.45 mile W of bridge; 223-foot face, 550 feet with dolphins; 39 feet alongside; deck height, 12 feet; receipt and shipment of crude oil, petroleum products and petrochemicals; bunkering vessels; owned and operated by Fina Supply, Inc.

Fina Supply, Inc., Dock B: 0.5 mile W of bridge; 237-foot face, 430 feet with dolphins; 36 feet alongside; deck height, 12 feet; receipt of crude oil, receipt and shipment of petroleum products and petrochemicals by barge; owned and operated by Fina Supply, Inc.

Port Neches:

Texaco Chemical Co., Neches Chemical Plant Wharf: 3.1 miles W of bridge; 160-foot face, 330 feet

with dolphins; 40 feet alongside; deck height, 10 feet, shipment of petrochemicals, receipt of liquid caustic soda; owned and operated by Texaco Chemical Co., Inc.

Texaco Port Neches No. 3 Dock: 3.4 miles W of bridge; 200-foot face, 600 feet with dolphins; 30 to 36 feet alongside; deck height, 8½ feet; receipt of crude oil and petroleum products, shipment of petroleum products; owned and operated by Texaco, Inc.

Texaco Port Neches No. 2 Dock: 3.5 miles W of bridge; 160-foot face, 300 feet with dolphins; 36 feet alongside; deck height, 8½ feet; receipt of crude oil and petroleum products, shipment of petroleum products and bulk asphalt; owned and operated by Texaco, Inc.

Texaco Port Neches No. 1 Dock: 3.6 miles W of bridge; 270-foot face, 1,100 feet with dolphins; 36 feet alongside; deck height, 8½ feet; receipt of crude oil and petroleum products; shipment of bulk asphalt and petroleum products; owned and operated by Texaco, Inc.

Texas-U.S. Chemical Co. Wharf: 3.8 miles W of bridge; 81-foot face, 320 feet with dolphins; 25 feet alongside; deck height, 12 to 10 feet; receipt and shipment of petrochemicals; owned by Texas-U.S. Chemical Co., and operated by Neches Butane Products Co.

B.F. Goodrich Chemical Division Marine Terminal Wharf: 3.9 miles W of bridge; 40-foot face, shore moorings allow berthing of 500-foot vessels; 24 feet alongside; deck height, 14 feet; receipt and shipment of petrochemicals and chemical additives; owned by B.F. Goodrich Chemical Division, and operated by Neches Butane Products Co. and The Lubrizol Corp.

Erikson Refining Corp., "A" Dock and "B" Dock: 4.6 miles W of bridge; "A" (inner) Dock, 60-foot face, 300 feet with dolphins, 29 feet alongside, deck height, 8 feet; "B" (outer) Dock, 40-foot face, 400 feet with dolphins, 34 feet alongside, deck height, 12 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Erikson Refining Corp.

Union Oil Co., Main Wharf (30°00.5'N., 93°58.5'W.): 1,170-foot face; 38 feet alongside; deck heights, 14½ feet upper deck, 4½ feet lower deck; 16,500 square feet covered storage; portable conveyor system; receipt of crude oil, shipment of bulk and packaged petroleum products and petrochemicals; bunkering vessels; owned and operated by Union Oil Co. of California.

Sunoco Terminals, Inc., Ship Dock No. 1 (30°00.5'N., 93°59.0'W.): 93-foot face, shore moorings allow berthing of 850-foot vessels; 40 feet alongside; deck height, 18 feet; receipt and shipment of crude oil, petroleum products, and petrochemicals; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

Sunoco Terminals, Inc., Ship Dock No. 2: 0.3 mile NW of Ship Dock No. 1; 114-foot face, shore moorings allow berthing of 950-foot vessels; 40 feet alongside; deck height, 18 feet; receipt and shipment of crude oil; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

Sunoco Terminals, Inc., Ship Dock No. 3: 0.5 mile NW of Ship Dock No. 1; 75-foot face, shore moorings allow berthing of 950-foot vessels; 40 feet alongside; deck height, 18 feet; receipt and shipment of crude oil and bunker fuels; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

Sunoco Terminals, Inc., Ship Dock No. 4: 0.7 mile NW of Ship Dock No. 1; 75-foot face, shore moorings allow berthing of 950-foot vessels; 40 feet alongside; deck height, 18 feet; receipt and shipment of crude oil; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

Sunoco Terminals, Inc., Ship Dock No. 5: 1.2 miles NW of Ship Dock No. 1; 75-foot face, shore moorings allow berthing of 950-foot vessels; 40 feet alongside; deck height, 18 feet; receipt and shipment of crude oil; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

Beaumont:

Du Pont Beaumont Works Main Wharf (30°01.2'N., 94°01.5'W.): 785 feet of berthing space with dolphins; 35 feet alongside; deck height, 12 feet; receipt of tetraethyl lead, methanol, and sulfuric acid, shipment of anhydrous ammonia and methanol; owned and operated by E. I. du Pont de Nemours and Co., Inc.

Amoco South Dock (30°01.9'N., 94°02.0'W.): 60-foot face, 400 feet with dolphins; 42 feet alongside; deck height, 12 feet; receipt and shipment of petroleum products; owned by Amoco Oil Co., and operated by Amoco Pipeline Co.

Amoco North Dock: 0.1 mile N of Amoco South Dock; 60-foot face, 400 feet with dolphins; 42 feet alongside; deck height, 12 feet; receipt and shipment of petroleum products; owned by Amoco Oil Co., and operated by Amoco Pipeline Co.

Texasgulf Chemical Co., Dry Bulk Sulphur Dock (30°02.2'N., 94°02.7'W.): 565-foot face; 35 feet alongside; deck height, 15 feet; electric loading tower with conveyor and loading spout with trimmer, loading rate 1,000 tons per hour; shipment of dry bulk sulfur; owned and operated by Texasgulf Chemical Co.

Texasgulf Chemical Co., Liquid Sulphur Dock: W of Dry Sulphur Dock; 31-foot face, 500 feet with dolphins; 35 feet alongside; deck height, 11 feet; shipment of liquid sulfur; owned and operated by Texasgulf Chemical Co.

Texas Oil and Chemical Terminal, Inc., Ship Dock (30°02.6'N., 94°01.7'W.): 60-foot face, shore moorings allow berthing of 800-foot vessels; 42 feet alongside; deck height, 12 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Texas Oil and Chemical Terminal, Inc.

Estech General Chemical Nitrogen Plant Loading Wharf (30°03.6'N., 94°02.2'W.): 49-foot face, 500 feet with dolphins; 30 feet alongside; deck height, 10 feet; shipment of liquid fertilizer, receipt of anhydrous ammonia; owned and operated by Estech General Chemical Corp.

Mobil Chemical Co., Olefins/Aromatics Wharf:

0.6 mile above Old River; 150-foot face, 215 feet with dolphins; 26 feet alongside; deck height, 13 feet; shipment and receipt of petrochemicals; owned and operated by Mobil Chemical Co., a division of Mobil Oil Corp.

Mobil Oil Corp., Wharf No. 4: 0.5 mile above Olefins/Aromatics Wharf: 250-foot face, 410 feet with dolphins; 42 feet alongside; deck height, 13 feet; receipt of crude and lubricating oils, shipment of petroleum products; bunkering vessels and loading barges for bunkering vessels; owned and operated by Mobil Oil Corp.

Mobil Oil Corp., Wharf No. 3: 0.1 mile above Wharf No. 4; 303-foot face, 323 feet with dolphins; 39 feet alongside; deck height, 13 feet; receipt of crude and lubricating oils, shipment of petroleum products and fresh caustic soda; bunkering vessels and loading barges for bunkering vessels; owned and operated by Mobil Oil Corp.

Mobil Oil Corp., Wharf No. 2: 0.1 mile above Wharf No. 3; 157-foot face, 270 feet with dolphins; 39 feet alongside; deck height, 13 feet; receipt of crude and lubricating oils, shipment of petroleum products and fresh caustic soda; owned and operated by Mobil Oil Corp.

Port of Beaumont Navigation District, Grain Wharf (30°04.5'N., 94°04.7'W.): 597-foot face, 700 feet with dolphins; 40 feet alongside; deck height, 16 feet; three grain spouts and conveyors, loading rate 50,000 bushels per hour; shipment of grain; owned by Port of Beaumont Navigation District of Jefferson County; operated by Continental Grain Co., Southwest Division.

Port of Beaumont Navigation District, Carroll Street Wharf (30°04.5'N., 94°04.8'W.): 764-foot face, 800 feet with dolphins; 40 feet alongside; deck height, 16 feet; 58,000 square feet of covered storage; receipt and shipment of general and containerized cargoes, lumber and steel products; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Harbor Island Marine Terminal Wharf: 0.2 mile W of Carroll Street Wharf; 1,200-foot face; 40 feet alongside; deck height, 16 feet; 220-ton mobile crane, forklifts to 40 tons; 112,000 square feet of covered storage, 38 acres of open storage; receipt and shipment of general and containerized cargoes, roll-on/roll-off cargo, and heavy-lift items; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Berth No. 1 (30°04.6'N., 94°05.5'W.): 580-foot face; 30 feet alongside; deck height, 16 feet; about 6 acres open storage; receipt and shipment of general and containerized cargoes; 125-foot NE face with 30 feet alongside used as stern ramp by roll-on/roll-off vessels at Berth No. 2; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Berths Nos. 2 and 3 (30°04.7'N., 94°05.3'W.): 825-foot face; 38 feet alongside; deck height, 16 feet; 60-ton traveling gantry crane; use of equipment from Marine Terminal Wharf; about 6 acres open storage; receipt and shipment of general, roll-on/roll-off, and containerized cargoes and dry bulk commodities; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Berth No. 4 (30°04.7'N., 94°05.2'W.): 560-foot face; 38 feet alongside; deck height, 16 feet; 42,000 square feet of covered storage; 5,000 square feet open storage; receipt and shipment of general cargo; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Berths Nos. 5 and 6: 0.25 mile below railroad lift bridge; 880-foot face; 36 feet alongside; deck height, 16 feet; 65,000 square feet covered storage; 5,000 square feet open storage; receipt and shipment of general cargo; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Port of Beaumont Navigation District, Berth No. 7: 0.15 mile below railroad lift bridge; 570-foot face; 36 feet alongside; deck height, 16 feet; 55,000 square feet covered storage; 5,000 square feet open storage; receipt and shipment of general cargo, receipt of molasses; owned and operated by Port of Beaumont Navigation District of Jefferson County.

Supplies.–Water is available at most of the wharves and piers, and Bunker C and diesel oil can be obtained by barge or at the several oil terminals. General and marine supplies are available at Beaumont.

Repairs.–A shipyard that builds offshore oil well drilling towers and barges up to 500 feet is on the W side of the river about 0.5 mile above the railroad bridge. The shipyard has a 17,500-ton floating drydock that can handle vessels up to 645 feet, cranes up to 65 tons, a 500-ton floating crane, and complete machine, welding, pipe, joiner, and metal shops. In addition, the yard can make most any type of repairs to wooden and steel vessels, and engines. Other repair plants can make above-the-waterline repairs to vessels anywhere in the harbor. Iron works in the port can handle any kind of foundry or machine work.

Small-craft facilities.–Gasoline, diesel fuel, water, and ice are available at a boat club just above the Interstate 10/U.S. Route 90 highway bridge. A privately marked channel with a reported controlling depth of 5 feet in July 1982, leads to the private boat club's berthing facilities.

Communications.–The Port Authority controls the terminal's rail trackage at the Port of Beaumont. It connects with the four trunkline railroads serving the city. They are the Southern Pacific, Kansas City Southern, Atchison, Topeka and Santa Fe, and the Missouri Pacific Railroads. Over 80 steamship lines offer service to all ports of the world and barge lines operate in coastwise service from the port. Several motor freight lines and interstate buslines serve the city. Radio Station WPA at Port Arthur provides ship-to-shore radio and radiotelephone service.

Pine Island Bayou empties into Neches River 9

miles above Beaumont and has a navigable depth of about 8 feet for about 10 miles to the pumping plant of the Lower Neches Valley Authority. The only commerce on the bayou is the transportation of fuel oil to this plant.

The Santa Fe railroad bridge, 6.5 miles above the mouth, has a 37-foot fixed span with a clearance of 20 feet. An overhead power cable on the E side of the bridge has a clearance of 47 feet. Highway and railroad bridges 6.8 miles above the mouth at Voth, Tex., have a minimum channel width of 40 feet and clearance of 21 feet.

Sabine River empties into Sabine Lake from the N. **Orange** is a city of some commercial importance on the river about 8 miles above Sabine Lake, and 36 miles from the Gulf. The city is on the main coastal highway between Lake Charles and Beaumont. The principal commodities handled at the Port of Orange include rice, flour, cornmeal, treated timbers and lumber, naval stores, carbon black, steel products, chemicals, petroleum products, alcohol, container board, shell, rubber, powdered milk, and general cargo. Shipbuilding and petrochemical production are the most important industries at Orange.

Channels.–The section of the Sabine River from the mouth to Orange, which is part of the Sabine-Neches Waterway, has been improved by dredging a deep-draft channel, which with land cuts, has eased or bypassed the sharp bends in the river. The Federal project depths are 30 feet from the end of the Sabine-Neches Canal, at the mouth of the river, to the site of the old highway bridge (30°05.6′N., 93°43.4′W.) at Orange, thence 25 feet in the channel around Orange Harbor Island to Orange. (See Notice to Mariners and latest editions of charts for controlling depths.) Lights, lighted ranges, and buoys mark the channel to Orange. In July 1982, a reported depth of 12 feet, except on the sharp bends, could be carried to Echo, about 6 miles above Orange. An overhead power cable with a clearance of 172 feet crosses the river about 3 miles below Orange. Between Orange and Echo, an overhead power cable, a fixed highway bridge (I-10/U.S. 90), and a swing bridge cross the river; clearances are 146 feet, 47 feet, and 6 feet, respectively. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(26), chapter 2, for drawbridge regulations and opening signals.)

The channel around Orange Harbor Island is crossed by a swing-type pontoon bridge that connects the N end of the island with the mainland. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(26-a), chapter 2, for drawbridge regulations and opening signals.)

Anchorages.–There are no anchorage areas for commercial vessels in the port. Vessels may tie up along the bank of the river for limited periods if permission is obtained from the Corps of Engineers.

Tides and currents.–Practically no periodic tides occur. The rise and fall of the water depends upon the meteorological conditions. Currents in the Sabine River are about 2.5 knots during high stages.

Pilotage is covered at the beginning of this chapter.

Towage.–Tugs of up to 3,900 hp are available at Orange.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Orange has two hospitals.

Orange is a **customs port of entry.**

Harbor regulations.–The local regulations are established by the Orange County Navigation and Port District of the Port of Orange. A Port Director is in charge of operations. Regulations are enforced by a harbormaster, whose office is at the Municipal Terminal.

A **restricted area** for vessels of a Navy reserve fleet has been established at Orange. (See 207.184, chapter 2, for limits and regulations.)

Wharves.–Deep-draft vessels at the Port of Orange berth alongside the long wharf on the SW side of the Orange Municipal Slip (30°03.9′N., 93°43.2′W.), about 2 miles below the city. The wharf has four ship berths for a total length of 2,300 feet. In July 1982, depths of 30 feet were reported alongside the wharf. Transit sheds with a total capacity of over 346,000 square feet of covered storage are available on the wharf. Depressed railroad tracks are in the rear of the transit sheds, and a paved highway leads to the wharf. Electricity and fresh water are available at all berths. A 30-ton mobile crane and floating cranes to 150 tons are available by special arrangement. General cargo is handled at the wharf. Oil-handling barge berths are on both sides of the channel opposite the S end of Orange Harbor Island.

Lay berths for 36 vessels are available at Orange about 2 miles above the Municipal Slip. The reported depth alongside the berths is 18 feet. Electrical, fresh water, and telephone connections are available.

Supplies.–Provisions and some marine supplies are available in Orange. Water can be obtained at either the Municipal Slip or along the riverfront in town. Bunker C and diesel oil are available by barge or truck from Port Arthur.

Small-craft facilities.–A marina is on the W side of the channel opposite the N end of Orange Harbor Island. Berths with electricity, water, ice, and hotel accommodations are available. In July 1982, a depth of 12 feet was reported available alongside the pier at the marina.

Repairs.–Orange has several shipyards that build vessels, offshore oil rigs, and barges. The largest yard is at the N end of Orange Harbor Island. It has three floating drydocks, a pontoon pier, and a marine railway. The largest drydock at this yard has an 11,000-ton capacity, is 600 feet long, has a clear width of 50 to 126 feet, and can handle vessels to 388 feet. The yard has machine, metal, welding, paint, and joiner shops, and can make above- and below-the-waterline repairs of any type. Two repair yards

on the W side of the channel 0.6 mile SSE of the S end of Orange Harbor Island have floating drydocks up to 2,500 tons and 185 feet long. A repair yard W of Orange Harbor Island has a 250-foot marine railway. Floating cranes up to 150 tons are available in the port, and a 500-ton floating crane can be obtained from Port Arthur.

Communications.-The Missouri Pacific, Sabine River and Northern, and Southern Pacific Railroads serve the port. Several motor freight lines offer service, and buslines pass through the city. The main coastal highway (U.S. Route 90) and Interstate 10 pass N of the city, and State Route 87 connects with Port Arthur over the Rainbow Bridge.

Cow Bayou flows into Sabine River about 4 miles above Sabine Lake. A dredged channel leads from the Sabine River to a turning basin at the highway bridge at **Orangefield.** In July 1983, the controlling depth was 9 feet in the channel and 10 feet in the basin. A draft of 4½ feet can be carried for about 15 miles above the basin. Below the basin, one fixed highway bridge and two swing highway bridges cross the bayou; clearances are 8 feet for the swing bridges and 55 feet for the fixed bridge. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(27), chapter 2, for drawbridge regulations and opening signals.) The fixed highway bridge at the upper end of the turning basin at Orangefield has a clearance of 18 feet. The minimum clearances of the overhead power and telephone cables below the Orangefield turning basin are 63 feet; overhead power cables at the turning basin and 0.5 mile above have clearances of 30 and 37 feet, respectively. A shipyard about 300 yards above the first bridge has a 1,000-ton floating drydock that can handle vessels up to 200 feet long.

Adams Bayou empties into Sabine River 2 miles above Cow Bayou. A dredged channel leads from the Sabine River to the first fixed highway bridge. The controlling depth in the channel was 7 feet in July 1983. The highway bridge has a fixed span with a clearance of 11 feet. Just below the bridge is a shipyard with a 100-ton floating drydock that can handle vessels up to 70 feet for general repairs. Below the bridge is a yacht basin with covered and open berths for yachts up to 45 feet. Gasoline, a 2-ton hoist, and water are available. Minor engine and hull repairs are made. The channel leading to the basin had a reported controlling depth of 6 feet in July 1982. A large plant of the Dupont Chemical Company is halfway between the Sabine River and the fixed bridge; its piers are not available to the public.

Charts 11331, 11348.-Lake Charles Deepwater Channel, a part of the Intracoastal Waterway, enters Sabine River 0.7 mile above Adams Bayou and extends E for 22 miles to the Calcasieu River at a point 13 miles below Lake Charles. Lake Charles is described in chapter 9.

The Intracoastal Waterway route continues along Sabine River and the Sabine-Neches Canal. (See chapter 12.)

Charts 11332, 11323.-High Island, a small settlement on the mainland about 30 miles W of Sabine Pass, is a mound about 1 mile in diameter and 40 feet high, the highest land on the coast between Sabine Pass and Galveston. It is a conspicuous landmark for vessels making, or standing along the coast. Numerous oil derricks are on the mound, and about 1.5 miles N are two 132-foot towers for a transmission line crossing the Intracoastal Waterway.

Gasoline, water, and provisions can be obtained in the town. The ruins of a long fishing pier extend about 0.7 mile into the Gulf.

Rollover Pass, about 6.5 miles WSW of High Island, is a shallow inlet from the Gulf into East Bay, which is not passable for even the smallest of outboard craft because of very strong tidal currents, reported obstructions, and shifting bottom. The pass is bulkheaded with steel piling. The village of **Gilchrist** is on the pass. Gasoline is available in cans from a station near the pass, and water and ice can be obtained at several nearby bait stands.

Heald Bank, lying 34 miles E of Galveston and 27 miles offshore, is nearly 5 miles long in a NE and SW direction. Depths of 25 to 35 feet extend over the bank, and depths of 50 to 60 feet are found as close as 1.5 to 2 miles to the SE. In a heavy sea Heald Bank should be avoided by all vessels, including those of moderate draft which could pass over it in smooth water. A lighted bell buoy is 3 miles SW of the bank. In 1965, a vessel reported striking a submerged object about 5.6 miles SE of the buoy. In August 1982, shoaling to 35 feet was reported in the safety fairway about 2.2 miles W of the buoy, and a 34-foot spot was reported in the fairway about 1 mile S of the buoy in about 29°04.1'N., 94°13.9'W. Caution is advised in these areas. In August 1982, a 35-foot spot was reported close SW of the fairway in about 29°04.3'N., 94°18.1'W. A 33-foot spot, marked by a buoy, is about 11 miles SW of the bank.

The currents at Heald Bank are due largely to winds. In calm weather or with light breezes, little current is experienced. Wind velocities of 20 to 35 knots produce currents of about 0.5 to 1 knot, setting in a direction approximately fair with the wind. In February 1919, a velocity of 2.6 knots in a SW direction was observed; a N wind of about 45 knots was blowing at this time. From observations made during the first 6 months of 1915, the average drift was one-fourth knot, setting in a W direction.

Chart 11340.-East Flower Garden Bank and **West Flower Garden Bank,** covered 9 and 10 fathoms, respectively, are coral reefs about 108 miles S of Sabine Pass. To help preserve the fragile coral structures, the Office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration, has requested that vessels greater than 50 feet in length not anchor or discharge oil in depths of less than 30 fathoms in this area.

Chart 11323.-Bolivar Peninsula, SW of High Island, extends to the Galveston Bay Entrance. The

land is low with few prominent features. An abandoned lighthouse, a black conical tower 116 feet high, is on the S end of the peninsula. Numerous wrecks lie in the shoal water along the Gulf Coast off Bolivar Peninsula. It is reported that several fishing vessels have been wrecked on these obstructions.

Galveston Entrance.–Vessels should approach Galveston Bay through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

Traffic Separation Scheme (Galveston) has been established in the approach to Galveston Bay. The Scheme consists of **directed traffic lanes** for inbound and outbound traffic, a **separation zone**, and two **precautionary areas**. The Traffic Separation Scheme is coterminous with the existing safety fairway from the vicinity of Galveston Bay Entrance Lighted Whistle Buoy GA to the vicinity of Galveston Bay Entrance Channel Lighted Buoy 1.

The Traffic Separation Scheme has been designed to aid in the prevention of collisions in the approach to the harbor, but is not intended in any way to supersede or alter the applicable Navigation Rules. Separation zones are intended to separate inbound and outbound traffic lanes and to be free of ship traffic, and should not be used except for crossing purposes. Mariners should use extreme caution when crossing traffic lanes and separation zones.

Note.–A pilot boarding area is located near the center of the inshore precautionary area. Due to heavy vessel traffic, mariners are advised not to anchor or linger in this precautionary area except to pick up or disembark a pilot. (See Traffic Separation Schemes, chapter 1, and 33 CFR 167, chapter 2, for additional information.)

Charts 11324, 11327, 11323, 11331, 11322, 11326, 11330.–Galveston Bay is a large irregularly shaped shallow body of water on the coast of Texas, about 285 miles W from Southwest Pass and 690 miles NW from Dry Tortugas. The bay is about 30 miles long in a general NNE and SSW direction, about 17 miles wide at its widest part, and has general depths of 7 to 9 feet. About midway of its length it is nearly divided into parts by **Red Fish Bar,** a chain of small islets and shoals, through which the Houston Ship Channel has been dredged. N of Red Fish Bar the bay is known as the Upper Bay and S as the Lower Bay. The NE end of the upper bay is Trinity Bay.

Galveston Bay is the approach to East and West Bays, Houston Ship Channel, and the cities of Galveston, Texas City, and Houston, as well as to numerous smaller towns and bayous.

Galveston Entrance, the approach to Galveston Bay, lies between two converging stone-rubble jetties about 4 miles long and 1.3 miles apart at the outer ends. From deep water in the Gulf, the N jetty extends to Bolivar Peninsula and the S jetty extends to the N end of Galveston Island.

Bolivar Roads is the large deepwater area between the jetties extending W between Bolivar Peninsula on the N and Pelican Island and Galveston Island on the S. On the S and W it connects with the ship channels to Galveston, Texas City, and Houston. The Intracoastal Waterway crosses its NW side.

Galveston occupies the entire width of the E end of **Galveston Island.** The wharves are built along Galveston Channel on the N side of the city, and the S side fronts upon the Gulf from which the city is protected by a concrete seawall 17 feet high. Galveston, although widely known as the major seashore resort in the SW, is essentially and primarily a place of maritime commerce and industry.

The principal industries consist of shipping, boat building and repairing, grain elevators, machine shops, cotton compresses, meat packing, fishing, dairying, and agriculture.

The Port of Galveston offers a short route to the sea, and together with the deep and easily navigated channel and excellent port facilities enable Galveston to handle cargo most expeditiously and economically. The principal commodities handled at the port are shell, wheat, rice, flour, synthetic rubber, cotton, molasses, sugar, tea, petroleum products, scrap iron, lumber, wood pulp, paper products, coke, coal tar products, steel products, oil well pipe casing, machinery and supplies, sulfuric acid, alcohol, caustic soda, industrial chemicals, liquid and dry sulfur, stone and gravels, ores and concentrates, lead, zinc, copper, aluminum, bituminous coal, and general cargo.

Both foreign and domestic commerce are extensive, the principal exports are cotton, grain, flour, rice, sulfur, fertilizer chemicals, and metals. The main imports are bananas, plywood, seafood, raw sugar, and tea.

Port Bolivar has been abandoned as a port. The pier slips have shoaled; the only marine activity is an auto ferry operating between Galveston and Port Bolivar and several small shrimp-packing plants. In March 1983, the controlling depth in the ferry channel was 14 feet.

The current outside the jetties frequently has a velocity exceeding 1 knot. The set may be in any direction under the combined influence of the entrance currents and currents setting along the coast.

Daily predictions for Galveston Bay Entrance are published in the Tidal Current Tables.

Pelican Island, an artificial island, is on the N side of Galveston Channel and protects the channel from northers. A large shipyard, a radio station, an offshore drilling service facility, Texas A and M Maritime Academy, Texas University System's Moody Marine Institute, and a SEABEE and LASH barge marshalling area, Marine Geophysical Survey Company, and ship wharf are located on the island. Dikes enclose the central part of the island. Seawolf Park, a city park and recreation area with a public mooring wharf, occupies the former quarantine station at the E tip of the island. The submarine CAVALLA, a memorial to the submarine crews who lost their lives during World War II, and the destroyer escort STEWART are berthed adjacent to the park.

Prominent features.–Approaching the entrance to Galveston Bay, among the first objects sighted on a

clear day will be the 363-foot high American National Insurance Co. Building at about 29°18.4'N., 94°47.4'W., which displays aircraft warning lights at night, two grain elevators on Galveston Channel in the vicinity of Pier 29, the numerous hotels and motels along the seawall, and a tall hotel on a pier. The 116-foot abandoned lighthouse on Bolivar Point, the Santa Fe Building, and the many buildings of the medical center and the University of Texas, show conspicuously on closer approach and are easily identified. Vessels approaching from E near the coast will first sight High Island, and those approaching from SW will probably first sight the water tank near Scholes Field in about 29°16.0'N., 94°51.0'W., and then the American National Insurance Co. Building.

Galveston South Jetty Light 5A (29°19.6'N., 94°41.4'W.), 30 feet above the water, is shown from a skeleton tower with a square green daymark at the outer end of the S jetty. A fog signal is at the light.

Galveston Light (29°19.7'N., 94°44.2'W.), 145 feet above the water is shown from a skeleton tower at the inner end of the S jetty. A radiobeacon and a special radio direction finder calibration station are near the light. (See Light List for details.)

Galveston Bay Entrance Channel Lighted Buoy 1 (29°18.3'N., 94°37.6'W.), the sea buoy, is 3.7 miles off Galveston South Jetty Light 5A, and marks the entrance to the channel. A radar transponder beacon (Racon) is at the buoy. (See Racons, chapter 1, for additional information.)

Galveston Bay Entrance Lighted Whistle Buoy GA (29°09.0'N., 94°25.1'W.) is about 18 miles SE of Galveston South Jetty Light 5A.

A voluntary **Vessel Traffic Service (Houston–Galveston)** has been established in the Houston–Galveston area. The service is composed of **precautionary areas, reporting points,** and a **Vessel Traffic Center (VTC).**

The Vessel Traffic Center, operated continuously by the Coast Guard, maintains radiotelephone communications with vessels via VHF-FM channels 11 (156.55 MHz) and 12 (156.60 MHz) primary, and 13 (156.65 MHz) secondary. The Vessel Traffic Service will maintain a continuous guard only on these frequencies and answer on whichever frequency the call is received. Channel 12 is for use only by vessels below Baytown, about 26 miles above Galveston. Channel 11 is for use only by vessels above Baytown. Participating vessels are not required to guard channels 11 and 12. However, vessels with capabilities on those channels are requested to make initial contact with the Vessel Traffic Center on the channel designated for their location, transmit subsequent routine reports on that frequency, and switch to the other designated frequency when reaching Baytown. Vessels without channels 11 or 12 may continue to use channel 13 (156.65 MHz). The call sign is "Houston Traffic."

The purpose of the service is to prevent collisions and groundings and to protect the navigable waters from environmental harm resulting from collisions and groundings.

The center will process information received from vessels, and will disseminate information to other participating vessels operating in the Vessel Traffic Service. It is the goal of the Vessel Traffic Service to improve vessel transit safety by providing participating vessels advance information of other vessel movements occurring within the area of the Vessel Traffic Service. **This service is not intended in any way to supersede or alter applicable Navigation Rules.**

The Service is voluntary and is recommended for all vessels of 300 or more gross tons that are propelled by machinery; vessels of 100 or more gross tons that are carrying one or more passengers for hire; each commercial vessel of 26 feet or over in length, engaged in towing another vessel astern, alongside, or by pushing ahead; each ferry vessel operating in the area, and each dredge or floating plant.

For a complete detailed description of the service, mariners should obtain the latest edition of the U.S. Coast Guard's **Users Manual, Houston-Galveston Vessel Traffic Service,** available from the Commanding Officer, U.S. Coast Guard, Vessel Traffic Service, P.O. Box 545, Galena Park, Texas 77547.

COLREGS Demarcation Lines.–The lines established for Galveston Bay are described in 80.845, chapter 2.

Channels.–The Federal project provides for an Entrance Channel and an Outer Bar Channel both dredged to 42 feet from the Gulf to about 2 miles W of the outer end of the jetties; thence 40 feet in the Inner Bar Channel to Bolivar Roads, and in Galveston Channel from the roads to Pier B at West 43rd Street in Galveston. (See Notice to Mariners and latest editions of charts for controlling depths.) The channels are well marked. Lighted ranges mark the Entrance, Outer Bar, and Inner Bar Channels.

Anchorages.–Vessels may anchor off the bar in the Galveston Entrance Anchorages just inshore of the intersection of the Galveston Safety Fairway with the Coastwise Fairway. (See 166.100 through 166.200, chapter 2, for limits and regulations.) An anchorage area, for temporary use only, is N of the realigned Inner Bar Channel W of the spoil areas in Bolivar Roads. (See 110.197, chapter 2, for limits and regulations.) In all instances, vessels must anchor sufficiently clear of all active channels so as not to interfere with navigation or the usefulness of any established aids to navigation.

Because of heavy traffic, Galveston Channel can be used only for temporary anchorage by vessels preparing to haul into the berth at wharves or after leaving the wharves before going to sea. **Small craft anchoring in the designated areas should find the shoaler water so as to leave the deeper areas clear for larger vessels.**

In Galveston Bay small craft can anchor anywhere outside of the dredged channels where the depth is sufficient. The water in the bay may be lowered as much as 3 feet by a norther, and vessels should anticipate this when selecting anchorage during the winter.

Dangers.–A considerable number of unmarked

dangerous wrecks exist in the approaches to Galveston Bay Entrance. A spoil bank is S of the Outer Bar Channel, and an extensive shoal area is S of the channel between the jetties. Heald Bank and the offshore oil well structures are the principal hazards.

In January 1984, a submerged obstruction was reported in the outbound lane of the Traffic Separation Scheme in about 29°12′00″N., 94°30′42″W.

Vessels navigating in the Houston Ship Channel from Bolivar Roads to Morgans Point are cautioned about the heavy breakers which result from the bow wakes of tankers and other large merchant vessels in the channel.

Bridges.–A rail and highway causeway crosses Galveston Channel and connects Galveston Island with Pelican Island; the bascule span has a clearance of 12 feet; the single bascule leaf overhangs the channel above a clearance of 75 feet when the bridge is open, and caution is necessary. (See 117.1b, 117.240, and 117.553, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable close E of the bridge has a clearance of 85 feet. Galveston is connected to the mainland by three parallel causeways 1.75 miles long crossing the Intracoastal Waterway at the SW end of Galveston Bay. The rail-highway bridge has a bascule span with a clearance of 7 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The bridgetender monitors VHF-FM channels 14 (156.70 MHz) and 16 (156.80 MHz). An overhead power cable immediately SW of the bridge has a clearance of 99 feet. Twin fixed bridges 0.1 mile SW of the rail-highway bridge have clearances of 73 feet.

Tides and currents.–The diurnal range of tide at Galveston Bay Entrance at the S jetty is 2.0 feet. The effect of the wind on the water level in this part of the Gulf and adjoining bays may be considerable. A level 2 to 4 feet above mean low tide may result from a strong wind blowing continuously for several days from the E and SE. A strong wind blowing steadily from the N for several days may lower the water to a level 2 or 3 feet below mean low tide. Daily predictions for Galveston Channel are given in the Tide Tables.

The currents are also modified frequently by the winds. E or SE winds may cause a continuous flood current between the jetties at the entrance for a period of a day or more, and W or NW winds sometimes set up a continuous outgoing current for a similar period. The average velocity of the current between the jetties at strength is 1.7 knots on the flood and 2.3 knots on the ebb.

Weather.–The climate of the Galveston area is predominantly marine, with periods of modified continental influence during winter when cold fronts reach the coast. Cold fronts that reach the area are usually not severe. Temperatures drop to 32°F or below on just 4 days annually, on average.

The cold fronts or northers are responsible for a preponderance of N winds from November through March. Windspeeds climb to 28 knots or more about 1 percent of the time during this period and reach the 17- to 27-knot range 13 to 19 percent of the time. On occasion they have been observed at 50 knots. However, northerlies, since they blow offshore, are less of a problem to vessels close to the coast, although they are often preceded by strong, gusty onshore winds which generate heavy seas. Waves of 12 feet or more are encountered 1 to 2 percent of the time during this period. The frontal activity is also responsible for precipitation on about 2 to 4 days per month, usually in the form of steady rains. Poor visibilities are sometimes a problem in winter, and fog occurs from November through April. Offshore visibilities drop below 0.5 mile about 1 to 2 percent of the time, while Galveston records heavy fog (visibilities of 0.25 mile or less) on an average of 1 day per month in December and January. The Galveston South Jetty Light 5A fog signal operates an average of about 70 to 100 hours per month from December through March.

During spring and fall, weather is often variable. Thunderstorms are common from May through September. During July and August, they occur on about 10 days per month around the bay. Thunderstorms and showers provide most of the summer rainfall.

From late May through early November, there is the threat of a tropical cyclone with its strong winds, rough seas, storm tides, and torrential rains. Galveston has experienced all of these. The 1900 hurricane completely destroyed the city as storm tides were driven to 20 feet above mean sea level. An 1885 storm dumped 26 inches of rain on the city. During Carla, in September 1961, winds gusted to 112 mph. Since 1886, 15 tropical storms and 16 hurricanes have passed close to Galveston. A hurricane can be expected to affect the area about once in 5 years, on average. While September is the most likely month for a hurricane, devastating storms have occurred in all the hurricane months except November.

The National Weather Service maintains an office in Galveston; **Barometers** may be compared there or by telephone. (See appendix for address.) (See page T-9 for **Galveston climatological table.**)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register. Pilotage is optional for U.S. vessels in coastwise trade that have on board a pilot licensed by the Federal Government. The Galveston-Texas City Pilots have two boats, TEXAS, 70 feet long, and GALTEX, 47 feet long, an alternate pilot boat. Each boat has a black hull and white superstructure with the word PILOT on each side of the superstructure. The boats fly the international code flag "P" by day and display the standard pilot lights at night. The pilot boats monitor VHF-FM channels 13 (156.65 MHz), 16 (156.80 MHz), and 73 (156.675 MHz) and work on channel 13. The call signs for pilot boats TEXAS and GALTEX are WX-8357 and WYU-8513, respectively. The pilots carry portable radiotelephones. The sound and visual signals are four long blasts on the whistle or flashes on the signal light.

The Houston pilots have three boats: HOUSTON

PILOT No. 1, 54 feet long, HOUSTON PILOT No. 2, 61 feet long, and HOUSTON PILOT No. 3, 85 feet long. The boats have gray hulls and white superstructures. The pilot boats display the International Code flag P by day and the standard pilot lights by night. The pilot boats monitor VHF-FM channels 16 (156.80 MHz), 74 (156.725 MHz), and the working channel 12 (156.60 MHz) continuously. The pilot boats call signs are WYR-8541, WG-6780, and WZR-9849. The sound and visual signals are two long and three short blasts on the whistle or flashes on the signal light. The Houston pilots serve all ports above Texas City in Harris County.

The pilot boats come out when vessels are expected, and the pilots board at Galveston Bay Entrance Channel Lighted Buoy 1. Vessels should maintain steerage way and offer a good lee for the pilot to board. The pilots will advise vessels on the radiotelephone if special procedures are necessary. All pilots carry portable radiotelephones.

Pilots can be obtained by making a signal off the bar or with a 1½-hour advance notice by cable, telegram, radio, or radiotelephone to Galveston-Texas City Pilots (telephone, 409-765-9397 or 765-6511); or with 8 hours advance notice to the Houston Pilots (telephone, 713-645-4174); or through the ships' agents.

Towage.–Tugs up to 4,200 hp are available.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

The medical school and hospital of the University of Texas and other hospitals are in the city.

Galveston is a **customs port of entry.**

Coast Guard.–A **marine safety office** is in Galveston. (See appendix for address.)

Storm warning signals are displayed. (See chart.)

Harbor regulations.–The **Galveston Wharves,** which comprise piers, warehouses, wharves, export grain elevator, cotton compresses, terminal switching railroad, and special modern handling equipment, is a municipally owned Port Authority, administered by the Board of Trustees appointed by the City Council. The operation of the wharves is under direction of a Port Director. The Board establishes tariff rates and regulations governing the wharves. The individual piers and terminals are administered by the firms operating them.

Wharves.–Galveston has more than 50 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 23, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact port authorities. Almost all the facilities are on the S side of Galveston Channel and are owned and operated by the Board of Trustees of the Galveston Wharves, a city-owned corporation. All the deep-draft facilities have water, shore power, railroad, and highway connections. General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Cranes up to 300-ton capacity are available in Galveston. A 200-ton floating crane is available at the port, and a 500-ton floating derrick is available from Houston.

East End Container Terminal Pier 10 (29°19.0'N., 94°46.9'W.): 1,346-foot face, 40 feet alongside; deck height, 11 feet; 44 acres of open storage; three container cranes to 60 tons; receipt and shipment of containerized, roll-on/roll-off and conventional general cargo, including steel and lumber; operated by Galport Terminal Inc.

Pier 12: SW side of Container Terminal; 845-foot face, 34 feet alongside, deck height, 11 feet; 53,240 square feet covered storage; 60-ton container crane; one 300-ton diesel mobile crane; fork lifts; one diesel mobile straddle carrier; receipt and shipment of general cargo.

Pier 14: 200 yards SW of Container Terminal; 253-foot face, 22 feet alongside; W side 689 feet long, 35 feet alongside; E side 663 feet long, 36 feet alongside; deck height, 10 feet; 6 acres open storage; 50-ton traveling crane with hook, bucket, and 55-inch magnet, bucket unloading capacity 540 tons per hour; receipt and shipment of general and containerized cargoes and dry bulk commodities and ores and heavy lifts.

Piers 15, 16, and 18: 0.4 mile SW of Container Terminal; 1,203-foot face, E side 663 feet long; 34 to 35 feet alongside; deck height, 11½ feet; 194,000 square feet covered storage; 0.6 acre of open storage; receipt and shipment of general cargo; passenger terminals for cruise vessels; fueling of small vessels on upper side.

Piers 19 and 20: 1,250 feet of continuous berthing space in line with Pier 21; 20 feet alongside; deck height, 8½ feet; two electric 24-inch conveyors; 7,500 square feet of covered storage; receipt of bananas.

Pier 21: 0.6 mile SW of Container Terminal; 650-foot face, 23 feet alongside; W side 200 feet long, 23 to 10 feet alongside; deck height, 7½ feet; 55,000 square feet covered storage, conveyors; receipt of bananas and seafood.

Piers 23-26: 0.9 mile SW of Container Terminal; 1,415-foot face, 32 feet alongside; E side 167 feet long, 32 to 16 feet alongside; deck height, 12 feet; 296,000 square feet of covered storage; one electric freight elevator, one gravity chute, one fixed conveyor; receipt and shipment of general cargo.

Piers 27-29: 1.1 miles SW of Container Terminal; 1,478-foot face; 28 to 44 feet alongside; deck heights, 8 to 12 feet; 95,000 square feet covered storage; 8 grain loading spouts, loading rate 50,000 bushels per hour, unloading rate 33,000 bushels per hour; electric conveyors; receipt and shipment of grain and general cargo.

Piers 30, 32, and 33: 1.3 miles SW of Container Terminal; E side 1,185 feet long; 34 to 40 feet alongside; deck height, 11 feet; 185,000 square feet of covered storage; 3 grain loading towers, rate 120,000

bushels per hour; one pneumatic unloader, rate 8,000 bushels per hour; receipt and shipment of grain and general cargo.

Pier 34: 1.4 miles SW of Container Terminal; E side 878 feet long; 29 feet alongside; deck height, 8 feet; 5 acres of open storage; receipt and shipment of conventional and roll-on/roll-off general cargo, heavy machinery and steel.

Pier 35, Covered Barge Loading Terminal: 1.5 miles SW of Container Terminal; E side 770 feet long; 400 feet of berthing space; 21 to 25 feet alongside; deck height, 11 feet; two 35-ton bridge cranes and one 5-ton bridge crane; 92,000 square feet covered storage; all-weather loading of LASH and SEABEE barges; receipt and shipment of general cargo by vessel borne barge.

Imperial Sugar Co. Dock: 642 feet of berthing space; 36 feet alongside; deck height, 11 feet; one 11-ton electric traveling gantry crane with 80-foot boom with bucket and hopper; 48-inch belt conveyor system; storage building with capacity for 30,000 tons of sugar; receipt of bulk raw sugar by vessel; owned by the City of Galveston; operated by Imperial Sugar Co.

Pier 36: 1.5 miles SW of Container Terminal; 1,205 feet long, head of slip 204 feet long; 33 feet alongside; deck height, 11 feet; 239,000 square feet covered storage; receipt of raw sugar, receipt and shipment of general cargo.

Piers 37-38: 1.7 miles SW of Container Terminal; 348-foot face, E side 1,163 feet long, W side 1,180 feet long; 33 feet alongside Pier 37; 34 feet alongside Pier 38; deck height, 11 feet; 75,000 square feet covered storage; 8 acres of open paved storage; receipt and shipment of containerized, roll-on/roll-off, and conventional general cargo.

Piers 39-40: 1.8 miles SW of Container Terminal: 787-foot face, E side 1,173 feet long, W side 1,163 feet long; 34 feet alongside; deck height, 10 feet; 458,000 square feet covered storage; receipt and shipment of general cargo.

Pier 41: 1.9 miles SW of Container Terminal: 373-foot face, E side 1,195 feet long; 34 feet alongside; deck height, 11 feet; 471,000 square feet covered storage; receipt and shipment of general cargo.

Duval Corp. Ship Dock, Pier B: 2.0 miles SW of Container Terminal; 575-foot face, 40 feet alongside; E side 1,390 feet long, 700 feet usable with dolphins, 20 to 36 feet alongside; W side 1,309 feet long, 11 feet alongside; deck height, 9 feet; sulfur loading tower with loading spout, conveyor; shipment of dry bulk and liquid sulfur; bunkering vessels berthed at wharf; owned and operated by Duval Corp.

SEABEE Berth (29°18.7'N., 94°48.4'W.): S side of Pelican Island; 1,000 feet of berthing space with dolphins alongside offshore platform; 42 feet alongside; a barge marshalling area with depths of 14 feet is adjacent N of offshore platform; operated by Western Towing Co. and Lykes Brothers Steamship Co.

Supplies.-Provisions and marine supplies are available. Water for boiler use or drinking may be obtained at all piers. Bunker C and diesel oil are available by truck or barge; maximum loading rate is about 3,000 barrels per hour.

Foreign-Trade Zone No. 36 is in Galveston. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Repairs.-A large shipyard that specializes in ship conversions is on Pelican Island. The largest floating drydock at the yard is 873 feet long and 165 feet wide and has a lifting capacity of 40,000 tons. Cranes to 75 tons are also available. There is berthing space where topside repairs or conversions can be made to 20 vessels at one time. This yard has complete shops for all types of marine repairs to steel or wooden vessels.

The port of Galveston has numerous marine repair shops and foundries capable of making repairs to the hull or machinery of steel or wooden vessels. A company has facilities to repair refrigerator equipment. In the slip E of the Container Terminal (Pier 9) are two boatyards with marine ways the largest of which can handle vessels up to 250 tons or 130 feet for general repairs. A machine and carpenter shop operates in connection with the yard. A marine repair plant, 1.7 miles W of the bridge between Galveston Island and Pelican Island, has a 1,000-ton vertical lift and related shops for the construction and repair of steel barges, tugs, and various types of small vessels.

Salvage.-Tugs, lighters, pumps, derricks, diving equipment, and other facilities are available for wrecking and salvage operations.

Small-craft facilities.-A marina, yacht club, and yacht yard are in a basin about 400 yards E of the Container Terminal (Pier 9). The marina is protected by a concrete breakwater and has five piers with covered and open berths for more than 400 craft; each berth has electrical and water connections. The slips and entrance channel had a reported controlling depth of 12 feet in August 1982. The yacht yard at the inner end of the basin has a lift that can handle craft up to 65 feet for hull, engine, and electronic repairs, or dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, and berths with electricity are available in the yacht basin. A launching ramp is available, and a mooring area is N of the marina.

Communications.-Galveston is served by a small airport with flights to Houston Intercontinental Airport and helicopter charter service associated with the offshore oil industry. There are close to 100 steamship lines that provide service to all ports of the world. In addition, several barge lines operate along the Intracoastal Waterway to other Gulf ports and to the Mississippi and other river systems. The terminal railroad connects with the six trunkline railroads serving the port. They are the Burlington Northern; Galveston, Houston, and Henderson; Atchison, Topeka, and Santa Fe; Missouri-Kansas, and Texas; Missouri-Pacific; and the Southern Pacific Railroads. Interstate and local buslines provide service and motor freight lines serve the port. A radio station provides ship-to-shore radio and radiotelephone service, and weather reports are broadcast.

Texas City, on the W side of Galveston Bay about 7 miles NW from Galveston, is a privately owned port of considerable commercial importance. It has extensive foreign and coastwise trade in petroleum, chemicals, fertilizer, and tin ore. Commodities handled through the port include shell, rice, wheat, flour, molasses, hides, synthetic rubber, naval stores, textiles, lumber, wood pulp paper products, petroleum products, steel products, salt, aluminum, zinc, copper, and tin ores, machinery, coal tar products, sulfuric acid, industrial chemicals, scrap iron, and fertilizer. A 23-foot storm levee has been constructed around the city.

Prominent features.–The Texas City Dike that extends about 4.5 miles into Galveston Bay, the three elevated tanks in the port area, and the numerous cracking towers of the oil refineries and chemical plants are conspicuous.

Channels.–Texas City Channel extends WNW from deep water in Bolivar Roads through the lower end of Galveston Bay to a turning basin off the wharves at Texas City. A Federal project provides for a depth of 40 feet in the channel and basin. (See Notice to Mariners and latest editions of charts for controlling depths.) The channel is marked by lighted ranges and buoys.

Texas City Channel is protected by Texas City Dike on the N. The dike is earth-filled, protected by stone revetment, and is about 4.5 miles long. It is 900 feet N of the channel at the E end and about 2,300 feet N at the W end. The wharves are protected by a large spoil bank known as **Snake Island,** extending along the E side of the turning basin.

The W shore of Snake Island and the turning basin W of the island are within a **safety zone.** (See 165.1 through 165.7, 165.20 through 165.25, and 165.804, chapter 2, for limits and regulations.)

Texas City Canal, a private industrial canal, extends from the S end of the turning basin off the Texas City wharves S and W for about 2 miles to another turning basin. In September 1981, the controlling depth was 40 feet in the channel and the basin. The channel is marked by a private light and a **090°** lighted range.

About midway in Texas City Channel, a small-boat channel between the dike and the dredged channel leads NW' to a landing and small-boat basin at the inshore end of the dike. The channel had a reported depth of about 6 feet and is used by fishing and pleasure boats.

A natural small-boat channel about 5 to 7 feet deep, marked by daybeacons, leads S from the Texas City Channel to the Intracoastal Waterway through the lower Galveston Bay.

Dangers.–A sunken wreck reportedly covered 4 feet is off the entrance to North Slip.

Pilotage for Texas City is discussed in this chapter under Pilotage, Galveston Bay.

Towage.–Vessels usually proceed without assistance from the bar to Bolivar Roads. Tugs up to 3,400 hp are available at Texas City for docking, undocking, and shifting.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Texas City has a county and a private hospital.

Wharves.–Texas City has over 40 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 23, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depth contact the private operator. The port's waterfront facilities are on the turning basin and along the Texas City Canal. Almost all facilities have highway, railroad, water, and electrical shore power connections. The Texas City Terminal Railway Co. owns most of the waterfront facilities in Texas City. General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. A 50-ton floating crane is available at Galveston, and a 500-ton floating derrick is available from Houston.

Monsanto Tanker Dock No. 1 (29°22′41″N., 94°53′33″W.): 110-foot face, 750 feet with dolphins; 35 feet alongside; deck heights, 5 and 15 feet; shipment of acetic acid, phenol, styrene, vinyl acetate, and methanol; owned and operated by Monsanto Co.

Texas City Terminal Railway Co., Dock No. 15 (29°22′31″N., 94°53′26″W.): 400-foot face; 30 to 32 feet alongside; deck height, 15 feet; 10,000 square feet open storage; tank storage for 1½ million barrels; receipt and shipment of general cargo and chemicals; receipt of tin ore and petrochemicals; operated by Texas City Terminal Railway Co. and Anchortank, Inc.

Texas City Terminal Railway Co., Dock No. 16 (29°22′26″N., 94°53′21″W.): 140-foot face, 283 feet with dolphins; 42 feet alongside; deck height, 16 feet; tank storage for 6¾ million barrels; receipt of crude oil, receipt and shipment of petroleum products and petrochemicals; bunkering vessels; operated by Marathon Oil Co., Anchortank, Inc., and Texas City Refining Co.

Texas City Terminal Railway Co., Oil Dock No. 18: SE end of Pier E; 88-foot face, 320 feet with dolphins; 34 feet alongside; deck height, 14 feet; receipt of crude oil, shipment of petroleum products, chemicals, and petrochemicals; bunkering vessels; operated by Marathon Oil Co., Texas City Refining, Inc., Union Carbide Corp., and Amoco Chemicals Corp.

Union Carbide Corp., Container Dock No. 19: 100 yards W of Oil Dock No. 18; 233-foot face; 32 feet alongside; deck height, 12 feet; straddle carrier, 30-ton traveling bridge crane; receipt and shipment of containerized cargo; owned and operated by Union Carbide Corp., Chemicals and Plastics Division.

Texas City Terminal Railway Co., Oil Dock No. 19: 100 yards W of Container Dock No. 19; 77-foot face, 152 feet with dolphins; 32 feet alongside; deck

height, 14 feet; receipt of crude oil, receipt and shipment of petroleum products, chemicals, and petrochemicals; bunkering vessels; operated by Union Carbide Corp., Chemicals and Plastics Division; Marathon Oil Co., Texas City Refining, Inc.

Texas City Terminal Railway Co., Oil Dock No. 20: across slip S of Oil Dock No. 19; 98-foot face, 300 feet with dolphins; 32 feet alongside; deck height, 14 feet; receipt of crude oil, receipt and shipment of petroleum products; bunkering vessels; operated by Marathon Oil Co. and Texas City Refining, Inc.

Amoco Tanker Dock No. 31 (29°22′16″N., 94°53′22″W.): 80-foot face, 320 feet with dolphins; 38 feet alongside; deck height, 15½ feet; tank storage for 3 million barrels; receipt and shipment of crude oil, petroleum products, and asphalt; bunkering vessels; owned and operated by Amoco Texas Refining Co.

Amoco Tanker Dock No. 32: 200 yards S of Dock No. 31; 80-foot face, 320 feet with dolphins; 38 feet alongside; deck height, 15½ feet; receipt of crude oil, ammonia, and petroleum products, shipment of petroleum products, ammonia, and asphalt; bunkering vessels; owned and operated by Amoco Texas Refining Co.

Amoco Tanker Dock No. 32A: 75 yards S of Dock No. 32; 20-foot face, 320 feet with dolphins; 38 feet alongside; deck height, 15½ feet; receipt of crude oil; operated by Amoco Texas Refining Co.

Texas City Tanker Dock, Berths Nos. 40 and 41: 400 yards SW of Dock No. 32A; 1,090 feet of berthing space with dolphins along N and S sides; 40 feet alongside; deck height, 16 feet; receipt of crude oil; owned and operated by Amoco Texas Refining Co.

Amoco Chemicals Corp. Tanker Dock 50 (29°21′48″N., 94°54′15″W.): N side of Texas City Canal; 44-foot face, 400 feet with dolphins; 40 feet alongside; deck height, 12 feet; receipt and shipment of chemicals; owned by Texas City Terminal Railway Co., operated by Amoco Chemicals Corp.

Union Carbide Corp., Tanker Dock No. 66: W side of turning basin at head of Texas City Canal; 90-foot face, 250 feet with dolphins; 31 feet alongside; deck height, 12 feet; receipt and shipment of chemicals; owned and operated by Union Carbide Corp., Chemicals and Plastics Division.

Union Carbide Corp., Tanker Dock No. 67: S side of turning basin at the head of Texas City Canal; 100-foot face, 600 feet with dolphins; 38 feet alongside; deck height, 6 feet; receipt and shipment of chemicals; owned and operated by Union Carbide Corp., Chemicals and Plastics Division.

Small-craft facilities.–There are several fish camps at the inner end of the Texas City Dike where water, ice, and launching ramps are available. A paved highway leads to a dry storage marina near the outer end of the dike on the N side. Gasoline, diesel fuel, water, ice, marine supplies, and a launching ramp are available. A 6-ton forklift can handle vessels up to about 30 feet for hull and engine repairs or dry covered and open storage. A depth of 6 feet was reported in the entrance channel and alongside the fuel pump in August 1982. A fishing pier is at the end of the dike.

Communications.–The Texas City Terminal Railroad connects with the six trunkline railroads that serve the city. They are: Atchison, Topeka, and Santa Fe; Galveston, Houston, and Henderson; Missouri-Kansas-Texas; Missouri-Pacific; Southern Pacific; and Fort Worth and Denver (Burlington Lines). Buslines and a motor freight line serve the city. Air service is available at the Houston Airport.

Chart 11326.–East Bay is a large and shallow bay extending E about 16 miles from the S end of Galveston Bay and lying N of Bolivar Peninsula. The depths in the bay range from 2 to 7 feet. **Hanna Reef** is a chain of low islands and shoals composed of broken shell. Only a heavy anchor will penetrate more than a few inches. The islands support no life. Breaker action is reported to be severe along the S side. The chain lies E of the Houston Ship Channel and partially separates Galveston Bay from East Bay. Small craft of about 3-foot draft can pilot their way between bays through two passes or around either end of the reef.

Trinity Bay is a large body of water NE of the upper part of Galveston Bay. Depths in the bay proper range from 5 to 9 feet. Extensive oil-drilling operations are in progress in the Red Fish Bar, Cedar Point, and Trinity Bay areas. Numerous oil well structures and derricks are visible to the E of the Houston Ship Channel. The derricks are moved as soon as wells are brought in or abandoned. Numerous pipes, piles, and abandoned oil wells which constitute a menace to navigation are in the N and W part of the bay between Trinity River and Umbrella Point.

Caution.–There are a number of fishing locations in Trinity Bay in the vicinity of which caution should be exercised as piles or other structures may exist. They are marked by quick flashing red lights.

Lake Anahuac is separated from the N part of Trinity Bay by an earth dike which obstructs all navigation.

Although a Federal project authorizes a channel 9 feet deep from Houston Ship Channel to and in Trinity River, **Trinity River Channel** does not lead into the river; it leads NE from Houston Ship Channel to **Smith Point,** the Ence follows the E shore N between a protective spoil bank and the mainland to a dead end where the spoil bank crosses the channel and joins the mainland at Anahuac. The channel is not maintained.

Double Bayou, 8 miles NE of Smith Point, flows into Trinity Bay and is used mainly by oil and fishing interests. A dredged entrance channel, marked by lights and daybeacons leads to the mouth of the bayou and thence upstream for about 1.7 miles. In May 1983, the controlling depth was 7 feet.

At a point 0.5 mile above its mouth, the bayou divides into East and West Forks and is navigable for respective distances of about 4 and 12 miles. **Double Bayou** and **Eagle** are settlements along the

West Fork between the mouth and the highway bridge 3 miles from Trinity Bay. The bridge has a fixed channel span with a width of 10 feet and clearance of 14 feet. A marina at Double Bayou has covered berths and a marine railway capable of handling boats up to 55 feet for hull and engine repairs. A shipyard just above the marina builds barges and other commercial vessels. A marine railway at the yard can handle vessels up to 120 feet for general repairs. Diesel fuel, ice, and a launching ramp are available at seafood wharf on the West Fork near its junction with East Fork. A bridge crosses East Fork, 5 miles from the junction of the bayou.

Anahuac Channel, a dredged channel, leads from the upper part of Trinity Bay to Anahuac and **Browns Pass,** and is the entrance channel to Trinity River. In October 1983, the midchannel controlling depth was 3 feet. The channel is marked by lights and daybeacons. Mariners should be on the lookout for floating logs.

Anahuac is a town at the NE end of Trinity Bay, opposite the mouth of Trinity River. There was a reported depth of 6 feet at a small landing used for handling barge shipments of shell. Small shrimp boats tie up just above the shell wharf. Gasoline is available at service stations in the town. The **Chamber-Liberty Counties Navigation District Canal** is used for irrigation purposes only. A highway connects Anahuac with Goose Creek and Houston.

Trinity River is one of the largest rivers in Texas and empties into the NE end of Trinity Bay. Entrance to the river is through Anahuac Channel and Browns Pass, and not through Trinity River Channel. In October-November 1979, the controlling depth was 6 feet from the mouth of the river at Anahuac through **Browns Pass** to **Devers Canal,** about 17 miles above the mouth, thence 1 foot to Liberty. Sulfur is moved by barge from **Moss Bluff,** about 10 miles above the river mouth, to Galveston Bay. A highway bridge with a fixed channel span having a clearance of 73 feet crosses the river about 6 miles above Anahuac. An overhead power cable with a clearance of 78 feet crosses the river about 3 miles below the highway bridge.

In the open waters of Trinity Bay about 2 miles W of Anahuac Channel, a 0.5-mile-long overhead power cable with a clearence of 29 feet is strung in a NW-SE direction on poles about 200 feet apart.

Off **Houston Point (Cedar Point),** a small dredged channel with a reported depth of 6 feet in August 1982, leads to an oil company dock in a basin.

Berths for tenders and crew boats are at the bulkhead at the head of the basin, and dolphins for mooring barges are on the W side of the basin. A walkway extends about 0.3 mile seaward from the basin.

Chart 11328.–Cedar Bayou is a crooked stream flowing in a S direction into the NW corner of Galveston Bay, 2.5 miles E of Morgans Point and 25 miles N of Galveston.

The principal commerce is in crude oil and shells, handled mostly in barges. A channel has been dredged across the flats from the Houston Ship Channel to the first bend above the mouth of the bayou. Two submerged jetties are on the N side of the channel, at the mouth of the bayou. The outer end of the westernmost jetty is marked by a light. In May 1983, the controlling depth was 8 feet from the Houston Ship Channel to the first bend above the mouth of the bayou. In June-August 1980, the bayou above the dredged channel had a controlling depth of 6 feet in the natural channel to State Route 146 highway bridge, about 8.5 miles above the mouth.

The Cedar Bayou entrance channel across the flats is marked by lights, buoys, and daybeacons. About 0.5 mile above the mouth, the bayou is crossed by Tri City Beach Road highway bridge having a bascule span with a clearance of 13 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The Missouri Pacific railroad bridge, about 6.1 miles above the entrance, has a vertical lift span that is on automatic operation; clearances are 13 feet down and 81 feet up. The lift span is normally kept in a raised position, except for the passage of trains when it is lowered to a clearance of 13 feet. (See 117.550 chapter 2, for drawbridge regulations.) A fixed highway bridge about 6.4 miles above the entrance has a clearance of 52 feet.

Overhead power cables crossing the bayou between the mouth and the N side of the railroad bridge have a least clearance of 85 feet.

A highway bridge 9.7 miles above the entrance and a railroad bridge 13.4 miles above the entrance have fixed spans with a minimum width of 45 feet and clearance of 19 feet. In October 1982, the highway bridge was being modified to provide a clearance of 18 feet. A highway bridge crossing a cutoff between **Boaz Island** and the mainland has a 13-foot fixed span with a clearance of 6 feet. Only very small craft use the cutoff.

Shallow **Tabbs Bay** is at the NW end of Galveston Bay, and contains numerous oil well structures and overhead power cables. There are no defined channels; the average depth is reported to be less than 3 feet.

A channel from Houston Ship Channel follows the W end of **Hog Island** and Tabbs Bay to **Baytown** on the N shore. **Goose Creek** is navigable for craft drawing up to 5 feet to a highway bridge 2.8 miles above the entrance. The channel, unmarked and ill-defined, runs close aboard the N shore of the island N of the W end of Hog Island and leads to Goose Creek. Private poles and markers may at times mark the preferred route. Goose Creek contains numerous oil wells, pipelines, pilings, and other hazards; local knowledge is advised. The creek is used by oil well supply and commercial fishing vessels.

The highway bridge 2.8 miles above the entrance has a 48-foot fixed span with a clearance of 9 feet. Two highway and two railroad bridges between the entrance and this bridge have fixed spans with a minimum width of 32 feet and minimum clearance of 14 feet. Overhead power cables crossing the creek

between the mouth and the highway bridge 2.8 miles above the entrance have a least clearance of 38 feet.

Barbours Cut, opposite Hog Island, extends about 1.2 miles W from Houston Ship Channel. A privately dredged area extends W about 0.6 mile into the cut from Houston Ship Channel. A turning basin, at the head of the cut and W of the dredged area, provides excellent shelter in depths of 20 to 26 feet for vessels up to 150 feet long.

The Port of Houston, Barbours Cut Terminal is on the S side of Barbours Cut. The terminal, owned by the Port of Houston Authority, has three container wharves, a LASH/SEABEE wharf, and a roll-on/roll-off wharf. For complete information on these facilities, refer to Port Series No. 24, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths given for these facilities are reported depths. All berths have railway and highway connections. Water is available at all but the roll-on/roll-off wharf, and electrical shore-power connections are available at the container wharves. There are 36 acres of open storage at each container wharf. In 1983, another wharf was under construction.

Barbours Cut LASH Vessel Mooring Wharf: about 250 yards W of Houston Ship Channel; 282-foot wharf, 790 feet of berthing space with dolphins; 40 feet alongside; deck height, 16 feet; 3 acres open storage; mooring vessels for handling LASH barges; barge mooring area on N side of Cut opposite wharf; operated by Port of Houston Authority.

Barbours Cut Roll-on/Roll-off Wharf: 0.2 mile W of LASH Vessel Mooring Wharf; 63-foot face; 40 feet alongside; deck height, 10½ feet; deep-draft vessels dock at Barbours Cut Terminal No. 1, shallower-draft vessels moor along dolphins E of wharf; 99,000 square feet covered storage; 9 acres open storage; 82-ton mobile crane; 50-ton container lift truck; receipt and shipment of roll-on/roll-off general cargo; operated by Port of Houston Authority.

Barbours Cut Terminal No. 1: immediately W of Barbours Cut Roll-on/Roll-off Wharf; 1,000-foot face; 40 feet alongside; deck height, 19 feet; two 40-ton container cranes; receipt and shipment of containerized and roll-on/roll-off general cargo; operated by Port of Houston Authority.

Barbours Cut Terminal No. 2: adjacent W of Barbours Cut Terminal No. 1; 1,000-foot face; 40 feet alongside; deck height, 19 feet; two 40-ton container cranes; 40-ton mobile crane; receipt and shipment of containerized general cargo; operated by Port of Houston Authority.

Barbours Cut Terminal No. 3: adjacent W of Barbours Cut Terminal No. 2; 1,000-foot face; 40 feet alongside; deck height, 19 feet; two 40-ton container cranes; receipt and shipment of containerized general cargo; operated by Sea-Land Service, Inc.

Charts 11327, 11326, 11323.–Morgans Point is on the NW end of Galveston Bay on the W side of Houston Ship Channel. **La Porte,** a town 2 miles SW of Morgans Point, has rail and highway connections with other parts of the State.

From Morgans Point S to **Red Bluff,** (29°36.2′N., 94°59.0′W.) are summer homes with numerous boat landings along the shore. The Houston Yacht Club is in a basin formed by breakwaters about 1.3 miles NW of Red Bluff. Private lights mark the outer ends of the breakwaters, and a private **211°46′** lighted range marks the approach. The channel leading to the basin had a reported controlling depth of 5 feet in August 1982. Gasoline, diesel fuel, water, ice, open and covered berths with electricity, a launching ramp, and an electric hoist are available. A submerged wreck is about 0.9 mile N of Red Bluff.

Bayport is a new deepwater port and industrial complex under development by the Port of Houston Authority. A privately dredged channel leads from Houston Ship Channel close S of Atkinson Island to the shore about 0.9 mile NW of Red Bluff, thence W in a landcut to a turning basin. In March 1978-February 1979, the controlling depth was 38 feet in the channel and turning basin. The channel is marked by a private lighted range, lights, and buoys. Two deep-draft wharves are at the head of the basin:

Celanese Chemical Co. Bayport Terminal Dock: S side of basin; 140-foot wharf, 225 feet of berthing space with dolphins; 37 feet reported alongside; deck height, 20 feet; storage tanks for 571,000 barrels of petrochemicals, receipt and shipment of petrochemicals; owned and operated by Celanese Chemical Co., Inc.

PetroUnited Bayport Terminal Dock: SW side of basin; 100-foot wharf, 240 feet of berthing space with dolphins; 38 feet reported alongside; deck height, 16 feet; storage tanks with 990,000-barrel capacity; receipt and shipment of petroleum products; owned and operated by PetroUnited, Inc.

Clear Creek empties into the W side of Galveston Bay 20 miles NW of Galveston; 2 miles above its mouth the creek broadens into shallow **Clear Lake,** 2.5 miles long. A dredged channel leads from Galveston Bay through Clear Creek and across Clear Lake, thence a natural channel leads for another 3.3 miles through Clear Creek to the railroad bridge at **League City.** In June 1981, the controlling depth was 7 feet through Clear Lake, thence 5 feet to the railroad bridge at League City. The Clear Creek entrance channel and the creek and lake channels are well marked with lights, buoys, and daybeacons; the entrance channel is marked by a seasonal fog signal and a lighted **260°** range. Seabrook Channel, a dredged side channel, leads N from the mouth of Clear Creek about 0.6 mile along the S waterfront of **Seabrook.** In August 1980, the controlling depth was 5½ feet except for shoaling to 1 foot in the upper 170 yards. A sunken wreck, covered 2 to 3 feet, is at the junction of Clear Creek channel and the channel to Seabrook in about 29°32′54″N., 95°01′03″W.; caution is advised. The channel from Galveston Bay to Clear Lake is reported to be highly congested with light commercial and pleasure-craft traffic, especially on weekends; a **speed limit** of 5 miles per hour is posted.

At the entrance to Clear Creek, an overhead power cable has a clearance of 99 feet. About 0.3 mile inside the entrance, two bridges cross the creek, State Route 146 highway bascule bridge with a clearance of 37 feet, and Southern Pacific Railroad (Texas and New Orleans) swing bridge with a clearance of 2 feet; the railroad swing bridge remains open until a train approaches, reported to be twice daily. (See 117.1b, 117.240, and 117.245 (a), (e) and (j)(33), and 117.552, chapter 2, for drawbridge regulations and opening signals.) Overhead power cables at the bridges have a clearance of 100 feet. A fixed highway bridge 5.6 miles above the entrance has a clearance of 25 feet. About 6 miles above the entrance, overhead power cables have a least clearance of 55 feet.

In August 1982, numerous unlighted piles were reported about 2 miles SE of Clear Creek Channel Light 2, in about 29°32.5'N., 94°58.5'W. Mariners are advised to exercise caution while navigating in the area.

Seabrook, a town on the N side at the entrance to Clear Creek, is headquarters for fishing and pleasure craft. **Kemah** is a town on the S side of the entrance to Clear Creek. Gasoline, diesel fuel, water, and provisions can be obtained on the waterfront at both towns.

There are several large yacht basins at the W end of Clear Lake, and numerous marinas and boatyards are on the lake, on both sides of Clear Creek, and on the Seabrook channel. (See the small-craft facilities tabulation on chart 11326 for services and supplies available.)

Most of the shrimp and fishing wharves and seafood packing plants are along the waterfront E of the bridges.

Dickinson Bayou empties into **Dickinson Bay,** a small indentation in the W side of lower Galveston Bay, between **April Fool Point** and **Miller Point,** about 13 miles N of Galveston. A dredged channel leads from Galveston Bay through Dickinson Bay and Dickinson Bayou to the railroad bridge at Dickinson, a small settlement about 7 miles up the bayou. In August 1976, the controlling depth was 6 feet. In August 1982, the channel was reported to have shoaled to 5 feet. The entrance channel is marked by lights, buoys, and daybeacons.

Marinas and boatyards are at April Fool Point and at a basin about 1 mile NW of the point. Gasoline, diesel fuel, ice, marine supplies, launching ramps, cranes up to 10 tons, open and covered berths with electricity, and storage facilities are available; hull and engine repairs can be made. In September 1981, a sunken wreck was reported about 0.1 mile SSW of April Fool Point in about 29°28'10"N., 95°55'32"W.

About 1.2 miles above the mouth of Dickinson Bayou, State Route 146 fixed highway bridge has a clearance of 45 feet. The Southern Pacific Railroad bridge, about 0.1 mile W of the highway bridge, has a swing span with a channel width of 40 feet and a clearance of 8 feet. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Overhead power and telephone cables at the bridges have minimum clearances of 56 feet.

A marina, on the N side of the Dickinson Bayou just above the bridges, has berths for pleasure and fishing craft, gasoline, diesel fuel, and ice. The largest marine railway at the marina can handle craft up to 48 feet for hull and engine repairs and storage. An overhead power cable about 2.2 miles above the bridges has a clearance of 85 feet.

At Dickinson two bridges cross the bayou. The Missouri Pacific railroad bridge has a 23-foot fixed channel span with a clearance of 15 feet. State Route 3 fixed highway bridge has a clearance of 12 feet. The overhead power cable at the railroad bridge has a clearance of 42 feet. **Moses Lake,** a shallow lagoon S of Dickinson Bay, is used as a harbor of refuge by many small craft during hurricane warnings. The entrance to the lake is through a vertical lift tide gate that has a width of 56 feet and an open clearance of 51 feet; the twin supporting towers of the gate are visible from the Houston Ship Channel. A privately marked channel leads from Dickinson Channel through Moses Lake to Moses Bayou. In August 1982, the channel had a reported controlling depth of 8 feet. Commercial traffic consists of chemical barges enroute to a plant on Moses Bayou. There are several marinas, small-craft launching ramps, and fish camps on a slip on the S side of the entrance to **Dollar Bay.** Gasoline, diesel fuel, ice, and provisions are available. A branch channel privately marked by poles with a reported depth of 3 feet in August 1982 leads from the main channel to the slip.

Charts 11323, 11324, 11325, 11327, 11328, 11329, 11326.-Houston Ship Channel extends from Galveston Harbor across Galveston Bay and through parts of San Jacinto River and Buffalo Bayou to the city of Houston, a distance of 44 miles. The entrance to the channel is at the NW end of Bolivar Roads, between Port Bolivar and Texas City channels. The entrance is marked by a **318°** lighted range and by a lighted bell buoy on the NE side of the channel. The channel through the bay is marked by lights, lighted ranges, buoys, daybeacons, and a leading light at Baytown Bend.

The Federal project provides for a 40-foot channel from Bolivar Roads for about 42 miles to Brady Island, thence 36 feet for about 2 miles to and in Houston Turning Basin. (See Notice to Mariners and latest editions of charts for controlling depths.)

N of Bolivar Peninsula, spoil banks on both sides of the channel extend N to Red Fish Bar. About 1.5 miles below Red Fish Bar, a narrow channel with a depth of 8 feet and marked by stakes and an oil drum leads W to Dickinson Bayou. Another gap, 500 feet wide and 6 feet deep, opens W about 2.8 miles above Red Fish Bar. Along the E side of the channel N of Red Fish Bar, two openings through the continuous spoil bank permit passage into the NW portions of Galveston Bay. The first is about 1.8 miles above Red Fish Bar and has a depth of 7 feet; the second **Five Mile Cut,** about 8 miles above Red Fish Bar and opposite Red Bluff, is a dredged cut which had a

controlling depth of 7 feet in May 1983. The channel is marked by buoys; the easternmost one is lighted.

Part of the spoil material from the dredging of Houston Ship Channel shows above water and forms a dike protection for the channel; for several miles S of Morgans Point this dike is relatively high and is known as **Atkinson Island.** In August 1982, it was reported that the spoil banks were beginning to encroach into the openings and caution was advised.

A barge assembly basin, 2,300 feet long, 150 feet wide and 12 feet deep, has been dredged into Atkinson Island S of Morgans Point and E of Houston Ship Channel. The entrances to the basin are E of Morgans Point and 1.3 miles S of the point. Barge moorings spaced 175 feet apart are on the E side of the basin. The complete route through the interconnecting entrance channels and the basin is known as Government Channel. In January 1984, the controlling depth was 12 feet.

From Morgans Point to Lynchburg, a distance of 8 miles, the ship channel is marked by numerous lighted ranges and other aids. Above Lynchburg, lights are on the outside of curves as far as **Galena Park.**

A ferry operates across the Houston Ship Channel at Lynchburg. A high-level fixed highway bridge with a clearance of 175 feet is about 4.2 miles above the ferry crossing. A high-level fixed highway bridge with a clearance of 135 feet crosses the ship channel at Manchester. Overhead power cables near **Mitchell Bay, Carpenter Bayou** and Galena Park have clearances of 162 feet or higher. There is a vehicular tunnel under the channel 2.4 miles from the upper end of Morgans Point Cut and another one between **Pasadena** and Galena Park.

Charts 11328, 11329.–Morgans Point, 23 miles NW of Bolivar Roads, marks the beginning of an extensive industrial area of oil refineries, cotton compresses, and other industrial plants lining the ship channel to Houston.

Baytown, 4 miles above Morgans Point on the NE side of the channel, is the site of the Exxon Company, U.S.A., refining facilities. The oil company has a deepwater wharf and two deep-draft piers, with railroad and highway connections, and several barge wharves. Petroleum products and petrochemicals are received and shipped and vessels are bunkered at these facilities.

Pier 1 (29°43'27"N., 95°01'11"W.) is a 770-foot wharf with 820 feet of berthing space with dolphins; with 36 feet reported alongside. Deck height, 9 feet.

Pier 2, .015 mile N of Pier 1, is 432 feet long with 550 feet of berthing space with dolphins on the E and W sides; with 40 to 39 feet reported along the E side and 39 feet along the W side. Deck height, 9 feet.

Pier 5, 150 yards NW of Pier 2, is 400 feet long; with 40 to 39 feet reported along the E side and 39 to 25 feet along the W side. Deck height, 13½ feet.

Two overhead power cables crossing the channel about 0.3 mile above the Baytown facilities have a minimum clearance of 162 feet. The transmission towers are prominent.

About 1.5 miles above the Baytown facilities, a privately maintained channel leads in a SW direction from the main ship channel along the NW end of **Alexander Island** to the piers of a powerplant at the head of the basin. In August 1982, the reported controlling depth in the channel was 11 feet.

Charts 11329.–San Jacinto River branches N from the ship channel at **Lynchburg,** 8 miles above Morgans Point. It has a navigable depth of 5 to 6 feet for about 13.5 miles to the bridge on the Beaumont-Houston highway that has a fixed channel span having a clearance of 24 feet. The overhead power cable near the entrance at Lynchburg has a clearance of 85 feet. Twin highway bridges, 1.8 miles above the mouth, have fixed spans with minimum clearance of 25 feet. The Missouri-Pacific railroad bridge, 4.2 miles above the mouth has a fixed span with clearance of 24 feet. **Highlands** and **Sheldon** are villages 5.5 and 13 miles, respectively, above Lynchburg.

San Jacinto State Park, on the S side of the channel 9 miles above Morgans Point, is the site of the battle by which the Republic of Texas won its independence. Landings are provided for small craft, and vessels should slow down to prevent wave wash and damage to boats. A monument 605 feet high is the most prominent object in the area. On and around its top are fixed red lights visible on clear nights from Galveston entrance. The U.S.S. TEXAS, historic battleship veteran of two World Wars, is moored permanently in a slip in the park area, just off the ship channel. A submerged breakwater extends across the entrance to the slip.

An overhead power cable crossing the channel about 500 yards above the TEXAS has a clearance of 165 feet.

About 0.7 mile above the TEXAS on the N side of the channel, Jacintoport Terminal slip extends about 0.6 mile W. Depths of 25 to 32 feet are in the slip. Bethlehem Steel Corp. has a wharf 1,500 feet long with 2,050 feet of berthing space with dolphins on the N side of the slip with depths of 32 feet reported alongside. Deck height is 14 feet. In addition to the steel company wharf the slip has several barge wharves. The terminal, formerly an ordnance depot, has several warehouses and additional open storage space.

Close NE of Jacintoport Terminal slip entrance, Houston Fuel Oil Terminal, Inc., receives and ships fuel oil at an offshore wharf with reported depths of 40 feet alongside and a deck height of 15 feet. Mooring dolphins provide berthing for vessels up to 850 feet long.

On the S side of the channel, opposite Jacintoport Terminal slip, is a large deepwater basin with depths of about 40 to 45 feet reported in August 1982. The head of the basin has an 830-foot-long pier with 600 feet of berthing space. Depths of 50 feet are reported alongside. an 8½-million-bushel grain elevator is on the slip. On the W side of the basin is a bulk liquid

wharf with 1,370 feet of berthing space with reported depths of 40 feet alongside. A transit shed with 64,000 square feet of covered storage is adjacent to the wharf, and there is tank storage for 3 million barrels. Two petroleum and petrochemical docks on the E side of the basin each have dolphins to provide berthing space for 900-foot vessels. Storage tanks have a total capacity of 4¼ million barrels.

On the N side of the channel, about 0.7 mile above Jacintoport slip, is the Cargill, Inc., pier providing two 750-foot berths with reported depths of 44 to 46 feet alongside. A 6½-million-bushel grain elevator and a 6-million-gallon molasses mixing facility are adjacent to the pier. A wharf for handling general and containerized cargo and heavy equipment is 0.2 mile W of the grain pier. The wharf has a 500-foot face along the river and a 660-foot face slipside, each with 22 feet reported alongside and a deck height of 6 feet.

There are chemical and liquid cargo handling wharves on the S side of the channel at the mouth of Tucker Bayou and at the mouth of **Patrick Bayou.**

Chart 11329.–Boggy Bayou Basin, on the S side of the channel about 2 miles above Jacintoport Terminal slip, is the site of the Shell Oil Company refinery. On the S side of the basin are four 600-foot tanker berths with depths of 40 feet reported alongside. An 850-foot berth with depths of 41 feet alongside is just E of the mouth of the basin. All the berths have railway and highway connections, and freshwater is available. Crude oil petroleum products, petrochemicals, and chemicals are received and shipped, and vessels can receive bunker fuels.

Traffic warning signals to indicate when oil loading operations are in progress at the terminal are displayed both day and night from a 70-foot mast on the S side of the basin near the mouth. The night signal is a fixed amber light (the light blinks when extremely dangerous conditions exist); the day signal is an orange colored cylinder. When such signals are displayed, passing vessels shall reduce speed sufficiently to prevent any damage to vessels and equipment, and to prevent oil spills.

A high-level fixed highway bridge with a clearance of 175 feet is about 0.9 mile above Boggy Bayou Basin.

A deepwater basin on the N side of the river opposite Boggy Bayou Basin has two piers for receipt of crude oil and aragonite and shipment of animal fats. The pier that extends from the head of the basin has 720-foot berths on the E and W sides. The pier on the W side of the basin has a 580-foot berth. All the berths have depths of 42 feet reported alongside.

On the S side of the channel about 1 mile W of Boggy Bayou, there is a chemical plant and a wharf that is marked by lights. The wharf has 500 feet of berthing space with dolphins and reported depths of 32 feet alongside. The Georgia-Pacific Ship Dock, 0.3 mile W of the chemical wharf, has berthing space for 900-foot vessels along dolphins with a reported depth of 42 feet alongside. Propylene and benzene are received, and cumene is shipped.

Greens Bayou enters the main ship channel from N at a point 2.1 miles above Boggy Bayou. A Federal project provides for a 36-foot channel to about 0.3 mile above the entrance, thence 15 feet for about 1 mile. (See Notice to Mariners and latest edition of the chart for controlling depths.) Above this point, the bayou is navigable for drafts of 8 to 10 feet for about 4 miles, thence drafts of 4 to 5 feet for another 5 miles.

The bayou is crossed by a vertical lift bridge, and several fixed bridges and overhead pipelines above the limits of the Federal project. The lift bridge, about 2.4 miles above the mouth, has a clearance of 27 feet up and 18 feet down. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(32), chapter 2, for drawbridge regulations and opening signals.) The least clearance of the fixed bridges and overhead pipelines is 21 feet. Three overhead power cables cross below the bridges with a least clearance of 70 feet. There are shipyards, chemical plants, and barge terminals on the bayou.

The Port of Houston Authority bulk materials handling plant is on the E side of the bayou just inside the entrance. The facility has a 270-foot T-head layup berth and a 650-foot wharf with 40 feet reported alongside. The wharf is served by loading and unloading towers, chutes, and conveyors. Freshwater and electric shore power are available. Vessels can receive bunkers by barge while alongside. The plant has railway and highway connections.

A shipyard and floating drydock are on the W side of the bayou opposite the bulk materials plant.

Adams Terminal, on the S side of the ship channel about 0.3 mile W of Greens Bayou, is a large industrial complex owned by Phillips Petroleum Company, and operated by various concerns. The terminal has a 960-foot wharf on the ship channel and 1,780 feet of berthing space on the W side of the terminal slip; 22-35 feet is reported alongside. Deck heights are 8 feet. Bulk handling equipment, heavy lifts, and large storage yards and warehouses are at the terminal. Water and electric shore power are available. The terminal has railway and highway connections. General cargo, dry bulk commodities, automobiles, steel products, and chemicals are handled.

The Armco Western Steel Division Lower Wharf, on the N side of the channel 1 mile W of Greens Bayou, has a 1,080-foot face with 36 to 41 feet reported alongside. Deck height is 20 feet. The wharf has railway and highway connections. Coal, iron ore pellets, and scrap metals are received, and steel products are shipped and received.

On the S side of the channel about 1.4 miles W of Greens Bayou is the Olin Corp. plant. The plant has a 1,060-foot wharf with deck heights of 8 to 10½ feet and depths of 30 to 32 feet reported alongside. Dry bulk fertilizers are shipped and phosphate rock is received.

On the N side of the channel, opposite the Olin Corp., are the Amerada Hess Petroleum Corp.

wharves. Ship Dock No. 2 (29°44′30″N., 95°11′59″W.) has a 100-foot face with 300 feet of berthing space with dolphins; 33 feet is reported alongside. The wharf has a deck height of 13 feet at the center and 3 feet at each end. Ship Dock No. 1, 160 yards W of Dock No. 2, has a 120-foot face with 400 feet of berthing space with dolphins; 45 feet is reported alongside. The wharf has a deck height of 17½ feet. Petroleum products are received and shipped, and vessels can receive bunker fuels alongside.

Hunting Bayou, on the N side of the channel 1.9 miles W of Greens Bayou, is the site of the Warren Petroleum Corp. Wharves, where liquified petroleum gas is shipped and received. The two wharves on the NE side of the bayou's mouth each have 300 feet of berthing space with dolphins. The wharves have a deck height of 15 feet; 45 feet is reported alongside. Water, and railway and highway connections are available. The wharf on the SW side of the bayou has dolphins to allow berthing of 850-foot vessels. Depths of 45 feet are reported alongside.

Cotton Patch Bayou is on the S side of the channel about 0.2 mile above Hunting Bayou. A marine repair plant has a 400-foot wharf with depths of 12 feet on the NE side of the bayou and a 600-foot wharf with depths of 6 to 9 feet on the SW side of the bayou. Floating drydocks to 1,500 tons are at the NE wharf and an 800-ton marine railway is at the inner end of the bayou.

Close W of Cotton Patch Bayou is the site of the General American Transportation Corp. tank storage terminal (Pasadena Wharf). The wharf has a 75-foot face, 230 feet of berthing space with dolphins, a deck height of 12 feet, and reported depths of 40 feet alongside. Petroleum products, petrochemicals, and other bulk liquid commodities are handled on the wharf.

Washburn Tunnel crosses under the ship channel from **Galena Park** to Pasadena about 0.9 mile above Hunting Bayou. Both Galena Park and Pasadena have large petrochemical industries.

The Crown Central Petroleum refinery and wharves are on the S side of the ship channel close E of the tunnel. The wharves are in line, providing 950 feet of berthing space with dolphins and reported depths of 39 feet alongside. Storage tanks with 2¼-million-barrel capacity are at the wharves. Crude oil, petroleum products, petrochemicals, and calcined petroleum coke are handled.

About 1.1 miles above Hunting Bayou on the S side of the ship channel is the Champion Paper and Fibre plant and barge wharves.

About 1.5 miles above Hunting Bayou, on the N side of the ship channel, is the GATX Terminal Corp. plant and wharves. Wharf No. 1 has a 125-foot face, 275 feet of berthing space with dolphins, and a deck height of 14 feet. Wharf No. 2, 0.4 mile W of Wharf No. 1, has a 140-foot face, 400 feet of berthing space with dolphins, and a deck height of 19 feet. Both wharves have 36 feet reported alongside. Two barge wharves are between wharves No. 1 and No. 2. Storage tanks with 4-million-barrel capacity are at the plant. Petroleum products, chemicals, petrochemicals, vegetable oils, and other bulk liquids are handled, and vessels are bunkered. The basin off Wharf No. 1 had a reported controlling depth of 40 feet in August 1982.

The Houston Light and Power Plant is on the S side of the ship channel opposite GATX Terminal Corp. Wharf No. 1. Overhead power cables crossing the ship channel just E and W of the plant have clearances of 165 feet and 185 feet, respectively.

The Atlantic Richfield Co. refinery and wharves are on the S side of the ship channel about 0.5 mile above the powerplant. Dock B has berthing space for 800-foot vessels with dolphins and shore moorings, 40 feet reported alongside, and a deck height of 16 feet. Dock C has 490 feet of berthing space with dolphins, 36 feet reported alongside, and a deck height of 14 feet. Storage tanks at the facility have a capacity of 9½ million barrels. Petroleum products and petrochemicals are received and shipped, and vessels are bunkered.

Paktank Gulf Coast Terminal and wharf are on the N side of the ship channel opposite the Atlantic Richfield Co. refinery. The wharf has a 70-foot face, 390 feet of berthing space with dolphins, and depths of 34 feet reported alongside.

Just W of the Paktank Gulf Coast Terminal are the AGRI Industries 6-million-bushel grain elevator and wharves. The elevator is one of the most prominent landmarks on the Houston Ship Channel. The E wharf provides 680 feet of berthing space with dolphins and 42 feet reported alongside. Just W of the wharf, a slip with a 1,250-foot wharf on its E side has depths of 38 feet reported alongside. A 415-foot wharf close W of the slip has 650 feet of berthing space with platforms and reported depths of 42 feet alongside. The E wharf and the wharf at the slip are used for receipt and shipment of general, containerized, and roll-on/roll-off cargo, vegetable oil, and bulk fertilizer, and shipment of bagged fertilizer and steel. More than 167,000 square feet of covered storage and 25 acres of open storage are available. Storage tanks have a capacity of 106,000 barrels. Cranes to 300 tons are available. Grain is shipped from the W wharf. Three spouts can load vessels at 120,000 bushels per hour.

Sims Bayou Turning Basin is off the S side of the ship channel close E of Sims Bayou. (See Notice to Mariners and latest edition of the chart for controlling depth.)

Sims Bayou enters Houston Ship Channel about 2.7 miles above Hunting Bayou. The Harris County Houston Ship Channel Terminal railroad bridge crossing the bayou about 0.8 mile above the mouth has a 26-foot fixed span with a clearance of 18 feet. An overhead power cable crossing at the bridge has a clearance of 46 feet. A shell-handling wharf is on the N side just below the bridge. Between the bridge and the shell-handling wharf, several sunken shell barges are reported to block the bayou and prevent navigation above this point.

Port of Houston tanker facility, on the W side of

Sims Bayou Turning Basin, has 273 feet of berthing space with 40 feet reported alongside its wharf.

U.S. Gypsum Co. plant and wharf are on the N side of the ship channel opposite the entrance to Sims Bayou. The wharf has 600 feet of berthing space with 32 feet reported alongside. Gypsum rock is received from self-unloading vessels.

Texport Terminal, on the S side of the ship channel, is close W of the mouth of Sims Bayou. The terminal is one of the largest privately operated general cargo terminals on the Houston Ship Channel. The terminal wharf is 1,520 feet long with depths of 34 feet reported alongside. The terminal has over 1 million square feet of covered storage, 22 acres open storage, cranes to 125 tons, and railway and highway connections. General and containerized cargo are handled.

Close W of the Texport Terminal is the Charter International Oil Co. Refinery. The ship wharf has shore moorings to allow berthing of 700-foot vessels and reported depths of 34 feet alongside. Several barge wharves are adjacent to the ship wharf. Crude oil and petroleum products are handled.

A large cotton compress and storage warehouses are on the N side of the ship channel opposite the Texport Terminal.

The Southern Pacific Railroad Terminal slip and wharf are on the N side of the ship channel close W of the cotton compress. An 825-foot wharf on the W side of the slip has reported depths of 12 to 32 feet alongside. Bulk cement is handled.

The former U.S. Army Ordnance Dickson Gun Plant is on the N side of the Houston Ship Channel about a mile above Sims Bayou. The plant is now inactive. A Coast Guard Port Safety Station is on the N side of the ship channel in about 29°43′41″N., 95°15′26″W. The area on the N side of the channel in the vicinity of the Coast Guard wharf is foul. **Fidelity Island** is a group of rocks awash S of the wharf.

Port of Houston Authority Manchester general cargo terminal and Elco Shipside Elevator Company's 2½-million-bushel rice elevator are on the S side of the ship channel about 1.3 miles above Sims Bayou. The terminal has 1,447 feet of berthing space with reported depths of 32 feet alongside. In addition to handling general cargo and rice, the terminal has facilities for handling and storage for over 850,000 barrels of petrochemicals and edible oils and 10½ million gallons of molasses. The terminal has bulk material handling equipment and oil handling facilities.

A high-level fixed highway bridge with a clearance of 135 feet crosses the ship channel at Manchester, about 1.4 miles above Sims Bayou.

Harrisburg, about 2 miles below the Houston Turning Basin, comprises the industrial section of the city of Houston. **Harrisburg Bend,** a dredged channel around **Brady Island,** has unloading rigs for sand and shell, boat repair yards, and other facilities. In November 1983, the controlling depth was 7 feet. Cypress Street Bridge to Brady Island over the bend, 0.2 mile S of Brays Bayou, has a fixed span with a clearance of 7 feet. Overhead power cables with clearances of 50 and 67 feet cross the bend immediately S and 150 yards S, respectively, of the bridge.

Shipyards on Brady Island and on Harrisburg Bend have marine ways that can handle vessels up to 300 feet long, 600 feet wide, and 22-foot drafts. General repairs are made on all types of vessels, but the yards specialize in work on towboats, barges, and other small commercial craft. Machine shops are nearby.

Brays Bayou branches off the W entrance to Harrisburg Bend. A highway bridge just above the bayou mouth has a fixed span with a clearance of 23 feet. Three highway and two railroad bridges crossing the bayou above the first bridge have fixed spans with minimum channel widths of 31 feet and clearances of 12 feet. Overhead power cables crossing the bayou have a minimum clearance of 23 feet.

Buffalo Bayou, above the Houston Turning Basin, in January 1983, had a controlling depth of 7 feet to the Jensen Drive fixed highway bridge, about 3.5 miles above the Houston Turning Basin; thence in 1975, 7 feet for about another 0.6 mile to the Southern Pacific Dock. It is used considerably by barge traffic. The upper light-draft channel through the bayou is crossed by many bridges of all types between the turning basin and Franklin Avenue. Minimum clearance is 21 feet for the bascule, swing, and vertical lift spans, and 9 feet for the fixed spans. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(31), chapter 2, for drawbridge regulations and opening signals.) In 1981, a combination bascule highway bridge and pipe bridge with design clearances of 26 feet for the highway bridge and 59 feet for the pipe bridge was under construction 0.7 mile above the mouth. When completed, it will replace the existing 69th Street Bridge. In 1981, a fixed highway bridge with a design clearance of 52 feet was under construction 2 miles above the mouth. When completed, the fixed span will replace the existing vertical lift bridge at the site. Numerous overhead pipelines and telephone and power cables cross the bayou; minimum clearance is 46 feet. The principal commodities handled on the bayou are shell, petroleum, sand and gravel, clay, steel products, and cotton.

Houston, the largest city in Texas, is at the head of Houston Ship Channel 22 miles above Galveston Bay and 44 miles from Galveston Entrance to the Gulf. The city is the principal distribution point for Texas and one of the main distribution points for the W and SW United States. Houston has many colleges and universities within its metropolitan area, among which are the University of Texas, Rice University, Texas Southern University, and other private and public colleges. It also has a large medical center with 16 participating institutions and medical organizations.

Port of Houston lies within Harris County and is one of the largest ports in the United States in total tonnage handled. The port extends along Houston Ship Channel from the turning basin at the head of

the channel to Morgans Point and takes in Harrisburg, Manchester, Clinton Park, Galena Park, Pasadena, Lynchburg, and Baytown. The port also includes Buffalo Bayou, Sims Bayou, Hunting Bayou, Greens Bayou, Boggy Bayou, Goose Creek, Cedar Bayou, Barbours Cut, and the new industrial development and port facilities at Bayport on Galveston Bay near Red Bluff.

The principal imports include coffee, molasses, burlap, jute, lumber, wood products, newsprint, petroleum, gypsum, various ores and concentrates, steel products, and motor vehicles. The principal exports include wheats and various grains and sorghums, animal feeds, petroleum products, cotton, vegetable oils and fats, synthetic rubber, coke, clays and earths, scrap iron, steel products, machinery, coal tar products, caustic soda, alcohol, industrial chemicals, carbon black, and fertilizers.

There is one public and four privately owned grain elevators in the port with capacities of up to 8½ million bushels. In addition, the port has numerous petroleum, petrochemical, and fertilizer plants, large cotton compresses with warehouses, shipyards, and steel mills.

Anchorages.–Vessels are prohibited from anchoring in the Houston Ship Channel or turning basin except in case of emergency, in which circumstances they shall anchor as near as possible to the channel edge or turning basin so as not to interfere with free navigation or obstruct the approach to any pier.

Tides.–The diurnal range of tide in the Houston Ship Channel at Morgans Point is 1 foot. At Houston there is practically no periodic tide but the waterfront is greatly influenced by winds.

Weather.–The climate of Houston is predominantly marine. The terrain includes numerous small streams and bayous, which together with the nearness to Galveston Bay favor the development of both ground and advective fogs. Prevailing winds are from the SE and S, except in January, when frequent passages of high-pressure areas bring invasions of polar air on prevailing N winds.

Temperatures are moderated by the influence of winds from the Gulf, which results in mild winters and, on the whole, relatively cool summer nights. Another effect of the nearness of the Gulf is abundant rainfall, except for rare extended dry periods. Polar air penetrates the area frequently enough to provide stimulating variability in the weather.

The average number of days with minimum temperatures of 32°F. or lower is only about 7 per year at the city's NWS office and about 15 per year at William P. Hobby Airport, which is about 10 miles SE of the city. Most freezing temperatures last only a few hours because they are usually accompanied by clear skies.

Monthly rainfall is evenly distributed throughout the year. In past years about 75 percent of the total precipitation has been between 30 and 60 inches. Since thundershowers are the main source of rainfall, precipitation may vary substantially in different sections of the city on a day-to-day basis.

Records of sky cover for daylight hours indicate about one-fourth of the days per year as clear with maximum of clear days in October. Cloudy days are relatively frequent from November to May, and partly cloudy days are more frequent from June through September.

Snow rarely occurs; however, on February 14-15, 1895, 20 inches of unmelted snow was measured.

Heavy fog occurs on an average of 16 days a year, and light fog occurs about 62 days a year in the city, but the frequency of heavy fog is considerably higher at William P. Hobby Airport.

Destructive windstorms are fairly infrequent, but both thundersqualls and tropical storms occasionally pass through the area.

The National Weather Service maintains an office at the Houston International Airport; **barometers** may be compared there or by telephone. (See appendix for address.)

(See page T-10 for **Houston climatological table.**)

Pilotage for Houston is discussed in this chapter under Pilotage, Galveston Bay.

Towage.–Tugs up to 4,200 hp are available at Houston.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Houston has many private hospitals.

Houston is a **customs port of entry.**

Coast Guard.–The **Captain of the Port's** office, a **marine inspection** office, and a **vessel documentation** office are in Houston. (See appendix for addresses.) A Coast Guard air station is at Ellington Air Force Base.

Harbor regulations.–The Port of Houston is managed, governed, and controlled by the **Port of Houston Authority.** The regulations are enforced by the **Director of the Port** whose offices are in the Port Authority Building at 1519 Capital Avenue; telephone (713-225-0671). (See 162.75 (b)(4), chapter 2, for **speed limit** in the harbor.) Smoking is prohibited on any wharf except in designated smoking areas, and is also prohibited on the open decks or in the hatches of any vessel in the harbor. These regulations are strictly enforced.

Wharves.–Houston has over 200 piers and wharves. Only the deep-draft facilities at Houston are described. For a complete description of the port facilities refer to Port Series No. 24, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths for the facilities described are reported; for information on the latest depths contact the operator. Unless otherwise mentioned, all the facilities described are owned and operated by the Port of Houston Authority. Most of the piers and wharves have water and electrical shore power connections, and highway and railroad connections.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if avail-

able, is mentioned in the description of the particular facility.

About 200 acres of open storage area, over 9 million square feet of covered storage, and 2½ million cubic feet of cooler and freezer space are available in the port. Mobile cranes up to 300 tons and a floating derrick with a capacity of 800 tons are available at the port. The Port of Houston Authority operates a 40-ton container crane and a 30-ton gantry crane available for use at Public Wharves Nos. 23-31, and a 60-ton locomotive crane available for use at Public Wharves Nos. 3, 8-31, and 41-48.

N side Houston Ship Channel:

Public Wharves Nos. 30 and 31 (29°43′32″N., 95°16′06″W.): 1,176-foot face; 38 feet alongside; deck height, 15½ feet; 140,000 square feet covered storage; 16 acres open storage; receipt and shipment of general cargo.

Public Wharf No. 29: W of Public Wharf No. 30; 600-foot face; 38 feet alongside; deck height, 15½ feet; 5 acres of open storage; receipt and shipment of general and containerized cargo.

Public Wharves Nos. 27 and 28: NW of Public Wharf No. 29; 1,200-foot face; 38 feet alongside; deck height, 15½ feet; 144,000 square feet covered storage; receipt and shipment of general cargo.

Public Wharf No. 26: N of Public Wharf No. 27; 600-foot face; 38 feet alongside; deck height, 15½ feet, 2 acres of open storage; receipt and shipment of general and containerized cargo.

Public Wharves Nos. 24 and 25: N of Public Wharf No. 26; 1,200-foot face; 38 feet alongside; deck height, 15½ feet; 144,000 square feet covered storage; 2 acres open storage; receipt and shipment of general cargo.

Public Wharf No. 23: N of Public Wharf No. 24; 600-foot face; 38 feet reported alongside; deck height, 15½ feet; 2 acres of open storage; receipt and shipment of general and containerized cargo.

Public Wharves Nos. 21 and 22: N of Public Wharf No. 23; 1,200-foot face; 38 feet alongside; deck height, 15½ feet; 144,000 square feet covered storage; 3 acres open storage; receipt and shipment of general cargo.

Public Wharf No. 20: N of Public Wharf No. 21; 600-foot face; 38 feet alongside; deck height, 15½ feet; 2 acres of open storage; receipt and shipment of general cargo and structural steel products.

Public Wharves Nos. 18 and 19: N of Public Wharf No. 20; 1,177-foot face; 38 feet alongside; deck height, 15½ feet; 133,000 square feet covered storage, 9 acres open storage; receipt and shipment of general cargo.

Public Wharf No. 17: N of Public Wharf No. 18; 600-foot face; 38 feet alongside; deck height, 15½ feet, 1½ acres of open storage; one 50-ton gantry crane; receipt and shipment of general and containerized cargo.

Public Wharf No. 16: N of Public Wharf No. 17; 603-foot face; 38 feet alongside; deck height, 15½ feet, 1½ acres of open storage; one 50-ton gantry crane available from Wharf No. 17; receipt and shipment of general and containerized cargo.

Public Wharf No. 15: N of Public Wharf No. 16; 480-foot face; 34 feet alongside; deck height, 15½ feet; 44,000 square feet covered storage; grain gallery with eight loading spouts; receipt and shipment of general cargo.

Public Wharf No. 14: N of Public Wharf No. 15; 480-foot face; 34 feet alongside; deck height, 15½ feet; grain gallery with six loading spouts, loading rate, 80,000 bushels per hour; 6-million-bushel grain elevator; receipt and shipment of general cargo, shipment of grain.

E side of Turning Basin:

Public Wharves Nos. 12 and 13: N of Public Wharf No. 14; 990-foot face; 33 feet alongside; deck height, 15½ feet; 87,000 square feet covered storage; receipt and shipment of general cargo.

Public Wharf No. 11: N of Public Wharf No. 12; 530-foot face; 33 feet alongside; deck height, 15½ feet; 41,000 square feet covered storage; receipt and shipment of general cargo.

Public Wharf No. 10: N of Public Wharf No. 11; 700-foot face; 33 feet alongside; deck height, 15½ feet; 48,000 square feet covered storage; receipt and shipment of general cargo.

W side of Turning Basin:

Public Wharf No. 9 (29°45′04″N., 95°17′24″W.): 501-foot face; 34 feet alongside; deck height, 19 feet; 50,000 square feet covered storage; 9 acres open storage; receipt and shipment of general cargo.

Public Wharf No. 8: S of Public Wharf No. 9; 624-foot face; 38 feet alongside; deck height, 19 feet; 10 acres open storage; receipt and shipment of general cargo.

S side of Turning Basin:

Public Wharf No. 4 (29°44′52″N., 95°17′24″W.): 779-foot face; 27 to 32 feet alongside; deck height, 8½ feet; 40,000 square feet covered storage; receipt and shipment of general cargo.

Public Wharf No. 3: E of Public Wharf No. 4; 802-foot face; 33 feet alongside; deck height, 9 feet; 25,000 square feet covered storage; receipt and shipment of general cargo.

S side of Houston Ship Channel:

Public Wharf No. 2 (29°44′50″N., 95°17′12″W.): 519-foot face; 33 feet alongside; deck height, 12½ feet; 38,000 square feet covered storage; storage tanks, 3-million-gallon capacity; receipt and shipment of general cargo, receipt of vegetable oil; operated by Port of Houston Authority and Houston Tank Storage Co.

Public Wharf No. 1-W: SE of Public Wharf No. 2; 603-foot face; 34 feet alongside; deck height, 14 feet; 28,000 square feet of covered storage; storage tanks, 10¾-million-gallon capacity; receipt and shipment of general cargo, shipment of tallow and vegetable oil; operated by Port of Houston Authority, Jacob Stern & Sons, Inc., Southern Stevedoring, Inc., and Pacific Molasses Co.

Public Wharf No. 1-E: SE of Public Wharf No. 1-W; 42-foot face, 175 feet of berthing space with dolphins; 34 feet alongside; deck height, 16½ feet; receipt of molasses; shipment of tallow, vegetable

oils, and chemicals; operated by Port of Houston Authority and Pacific Molasses Co.

Pacific Molasses Co. Dock: about 0.1 mile SE of Public Wharf No. 1-E; 210-feet of berthing space with dolphins; 30 feet alongside; deck height, 9 feet; storage tanks with 22½-million-gallon capacity; receipt of liquid fertilizer, caustic soda, and molasses; shipment of tallow and liquid wax; owned and operated by Pacific Molasses Co.

Public Wharves Nos. 41 through 48: 500 yards SE of Public Wharf No. 1-E; 3,428-foot face; 33 feet alongside; deck height, 15½ feet; 730,000 square feet covered storage, 1½ acres of open storage; 75-ton crane; receipt and shipment of general cargo, shipment of cotton.

New Terminal Warehouse Corp., Berths 1 and 2: 300 yards S of Public Wharf No. 48; 830-foot face; 27-35 feet alongside; deck height, 18 feet; 127,000 square feet covered storage; shipment of general cargo; owned and operated by the New Terminal Warehouse Corp.

Foreign-Trade Zone No. 84 is in Houston. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–All types of marine supplies and services are available at Houston. Freshwater is available at all the wharves and piers. Vessels can receive bunker fuels at many of the oil companies wharves or by oil barges.

Small-craft supplies and services are available at Houston.

Repairs.–A shipyard adjacent to Greens Bayou has a floating drydock with a lifting capacity of 9,000 tons. The drydock is 488 feet long on the keel blocks, 101 feet wide, and has a depth of 10 feet over the keel blocks. Houston has machine shops, foundries, and other repair facilities that can handle most above- and below-waterline repairs.

Communications.–The Houston Belt & Terminal Railway Co. and the Port Terminal Railroad Association serve the majority of the waterfront facilities and connect with the six trunk line railroads serving the port and city. They are the Burlington Northern; Missouri Pacific; Chicago Rock Island and Pacific; Atchison, Topeka and Sante Fe; Southern Pacific; and Missouri-Kansas-Texas Line (Katy) Railroads. Over 100 steamship lines offer cargo service from Houston to world ports, and some 90 tanker operators serve the port.

Millions of tons of cargo are moved annually in the coastwise service through the Port of Houston via the Intracoastal Waterway by common carrier barge lines, 20 specialized cargo, and many private barge operators. There are over 30 major motor freight carriers and numerous specialized truck lines. Buslines operate from two terminals and there is local bus service.

Several airlines provide passenger, freight, and mail service, and one carrier handles only air cargo from Houston Intercontinental Airport.

Charts 11323, 11330.–From Galveston Entrance to San Luis Pass, a distance of 27 miles, the Gulf coast trends in a general SW by W direction. The SW end of Galveston Island is low and sandy, with no conspicuous natural marks. Except in the vicinity of the Galveston Entrance, the coast has fairly uniform depth with few outlying dangers and can be approached to within about 3 miles by deep-draft vessels.

Charts 11324, 11322, 11323.–West Bay is a shallow body of water which extends 16 miles SW from the SW part of Galveston Bay, between Galveston Island and the mainland. The bay proper is of no commercial importance.

The Intracoastal Waterway crosses the E end of West Bay between **North Deer Island** and **Tiki Island.** A marina, in a basin enclosed by timber breakwaters, is on the S side of the E end of Tiki Island. A privately dredged channel, marked by privately maintained daybeacons and with a reported controlling depth of 8 feet in August 1982, leads to the marina from the Intracoastal Waterway, 0.3 mile SW from the twin causeways connecting Virginia Point and Galveston. In August 1982, depths of 10 feet were reported in the basin. The marina has open and covered slips for about 120 boats up to 50 feet long, water, electricity, gasoline, diesel fuel, ice, some marine supplies, a complete marine service station, and an 80-ton mobile lift that can handle craft up to 50 feet. Hull and engine repairs can be made, and salvage equipment is available.

Tiki Island is being developed as a resort home project. A number of lagoons have been dredged into both the N and S sides of the island. From the marina, a dredged access channel with depths of 7 feet reported in August 1982, leads around the N side of the island to a turning basin. A fixed bridge that connects Tiki Island with the mainland crosses this channel about 300 yards N of the marina; clearance is 14 feet. An overhead power cable with a clearance of 37 feet crosses the channel just N of the bridge. Another privately dredged channel with a reported controlling depth of 8 feet in August 1982, leads from the SW side of the marina basin along the SE side of the Island to a junction with a dredged spur channel near Wilson Point; the spur channel connects with a natural channel that joins the Intracoastal Waterway N of North Deer Island.

Offatts Bayou extends from off the S side of West Bay to the SW limits of Galveston. The entrance channel leaves the Intracoastal Waterway about 0.3 mile W of the causeway and leads close around **Teichman Point.** Off the point the channel divides, one channel leading to the Galveston Airport and the other into the bayou. The channels are marked by daybeacons. The bayou is frequented by small pleasure and fishing boats and some commercial traffic out of Galveston. A yacht club is on the S side of the bayou. Several commercial bait camps are around the bayou, and a city park is on the S shore.

In September 1980, the controlling depth was 6 feet in the channel from the waterway to the bayou. In August 1982, the reported controlling depth from

the fork at Teichman Point to the turning basin near the airport was about 7 feet.

In July 1980, a pipe was reported in Offatts Bayou near Daybeacon 28 in about 29°17′01″N., 94°51′22″W.

A boatyard at Teichman Point has a 1,000-ton marine railway that can handle 125-foot vessels for hull, engine, and electronic repairs. A marina in Offats Bayou has moorings for transients, electricity, water, ice, and a launching ramp. Hull repairs can be made. A fill for 61st Street, Galveston, crosses the bayou near its head. An opening in the fill provides a passage for small boats to a small lagoon E of 61st Street. A fixed bridge with a horizontal clearance of 38 feet and a vertical clearance of 9 feet crosses the opening. An overhead power cable with a clearance of 43 feet is on the W side of the bridge.

Chocolate Bay extends about 2.5 miles NW from the W end of West Bay to the mouth of **Chocolate Bayou.** The Intracoastal Waterway crosses the mouth of Chocolate Bay. A barge assembly basin with mooring buoys, is on the S side of the Intracoastal Waterway on the N side of Alligator Head, the E entrance point to Chocolate Bay; depths of about 16 feet are reported in the basin. The basin is intended only for temporary mooring of barges.

A dredged channel, entered through two connecting channels and marked by buoys, daybeacons, lights, and a **142°** lighted range, leads N from the Intracoastal Waterway to the Monsanto Chemical Co. plant basin on Chocolate Bayou, 7.3 miles above the Intracoastal Waterway. In May-June 1983, the controlling depth was 10 feet to the Monsanto basin. It was reported that shell barges and pleasure craft navigate the natural channel in the bayou above the Monsanto basin to a highway bridge near the town of **Liverpool,** 13 miles above the Intracoastal Waterway. There are shell-handling wharves at and just below **Snug Harbor,** about 1.6 miles below the highway bridge.

The State Route 1561 fixed bridge crosses Chocolate Bayou 5.5 miles above the Intracoastal Waterway with a clearance of 50 feet. The least known clearance of the overhead power and telephone cables across the bayou is also 50 feet.

Chocolate Bayou is used mostly by small pleasure craft. Most of the land on both sides has been developed into resort homes. The water is brackish to fresh in the upper reaches, and is pumped from the bayou into nearby rice fields. Depths in the bayou are reported to average 8 feet or more, but are greatly affected by winds and are considerably less with N winds, which prevail during the winter months. During hurricanes, the bayou is reported to afford protection from waves and wind, but some danger still exists from heavy rain runoff.

There are marinas and yacht basins on the bayou above the chemical plant. Gasoline, diesel fuel, water, marine supplies, open and covered berths with electricity, a launching ramp, and lifts are available. Boats up to 35 feet can be handled on flatbed trailers for general repairs.

The principal commodites carried by barge on the bayou are shell, petroleum products, and industrial chemicals.

Scholes Field, the airport for Galveston, is on the S side of the entrance to Offatts Bayou. The red and white checkered water tank is prominent.

Bermuda Beach and **Palm Beach** are summer resorts on the Gulf shore about 5 and 6.5 miles SW of Scholes Field. The homes along the Gulf shore on the W half of Galveston Island are all raised on piles and are very distinctive.

Pirates Cove and **Jamaica Beach** are resorts about 5.7 and 8 miles, respectively, SW of Scholes Field on the bay side. Numerous canals have been dredged to provide waterfront homes. Privately dredged and marked channels lead to these resorts from West Bay. The reported controlling depth in the Pirates Cove channel was 2½ feet in August 1982. A marina at Pirates Cove can provide berths, gasoline, water, and ice. The channel to Jamaica Beach had a reported controlling depth of 3 feet in August 1982. This channel is the approach to a marina at which gasoline, diesel fuel, water, ice, and berths with electricity are available. Jamaica Beach is the site of the Karankawa Indian burial ground.

Sea Isle is a resort about 5.5 miles E of San Luis Pass. A privately dredged entrance channel, with a reported controlling depth of 1½ feet in 1982, leads S from the bay to three boat slips or lagoons. The entrance channel is marked by a private lighted entrance range and other aids. The ruins of a 3,000-foot pier are E of the entrance channel. A marina has berths with electricity, gasoline, diesel fuel, water, and ice; hull and engine repairs can be made.

Bay Harbor is a resort about 4 miles E of San Luis Pass. A privately dredged channel, with a reported controlling depth of 3 feet in August 1982, leads S to a boat basin on the N shore of the island. A privately lighted entrance range and daybeacons mark the entrance channel.

San Luis Pass, an unmarked channel 0.2 mile wide, leads NW from the Gulf and passes between the shoals S from Galveston Island and E from **San Luis Island.** In July 1981, the pass had a reported controlling depth of ½ foot. It is not recommended for strangers. Fishermen acquainted with the pass may sometimes be hired to pilot vessels, but the shoal waters of West Bay and **Christmas Bay** limit passage to lightdraft craft.

A fixed highway bridge and causeway across San Luis Pass connects Galveston Island with San Luis Island; clearance is 29 feet.

Off the NE side of San Luis Island are depths up to 22 feet; this deeper area offers protected anchorage for small craft, but the bottom is hard sand. The best anchorage is in **Cold Pass** on the W side of San Luis Island. A campground is on San Luis Island about 0.4 mile NW of the highway bridge. There is a marina on a dredged basin at the campground at which gasoline, provisions, a launching ramp, ice, and water are available. The basin and entrance channel from Cold Pass had a reported controlling depth of of 5 feet in August 1982.

A depth of 5 feet can be carried from San Luis

Pass to the W side of San Luis Island, thence S in Cold Pass to **Moodys Island** and W and NW into Christmas Bay; a draft of 4 feet can then be taken to and through **Bastrop Bay.** Privately maintained aids mark the channel from the W end of Cold Pass to **Christmas Point,** and a privately marked channel crosses Bastrop Bay and joins the Intracoastal Waterway.

A channel has been dredged in **Bastrop Bayou** by private interests from the Intracoastal Waterway, Mile 382.2W, to the fixed highway bridge at Mims, Tex. Landcuts eliminate the bends in the bayou and bypass Cox Lake. The controlling depth was reported to be about 5 feet in August 1982. Total length of the channel from the Intracoastal Waterway to the fixed highway bridge is about 4.7 miles; the bridge has a clearance of 45 feet. Small-craft facilities are available at various fishing camps along the Bastrop Bayou Channel. Gasoline, diesel fuel, water, ice, limited berthing, and launching ramps are available at marinas near the highway bridge. A 5-ton fixed lift capable of handling boats up to 27 feet is also available.

A channel between Bastrop Bay and **Mud Island** connects Christmas Bay and West Bay; formerly a section of the Intracoastal Waterway, this channel has been abandoned and is no longer maintained. A shallow dredged channel from the S end of Christmas Bay leads into and through **Drum Bay** and thence SW to a connection with the Intracoastal Waterway. This channel is used by small fishing craft with drafts of 1 to 2 feet.

11. SAN LUIS PASS TO THE RIO GRANDE

This chapter describes the Texas Gulf Coast from San Luis Pass to the Rio Grande, a distance of about 238 miles, and Matagorda, Tres Palacios, Lavaca, Aransas, and Corpus Christi Bays and their tributaries. Also discussed are the deepwater ports of Freeport, Point Comfort, Corpus Christi, and Brownsville, and many of the smaller barge ports.

COLREGS Demarcation Lines.-The lines established for this part of the coast are described in 80.845 and 80.850, chapter 2.

Charts 11300, 11330.-From San Luis Pass to the entrance to Matagorda Bay at Pass Cavallo, the coast trends for 80 miles in a general SW by W direction. From Pass Cavallo it curves gently SW for 100 miles to latitude 27°N., where the trend is S; thence it curves gently a little E of S for 58 miles to the mouth of the Rio Grande. Throughout its whole distance the coast encloses a chain of shallow bays or lagoons, some of considerable size. These are separated from the Gulf by long, narrow islands and peninsulas which are generally low and sandy, with few natural distinguishing marks. Some of the bays and lagoons may be entered from the Gulf through dredged passes protected by jetties, and others through small passes partly obscured by bars with little depth on them.

Shipping Safety Fairways and Fairway Anchorages.- A system of shipping safety fairways has been established along the Gulf Coast to provide safe lanes for shipping that are free of oil-well structures. Vessels approaching the passes and entrances to ports, or bound along the Gulf Coast between San Luis Pass and Brazos Santiago Pass should proceed in the charted shipping safety fairways. Caution should be exercised when approaching or navigating in these fairways as they are unmarked.

Fairway Anchorages have been established off some of the entrances to the ports, which will be generally free oil-well structures. (See 166.100 through 166.200, chapter 2, for regulations governing the **fairways** and **anchorages.**)

Dangers.-The coast has fairly uniform depths with few outlying dangers except in the vicinity of the passes and off the mouth of the Brazos River where shoaling to 18 feet is reported as far as 5 miles offshore; otherwise, vessels of any draft can approach to within 2.5 miles of the shore. Other reported dangers are about 20 miles SW of the entrance to the Brazos River and consist of occasional ridges of soft mud having as little as 4 fathoms over them, with general surrounding depths of 5 to 5½ fathoms. Oil wells may be encountered offshore, especially in the vicinity of Freeport Harbor. Mariners are cautioned to give them a wide berth especially when drilling operations are in progress.

Caution.-Hurricane Beulah in September 1967 caused considerable damage in the Gulf Coast area. Mariners are advised to exercise extreme caution as depths may vary from those charted and mentioned in the Coast Pilot. In addition, Hurricane Beulah created many new cuts or passes through the beach. Many of these cuts were reported in the stretch of beach extending N from about 6 miles N of Port Mansfield Channel for a distance of 20 miles. These openings in the beach should not be used for navigation.

Currents.-Along the W side of the Gulf of Mexico between Tampico and Corpus Christi is a N flow which in the vicinity of the 100-fathom curve off the mouth of the Rio Grande has an average velocity of nearly 0.5 knot.

Strong currents caused by winds would be expected to set somewhat to the right of the wind direction or, near the coast, in a direction parallel to the shoreline, current velocities of 0.5 to 1 knot being produced by wind velocities of 20 to 40 miles per hour.

However, it has been reported that at times strong currents set W toward the coast and the possibility of being carried inshore by such currents should be guarded against. The grounding of a vessel at a location 9 miles SW of Aransas Pass was reported caused by strong W currents that accompanied winds from the N and NE.

Weather.-The climate of the coast from San Luis Pass to the Rio Grande is the product of the combined effects of the humid subtropical region to NE, the semi-arid area to W and SW, and the warm, moist, moderating influences of the Gulf of Mexico. The maritime flow predominates, modifying the humidity and temperatures and decreasing the range of extremes. As a result, the few continental cold fronts reaching this coast are seldom severe. Winters are usually mild, and temperatures rarely drop below freezing in coastal waters. Inland, freezes occur on about 4 to 8 days annually. Spring is characterized by mild, brisk days with frequent showers. There is little change in the day-to-day weather of summer, except for an occasional rain shower or possibly a thunderstorm. Tropical cyclones are a threat from late May into early November. The early fall is an extension of summer, while November is a transition to winter with its greater temperature ranges, stronger winds, and first occurrences of "northers".

While the frequency of N winds increases in winter because of the southerly latitude, southeasterlies remain predominant. However, northerlies and northeasterlies are responsible for most of the windspeeds over 20 knots. At times during the winter, an atmospheric wave will develop along a stationary front off the coast. This is usually associated with the remnants of a polar high. These waves may

intensify and head NE. They can develop into strong extratropical storms, known as "Texas Lows". Offshore, gales blow 1 to 2 percent of the time, and seas of 8 feet or more occur 10 to 15 percent of the time from November through March. Seas of 20 feet or more, while not frequent, do occur occasionally during winter.

Another winter navigational hazard is fog, which is reported 2 to 7 percent of the time in open waters from December through April. Visibilities fall below 0.5 mile about 1 to 3 percent of the time. Fog is most likely with winds out of the E through S.

During the warmer months, the Bermuda High increases in strength and generates a persistent southeasterly flow, which produces an almost monotonous summer period interrupted only occasionally by a rain shower or tropical cyclone. Windspeeds drop, on average, during the summer, although annual extremes are likely to occur if there is hurricane activity. On average, an 85-knot wind is likely once in 10 years, while a 105-knot wind blows once every 50 years.

While the hurricane season lasts from late May into early November, tropical cyclones are most likely during August and September along this coast. Since 1900, some 45 tropical cyclones have affected this area; 26 of these have generated hurricane-force winds. A hurricane can be expected about every 3 years, on average. Many of the hurricanes that strike this area are devastating. Between 1875 and 1900, three hurricanes generated tides that nearly destroyed Indianola and Brownsville. Since 1900, seven severe hurricanes have hit this area. From Freeport to Brownsville, they have generated tides of 10 to 17 feet and wind gusts to 175 mph. During the September 1919 hurricane, some 300 to 600 people lost their lives in Corpus Christi as tides rose to 16 feet. In August 1945, the Matagorda Bay area was devastated as 135-mph winds were reported at Port Lavaca, while 153-mph gusts were measured on the anemometer of the Bauer Dredging Co. before the instrument failed. Beulah generated 18-foot tides on Padre Island in September 1967, while Celia in August 1970 delivered 130-mph sustained winds at Aranasas Pass.

Charts 11321, 11322, 11330.-Freeport Harbor, lying 40 miles SW of Galveston entrance, is the harbor for the town of **Freeport.** The area is known locally as Brazosport. The principal industry is the Dow Chemical Corporation which operates two large plants. Other industries are oil, sulfur, and shrimp. Oil and chemical products are the principal exports. The Intracoastal Waterway crosses Old Brazos River about 1 mile above the jettied entrance. At this point, the Dow Barge Canal leads N and the river channel W. Old Brazos River has been dammed about 6 miles above the jettied entrance. Below the dam, the old river channel is now a tidal estuary and the harbor is protected against flood conditions in the river.

Prominent features.-The buildings, stacks, and tanks of the large chemical plant are the most prominent features. From seaward, by day, the State Route 322 fixed highway bridge crossing the Intracoastal Waterway is also prominent. By night, the numerous lights and flared gas at the chemical plant can be seen, and the obstruction lights on the radio towers at Freeport are conspicuous. **Freeport Entrance Light** (28°56.5'N., 95°18.1'W.), 69 feet above the water, is shown from a steel tower at the Coast Guard station on the N side of the entrance channel. A radiobeacon is at the light.

Vessels should approach Freeport Harbor through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines-The lines established for Freeport Harbor are described in 80.845, chapter 2.

Channels.-The ship channel has been improved by construction of jetties on either side of the entrance. Federal project depths are 38 feet in the channel from deep water to the seaward end of the jetty, thence 36 feet through the channel and Brazosport turning basin to and in the upper turning basin, and 30 feet in the Brazos Harbor approach channel and turning basin, thence from the upper turning basin 25 feet to and in Stauffer turning basin. (See Notice to Mariners and latest editions of charts for controlling depths.)

A vertical lift tide gate with a horizontal clearance of 75 feet, a vertical clearance of 60 feet, and a depth over the sill of 16 feet, crosses the channel just above Stauffer turning basin. The tide gate is closed during hurricane conditions or when tides are 2.5 feet or more above normal.

Above Stauffer turning basin, a depth of 10 to 12 feet can be carried to the wharves at Freeport.

Anchorages.-Vessels should anchor off the entrance to Freeport Harbor in the Freeport Fairway Anchorage. (See 166.100 through 166.200, chapter 2.)

Dangers.-About 6 miles SW of the entrance to Freeport Harbor, Brazos River has generated a shoal extending about 5 miles into the Gulf off the mouth of the river. This area is foul and should be given a wide berth. It is reported that several vessels have stranded in this vicinity and that the depths are considerably less than charted. The bottom is soft mud, indicating that silting from the river has occurred.

Oil drilling structures may be erected in the Gulf near the approach to Freeport Harbor. Mariners should be on the lookout for these structures and give them a wide berth.

A fish haven, marked by a private lighted horn buoy, is about 7.7 miles SW of Freeport Harbor Entrance Lighted Gong Buoy 1.

Bridges.-No bridges cross the channel from the entrance to the upper turning basin. An overhead power cable with a clearance of 63 feet crosses the harbor just above the Stauffer turning basin. A fixed highway bridge with a clearance of 60 feet crosses the harbor about 0.4 mile above the turning basin; overhead telephone cables at the bridge have clearances of 107 feet. The Missouri-Pacific railroad bridge, with a swing span having a clearance of 11

feet, crosses the harbor about 1 mile above the turning basin. (See 117.245 (a) through (e) and (j)(35), chapter 2, for drawbridge regulations.) A highway bridge that has a 36-foot fixed channel span and a clearance of 20 feet is about 0.3 mile above the railroad bridge. An overhead power cable at the bridge has a clearance of 58 feet.

Tides and currents.–The diurnal range of tide at Freeport Harbor entrance is 1.8 feet. The current off the entrance generally sets to the W, with a countercurrent near the beach, largely influenced by the direction of the wind. The bar is rough with an E breeze.

Strong cross winds and currents at the jetty entrance make navigation difficult for larger vessels. Difficulty in navigation is experienced with larger vessels at the junction with the Intracoastal Waterway when strong currents are flowing from the canal. Large vessels are difficult to turn in the smaller upper turning basin.

Weather.–Weather in this area is only an occasional navigational problem. Winds blow at 28 knots or more about 3 to 4 percent of the time in November and from January through April. Average speeds are 12 to 14 knots during this period. Fog is also a winter problem, and visibilities drop below 0.25 mile on about 3 to 6 days each month from November through April. Thunderstorms are most frequent from April through September, during the afternoon and evening. These thunderstorms are usually air mass types as opposed to the less frequent but more severe thunderstorms that occur with fronts and squall lines from fall through spring. Tropical cyclones, particularly severe hurricanes, are most likely in August and September.

Storm warning signals are displayed. (See chart.)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal government. Vessels are taken in day or night. Pilots board vessels 1 mile SE of Freeport Entrance Lighted Gong Buoy 1 (28°54.1'N., 95°15.8'W.). The pilot boat is 42 feet long, with black hull and white superstructure and the name BRAZOS PILOT in white letters on both sides of the hull and the word PILOT on a sign on the upper deck. The pilot station and boat monitor VHF-FM channels 14 (156.70 MHz) and 16 (156.80 MHz) and use channels 14 and 77 (156.875 MHz) as working frequencies. For boarding, pilots request that vessels maintain a speed of 5 knots or less and have the pilot ladder rigged 8 feet above the water. Pilots can be obtained from the Brazos Pilots Association by telephone (409-233-1120) or by prior arrangement through ships' agents; a minimum of 2-hour notice of time of arrival is requested. Until channel modifications are completed, vessels over 600 feet long are brought in only during daylight.

Towage.–Tugs up to 4,200 hp are available at Freeport.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) Freeport has a hospital.

Freeport is a **customs port of entry.**

Harbor regulations.–The Navigation and Canal Commissioners of the Brazos River Harbor Navigation District have jurisdiction and control of the navigable waters of the district. The district includes that portion of Brazoria County W of the W bank of Chocolate Bayou. A **speed limit** of 8 m.p.h. for all vessels proceeding in the channels and 5 m.p.h. while passing the wharf, dock, or moored craft is enforced. The general manager acts as Port Director. The Terminal Superintendent assigns berths on application for the facilities operated by the Brazos River Harbor Navigation District.

Wharves.–Freeport has more than 75 wharves and piers. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 26, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported; for information on the latest depths contact the operator. Almost all the piers and wharves have highway, railway, water, and shore power connections. General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. A 500-ton floating stiff-leg derrick is available for heavy lifts by special arrangements.

Dow Chemical U.S.A., Wharf A-14: E side of the entrance to Dow Barge Canal; 122-foot E and W faces, berthing space for 800-foot vessels; 38 feet alongside; deck height, 25 feet; receipt of crude oil and shipment of chemicals and petrochemicals; owned and operated by Dow Chemical U.S.A., Texas Division.

Dow Chemical U.S.A. Wharf A-13: 150 yards NW of Wharf A-14; 100-foot W face, 670 feet of berthing space; 38 feet alongside; deck height, 16 feet; receipt and shipment of chemicals and petrochemicals; owned and operated by Dow Chemical U.S.A., Texas Division.

Dow Chemical U.S.A., Wharf A-8: W side of entrance to Dow Barge Canal; 61-foot face, 380 feet with dolphins; 36 feet alongside; deck height, 16 feet; receipt and shipment of chemicals and petrochemicals; owned and operated by Dow Chemical U.S.A., Texas Division.

Dow Chemical U.S.A., Wharf A-5: 500 yards WNW of Dow Barge Canal; 260-foot face, 270 feet with dolphins; 34 feet alongside; deck height, 16 feet; 16,000 square feet covered storage; receipt and shipment of general cargo; owned and operated by Dow Chemical U.S.A., Texas Division.

Dow Chemical U.S.A., Wharf A-4: 0.1 mile W of Wharf A-5; 115-foot face, 260 feet with dolphins; 34 feet alongside; deck height, 12 feet; receipt and shipment of chemicals and petrochemicals; owned and operated by Dow Chemical U.S.A., Texas Division.

Dow Chemical U.S.A., Wharf A-2: W side of Brazosport turning basin; 471-foot face; 32 feet

alongside; deck height, wharf 14½ feet, bulkhead 17½ feet; 85,000 square feet covered storage; receipt and shipment of general cargo; shipment of bagged organic chemicals, polyethylene, chemicals in drums, and dry caustic soda; owned and operated by Dow Chemical U.S.A., Texas Division.

Seaway Pipeline Ship Pier, Berths Nos. 2 and 3 (29°56.3'N., 95°19.2'W.): 70-foot face, 504 feet with platforms; 35 feet alongside; deck height, 15 feet; storage tanks with 4-million-barrel capacity; receipt of crude oil; owned and operated by Seaway Pipeline, Inc.

Phillips Petroleum Co. Wharf No. 2 (28°56.0'N., 95°19.9'W.): 88-foot face, 250 feet with dolphins; 40 feet alongside; deck height, 16 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Phillips Petroleum Co.

Phillips Petroleum Co. Wharf No. 3: 0.1 mile NW of Wharf No. 2; 88-foot face, 250 feet with dolphins; 40 feet alongside; deck height, 16 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Phillips Petroleum Co.

Brazos Harbor Dock A: W side of Brazos Harbor turning basin; 252-foot face; 30 feet alongside; deck height, 16 feet; 36,000 square feet covered storage; receipt and shipment of general cargo; owned and operated by Brazos River Harbor Navigation District.

Brazos Harbor Public Facility Wharf: N side of Brazos Harbor turning basin; 1,250-foot face; 30 feet alongside; deck height, 16 feet; 200,000 square feet covered storage; receipt and shipment of general cargo, bulk and bagged fertilizer, liquid bulk and packaged chemicals, and bagged grain; owned and operated by Brazos River Harbor Navigation District.

Brazos Harbor Wharf No. 2: N side of Brazos Harbor turning basin; 600-foot face; 30 feet alongside; deck height, 16 feet; 58,000 square feet covered storage; 55,000 square feet open storage; receipt and shipment of general cargo, bulk and bagged fertilizer, and liquid bulk and packaged chemicals; owned and operated by Brazos River Harbor Navigation District.

Supplies.–Gasoline, diesel fuel, marine bunkers, water, ice, and most marine supplies are available at Freeport.

Repairs.–The Port of Freeport has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Galveston. Freeport has several shipyards. The largest marine railway, at a yard on the Intracoastal Waterway 1.7 miles NE of Freeport Harbor Channel, can haul out vessels to 250 feet. A yard on the W side of the harbor 0.1 mile below Stauffer turning basin has a 220-foot marine railway. A yard on the N side of the Intracoastal Waterway at the junction with Freeport Harbor Channel has a 3,000-ton floating drydock with a length of 200 feet, width of 90 feet, and depth of 10 feet. The yard has a 165-ton mobile lift. All of the yards can make complete hull and engine repairs, and all have gasfreeing and barge cleaning facilities. A salvage company at Freeport has a 500-ton floating A-frame lift and salvage equipment.

Small-craft facilities.–Small craft can find excellent protection in the harbor at Freeport. Numerous small piers and wharves are along the waterfront. There are numerous small-craft facilities along the Intracoastal Waterway between the Freeport Harbor Channel and the entrance to Oyster Creek. Marine lifts to 30 tons and 90-foot marine railways are available for complete repairs and storage. Gasoline, diesel fuel, open and covered storage, launching ramps, ice, provisions, and marine supplies are available.

Communications.–The Missouri-Pacific Railroad serves the Freeport area. Numerous trucklines operate from the port, and buslines offer frequent service to Houston and other points. An airline has scheduled air service to Houston. Good paved roads and highways radiate to all points.

Charts 11321, 11322.–Brazos River enters the Gulf through the diversion channel about 6 miles SW of Freeport Harbor entrance. Because of logs, shoaling, and general foul ground, the mouth of the river is not used as an entrance. The Intracoastal Waterway crosses the river 1.6 miles above the mouth. A depth of 8 feet at ordinary river stage is available to **Bolivar Landing,** 36 miles upriver from the Intracoastal Waterway. Most of the traffic on the river consists of offshore oil supply vessels enroute to or from their base on the E side of the river, about 0.8 mile below the State Route 36 highway bridge, and chemical barges enroute to and from the wharf of a chemical company, about 2 miles above this highway bridge.

Overhead power cables having a minimum clearance of 42 feet cross Brazos River between the Intracoastal Waterway and Brazoria. In 1980, a fixed highway bridge with a clearance of 50 feet was under construction about 3.1 miles above the waterway. The highway bridge, 3.9 miles above the waterway, has a swing span with a clearance of 18 feet at low river stages and 10 feet at high river stages. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(36), chapter 2, for drawbridge regulations and opening signals.) A railroad bridge and a highway bridge at **Brazoria,** and a highway bridge at **East Columbia,** cross the river about 20 miles and 26 miles, respectively, above the waterway; minimum clearance of the fixed channel spans is 33 feet at low-river stages and 5½ at high-river stages. An overhead power cable crosses the river about 0.8 mile above the highway bridge at Brazoria; clearance is not known.

San Bernard River flows into the Gulf 3.5 miles SW from the mouth of Brazos River. San Bernard River is obstructed at the mouth by a shifting sandbar over which the channel depths vary from 3 to 5 feet. From the Intracoastal Waterway, 0.8 mile above the mouth, the channel has been dredged to a point near the West Columbia highway bridge 22 miles above the Intracoastal Waterway. In 1979-

March 1983, the midchannel controlling depth was 7 feet to the West Columbia highway bridge.

Some critical reaches in the river are caused by narrow widths or sharp bends. Complaints have been made that tows navigating the river have damaged wharves and the vessels moored to them; operators are advised to reduce speed to avoid wave-action damage. When towing barges in tandem, particular care must be taken to prevent any part of the tow striking the banks, boats, or structures along the banks.

There are several fishing camps along the San Bernard River in the vicinity of the narrows, about 0.8 mile above its junction with the Intracoastal Waterway, and at Churchill. Gasoline, ice, and launching ramps or lifts are available at these facilities. A fuel dock on the Intracoastal Waterway just W of its intersection with the San Bernard River has gasoline, diesel fuel, and ice available at its dock which has a reported depth of 6 feet alongside.

Between the waterway and the upstream limits of the improvement, San Bernard River is crossed by three fixed highway bridges with least clearance of 36 feet horizontal and 13 feet vertical and by a railroad swing bridge with a clearance of 2 feet. The swing bridge is equipped with radiotelephone. (See 117.1b and 117.245 (j)(40), chapter 2, for drawbridge regulations and opening signals.) Clearance of overhead cables is 38 feet. There is a fuel dock at which gasoline, diesel fuel, and water are available on the W side of the river's junction with the Intracoastal Waterway. A reported depth of 5 feet was alongside the facility in September 1972.

Cedar Lakes, East Matagorda Bay, Caney Creek, Live Oak Bayou, Old Gulf, Colorado River, and Matagorda are described in chapter 12.

Charts 11316, 11317, 11319.–Matagorda Bay is a large body of water separated from the Gulf by **Matagorda Peninsula.** Depths in the bay range from 5 to 13 feet, averaging 10 to 12 feet over the greater part. Considerable oil development and fishing are carried on in the bay and its main tributaries Tres Palacios and Lavaca Bays.

Matagorda Light (28°20.2'N., 96°25.4'W.), 90 feet above the water, is shown from a black conical tower on **Matagorda Island,** about 1.5 miles W of Pass Cavallo. The light is 7 miles SW of the Matagorda Ship Channel, the recommended entrance to Matagorda Bay.

Vessels should approach Matagorda Bay through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Matagorda Bay are described in 80.850, chapter 2.

Matagorda Ship Channel is a 22-mile-long deepwater channel from the Gulf to and through a landcut in Matagorda Peninsula thence through Matagorda and Lavaca Bays to a public terminal at Point Comfort. The entrance to the landcut is protected by jetties. The channel is well marked. The Federal project provides for a depth of 38 feet through the Sea Bar Channel and Jetty Channel, thence 36 feet through the landcut and Matagorda and Lavaca Bays to a turning basin of the same depth at Point Comfort. (See Notice to Mariners and latest editions of charts for controlling depths.)

Matagorda Ship Channel Approach Lighted Whistle Buoy MSC (28°12.0'N., 96°05.2'W.), about 18 miles SE of the jetties, marks the entrance to the Safety Fairway.

Matagorda Ship Channel Entrance Lighted Whistle Buoy MB, 2.5 miles SE of the jetties, marks the channel approach.

Matagorda Ship Channel Entrance Light (28°25.3'N., 96°19.1'W.), 52 feet above the water, is shown from a skeleton tower on a concrete block with a red and white diamond-shaped daymark on the E jetty at the entrance to Matagorda Bay.

A lighted **316°38'** range and lighted buoys mark the entrance channel through the jetties and landcut, and lighted ranges, lights, and buoys mark the bay channel.

Anchorages.–Vessels should anchor off the bar in the Matagorda Fairway Anchorages on either side of the safety fairways. (See 166.100 through 166.200, chapter 2.) With N winds or smooth sea, fair anchorage is available in 4 to 12 fathoms.

Good anchorage for small craft may be found on the W side of Pass Cavallo in **Saluria Bayou** in 7 to 10 feet. The entrance to the bayou is marked by a light.

The usual storm anchorages for small boats in Matagorda Bay area are: the Harbor of Refuge S of Port Lavaca, in depths of about 12 feet; **Chocolate Bay,** with depths of 3 feet; Lavaca Bay, on the E side to the N of the causeway, with depths of 4 to 5 feet; Lavaca River with depths of about 5 feet across the bar; Carancahua Bay with depths of 3 feet across the bar; and Tres Palacios Bay, off Palacios, with depths of 4 to 5 feet. Small craft should not anchor in Matagorda Bay in the vicinity of the landcut through Matagorda Peninsula as strong currents and turbulent water are reported in this area.

Pass Cavallo, 108 miles SW of Galveston Entrance, an entrance to Matagorda Bay from the Gulf, is 1.3 miles wide between **Matagorda Island** and Matagorda Peninsula. The pass is obstructed by a bar that is subject to frequent changes in location and depths. The depths vary from 3 to 8 feet. With a sea or swell running outside, there is virtually a continuous line of breakers across the bar. The pass is not recommended for strangers and is used only by a few local vessels that draw less than 5 feet and have thorough local knowledge.

Inside the bar, the channel extends along the E shore to Matagorda Island, passing about 0.5 mile E of Saluria and Big Bayous, and thence off the Port O'Connor jetties into the open waters of the bay. Unmarked shoals lie along the E side of the pass. There is a passage with a depth of 9 feet or more through these shoals in a NE direction, from off Saluria Bayou. This channel is particularly subject to change. The submerged ruins of East Shoal Light-

house on the N side of the passage in about 28°25.4'N., 96°22.4'W., should be avoided.

Tides and currents.-The diurnal range of tide in Pass Cavallo is 1.4 feet, 0.5 foot at Port O'Connor, and 0.7 foot at Port Lavaca. The level of the water surface is largely dependent on the winds, and during strong northers may be depressed 2 feet or more. The tidal current in Pass Cavallo is believed to attain a velocity of 2 knots with currents of 5 knots reported. It is reported to be very strong in the landcut through Matagorda Peninsula, especially on the runoff of the ebb after strong S winds. The current in Matagorda Ship Channel may attain a velocity of over 3 knots. Daily predictions of the tidal current may be found in the Tidal Current Tables, Atlantic Coast.

Pilotage.-Pilots are available for Matagorda Bay day or night. The pilots board vessels within 1 mile of the sea buoy from the MENA, a 45-foot steel vessel with a gray hull and a white superstructure with the word PILOT on both sides of the hull and across the front of the deckhouse. The pilot boat is equipped with VHF-FM channels 16 (156.80 MHz), 6 (156.30 MHz), and 13 (156.65 MHz); the pilot boat monitors channel 16 (156.80 MHz) 2 hours before the vessel is expected. Channels 6 and 13 are used as working frequencies. For boarding, the pilot ladder should be rigged 5 feet above the water on the leeward side on the flat surface of the ship, and the ship should maintain a speed of 4 to 5 knots. Pilots can be obtained by telephone (512-552-7774 or 552-4390) or by prior arrangements through ships' agents; 24-hour and 4-hour notices of time of arrival are requested.

Halfmoon Reef extends about 3 miles off **Palacios Point,** the SW point of the tongue of land extending between the E and N portions of Matagorda Bay. This is a shell reef 100 to 500 yards wide, covered about 1 foot at low tide over the greater portion of its length. Halfmoon Reef Light is at the outer end of the reef. Palacios Point Light is at the inshore end and marks the inshore side of a channel across the inner end of the reef.

Tres Palacios Bay, about 4 miles N of Palacios Point, is a shallow bay on the NE side at the center of Matagorda Bay. A dredged channel leads from the Intracoastal Waterway through Matagorda Bay and Tres Palacios Bay to two turning basins at the head of the harbor at the town of Palacios. In May-June 1983, the controlling depths were 12 feet from the Intracoastal Waterway to and in the City (E) Basin at Palacios, thence 12 feet in the entrance to the Municipal (W) Basin, thence in December 1982, 11 feet in the basin. Buoys, lights, and daybeacons mark the channel; two breakwaters protect the harbor entrance.

Palacios, a fishing and farming community, is on the W side of Tres Palacios Bay. Two elevated water tanks in the town show prominently from the bay.

Palacios has two freezer plants, an oil terminal, a grain and feed mill, and a concrete plant. The town has a hospital. The Southern Pacific Railroad, a busline, and a motor freight line serve the town. State Route 35, the main coastal highway passes through the town.

The E and W turning basins at the head of the harbor at Palacios are operated by the Board of Directors of Navigation District No. 1 of Matagorda County through a **harbormaster.** Berthing facilities are available.

A boat basin for small pleasure craft is on the E side of the town. The dredged entrance channel to the basin has a controlling depth of 4 feet. The larger of two shipyards at the head of E turning basin has a marine lift that can handle vessels up to 75 feet for general repairs. Gasoline, diesel fuel, water, ice, and marine supplies are available.

A privately dredged channel about 3.5 miles W of Tres Palacios Bay leads N to a State-maintained saltwater experimental station. In August 1982, the channel had a reported depth of 6 feet. A marked fish haven, known as Gadwall Reef, is off the W side of the channel near its head.

Carancahua Bay, 6 miles W of Tres Palacios Bay, is a shallow, unimportant body of water frequented only by small pleasure boats and oil-drilling equipment. A privately dredged channel, marked by piling on its W side, leads through the entrance. In August 1982, it was reported that the channel had a controlling depth of 6 feet, and that there were depths of 3 to 7 feet inside the bay. It was further reported that numerous wellheads, oyster shell reefs, platforms, and other obstructions, some marked by private lights, occupied the bay making navigation hazardous. Numerous beach houses are on both sides of the bay. State Route 35 highway bridge crossing the bay 7 miles above the entrance has a fixed channel span with a width of 18 feet and a clearance of 13 feet.

Keller Bay, an arm on the E shore of Lavaca Bay, is the site of oil exploration and development. Shell is barged through a privately maintained and marked channel to **Olivia,** a small farming community on the E side of the bay. Barges drawing 6 feet are brought in to Olivia.

Garcitas Creek, emptying into the head of Lavaca Bay, has a privately maintained and marked channel to the town of **La Salle.** Shell barges drawing 6 feet are brought in from Port Lavaca.

Lavaca Bay, an arm of Matagorda Bay at its NW corner, has a general depth of 5 to 7 feet with several reefs near the head of the bay. A dredged channel leads NW from the Matagorda Ship Channel off **Gallinipper Point** for about 3.5 miles to a turning basin at the mouth of **Lynn Bayou** at Port Lavaca. The channel is marked by lights and daybeacons. In June-August 1983, the controlling depth was 9 feet in the channel and 12 feet in the basin.

A dredged side channel, marked by daybeacons, about 1.6 miles above Gallinipper Point leads SW from the Port Lavaca Channel for about 1.4 miles to N-S and E-W basins at the **Harbor of Refuge** S of Port Lavaca. In June-August 1983, the controlling depth was 10 feet in the channel with 12 feet in the N-S and E-W basins.

About 2.3 miles above the entrance to Port Lavaca Channel, a dredged channel leads N through Lavaca Bay to the entrance to **Lavaca River** and through the river to **Red Bluff,** on the **Navidad River,** a distance of about 17.5 miles. The channel is marked by a lighted range, daybeacons, and a buoy to the mouth of the river, thence the mouth of the river is marked by lights. In February-August 1983, the controlling depth was 5½ feet to the mouth of Lavaca River, thence 2½ feet to Red Bluff.

State Route 35 highway causeway, crossing Lavaca Bay from **Noble Point** to Point Comfort, has a fixed span over the navigation channel with a clearance of 43 feet. About 0.5 mile of the former highway bridge adjacent to the SW end of the causeway has been retained as a fishing pier. An overhead power cable crossing Lavaca Bay about 500 yards NW of the causeway has a clearance of 69 feet over the channel. State Route 616 highway bridge having a removable span with a clearance of 18 feet and the Missouri-Pacific railroad bridge having a swing span with a clearance of 12 feet cross Lavaca River near its junction with the Navidad River in the vicinity of the towns of **Vanderbilt** and **Lolita.** (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(38), chapter 2, for drawbridge regulations and opening signals.) Several overhead power cables cross the Lavaca River between its mouth and the bridges near its junction with the Navidad River; least clearance is 59 feet.

Point Comfort, on the E side of Lavaca Bay, is the site of the ship and barge wharves of a large aluminum company, the Calhoun County Navigation District's general cargo facilities, and an electric powerplant.

About 0.5 mile SW of Point Comfort, a privately marked and dredged channel leads N from Matagorda Ship Channel to the private facilities on the W side of the point. In August 1982, the reported controlling depth was 36 feet for about 1.1 miles, thence 12 feet to the head of the channel.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Port Lavaca-Point Comfort is a **customs port of entry.**

Towage.–A 2,000 hp tug is available.

Wharves.–The Calhoun County Navigation District Wharf, on the N side of the Point Comfort turning basin, has a 250-foot marginal wharf with 36 feet reported alongside. The wharf, used for the receipt and shipment of general cargo and miscellaneous bulk liquid commodities, has 35,000 square feet of covered storage, railway and highway connections, and water.

The Alcoa Bauxite Pier 300 yards N of Point Comfort, has 875 feet of berthing space along the N and S sides with 39 feet reported alongside. The pier has 50 acres open storage and is used to receive bauxite, fluorspar, and limestone and to ship liquid caustic. Gantry cranes and a conveyor system can handle 2,000 tons of cargo per hour. Vessels moor bow in at this facility. Freshwater and shore power are available.

The Alcoa Bulk Loading Terminal, 700 yards N of the bauxite pier, a 500-foot wharf with 36 feet reported alongside, has a loading spout and conveyor system with a 750-ton-per-hour loading rate. The wharf is used to ship alumina, aluminum anodes, and carbon brickheads.

A 800-foot barge wharf with 12 feet reported alongside is 0.5 mile N of the bulk loading terminal.

Supplies.–Some marine supplies and provisions are available at Port Lavaca. Bunker C fuel oil can be obtained by barge from Corpus Christi or Houston on 2 days advance notice. Light diesel oil is available by tank truck.

Port Lavaca is a city on the W shore of Lavaca Bay in a fishing, farming, and industrial area. The municipal harbor (28°37.3'N., 96°37.5'W.) is under the jurisdiction of the Port Lavaca Port Commission. The local regulations are administered by the city manager. There are several boat basins along the waterfront S of the municipal harbor; depths of 6 to 14 feet are reported in the basins. These facilities are maintained by the port commission, and local fishing, dredging, and oil companies. Gasoline, diesel fuel, water, marine supplies, provisions, and ice are available. Engine and above-the-waterline repairs can be made. A hospital is in the city.

The Harbor of Refuge is S of Port Lavaca. The marginal barge wharves of a chemical company and a fertilizer company are along the N side of the harbor.

Port Lavaca-Point Comfort is a **customs port of entry.**

Port O'Connor is a small settlement at the SW end of Matagorda Bay N of Pass Cavallo.

The town is approached via the Intracoastal Waterway route between two jetties which extend into the bay and are marked by lights at their outer ends. The channel through the jetties favors the S jetty. Mariners are cautioned to keep in the channel as the entire width between the jetties is not dredged and shoal areas with rocky bottom lie outside the channel. Vessels should make their entrance approach well E of the jetties and through the buoyed Intracoastal Waterway. Along the Matagorda Bay shore, 0.4 mile NW of the jetties, are the piles of an old pier. Numerous docks and slips for shrimp boats and pleasure craft are along the N side of the waterway at Port O'Connor. Gasoline, diesel fuel, water, ice, and provisions are available. The Port O'Connor Coast Guard Station is on the N bank of the waterway about 1 mile W of the town. An improved highway leads to Port Lavaca and Seadrift. **Storm warning signals are displayed.** (See chart.)

Charts 11313, 11319, 11315.–Espiritu Santo and San Antonio, Mesquite, and Aransas Bays are a series of shallow bodies of water extending SW along the coast for a distance of 50 miles from Pass Cavallo to Aransas Pass, separated from the Gulf by

Matagorda Island and **San Jose Island.** The bays are filled with islands, reefs, and shoals, and are of little commercial importance except as a link in the Intracoastal Waterway.

Espiritu Santo Bay has depths up to 8 feet. In the E part of the bay, **Ferry Channel** extends from the waterway S to a fish and wildlife reserve at the former Matagorda Air Force Range on Matagorda Island. The channel is marked by lights and daybeacons. In August 1982, the reported controlling depth was 9 feet except for shoaling to 3 feet in the channel from the vicinity of Daybeacon 27 to the dock. The bay is entered from Matagorda Bay through the Intracoastal Waterway and the channel.

San Antonio Bay has depths up to 5 and 6 feet. It is separated from Espiritu Santo Bay by the **First Chain of Islands,** through which are South Pass and Steamboat Pass. **South Pass,** an old unmarked dredged cut, has a depth of about 4 feet. The channel extends between two islands and close to the privately maintained markers on the N side of the S island. **Steamboat Pass,** 1.5 miles to the N, has less than 3 feet of water.

The Intracoastal Waterway crosses San Antonio Bay from the vicinity of **Grass Island** to **False Live Oak Point.** The spoil banks on both sides of the channel have several openings. Small islets are in the spoil bank area.

Numerous reefs, some of which bare at low water, are in and about the bay, particularly in the upper end. They make navigation difficult, and local information is essential.

N of **Swan Point** and **McDowell Point** the delta of Guadalupe River divides the head of San Antonio Bay into **Guadalupe Bay** and **Mission Lake** on the E and **Hynes Bay** on the W. **Goff Bayou** and **Schwing Bayou** flow into Mission Lake.

Guadalupe River empties into the N end of San Antonio Bay. A depth of about 2 feet can be carried from the bay into the N fork of the river. Snags and driftwood make navigation almost impossible, but there are navigable depths as far as the San Antonio River, about 10 miles above the mouth.

Victoria Barge Canal is a dredged channel that leads from the Intracoastal Waterway NW along the E side of San Antonio Bay, thence through landcuts along the E side of Guadalupe Bay, Mission Lake, and Green Lake, thence in a dredged cut to **Pickering Basin** at the **Port of Victoria** about 30 miles above the Intracoastal Waterway and about 6 miles below the city of **Victoria.** In 1982-September 1983, the controlling depth was 8 feet (9 feet at midchannel) from the Intracoastal Waterway to Pickering Basin with 9 feet in the basin. A 330-foot public dock with 9 feet alongside is in the basin; water and electricity are available.

State Route 35 fixed highway bridge with a clearance of 50 feet, the Missouri-Pacific railroad lift bridge with a clearance of 22 feet down and 50 feet up, and a fixed highway bridge with a clearance of 49 feet, cross the channel 15 miles, 25 miles, and 27.6 miles, respectively, above the Intracoastal Waterway. (See 117.240 and 117.554, chapter 2, for drawbridge regulations and opening signals.) Least clearance of overhead power and telephone cables crossing the channel is 53 feet.

About 5.3 miles above the Intracoastal Waterway, a dredged channel leads E from Victoria Barge Canal to a turning basin at the town of **Seadrift.** In February 1983, the controlling depth was 9 feet in the channel and basin.

The facilities in the basin are under the control of the Westside Calhoun County Navigation District. Mooring dolphins are along the N side of the basin, and a wharf is on the S side of the basin. The facilities are used to unload shell from barges, to load and unload barge shipments of general cargo, and for the fueling of vessels. In addition, there are service wharves and seafood processing plants in the basin. Gasoline, diesel fuel, water, ice, and some provisions are available.

Seadrift, a small fishing and farming community, has highway connections.

A private channel about 0.3 mile S of the channel to Seadrift, privately marked by stakes, leads to a resort housing development at Swan Point. A depth of 3½ feet was reported in the channel in August 1982.

About 12 miles above the Intracoastal Waterway, a privately dredged channel, with a reported controlling depth of 10 feet in August 1982, leads to a basin at a large chemical plant at Long Mott.

Long Mott is a small town on Mission Lake that has railroad and highway connections.

Mesquite Bay lies between **Ayres Reef** and **Third Chain of Islands,** and is of no commercial importance except for fish and oysters. The buildings of a ranch are on Matagorda Island opposite the SE corner of the bay. A small water tank about 35 feet high shows prominently from the Gulf.

A marked channel leads from the Intracoastal Waterway at the E end of Aransas Bay across Carlos Bay into Mesquite Bay.

Cedar Bayou, separating Matagorda Island from San Jose Island, leads in a S direction from the SE corner of Mesquite Bay toward the Gulf. A bar has closed the outlet to the Gulf.

Charts 11313, 11314.–Aransas Bay, 15 miles long and 3 to 4 miles wide, is used extensively as a shrimping ground. The Intracoastal Waterway crosses the bay, and opposite Rockport turns W to and through Redfish Bay; at the turn, the channel of the Intracoastal Waterway Alternate Route continues to Lydia Ann Channel. A privately maintained channel near Blind Pass, at the SE end of the bay, is marked by lights and buoys. The periodic tide throughout the bay has a diurnal range less than 0.5 foot, the variation in water level depends principally on the wind. Many piles along the S side of the Intracoastal Waterway do not show at high water; they are very dangerous, and caution should be used near this edge of the waterway.

St. Charles Bay, an arm of Aransas Bay extending N, is the site of considerable hunting and sport fishing, but commercial fishing is prohibited. There

are numerous homes in the vicinity of Hail Point on the W side of the bay near the entrance. A depth of 2 to 3 feet is found through the entrance with somewhat greater depths and numerous reefs inside. The bay is used by small craft as a refuge during tropical storms. A small marina about 0.4 mile N of Hail Point has gasoline, diesel fuel, berths, water, ice, a launching ramp, and marine supplies. The facility is used by boats drawing 3 feet or less.

A privately maintained channel, marked by daybeacons about 1.3 miles W of **Hail Point,** leads to two loading docks about 0.7 mile E of the N end of the Copano Bay causeway. The channel had a reported controlling depth of 2 feet in August 1982. A privately marked channel branches off from this channel for about 1.1 miles E to lagoons at **Neptune Harbor** and Goose Island State Park. A State-maintained launching ramp is available at the State park. A fixed highway bridge about 0.1 mile SE of the entrance to Neptune Harbor is reported to have a 15-foot span and a clearance of 2 feet.

A yacht basin near the N end of the causeway at **Lamar** has storage facilities for boats up to 36 feet. There is a marine way capable of handling vessels up to 30 feet. Owners must arrange for their own repairs. A privately maintained and marked channel to the basin had a reported controlling depth of 6 feet in August 1982, with shoaling to 2½ feet reported in the E half of the channel near the point that encloses the E side of the basin. Gasoline, diesel fuel, water, ice, marine supplies, open and covered berths, and a launching ramp are available in the basin.

Copano Bay, a NW extension of Aransas Bay, is used principally as a center for hunting and sport fishing. No commercial fishing, except oystering, is permitted. Extreme caution is required to navigate the bay because of the numerous unmarked reefs. Depths up to 8 feet are found in the bay with 6 to 7 feet in the narrow sloughs or channels between the reefs. Numerous oil wells and pipelines fill the bay.

Good anchorage for small craft is available in the bight S of **Redfish Point,** inside the bay on the S side at the entrance. Storm anchorages for drafts up to 3 or 4 feet may be had in the S end of the bay in the small bight at the NE corner of **Port Bay.** Slightly greater draft can find good protection in the extreme NE corner of Copano Bay in the bight off Redfish Point. Soft mud bottoms are at these anchorages.

State Route 35 highway causeway across the entrance to Copano Bay has a fixed span with a clearance of 50 feet. Sections of a former bridge, close W of the causeway, remain as fishing piers.

Mission Bay, on the N shore of Copano Bay, is of no importance; only small skiffs can enter.

Bayside is a small resort town on the NW shore of Copano Bay. A large hotel shows prominently from the bay. Highway and telephone communications are available.

Aransas River, emptying into the NW end of Copano Bay, is shallow and navigable only for small craft of 1 foot or less. The State Route 136 highway bridge across the mouth has a 41-foot fixed span with a clearance of 15 feet. There is a small marina on the W side at the S end of the bridge. The channel leading to the facility had a reported controlling depth of 4 feet in August 1982, and was privately marked by stakes. Water, ice, open and covered berths with electricity, marine supplies, and a launching ramp are available. Overhead power and telephone cables at the bridge have clearances of 17 feet.

The ruins of a bridge cross Port Bay about 1.5 miles above the entrance. An overhead power cable crossing at the bridge ruins has a clearance of 20 feet. State Route 881 highway bridge crossing Port Bay about 4 miles above the entrance has a 41-foot fixed span with a clearance of 5½ feet; an overhead power cable crosses at the bridge.

There are fish camps along Live Oak Peninsula between Port Bay and Redfish Point where provisions, berths, and lodging are available.

Fulton, a small village on the W shore of Aransas Bay, is the site of a commercial fish harbor and yacht basin protected by a dike and breakwater. The harbor is entered from Aransas Bay through a dredged channel marked by lights and daybeacons. In February 1983, the controlling depths were 7 feet in the entrance channel and 7 to 8 feet in the basin. In August 1982, it was reported that when making the harbor local residents bear on a prominent, isolated old mansion which fronts on the beach close W of the harbor; a large water tower about 1 mile W of the mansion should not be used. Berth assignments and ship movements in the harbor are under the direction of a **harbormaster** who maintains an office in Rockport. A no-wake **speed limit** is enforced in the harbor.

The harbor at Fulton is used as a base by numerous shrimp boats and trawlers. A marina and boatyard are available in the harbor. The boatyard has a mobile lift that can handle craft to 55 feet and 7-foot draft for general repairs. Berths with electricity, gasoline, diesel fuel, water, ice, launching ramps, and marine supplies are available.

Key Allegro, a resort center built on filled-in marshland, is about a mile S of Fulton. **Little Bay** between the key and **Live Oak Peninsula** is shoal. Two private channels have been dredged into Little Bay to the lagoons and a marina on the W side of the key. The N channel had a reported depth of 6 feet in August 1982. A hump-backed highway bridge crossing the channel from the key to the mainland has a 25-foot fixed span with a minimum clearance of 8 feet. The S entrance channel had a reported depth of 8 feet in August 1982. Privately maintained lights mark the S channel. The marina has open and covered berths and launching ramps. Gasoline, diesel fuel, water, ice, and marine supplies are available. Depths of about 6 feet were reported alongside the fuel pier in October 1972.

A side channel branching off from the S Key Allegro Channel leads W to a boat basin on the long sandspit that extends E from Rockport Harbor. The reported depth in the channel was 5 feet in August

1982. The channel is privately marked by stakes. A launching ramp is available.

Rockport is a commercial fishing and resort town on the W shore of Aransas Bay. A water tank shows prominently from Aransas Bay. A spoil bank area extends along the NW side of the Intracoastal Waterway, through which are several openings marked by daybeacons. Natural depths of 10 to 13 feet lead to the light marking the approach to the harbor. A dredged channel leads from Aransas Bay to a basin in the harbor. The basin is about 0.3 mile long and protected by a concrete breakwater. In August 1983, the controlling depth was 9 feet in the entrance channel with 7½ to 9 feet in the basin. To enter, pass about 50 yards E of the approach light and head directly toward the light on the seawall at the basin entrance. The channel is marked by daybeacons on the W side.

There are excellent facilities in the basin for yachts and other craft. The marine laboratory of the Texas Game and Park Commission is at the N end of the basin. A marina and boatyard are in the basin. Gasoline, diesel fuel, water, ice, marine supplies, and berthing space for more than 100 yachts and commercial vessels are available. The boatyard builds steel tugs, trawlers, and shrimp boats up to 185 feet, and has a vertical lift that can handle vessels to 300 tons for general repairs. Berth assignments and ship movements are under the direction of a **harbormaster,** who maintains an office at the NE end of the basin. A no-wake **speed limit** is enforced in the harbor.

Rockport has highway connection with Port Lavaca and Corpus Christi and railroad connections to the interior.

Cove Harbor and **Palm Harbor,** 2.5 and 4 miles, respectively, S of Rockport, are discussed in chapter 12.

Lydia Ann Channel extends S from the S end of Aransas Bay to connect with Aransas Pass. The entrance from Aransas Bay is via the section of the dredged channel formerly part of the Intracoastal Waterway. In August 1982, depths of about 12 feet were reported available in the channel. The stranded wreck of the S.S. JOHN WORTHINGTON, only partially visible, is on the E side of the channel E of the abandoned lighthouse. This ship was torpedoed during World War II, and then towed into Lydia Ann Channel for salvage.

In July 1982, an obstruction, covered 10 feet, was reported in the channel about 0.2 mile SE of the wreck, in about 27°51′41″N., 97°03′10″W.

Charts 11309, 11314, 11307.–Aransas Pass, 154 miles SW of Galveston Entrance and 113 miles N of the mouth of the Rio Grande, is the principal approach from the Gulf to Aransas and Corpus Christi Bays and their tributaries. The pass lies between San Jose Island on the N and Mustang Island on the S. **Harbor Island,** directly opposite the inner end of the pass, separates Aransas Bay from Corpus Christi Bay.

Two jetties extend into the Gulf from San Jose and Mustang Islands. There are several submerged spurs in the bend of the N jetty, and three submerged spurs extend from the S jetty. Small craft are cautioned not to pass over these spurs. A submerged wreck, covered 24 feet, lies to the S of the channel inside the jetties.

The approach to Aransas Pass is marked by a lighted whistle buoy, 5.5 miles offshore, and a lighted buoy 1.5 miles off the N jetty. The entrance channel is marked by a lighted buoy at the submerged outer end of each jetty, a **301°** lighted range, lighted buoys, and lights.

Prominent features.–The water tank at Port Aransas is the first object sighted in approaching Aransas Pass in the daytime. Also prominent are a condominium apartment and other buildings at Port Aransas. The abandoned lighthouse, a 60-foot high red brick octagonal tower on Harbor Island, and the buildings at Port Aransas will be sighted as the pass is approached. The 78-foot-high tower of a rear range light, toward the S end of San Jose Island, shows prominently from the Gulf.

The flashing white and green rotating aerolight at the naval air station on Encinal Peninsula on the S side of Corpus Christi Bay is reported visible from the Gulf and from Corpus Christi Channel in the bay.

Aransas Pass Light (27°50.3′N., 97°03.5′W.), 140 feet above the water, is shown from a skeleton steel tower at the Aransas Pass Coast Guard Station. A radiobeacon is at the light.

Vessels should approach Aransas Pass through the prescribed Safety Fairways. (See 166.100 through 166.200, chapter 2.) **Note:** The Aransas Pass Safety Fairway, the SE approach to Aransas Pass, consists of partially divided parallel shipping fairways instead of a single fairway. These parallel fairways are not a traffic separation scheme. However, in the interest of vessel traffic safety, the use of the NE lane for inbound **(298°)** traffic and the SW lane for outbound **(118°)** traffic is recommended.

COLREGS Demarcation Lines.–The lines established for Aransas Pass are described in 80.850, chapter 2.

Channels.–The entrance channel through Aransas Pass is protected by jetties. A Federal project provides for an outer bar channel, 47 to 45 feet deep; a jetty channel, 45 feet deep; and an inner basin at Harbor Island with a depth of 45 feet.

Corpus Christi Channel extends from Aransas Pass to Corpus Christi on the W side of Corpus Christi Bay. For about 4 miles, at the E end, it extends through Turtle Cove between Harbor Island on the N and Mustang Island on the S; thence across Corpus Christi Bay to Corpus Christi. The channel is straight except for a 15° bend at about its midway point just S of Ingleside Cove. The Federal project depth is 45 to 40 feet to the Corpus Christi Turning Basin, thence 40 feet to the Viola Turning Basin, 28.5 miles from the outer bar.

A barge assembly basin, on the S side of Corpus Christi Channel, is entered through two channels

about 7 and 8 miles W of Port Aransas. In 1970, depths of 14 feet were available in the basin.

La Quinta Channel branches N from Corpus Christi Channel, and follows the NE side of Corpus Christi Bay to a turning basin at an alumina plant 4.5 miles above the entrance. Federal project depth is 45 feet in the channel and basin.

(See Notice to Mariners and latest editions of charts for controlling depths for the above deep-draft channels.)

Jewel Fulton Canal branches off La Quinta Channel about 2 miles NW of its junction with Corpus Christi Channel. The canal extends about 0.8 mile NE to a turning basin in Kinney Bayou. In November 1983, the controlling depth was 12 feet in the channel and 7½ feet in the basin. The entrance channel is marked by a light and daybeacons.

Encinal Channel branches off from Corpus Christi Channel about 0.6 mile W of the La Quinta Channel junction. It extends about 7 miles S to a turning basin at the naval air station on **Encinal Peninsula** on the S side of Corpus Christi Bay. The controlling depths were reported to be about 10 feet in the channel and 12 feet in the basin in August 1982. The channel is seldom used.

Anchorages.–Vessels should anchor off Aransas Pass in the Aransas Pass Fairway Anchorages. (See 166.100 through 166.200, chapter 2.)

Inside Aransas Pass, there is no suitable anchorage for deep-draft vessels. Light-draft vessels up to about a 10-foot draft can anchor in Lydia Ann Channel N of Inner Basin. Also, lighter draft vessels can anchor in Corpus Christi Bay in depths up to 13 feet and behind the breakwater off Corpus Christi in depths up to 15 feet. Under certain conditions, ships are anchored to short scope in the turning basins.

A **special anchorage** is in Corpus Christi Bay. (See 110.1 and 110.75, chapter 2, for limits and regulations.)

Tides and currents.–The diurnal range of tide at Aransas Pass is 1.4 feet. In Corpus Christi and Redfish Bays the periodic tide is too small to be of any practical importance.

The currents at times have velocities exceeding 2.5 knots in Aransas Pass; they are greatly influenced by winds. Predictions may be obtained from the Tidal Current Tables.

Winds from any E direction make a rough bar and raise the water inside as much as 2 feet above normal. Winds from any W direction have an opposite tendency. A sudden shift of the wind from S to N makes an especially rough bar for a short time. During summer months, S winds prevail, becoming moderate to fresh in the afternoon.

Weather.–Although located on the Gulf, Corpus Christi has an intermediate climate between that of the humid subtropical region to the NE and those of the semiarid region to the W and SW.

Normal rainfall for Corpus Christi is about 28 inches a year. Peak rainfall months are May and September, and the winter months have the least amounts. The season of tropical storms is from June to November and affects the rainfall during this period, otherwise these months are usually dry. Several months during the years of record have had no rainfall or only a trace. Since records began in 1887, snow has fallen on an average of about 1 day every 2 years.

There is little change in the day-to-day weather in the summer, except for an occasional rain shower or a tropical storm in the area. Maximum temperatures range in the high eighties to low nineties, except for brief periods in the high nineties, occasioned by a shift in the wind direction from the prevailing SE to S and SW. The sea breeze during the afternoon and evening moderates the heat of the summer day. Minimum temperatures are usually in the low seventies. The record maximum temperature in Corpus Christi was 105°F. The maximum temperatures usually occur about noon, with afternoons more pleasant than mornings in that they are usually cloudless and windy. In the summer season, the region receives near 80 percent of possible sunshine.

The fall months of September and October are essentially an extension of the summer months. November is a transition to the conditions of the coming winter months, with greater temperature extremes, stronger winds, and the first occurrences of "northers". The winters are relatively mild. Temperatures below 32°F seldom occur near the bay. January is the coldest month with a normal monthly temperature of 56.3°F and a prevailing N wind. The most extreme occurrences of cold weather are those in which daytime maxima do not exceed 32°F, which occur on the average of not more than about once every 3 to 4 years.

Relative humidity, because of the nearness of the Gulf of Mexico, is high throughout the year. However, during the afternoons the humidity usually drops to 50 and 60 percent.

Severe tropical storms average about one every 10 years. Lesser strength storms average about one every 5 years. The city of Corpus Christi has a feature not found in most other coastal cities. A bluff rises 30 to 40 feet above the level of the lowlands areas near the bay. This serves as a natural protection from high water. Protection for the main city is now furnished by seawalls. The chief hurricane months are August and September, although tropical storms have occurred as early as June and as late as October. Most of the storms pass either to the S or E of the city. Tornadoes are of infrequent occurrence in the area. Hail occurs about once a year.

While 26 hurricanes have affected Corpus Christi since 1900, only a few have been severe. In August 1916, a fast moving hurricane blew in over the city; winds reached 90 mph before the wind instruments were wrecked. In September 1919, a storm center moved ashore just S of the city, bringing a 16-foot storm tide, and was responsible for more than 300 deaths. Beulah, in September 1967, while moving inland near Brownsville, generated a 7-foot storm tide at Corpus Christi. Celia, in August 1970, belted the city with sustained winds of 125 mph and gusts to 161 mph.

The National Weather Service maintains an office in Corpus Christi where **barometers** may be compared, or they may be compared by telephone. (See appendix for address.)

(See page T-11 for **Corpus Christi climatological table.**)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. The Aransas-Corpus Christi pilots maintain an office and lookout on the S jetty. The pilot boat, ARANSAS PILOT, is a 42-foot steel vessel with a black hull and white superstructure with the word PILOT on each side of the deckhouse. The pilot boat flies the International Code flag "P". The pilots board vessels between the sea buoy, Aransas Pass Entrance Lighted Whistle Buoy AP, and Lighted Buoy 3.

The pilots monitor VHF-FM channels 12 (156.60 MHz) and 16 (156.80 MHz) continuously, and the pilots carry portable VHF-FM radiotelephones and use channel 12 (156.60 MHz) as working frequency.

Pilot services are available 24 hours a day, and arrangements for pilot services are usually made by telephone (512-749-5444 or 888-6230) through the Corpus Christi marine operator, through the harbormaster (telephone 512-882-1773), through ships' agents, or by radiotelephone on VHF-FM channel 12 to the pilot station or the harbormaster. A 2-hour advance notice of time of arrival is requested.

The harbormaster, pilot station, pilot boat, and all tugs and pilots maintain radio communications on VHF-FM channels 12 (156.60 MHz) and 16 (156.80 MHz) for docking, undocking, and all harbor movements.

Towage.-Tugs up to 3,200 hp are available at Corpus Christi and serve all of the Corpus Christi Bay area. The tugs are equipped with VHF-FM radiotelephones and use channels 12 (156.60 MHz), 13 (156.65 MHz), and 16 (156.80 MHz). Divers and salvage equipment are available.

Quarantine, customs, immigration, and **agricultural quarantine** officials are stationed in Corpus Christi. (See appendix for addresses.) Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

There are several hospitals in Corpus Christi.

Corpus Christi is a **customs port of entry.**

Coast Guard.-A **marine safety office** is in Corpus Christi. (See appendix for address.)

Port of Corpus Christi (see also chart 11311) is on the W side of Corpus Christi Bay about 20 miles from the outer end of the jetties at Aransas Pass. The port limits include all of Nueces County, Tex. Corpus Christi Main Harbor includes all of the waterfront facilities along the Industrial Canal, Tule Lake Channel, and Viola Channel, including the turning basins from Corpus Christi Turning Basin to Viola Turning Basin. Harbor Island, Port Aransas, Port Ingleside, and La Quinta are included in the port area.

The principal imports are crude oil, molasses, bauxite, chrome, zinc, bulk ores, petroleum products, paints and pigments. The principal exports include wheat and other grains, sorghums, flour, animal feeds, flax seed, cotton, petroleum products, zinc spelter, aluminum products and ores, coal tar products, caustic soda, industrial chemicals, synthetic rubber, carbon black, canned food, machinery, and general cargo. There is considerable local and coastwise movements of petroleum products, shell, sand and gravel, cement, various ores and metals, coal tar products, alcohol, sulfuric acid, and industrial chemicals.

Harbor regulations.-Port of Corpus Christi Authority, headed by the Port Director, has jurisdiction and control over the Port of Corpus Christi. The **harbormaster** assigns berths and enforces port regulations. VHF-FM channels 12 (156.60 MHz) and 16 (156.80 MHz) (call sign, KKQ-769) are monitored continuously from the harbormaster's office at Wharf No. 1 on the S side of the Corpus Christi Turning Basin. A **speed limit** of 4 knots is enforced in the harbor.

Wharves.-Corpus Christi has more than 100 piers and wharves. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 25, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths for the facilities described are reported; for information on the latest depths contact the operator. Water and electrical shore power connections are available at most piers and wharves. Almost all the facilities have highway and railroad connections.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility.

Over 45 acres of open storage space, 2 million square feet of covered storage, and over 900,000 cubic feet of cold storage space are available in the port. Mobile cranes to 600 tons, a 45-ton floating crane, and a 100-ton stiff-legged derrick are available at the port.

Harbor Island:

American Petrofina Pipe Line Co., Ship Dock (27°50'40"N., 97°03'40"W.): 260-foot face, 395 feet with dolphins; 53 feet alongside; deck height, 13 feet; receipt of crude oil; owned and operated by American Petrofina Pipe Line Co.

Exxon Pipeline Co. Dock No. 1: 300 yards SW of American Petrofina Pipe Line Co. Dock; 233-foot face, 815 feet of berthing space with dolphins; 35 to 43 feet alongside; deck height, 14 feet; receipt and shipment of crude oil; owned and operated by Exxon Pipeline Co.

Port Ingleside:

Sunoco Terminals, Ingleside Terminal Wharf (27°49'12"N., 97°12'04"W.): 60-foot face, 1,000 feet with dolphins; 40 to 42 feet alongside; deck height, 18 feet; receipt and shipment of crude oil and

occasionally petroleum products; bunkering vessels; owned and operated by Sunoco Terminals, Inc.

La Quinta Channel:

Du Pont Ship Wharf (27°52.1′N., 97°14.7′W.): 56-foot face, 920 feet with dolphins; 39 feet alongside; deck height, 15 feet; shipment of caustic soda and carbon tetrachloride; owned and operated by E. I. du Pont de Nemours & Co., Inc.

Reynolds Metals Co., Sherwin Plant, Alumina Dock (27°52′43″N., 97°15′38″W.): 400-foot face, 960 feet with dolphins; 37 to 39 feet alongside; deck height, 9 feet; fixed loading tower with loading chute, conveyor system, loading rate 825 tons per hour; shipment of bulk alumina, aluminum pigs and billets, and scrap carbon; receipt of caustic soda and fuel oil; owned and operated by Reynolds Metals Co.

Reynolds Metals Co., Sherwin Plant, Pier: 200 yards W of Alumina dock; 60-foot face, E and W sides 705 feet long; 42 to 44 feet alongside E side, 40 to 42 feet alongside W side; deck height, 10 feet; hopper and conveyor system for self-unloading vessels, unloading rate 2,500 tons per hour; receipt of bauxite and caustic soda and fuel oil; owned and operated by Reynolds Metals Co.

N side Corpus Christi Turning Basin:

Port of Corpus Christi, Cargo Dock No. 9: 150 yards NW of highway bridge; 660-foot face, 760 feet with trestle; 28 feet alongside; deck height, 15 feet; 32,000 square feet covered storage, cranes up to 35 tons, electric magnets and buckets; receipt and shipment of general cargo, receipt of molasses; owned and operated by Port of Corpus Christi Authority.

Port of Corpus Christi, Cargo Dock No. 10: 375 yards NW of highway bridge; 362-foot face, 700 feet of berthing space with Dock 11; 26 feet alongside; deck height, 15 feet; 45,000 square feet covered storage; cranes up to 30 tons, electric magnets and buckets; receipt and shipment of general cargo; owned and operated by Port of Corpus Christi Authority.

Port of Corpus Christi, Cargo Dock No. 11: 450 yards NW of highway bridge; 300-foot face, 700 feet of berthing space with Dock 10; 26 feet alongside; deck height, 15 feet; cranes up to 30 tons; receipt and shipment of newsprint; owned and operated by Port of Corpus Christi Authority.

Port of Corpus Christi, Oil Dock No. 1: 0.35 mile WNW of highway bridge; 64-foot face with 1,000 feet of berthing space with shore moorings; 31 feet alongside; deck height, 16 feet; receipt and shipment of crude oil, petroleum products, chemicals, naphtha, and liquid fertilizer; owned by Port of Corpus Christi Authority and operated by various companies.

Port of Corpus Christi, Oil Dock No. 2: 0.45 mile WNW of highway bridge; 156-foot face, 350 feet of berthing space with dolphins; 26 feet alongside: deck height, 10 feet; receipt and shipment of crude oil, petroleum products, naphtha, and liquid fertilizers; owned by Port of Corpus Christi Authority and operated by various companies.

Port of Corpus Christi, Cargo Dock No. 12: 0.7 mile WNW of highway bridge; 200-foot face, 700 feet with shore moorings; 18 feet alongside; deck height, 12 feet; cranes to 35 tons; 10 acres open storage; receipt and shipment of general cargo; owned and operated by Port of Corpus Christi Authority.

S side of Corpus Christi Turning Basin:

Port of Corpus Christi, Wharves Nos. 1 and 2: 175 yards W of highway bridge; 640-foot face; 32 feet alongside; deck height, 15 feet; 73,000 square feet covered storage; receipt and shipment of general cargo and cotton; owned and operated by Port of Corpus Christi Authority.

Port of Corpus Christi, Wharves Nos. 3, 4, 5, and 6: 0.25 mile W of highway bridge; 1,260-foot face; 33 feet alongside; deck height, 15 feet; 131,000 square feet covered storage; receipt and shipment of general cargo; owned and operated by Port of Corpus Christi Authority.

Port of Corpus Christi, Wharf No. 8: 0.4 mile W of the highway bridge; 448-foot face; 32 feet alongside; deck height, 15 feet; 15 acres open storage; receipt and shipment of general cargo; owned and operated by Port of Corpus Christi Port Authority.

Port of Corpus Christi, Richard King Terminal; Wharves Nos. 14 and 15: 0.55 mile W of highway bridge; 938-foot face; 30 to 34 feet alongside; deck height, 15 feet; 81,300 square feet covered storage, 1.3 acres of open storage, 100-ton stiff-legged derrick; receipt and shipment of general cargo; owned and operated by Port of Corpus Christi Authority.

Mobil Pipe Line Co. Terminal Dock No. 1: 0.8 mile W of highway bridge; 73-foot face, 178 feet with dolphins; 36 feet alongside; deck height, 12 feet; receipt and shipment of crude oil and petroleum products; owned and operated by Mobil Pipe Line Co.

Southwestern Refining Co. Dock No. 3: 1 mile W of highway bridge; 110-foot face, 800 feet of berthing space with mooring structures; 41 feet alongside; deck height, 14 feet; receipt of crude oil, receipt and shipment of petroleum products; bunkering vessels; owned and operated by Southwestern Refining Co.

N side Industrial Canal:

Corpus Christi Public Grain Elevator Wharf: 1.55 miles W of highway bridge; 205-foot face, 1,000 feet of berthing space with shore moorings; 34 feet alongside; deck height, 13 feet; grain gallery with conveyors and five loading spouts, loading rate 80,000 bushels per hour, 5½-million-bushel grain elevator; shipment of grain; owned and operated by Port of Corpus Christi Authority.

S side Industrial Canal:

Southwestern Refining Co. Dock No. 2: 1.2 miles W of highway bridge; 121-foot face, 800 feet of berthing space with mooring structures; 45 to 47 feet alongside; deck height, 10 feet; receipt of crude oil, receipt and shipment of petroleum products and petrochemicals; bunkering vessels; owned by Southwestern Refining Co. and operated by Southwestern Refining Co. and Champlin Petroleum Co.

Champlin Petroleum Co., Oil Dock No. 1: 1.5

miles W of highway bridge; 111-foot face, 700 feet of berthing space with mooring structures; 42 feet alongside; deck height, 14 feet; receipt and shipment of petroleum products; bunkering vessels; owned and operated by Champlin Petroleum Co.

S side Avery Point Turning Basin:

PPG Industrial Pier: 1.9 miles WNW of highway bridge; 100-foot face, E and W sides 520 feet long, 440 feet of berthing space; 22 feet alongside; deck height, 15 feet; 21,000 square feet covered storage; conveyor system, loading rate 200 tons per hour; shipment of gasoline and diesel oil; owned by PPG Industries, Inc. and operated by Champlin Petroleum Co.

S side Tule Lake Channel:

Port of Corpus Christi, Oil Dock No. 4: 2.15 miles W of highway bridge; 143-foot face, 850 feet of berthing space with mooring structures; 40 feet alongside; deck height, 16 feet; receipt and shipment of crude oil and petroleum products, shipment of chemicals and petrochemicals; bunkering vessels, loading barges for bunkering vessels; owned by Port of Corpus Christi Authority and operated by various companies.

Port of Corpus Christi, Oil Dock No. 7: 2.3 miles WNW of highway bridge; 143-foot face, 850 feet of berthing space with mooring structures; 40 to 37 feet alongside; deck height, 16 feet; receipt and shipment of crude oil and petroleum products, shipment of petrochemicals; bunkering vessels, loading barges for bunkering vessels; owned by Port of Corpus Christi Authority and operated by various companies.

Port of Corpus Christi, Oil Dock No. 11: 2.45 miles WNW of highway bridge; 143-foot face, 290 feet with dolphins; 42 to 37 feet alongside; deck height, 16 feet; receipt and shipment of crude oil, petroleum products, and petrochemicals; receipt of liquified petroleum gas; bunkering vessels; owned by Port of Corpus Christi Authority and operated by various companies.

An emergency yellow strobelight has been established on Oil Dock 11 to warn approaching traffic in the event of a liquified flammable gas spill, fire, or other hazardous conditions.

Interstate Grain Co. Elevator Wharf: 1.1 miles above Upper Harbor Bridge; 340-foot face, 900 feet of berthing space with mooring structures; 40 feet alongside; deck height, 10 feet; grain gallery with conveyor and five loading spouts, loading rate 80,000 bushels per hour, 6½-million-bushel grain elevator and warehouse; shipment of grain; owned and operated by Interstate Grain Co.

Saber Refining Co., Tanker Dock No. 2: 1.4 miles above Upper Harbor Bridge; 115-foot face; 1,000 feet of berthing space with mooring structures; 42 feet alongside; deck height, 18 feet; storage tanks with capacity over 2½ million barrels; receipt and shipment of LPG, crude oil, and petroleum products; fueling vessels and loading barges for bunkering vessels at berth; owned and operated by Saber Refining Co.; under construction in 1982.

Saber Refining Co., Tanker Dock No. 3: 1.6 miles above Upper Harbor Bridge, 115-foot face; 1,000 feet of berthing space with mooring structures; 42 feet alongside; deck height, 18 feet; receipt and shipment of LPG, crude oil, and petroleum products; fueling vessels and loading barges for bunkering vessels at berth; owned and operated by Saber Refining Co.

N side Tule Lake Channel:

Champlin Petroleum Co., Oil Dock No. 3: 2.2 miles above Upper Harbor Bridge; 62-foot face, 1,000 feet with platforms; 48 feet alongside; deck height, 22 feet; receipt of crude oil and asphalt by tanker and barge; owned by Champlin Petroleum Co. and operated by Champlin Petroleum Co. and Texas Fuel & Asphalt Co.

Port of Corpus Christi, Bulk Materials Dock: 0.4 mile above Upper Harbor Bridge; 394-foot face, 835 feet of berthing space with shore moorings; 38 to 32 feet alongside; deck height, 12 feet; 35-ton mobile cranes; traveling unloading tower with 7-cubic-yard buckets, unloading rate 500 tons per hour; receipt and shipment of bulk ores and other dry bulk commodities; owned and operated by Port of Corpus Christi Authority.

S side Viola Turning Basin:

Port of Corpus Christi, Oil Dock No. 8 (27°50′31″N., 97°31′16″W.): 87-foot face; 1,000 feet of berthing space with shore moorings; 37 feet alongside; deck height, 16 feet; receipt of crude oil; receipt and shipment of petroleum products, shipment of petrochemicals; bunkering vessels, owned by Port of Corpus Christi Authority and operated by Koch Refining Co. and Gulf States Oil and Refining Co.

Port of Corpus Christi, Oil Dock No. 9: 225 yards W of Dock 8; 57-foot face, 320 feet with dolphins; 32 to 30 feet alongside; deck height, 9½ feet; receipt of crude oil, receipt and shipment of petroleum products, shipment of petrochemicals; bunkering vessels; owned by Port of Corpus Christi Authority and operated by Koch Refining Co. and Gulf States Oil and Refining Co.

Supplies.–Water is available at all berths, and bunker fuels are available at the oil wharves and by barge at other berths. General and marine supplies are available; unusual items can be obtained from Galveston or Houston.

Repairs.–Corpus Christi has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Galveston. Several well-equipped firms are available for making above-the-waterline repairs to vessels. Shafts up to 25 feet in length can be produced by a local firm.

Repair facilities are available for medium-draft vessels. The largest floating drydock has a lifting capacity of 2,200 tons, length of 200 feet, width of 70 feet, and 16 feet over the keel blocks. The largest vertical boat lift has a capacity of 170 tons and can handle 125-foot vessels. A marine railway can handle keeled vessels up to 650 tons and flat bottom craft up to 1,000 tons; length of cradle, 140 feet, clear width of cradle at top of keel blocks, 52 feet.

Regulations have been established by the Nueces

County Navigation Commission governing the repairing of ships, particularly "hot work". Copies of these regulations can be obtained from the port officials.

Communications.–Three trunk railroads, the Missouri-Pacific, Southern Pacific, and Texas-Mexican, serve the port. Numerous motor freight lines operate from the port, and buslines serve the city. Airlines provide transportation from Corpus Christi International Airport NW of the city. Over 100 shipping companies provide water transportation to ports on the Gulf, Atlantic, and Pacific Coasts, and all world ports. Taxi and local bus service is available.

Port Aransas is a small commercial fishing and resort town on the N end of **Mustang Island** at the inner end of Aransas Pass. A marked dredged channel leads to a turning basin just inside the pass. In August 1983, the controlling depth was 9½ feet in the channel with 10 to 12 feet in the basin.

There are boatyards and a municipal marina in the basin. Lifts can handle craft up to 50 feet for general repairs or storage. Gasoline, diesel fuel, freshwater, ice, marine supplies, provisions, open and covered berths, and launching ramps are available. A 1,200-foot fishing pier extends into the Gulf about 0.5 mile S of Aransas Pass. An automobile ferry operates between Port Aransas and Harbor Island. A Coast Guard station is at Port Aransas.

Storm warning signals are displayed. (See chart.)

Harbor Island is at the head of Aransas Pass. Large oil-handling plants with berths are on the SE end of the island (see Wharves, Corpus Christi.). A dredged turning basin is E of the berths along the N side of the ship channel. A highway from the terminals crosses Morris and Cummings Cut and Redfish Bay, and leads to the town of Aransas Pass on the mainland.

Pilings, some submerged, of a former mooring slip were reported N of Harbor Island on the W side of Lydia Ann Channel.

From the Inner Basin off Harbor Island, a dredged channel leads NW to a basin off the town of **Aransas Pass,** with a connecting channel leading into **Conn Brown Harbor.**

In February 1984, the controlling depths were 12 feet (14 feet at midchannel) to the turning basin off the town of Port Aransas, thence in December 1983, 10 feet in the basin, thence 14 feet in the connecting channel to Conn Brown Harbor with 14 feet in the harbor.

A canal crossing the W end of Aransas Pass Channel extends along the E side of the town, sheltered from Redfish Bay by a spoil bank. S of the causeway the canal offers good protection to small boats. The channel and harbor to the N of the causeway have several seafood processing plants. A large fishing fleet operates out of the town.

There are boatyards and marinas in the harbor. The largest marine railway can handle craft up to 110 feet for general repairs or storage. Gasoline, diesel fuel, water, ice, marine supplies, open and covered berths with electricity, and launching ramps are available.

A 5-mph **speed limit** is enforced in the channel and harbor from Harbor Island to the town of Aransas Pass. The **harbormaster** has an office in the harbor at the city dock. The town has both highway and railroad connections to all parts of the State.

Storm warning signals are displayed. (See charts.)

Corpus Christi Bayou, at the S end of Aransas Bay, provides small craft a shortcut from Aransas Bay via **Morris and Cummings Cut** to Corpus Christi Bay. The bayou entrance is marked by a daybeacon on the S side of the channel and had a reported controlling depth of about 2 feet in January 1982. The channel is crooked and difficult to follow, as only a few piles mark the channel. The controlling depth through Morris and Cummings Cut is about 4 feet. About midway, this cut is crossed by a dredged channel from Aransas Pass to the town of Aransas Pass. In Morris and Cummings Cut just S of the dredged channel, the width is 24 feet through the draw of a bridge from which the bascule span has been removed. About 0.1 mile S of the dredged channel, the fixed span of a highway causeway bridge has a width of 28 feet and a clearance of 8 feet. Overhead power cables crossing at the bridges have a clearance of 28 feet.

A privately maintained and marked channel leads from the S end of Morris and Cummings Cut to a basin at the S end of the town of Aransas Pass; the reported controlling depth in August 1982 was about 5 feet.

Redfish Bay is shallow; it extends N along the mainland from Corpus Christi Bay to Aransas Bay. The dredged channel of the Intracoastal Waterway is adjacent to the mainland shore, traversing the bay N to S and joining Corpus Christi deep-draft channel at Port Ingleside.

Corpus Christi Bay is a large body of water, roughly elliptical in shape, lying to the W of Mustang Island and connected with Aransas Pass by the Corpus Christi Channel. The bay is about 15 miles long in an E and W direction and 11 miles wide at its widest part. About the E end of the bay the depths are 8 to 11 feet, and most of the rest of the bay has depths of 12 to 13 feet.

A **seaplane restricted area** is in Corpus Christi Bay. (See 207.188, chapter 2, for limits and regulations.)

Shamrock Cove, on the SE side of Corpus Christi Bay, affords good anchorage for small boats in depths of 7 to 8 feet, soft mud bottom. Shoals extend about 0.2 mile W and 0.3 mile S of **Shamrock Point.** In 1971, a 2-inch steel pipe, showing at low water, was reported near midentrance in Shamrock Cove, about 0.4 mile ESE of Shamrock Point. In April 1979, a submerged 6-inch steel pipe was also reported about 0.6 mile SSW of Shamrock Point.

In **Port Ingleside,** on the N shore of Corpus Christi Bay about 7.5 miles W of Aransas Pass, is a privately owned oil terminal. There are piers in a basin and a deep-draft wharf N of the Corpus Christi Channel.

A barge assembly basin, with attendant mooring buoys and a controlling depth of 1 foot in May-July 1981, is off the S side of the Corpus Christi Channel

opposite the oil piers at Port Ingleside. This basin is intended for the temporary moorings of barges.

La Quinta deep-draft channel is along the E side of Corpus Christi Bay, branching off Corpus Christi deep-draft channel about 8.5 miles W of Aransas Pass, and leads N through **Ingleside Cove** and **Donnel Reef** to the piers of a large aluminum plant in the turning basin at the town of La Quinta.

Ingleside on the Bay, a fishing community on the E shore of Ingleside Cove, has a marina at the S end of the cove that can accommodate boats up to 50 feet. Gasoline, diesel fuel, water, and open and covered berths with electricity, a launching ramp, and limited marine supplies are available. The unmarked channel leading to the facility had a reported controlling depth of about 5 feet in August 1982.

Jewel Fulton Canal is a dredged channel which leads from La Quinta Channel to a turning basin in **Kinney Bayou.** In November 1983, the controlling depth was 12 feet in the channel and 7½ feet in the basin. The channel is marked by a light and daybeacons. A boatyard in the bayou has a 35-ton mobile hoist and can handle boats to 60 feet for hull and engine repairs.

In Ingleside Cove, S of Donnel Reef, there is good small-boat anchorage in depths of 9 to 10 feet.

Nueces Bay has depths of only 1 to 2 feet, and is of little importance; it is a tributary of Corpus Christi Bay, partially separated from it by sandspits. **Indian Point** and **Rincon Point,** the NE and SW entrance points, respectively, to Nueces Bay, are connected by U.S. Route 181 highway causeway. **Rincon Canal,** a privately maintained channel, marked by daybeacons and an unlighted **320°** range, leads NW from Corpus Christi Bay to the Rincon Industrial Park complex at the SE end of Nueces Bay inside Rincon Point. The channel connects with a series of spur channels which front the E side of the complex and lead into it. In August 1982, the main channel had a reported controlling depth of 8 feet, and the connecting channels were reported dredged to 12 feet. The Industrial Park, in various stages of construction, will serve as a shallow-draft commerce terminal. A bascule span, maintained in the closed position, of the causeway over the main channel has a clearance of 50 feet. (See 117.245(a) and (j)(39), chapter 2, for drawbridge regulations.) The poles of a former power cable extend across the entrance to Nueces Bay below the causeway, and the piling of a former railroad bridge remain, except for removed sections at both ends.

A privately maintained channel, with reported depths of about 4 feet, leads to a marina at the NE end of the causeway. Covered berths for boats up to 40 feet, gasoline, oil, and marine supplies are available. A 10-ton lift can handle boats up to 40 feet for hull and engine repairs. A public launching ramp is near the marina. The channel is narrow and difficult to follow, and local knowledge is essential. **Nueces River** emptying into the W part of Nueces Bay is navigable for shallow-draft boats for a distance of 9 miles to a dam. The river is of no commercial importance.

Chart 11311.–Corpus Christi Harbor, on the N side of Corpus Christi, consists of inland basins connected by an industrial canal. The basins and connecting canal are landlocked and well protected.

Corpus Christi, (see also chart 11309) on the W side of Corpus Christi Bay and 18 miles from Aransas Pass, is the most important city commercially on the Texas coast SW of Galveston. The principal industries are in seafood processing, agriculture, livestock, meat packing and freezing, petroleum products, petrochemical and industrial chemicals, natural gas, manufacture of plastics, steel products, aluminum, zinc, machinery, oil field equipment, paper products, agricultural fertilizers, cement, gypsum products, textiles, and the shipment of wheat, cotton, and general cargo.

The city has several hospitals, a large municipal auditorium, a large boat harbor, and a Coast Guard air station.

Bridges.–U.S. Route 181 highway bridge over the entrance to Corpus Christi Turning Basin has a fixed span with a clearance of 138 feet over a center width of 300 feet. The combination highway and railroad bridge over the Industrial Canal, about 1.5 miles W of Avery Turning Basin, has a vertical lift span with a clearance of 9 feet down and 138 feet up. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable crosses the canal midpoint between Corpus Christi Turning Basin and Avery Point Turning Basin; clearance 165 feet.

Small-craft facilities.–The bay waterfront at Corpus Christi is protected by a breakwater nearly 2 miles long. Depths in most of the area behind the breakwater range from 5 to 17 feet, not including the ship channel crossing the N end. The main entrance is through the ship channel. Depths of 5 to 6 feet can be carried S inside the breakwater to three large piers of the municipal marina, about 0.7 mile S of the ship channel; boats should pass inshore of the center of this protected waterway. There are four openings in the breakwater S of the ship channel. The northernmost two are very shallow and are not used, with depths of 1 foot to bare, and the third opening was reported to have shoaled to about 4 feet in August 1982; the southernmost opening, which provides a direct entrance to the marina from the bay, has depths of about 7 feet and is marked on its N and S sides by lights.

There is a marina supervisor who assigns berths. His office is on the center pier. A municipal patrol and rescue boat operates from the marina. The patrol boat can be contacted through the marina supervisor (telephone, 512-882-7333) or the Corpus Christi police. The boat monitors VHF-FM channel 16 (156.80 MHz) when underway and is also equipped with VHF-FM channels 6 (156.30 MHz), 12 (156.60 MHz), and 26 (157.30 MHz).

The marina is opposite the center of the city and has excellent accommodations for yachts and small vessels. Protected berths for more than 500 craft are available in depths of 6 to 11 feet. Gasoline, diesel fuel, water, and launching ramps are available; a

repair yard has facilities for handling boats up to 40 feet, using a mobile hoist.

A repair yard on the N side of the Tule Lake Channel portion of the harbor channel has an 89-ton vertical lift and a 140-foot marine railway.

The Corpus Christi Yacht Club is at the marina.

Storm warning signals are displayed. (See chart.)

A **special anchorage area** is in the area S of the municipal marina. (See 110.1 and 110.75, chapter 2, for limits and regulations.)

Chart 11300.–Laguna Madre is a shallow body of water extending S from Corpus Christi Bay for a distance of 100 miles. Depths range from zero to 9 feet with reefs and mudflats throughout. The Intracoastal Waterway traverses Laguna Madre from Corpus Christi Bay to Port Isabel, Tex. (See chapter 12.) **Padre Island,** a low barren, storm-swept strip of sand beach, separates Laguna Madre from the Gulf. Most of the Island is part of the **Padre Island National Seashore** and subject to the rules and regulations of the U.S. Department of Interior's National Park Service.

A natural fishing reef is 1.5 miles offshore about 15.6 miles N of Port Mansfield jetties. Another natural fishing reef is 4.5 miles offshore about 11.2 miles N of the jetties.

Charts 11304, 11306.–Port Mansfield, 70 miles S of Corpus Christi Bay, is a commercial fishing and popular sport fishing and recreational center, and a base for oil exploration in Laguna Madre. A water tank at the town is prominent.

Vessels should approach Port Mansfield through the Port Mansfield Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.–The lines established for Port Mansfield are described in 80.850, chapter 2.

An 8.6-mile dredged channel leads from the Gulf, from a point 78 miles S of Aransas Pass and 31 miles N of Brazos Santiago Pass, through a jettied entrance and a land cut across Padre Island, and thence across Laguna Madre to a turning basin at Port Mansfield. A shrimp-boat basin and a small-craft basin extend S from the SW and SE corners of the turning basin, respectively. The entrance to the dredged channel is marked by a lighted whistle buoy 0.8 mile offshore, a lighted bell buoy off the end of the N jetty, and a lighted buoy off the end of the S jetty. The channel is marked by lights and daybeacons. In June 1983, the controlling depths were 26 feet in the bar and jetty channels, thence in February 1984, 9 feet (12 feet at midchannel) to the Intracoastal Waterway, thence in November 1983, 12 feet (14 feet at midchannel) to the turning basin with 14 feet in the basin, thence in March 1983, 12 feet in the shrimp-boat basin, and in March 1982, 8 feet in the small-craft basin. In November 1983, the controlling depth was 10 feet in the curved channels connecting the Intracoastal Waterway and Port Mansfield Channel.

Anchorages.–Vessels may anchor off the entrance to Port Mansfield on either side of the safety fairway.

Port Mansfield, under the jurisdiction of the Willacy County Navigation District, has a port director; a **harbormaster** assigns berths. There are berthing facilities, open storage space, commercial fish houses, and a transit shed with covered storage space. The basins have been bulkheaded, and vessels up to 128 feet can be berthed at finger piers in the shrimp-boat basin. There are about 200 berths in the small-craft basin.

There is a marina where berths with electricity, gasoline, diesel fuel, ice, water, and limited marine supplies are available.

A **speed limit** of 4 knots is enforced in the harbor. An improved highway connects with the nearest railroad shipping point at **San Perlita,** 14 miles distant, and with **Raymondville,** the nearest town of any size, 28 miles distant. Raymondville has a hospital, telegraph communications, and rail and highway connections.

Storm warning signals are displayed. (See charts.)

Charts 11301, 11303.–Arroyo Colorado enters Laguna Madre through **Arroyo Colorado Cutoff,** a dredged channel, 90 miles S from Corpus Christi. A dredged channel leads from the Intracoastal Waterway through Arroyo Colorado Cutoff and Arroyo Colorado to a turning basin at Port Harlingen, 22 miles from the mouth. In November 1983, the controlling depth was 11 feet to and in the basin.

A barge assembly basin with attendant mooring buoys and depths of about 14 feet is on the N side of Arroyo Colorado Cutoff about 1.7 miles W of the Intracoastal Waterway. This basin is intended for the temporary mooring of barges.

Arroyo City is a small village on the S bank about 6.5 miles W of the Intracoastal Waterway. There are fish camps at the village.

An overhead power cable with a reported clearance of 75 feet is about 1 mile N of Rio Hondo.

Rio Hondo is a small town on the Arroyo Colorado, about 20 miles above its mouth. There are privately operated wharves for the unloading of petroleum products and chemicals, and limited berthing facilities for pleasure craft. Water is available at a small pier. Ice by truck and provisions are available. There are railroad and highway connections to the N part of the state.

State Route 106 highway bridge at Rio Hondo has a vertical lift span with a clearance of 27 feet down and 73 feet up. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(41), chapter 2, for drawbridge regulations and opening signals.) Overhead power and telephone cables close S of the bridge have clearances of 63 feet.

Port Harlingen, under the jurisdiction of the Arroyo Colorado Navigation District known as the Port Commission, is E of Harlingen and about 2 miles above Rio Hondo. A Port Director is in charge of operations and enforces the regulations established by the Port Commission. A **speed limit** of 8 knots in the channel and 4 knots in the turning

basin is enforced. The Port Director assigns berths. There are two reinforced concrete wharves 650 feet and 100 feet long, three oil unloading piers, and aggregates and fertilizer wharf. A transit shed on the largest wharf has 12,000 square feet of covered storage, with a rail siding at a loading platform in the rear of the shed. All the wharves had a reported depth of 12 feet alongside in September 1982. Forklifts, crawler cranes, a grain elevator, and a compressed gas and oil storage facility are available. Water is available at the large wharf. Gasoline and diesel fuel are available by truck. The principal imports are petroleum products, steel products, and chemicals. The principal exports are grain, chemicals, and crude petroleum. There are railroad and highway connections to **Harlingen** and the interior. At Harlingen and **San Benito** there are hospitals, a grain elevator, railroad and bus transportation and communication facilities.

Charts 11301, 11302.-Brazos Santiago Pass (Brazos Santiago), the approach to Port Isabel and Port Brownsville, is a narrow pass from the Gulf to the lower end of Laguna Madre, between the S end of Padre Island and the N end of **Brazos Island.** It lies 236 miles SSW from Galveston entrance, 106 miles S from Aransas Pass, and 6 miles N from the mouth of the Rio Grande.

Prominent features.-In approaching Brazos Santiago Pass on a clear day, the radiobeacon antenna at the Coast Guard station and the water tank and Port Isabel Light are the first objects sighted. Soon thereafter the mariner will pickup Brazos Santiago Light and the Coast Guard station inside the entrance on the N side. The light on top of the radiobeacon antenna of the Coast Guard station is prominent at night. On clear nights it is reported to be visible 20 or more miles offshore. The large motels on Padre Island N of the entrance are prominent.

Port Isabel Light (26°04.6'N., 97°12.4'W.), 91 feet above the water, is shown from the white conical brick tower; the light is maintained by the State.

Brazos Santiago Pass Light (26°04.4'N., 97°09.8'W.), 136 feet above the water, is shown from atop the radiobeacon tower near the Coast Guard station on the N side of the entrance to Laguna Madre.

Storm warning signals are displayed. (See chart.)

Vessels should approach Brazos Santiago Pass through the Brazos Santiago Pass Safety Fairway or the Coastwise Safety Fairway. (See 166.100 through 166.200, chapter 2.)

COLREGS Demarcation Lines.-The lines established for Brazos Santiago are described in 80.850, chapter 2.

Channels.-The pass has been improved by the construction of two rubble mound jetties extending nearly 1 mile into the Gulf and by dredging a channel between them from deep water in the Gulf. Federal project depths are 38 feet through Brazos Santiago Pass, 36 feet across Laguna Madre to the junction of the channels leading to Port Brownsville and Port Isabel, 36 feet to Port Isabel turning basin, and 36 feet from the junction to the **Brownsville Turning Basin.** (See Notice to Mariners and latest editions of charts for controlling depths.)

The entrance is marked by a lighted whistle buoy about 2 miles E of the jetties, a lighted **269°30'** entrance range, a lighted bell buoy off the submerged part of the N jetty, and a lighted gong buoy off the end of the S jetty. The channels are marked by lighted ranges, lights, daybeacons, and lighted buoys.

In the 16-mile channel to Brownsville Turning Basin, **Boca Chica Cutoff Passing Basin** is 7 miles and **Goose Island Passing Basin** 11.3 miles above the outer end of the entrance jetties.

Private interests have dredged a ship basin at the S end of Padre Island just inside Brazos Santiago Pass entrance. The basin had shoaled to a reported depth of 9 feet in September 1982. There is a large motel-marina (boatel) in the basin where gasoline, diesel fuel, water, ice, open and covered berths, some marine supplies, and surfaced launching ramps are available.

Anchorages.-Vessels should anchor in the Brazos Santiago Pass Fairway Anchorages on either side of the safety fairway. (See 166.100 through 166.200, chapter 2.)

Directly off the entrance to Brazos Santiago Pass, the bottom is soft and affords fair anchorage with good holding ground; farther N and S the bottom is harder. After entering the pass, ships must proceed to the wharves. Once inside Brazos Santiago Pass, there is no satisfactory anchorage for deep-draft vessels.

Tides and currents.-The diurnal range of tide is 1.4 feet at Brazos Santiago Pass and 1.3 feet at Port Isabel. The variation in the water level is largely dependent on the wind.

Dangers.-An unmarked dangerous wreck is 4.5 miles N of Brazos Santiago Pass Entrance Lighted Whistle Buoy BS, and a fish haven is 1.3 miles N of the buoy.

Weather.-The climate of Brownsville is partly manmade. The prevailing winds of the area are from the Gulf of Mexico, but do not produce a truly marine climate. The region could be classified as semiarid because of the lack of rainfall, the result of the low elevation of the area which fails to give the air from the Gulf sufficient lift to cause condensation and of the considerable subsidence of the winds aloft due to the presence of mountains starting about 100 miles to the W. The manmade, and most important, climatic factor of this region is the irrigation that has changed the entire lower Rio Grande Valley into a semitropical area.

The normal annual rainfall of about 25 inches is poorly distributed, with maxima in May, June, and September. Most of the precipitation comes in the form of thunderstorm activity, and often a single thunderstorm will account for the entire month's rainfall. Some extreme rainfalls have occurred when hurricanes were in the vicinity. However, the frequency of hurricanes in this area is very small, and

the general path is a N and S one just off the coast in the Gulf.

Temperatures in summer and fall are not extremely high, but are fairly constant in the lower nineties during the daytime, and in the middle seventies at night. The prevailing onshore winds from the Gulf moderate the temperatures. The highest temperature recorded at Brownsville was 104°F in 1947.

Winter temperatures are mild, with the normal daily minimum for January, the coldest month, being 51.0°F. Frequently an entire winter will pass without a temperature as low as the freezing point occurring. The coldest temperature of record was 12°F in 1899.

Snow seldom occurs in Brownsville, however, local newspaper records reveal that 6 inches of snow blanketed the area in 1895.

Glaze is rare in Brownsville, but, during a cold wave in 1951, ice accretion was 1 to 1½ inches for the most severe glaze of record.

While hurricanes are rare in this region, Brownsville has suffered through some severe ones. In August 1880, the town was nearly destroyed by a storm. In August 1933, a hurricane generated 12- to 15-foot tides, and a month later another storm blasted Brownsville with sustained winds of 106 mph. During Beulah, in September 1969, a peak gust of 109 mph was recorded along with nearly 16 inches of rain; the SHIRLEY LYKES at anchor in Port Brownsville recorded 136-mph winds.

The National Weather Service maintains an office in Brownsville where **barometers** may be compared, or they may be compared by telephone. (See appendix for address.) (See page T-12 for **Brownsville climatological table.**)

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in foreign trade. Pilotage is optional for coastwise vessels that have on board a pilot licensed by the Federal Government. The Brazos Santiago Bar Pilots maintain a station on Padre Island near the Port Isabel Coast Guard Station. The pilot boat BROWNSVILLE PILOT is 50 feet long with a gray hull and white deckhouse with the word PILOT on the house. The pilots board vessels in the vicinity of the sea buoy. For boarding, pilots request that vessels maintain a speed of no more than 5 knots and have the pilot ladder rigged 5 to 6 feet above the water.

The pilot station monitors VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz), the pilot boat monitors VHF-FM channels 12 (156.60 MHz) and 16, and they use channels 6 (156.30 MHz), 9 (156.45 MHz), 12, and 13 as working frequencies. The harbormaster monitors channel 16.

Pilot services are available 24 hours a day weather permitting. Arrangements for Brazos Santiago Bar Pilots can be made through the harbormaster (telephone, 512-831-4592) or through the ships' agents. A minimum 2-hour notice of time of arrival is requested.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

There is a hospital in Brownsville.

Brownsville is a **customs port of entry.**

Coast Guard.-The **Captain of the Port** has an office in Port Isabel. (See appendix for address.)

Towage.-Two tugs of 1,600 and 1,800 hp are available at Brownsville for docking and undocking vessels, coastwise towing, or for salvage work.

Harbor regulations.-The Port Commission of the Brownsville Navigation District has jurisdiction and control over the Brownsville Ship Channel and turning basin and all wharves and transit sheds owned or operated by it. The Port Commission establishes rules and regulations governing the port. The Port Director is in charge of operations, and the **harbormaster** assigns berths and enforces the regulations. A **speed limit** of 8 knots in Brownsville Ship Channel and 4 knots in the turning basin is enforced.

Port Brownsville, about 14.5 miles from the inner end of Brazos Santiago Pass, is the port for the city of Brownsville. Exports include cotton, cotton products, lead, agricultural implements, zinc, sulfate, ores, chemicals, petroleum products, and citrus fruit. Imports are fruit, steel products, ores, and general cargo. Offshore oil rigs are constructed in Port Brownsville.

Brownsville, about 5 miles WSW of Port Brownsville, is a fast growing metropolis and the largest city in the rich agricultural section on the N side of the lower Rio Grande Valley that extends 100 miles W from the river mouth. Noted as a resort city, it is also a gateway to Matamoros, Mexico, on the opposite side of the Rio Grande.

Wharves.-The port of Brownsville has more than 40 piers and wharves. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 26, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths for the facilities described are reported; for information on the latest depths contact the operator. All the facilities described are owned and operated by the Brownsville Navigation District of Cameron County unless otherwise stated. All the facilities have highway, railroad, and water connections. Almost all have electrical shore power connections.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility. Two 150-ton floating cranes are available.

About 52 acres of open storage space, over 1 million square feet of covered storage, and over 2 million cubic feet of cold storage space are available in the port.

N side of Brownsville Ship Channel:

Brownsville Navigation District, Oil Dock No. 3 (25°57'35"N., 97°22'47"W.): 120-foot face, 420 feet with piers; 32 feet alongside; deck height, 14½ feet; storage tanks, 790,000-barrel capacity; receipt and shipment of petroleum products and chemicals; various operators.

Brownsville Navigation District, Oil Dock No. 2: 0.6 mile W of Dock No. 3; 120-foot face, 420 feet with platforms; 32 feet alongside; deck height, 14½ feet; storage tanks, 345,000-barrel capacity; receipt and shipment of crude oil and petroleum products; receipt of anhydrous ammonia; various operators.

Brownsville Navigation District, Oil Dock No. 1: 0.8 mile W of Dock No. 3; 120-foot face, 420 feet with platforms; 32 feet alongside; deck height, 14½ feet; receipt and shipment of crude oil and petroleum products; various operators.

N side of Turning Basin:

Brownsville Navigation District, Docks Nos. 7 and 8: 0.4 mile E from end of basin: 1,000-foot face, 1,125 feet with dolphins; 29 feet alongside; deck height, 12 feet; 100,000 square feet covered storage; 12 acres open storage; receipt and shipment of general cargo.

Brownsville Navigation District, Dock No. 2: 0.2 mile E from end of basin; 400-foot face; 32 feet alongside; deck height 12 feet; 32,000 square feet covered storage; 10 acres open storage; receipt of ores and bulk materials.

Brownsville Navigation District, Dock No. 1: 0.1 mile E from end of basin; 600-foot face; 29 feet alongside; deck height, 12 feet; 65,000 square feet covered storage; receipt of ores and bulk materials.

Brownsville Navigation District, Dock No. 4: NW end of basin; 425-foot face; 29 feet alongside; deck height, 12 feet; 47,000 square feet of covered storage; receipt of ores and bulk materials.

W end of Turning Basin:

Brownsville Navigation District, Dock No. 3: 450-foot face; 32 feet alongside; deck height 12 feet; shipment of scrap metal and ores.

S side of Turning Basin:

Brownsville Navigation District, Dock No. 5: SW end of basin; 300-foot face; 21 feet alongside; deck height, 10 feet; 100,000 square feet open storage; receipt and shipment of dry bulk commodities including ores and metals.

Brownsville Navigation District, Dock No. 9: 0.15 mile E from end of basin; 100-foot face, 21 feet alongside; deck height, 10 feet; receipt and shipment of dry bulk commodities including ores and metals.

Brownsville Navigation District, Dock No. 10: E side of S slip; 650-foot face; 21 feet alongside; deck height, 12 feet; receipt and shipment of dry bulk commodities including ores and metals.

Brownsville Navigation District, Dock No. 11: 0.3 mile E from end of basin; 600-foot face; 29 feet alongside; deck height, 12 feet; receipt and shipment of dry bulk commodities including ores and metals; receipt of steel products; shipment of scrap metal.

Brownsville Navigation District, Dock Nos. 12 and 13: 0.4 mile E from end of basin; 1,100-foot face; 28 to 29 feet alongside; deck height, 12 feet; 200,000 square feet covered storage; receipt and shipment of general cargo and ores; shipment of scrap metal.

S side of Brownsville Ship Channel:

Brownsville Navigation District, Grain Elevator Wharf (25°57′21″N., 97°22′55″W.): 400-foot face; 33 feet alongside; deck height, 12 feet; two traveling grain loading towers with conveyers and loading spout, loading rate 600 long tons per hour each tower; 3¾ million bushel grain elevator; shipment of grain.

Brownsville Navigation District, Liquid Cargo Dock (27°57′36″N., 97°22′18″W.): 60-foot face, 360 feet of berthing space with dolphins; 33 feet alongside; deck height, 10 to 14 feet; storage tanks, 200,000-barrel capacity; receipt and shipment of bulk liquids, lubricating oils, and vegetable oils; receipt of liquid sulphur and liquid fertilizer; operated by Sea Tank, Inc., and the Permian Corp.

Foreign-Trade Zone No. 62 is in Brownsville. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–All manner of marine supplies and provisions are available at the port. Freshwater is available at most of the wharves. Gasoline, diesel fuel, and kerosene are available at the oil wharves. Bunker fuels can be delivered by barge from Corpus Christi by special arrangements.

Repairs.–Port of Brownsville has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Galveston. Several firms are available for making above-the-waterline repairs to vessels. Shafts up to 30 feet long can be produced by a local firm. The largest marine railway can handle vessels up to 200 tons.

Small-craft facilities.–Brownsville Fishing Harbor is on the N side of the channel 3.6 miles below the head of the turning basin at Port Brownsville. In August 1983, the channel leading into the Brownsville Fishing Harbor had a controlling depth of 15 feet, thence depths of 14 feet in the harbor. Berthing facilities are usually leased to fishing companies and facilities for private yachts are very limited. There are seafood processing plants, marine supply outlets, and marine engine repair facilities in the fishing harbor. Two shipyards have marine ways, the larger capable of handling vessels up to 100 feet for general repairs. Gasoline, diesel fuel, water, ice, launching ramps, open and covered berths, and marine supplies are available. There is bus and taxi service from the basin to Brownsville. Most of the public facilities for yachts are at Port Isabel.

Communications.–Brownsville is connected with points in both the United States and Mexico by three trunkline railroads; the Missouri Pacific, the Southern Pacific, and the National Railways of Mexico. Switching service within the port is done by the Missouri Pacific Railroad. Several barge lines offer service at the port. Numerous motor freight lines operate out of the port and Brownsville. Steamship agencies represent numerous lines that offer service to all ports of the world. Airlines operate from the Rio Grande Valley International Airport about 4 miles E of the city, with daily scheduled flights to all parts of the United States. There is local taxi and bus service, and interstate bus service to all points.

Port Isabel, about 2.5 miles W from Brazos Santiago Pass, is an important point for the shipping of petroleum products by barge and the receipt of barge shipments of sand and gravel. It has a large

shrimp boat fleet, and the town is widely patronized as a resort for sport fishing and recreation.

Channels.–A marked, dredged channel leads from the Intracoastal Waterway, along the N side of the city, to the Port Isabel small-boat basin. In July 1983, the controlling depths were 7 feet from the Intracoastal Waterway to the basin entrance, thence 6 feet in the entrance to the basin, thence 6 feet in the basin.

A narrow dredged channel leads NW from the Intracoastal Waterway close SW of the pontoon bridge and leads around the N side of a small island marked at each end by a daybeacon. The channel connects with **Port Isabel Side Channel,** another dredged channel that extends W from the Intracoastal Waterway about 0.3 mile SW of the pontoon bridge and leads N to connect with side channels used principally by fishing vessels. In August 1983, the controlling depths were 11 feet in the channel around the island and 10 feet in Port Isabel Side Channel.

The deep-draft Port Isabel Channel departs the Laguna Madre Channel about 2.8 miles above the jetties and leads N for 1.2 miles to the turning basin at Port Isabel. A Federal project provides for a channel 36 feet deep from the Laguna Madre Channel to and in the turning basin at Port Isabel. (See Notice to Mariners and latest editions of charts for controlling depths.) The Intracoastal Waterway is described in chapter 12.

A causeway crossing the Intracoastal Waterway between Port Isabel and Padre Island has a fixed span with a clearance of 73 feet. The fixed span of the former causeway crossing the S end of Laguna Madre between Long Island and Padre Island has been removed; a 38-foot navigation opening remains. Overhead power and telephone cables at the former causeway have clearances of 39 feet at the navigation opening.

Wharves.–There are over 25 piers and wharves at Port Isabel. Most are of shallow draft and are used mainly by the seafood industry and for marine services and repairs. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 26, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The deep-draft facilities on the turning basin are owned by the Port Isabel-San Benito Navigation District and are managed by a **port director,** who assigns berths and controls the movement of vessels. A **speed limit** of 4 knots in the harbor and 8 knots in the ship channel is enforced.

The Port Isabel Turning Basin General Cargo Wharf, on the W side of the turning basin, has a 550-foot face with 30 feet reported alongside. About 50,000 square feet of covered storage, 72,000 square feet of open storage space, and storage tanks with 192,000-barrel capacity are available. The wharf is used for the receipt and shipment of general cargo, the receipt of sand and gravel, and the shipment of crude oil. The wharf has highway, freshwater, shore power, and pipeline connections.

The port has lay berth facilities for vessels to 200 feet long and 24-foot draft. An additional 600-foot cargo dock with 24 feet alongside is available and is currently used by the offshore drilling industry.

Supplies.–Port Isabel has no waterfront facilities for bunkering deep-draft vessels; fuel can be supplied to vessels berthed in the turning basin by tank barges from Corpus Christi. Gasoline, diesel fuel, and marine lubricants are available to fishing boats and other small vessels.

Repairs.–Port Isabel has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Galveston. Several firms are available for making above- and below-the-waterline repairs to smaller vessels. The largest marine railway can handle vessels up to 140 feet and 800 tons for general repairs.

Small-craft facilities.–There are several marinas at Port Isabel. (See the small-craft facilities tabulation on chart 11302 for services and supplies available.)

Communications.–Port Isabel has highway connections, and the Port Isabel Municipal Airport is about 8 miles NW of the city.

Del Mar Beach, on Brazos Island, is a swimming and fishing resort.

The **Rio Grande** empties into the Gulf of Mexico 6 miles S of Brazos Santiago Pass. The International Boundary and Water Commission states (December 28, 1953) that the river forms the International boundary between the United States and Mexico for 1,241 statute miles; further, that the total length of the boundary is 1,935 statute miles from the Gulf of Mexico to the Pacific Ocean. No survey of the river has been made recently, but access to the river over the entrance bar is limited to skiffs and small boats; inside, the channel is changeable. The International Boundary Commission has several dams on the Rio Grande to prevent freshwater from wasting into the Gulf.

The E coast of Mexico is described in Pub. No. 144, Sailing Directions (Enroute), Caribbean Sea, published by the Defense Mapping Agency Hydrographic/Topographic Center.

12. INTRACOASTAL WATERWAY, GULF SECTION

This chapter describes the **Intracoastal Waterway**, a toll-free "canal", from Caloosahatchee River, Fla., to Brownsville, Tex. The waterway except for a 140-mile stretch, Anclote River to Carrabelle, Fla., is a protected route inside the W coast of Florida and behind the Gulf Coast. The waterway is discussed in two sections: Caloosahatchee River to Anclote River, a distance of 150 statute miles; and Carrabelle to Brownsville, a distance of 1,059 statute miles. The outside route is described in chapter 5.

Also discussed in this chapter are the alternate routes of the Intracoastal Waterway: Algiers Alternate Route; Landside Route; Morgan City-Port Allen Alternate Route; and Atchafalaya River Route.

Supervision of the Intracoastal Waterway's construction, maintenance, and operation is divided among four U.S. Army Engineer Districts: Jacksonville, Mobile, New Orleans, and Galveston. (See appendix for addresses.)

Mileage.–The first section of the waterway is zeroed in 26°30.6'N., 82°01.1'W., near the mouth of the Caloosahatchee River at its junction with Okeechobee Waterway.

Distances along the Intracoastal Waterway are in statute miles to facilitate reference to the small-craft charts; all other distances are in nautical miles. Mileage conversion tables are on page T-29.

Channels.–The Federal project for the Intracoastal Waterway, Caloosahatchee River to Anclote River, provides for a channel 9 feet deep and 100 feet wide. Although effort is made to maintain the project depth, the channels may shoal several feet in places between maintenance dredgings. (See Local Notice to Mariners for controlling depths.) Additional information can be obtained from the U.S. Army District Engineers offices. (See appendix for addresses.)

Bridges.–Minimum overhead clearances of fixed bridges in this section of the waterway are 149 feet at **Mile 98.1.** Minimum horizontal clearance is 51 feet at the swing bridge at **Mile 63.0.**

General drawbridge regulations and opening signals for bridges over this section of the waterway are given in 117.1b and 117.240, chapter 2. Special drawbridge regulations for certain bridges that supplement the general regulations are referenced with the area description of the waterway.

Overhead cables.–Minimum clearance of overhead cables crossing this section of the waterway is 78 feet at **Mile 38.5.**

Cable ferries.–Cable ferries still cross the Intracoastal Waterway at several places.

Note: Generally, the cables are suspended during crossings and dropped to the bottom when the ferries dock; however, since operating procedures may differ in some cases, mariners are advised to exercise extreme caution and seek local knowledge. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Aids to navigation.–Intracoastal Waterway aids have characteristic yellow markings that distinguish them from aids to navigation marking other waters. (See U.S. Coast Guard Light Lists or Chart 1, Nautical Chart Symbols and Abbreviations, for illustrations of special markings.)

Tides.–The diurnal range of tide along this section of the waterway is from 1.6 to 3.0 feet. In most areas the tide level is greatly affected by the winds both in time and height.

Weather.–**Storm warning signals** are displayed at various places along the waterway and connecting channels. Display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Chart 11427.–From near the mouth of the Caloosahatchee River, the waterway crosses San Carlos Bay and enters Pine Island Sound, between Pine Island and Sanibel Island.

Strong cross currents are encountered in San Carlos Bay especially during ebb of spring tides between Pine Island Sound Daybeacon 2A and Daybeacon 8.

At **Mile 3.8,** an overhead power cable with a clearance of 26 feet, submerged at the waterway, crosses San Carlos Bay from St. James City to Woodrings Point.

A marina on the S side of Tarpon Bay has berths with electricity, gasoline, water, ice, limited marine supplies, and a launching ramp. In April 1982, a reported depth of 4 feet could be carried to the marina. **J. N. "Ding" Darling National Wildlife Refuge** is on Sanibel Island.

Pine Island Sound, between Pine Island and the outer islands, is the main thoroughfare between San Carlos Bay and Charlotte Harbor. Numerous small islands, keys, for the most part uninhabited, and shoals abound in the sound. Some of the islands are part of the **Pine Island National Wildlife Refuge.** The waterway through the sound is marked by lights and daybeacons.

Pine Island, between Pine Island Sound and Matlacha Pass, is about 13 miles long and about 2.5 miles wide at the N end. There are a number of seasonal and year-round settlements on the island.

St. James City is a small fishing and residential community on the S end of Pine Island, opposite **Mile 4.0.** In April 1982, the entrance channel had a reported controlling depth of 6 feet, and within the canal depths were 6 to 9 feet. A 5-ton hoist and a marine railway that can handle craft to 30 feet for hull and engine repairs are available.

There are several marinas and fish camps on

Monroe Canal and **Henley Canal** at St. James City where berths with electricity, gasoline, diesel fuel, water, ice, and some marine supplies can be obtained. Private daybeacons mark the entrance to **Long Cutoff,** which leads to the canals. In April 1982, the reported midchannel controlling depth was 6 feet. A road leads from St. James City to the N end of Pine Island and connects with a road across Little Pine Island and Matlacha Pass to Fort Myers and Cape Coral.

At **Mile 8.0,** an overhead power cable with a clearance of 85 feet over the waterway and 32 feet elsewhere crosses Pine Island Sound.

Opposite **Mile 10.0, Blind Pass,** which separates Sanibel Island from Captiva Island, enters Wulfert Channel and Pine Island Sound. Blind Pass is described in chapter 4.

Captiva is a small fishing and resort village on Captiva Island, W of **Mile 12.1** about 3 miles N of Blind Pass. Gasoline, water, ice, and some supplies are available at two marinas in Captiva. The approach channel, marked by a light and daybeacons, had a reported controlling depth of about 3½ feet in April 1982.

At **Mile 13.7,** a privately dredged and marked channel leads W from the waterway to a marina near the N end of Captiva Island. In April 1982, 6 feet was reported available in the channel. The marina has berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies.

Redfish Pass, W of **Mile 14.5,** separating Captiva Island and North Captiva Island is described in chapter 4. An unmarked channel reportedly skirting the N and E side of Captiva Island provides access to the marina near the N end of Captiva Island.

Captiva Pass, W of **Mile 18.0,** separating North Captiva Island and Cayo Costa is described in chapter 4. Fair anchorage is available for small boats in **Safety Harbor,** which is 0.5 mile S of Captiva Pass on the inner side of North Captiva Island. The depth inside the harbor is about 5 feet, but only small craft drawing less than 2 feet can enter. The holding ground is good, and the anchorage is well protected from all directions.

Useppa Island, near the N end of Pine Island Sound E of **Mile 21.5,** has a natural small-boat basin on its NW side. A privately marked channel leads to the basin; local knowledge is advised. The island is a private resort development with docking facilities for members only.

Cayo Costa is an island on the S side of the entrance to Charlotte Harbor. **Pelican Bay,** on the NE side of the island, affords well protected anchorage in depths of 4 to 7 feet. The entrance to Pelican Bay is through **Pelican Pass,** about 1 mile SSE from the N end of the island; the controlling depth is about 5 feet. A small circular basin at the N end of the bay affords excellent protection to small craft, but the entrance is reported almost filled in and is difficult to navigate.

At **Mile 22.6,** a channel marked by daybeacons and a light leads E from the waterway, N of Useppa Island, and thence NE to Charlotte Harbor in the vicinity of **Bokeelia Island.**

Charts 11427, 11426.–Bokeelia is a small settlement on **Bokeelia Island,** at the N end of Pine Island on the S side of Charlotte Harbor. Drafts up to about 5 feet can be taken to the wharf at Bokeelia. Several small marinas at Bokeelia, in **Back Bay,** can provide berths, gasoline, water, and ice. Launching ramps are available. A forklift can haul out craft to 26 feet for hull and engine repairs or storage. On the W side of Bokeelia Island, a privately marked channel leads from Charlotte Harbor through **Jug Creek** to Back Bay. In April 1982, the reported controlling depth through Jug Creek was 3 feet. An overhead power and telephone cable with a reported clearance of 22 feet crosses the mouth of Jug Creek. A 14-foot fixed highway bridge with a clearance of 9 feet connects Bokeelia Island with Pine Island E of Back Bay.

At **Mile 25.6,** the waterway enters Charlotte Harbor.

Boca Grande, the entrance from the Gulf of Mexico to Charlotte Harbor, Port Boca Grande, and Charlotte Harbor and its tributaries, Peace and Myakka Rivers, are discussed in chapter 4.

Chart 11425.–Anchorages.–Small vessels can anchor almost anywhere in Charlotte Harbor. Good depths for small craft can be found close inshore between Port Boca Grande and Boca Grande. Small craft also can use the lagoon at Boca Grande.

At **Mile 26.6,** the waterway passes Port Boca Grande.

Boca Grande, W of **Mile 28.6,** has marinas, boatyards, and a yacht basin. Berths with electricity, gasoline, diesel fuel, water, ice, marine supplies, and hull and engine repairs are available. The largest marine railway, in Boca Grande Bayou, can handle craft to 53 feet.

Boca Grande Bayou, a landlocked lagoon that provides shelter for small craft, can be entered from the waterway opposite **Mile 28.3.** The channel is marked by daybeacons, lights, and a private lighted range. In April 1982, the channel had a reported controlling depth of 6 feet. Boca Grande Bayou can also be entered at **Mile 29.4** by a privately dredged channel and a landcut. In April 1982, 9 feet was reported available in the channel. The bayou is crossed by two fixed highway bridges with a least channel width of 28 feet and a least clearance of 13 feet. Entry to the bayou from N is possible through a partially, privately marked channel.

Harbor Drive Waterway leads W from Boca Grande Bayou near its S entrance.

At about **Mile 30.0,** the waterway enters **Gasparilla Sound** which extends N from Charlotte Harbor for about 5 miles between **Gasparilla Island** and the mainland. **Island Bay National Wildlife Refuge** is about 2.2 miles E of the waterway.

At **Mile 34.0, Coral Creek** enters the head of Gasparilla Sound from N. A privately dredged channel leads NE from the waterway to the mouth

of the creek. In April 1982, the channel had a reported controlling depth of 7 feet. State Route 771 highway bridge crossing the creek about 0.4 mile above the mouth has a 13-foot fixed span with a clearance of 8 feet. An overhead power cable just above the bridge has a clearance of 32 feet.

The Seaboard System Railroad (SCL) trestle close NW has clearance for small skiffs only. **Placida** is a small village at the S end of the highway bridge. A marina with a boatyard is in the basin on the E side of the creek close S of the highway bridge. Berths with electricity, gasoline, water, ice, marine supplies, a launching ramp, and open and covered storage are available. In April 1982, there was reported to be 7 feet of water in the approaches and in the basin. A boatyard at the marina has a hydraulic lift that can handle craft to 75 tons for hull and engine repairs.

At the head of Gasparilla Sound, close E of the N end of the railroad bridge, a channel with a reported controlling depth of 7 feet in April 1982, and marked by private daybeacons, leads to a seafood shipping plant. The 100-foot marginal fish wharf at the plant was reported to have from 7 to 12 feet alongside in April 1982, with the deepest water at the end of the wharf nearest the plant. Gasoline, diesel fuel, water, ice, and some marine supplies are available.

At **Mile 34.1,** a railroad bridge crosses Gasparilla Sound from Placida to the N end of Gasparilla Island; the NE opening over the waterway has a bascule span with clearances of 55 feet, open, and 3 feet, closed; the middle span 0.6 mile SW has a 40-foot swing span with a clearance of 4 feet at the center; and the SW opening close to the Gasparilla shore has a fixed span which has a width of 10 feet and a clearance of 5 feet. The drawbridges are maintained in the open position. A highway causeway, close NW of and parallel with the railroad bridge, has three openings; a swing span with a clearance of 9 feet over the waterway, the middle opening over the main channel from Gasparilla Pass has a 48-foot fixed span with a clearance of 15 feet, and the SW opening has a 48-foot fixed span with a clearance of 7 feet. An overhead power cable on the NW side of the causeway has clearances of 35 and 27 feet at the middle and SW spans, respectively.

Between the N side of the railroad bridge and the highway bridge is an outboard motor test facility. It is closed to the public. A channel, marked by private daybeacons and with a reported controlling depth of 6 feet in July 1982, leads SSW between the bridges to a marina. Berths with electricity, gasoline, diesel fuel, water, ice, and a launching ramp are available.

Gasparilla Pass between Gasparilla Island and Little Gasparilla Island is discussed in chapter 4.

At **Mile 34.3,** the waterway enters **Placida Harbor.** Good small-boat anchorage is available inside the N point of Gasparilla Pass between Little Gasparilla Island and **Bird Key.**

At **Mile 36.6,** overhead power and telephone cables with minimum clearances of 81 feet cross the waterway.

At **Mile 37.4,** the waterway enters **The Cutoff,** a narrow shallow pass joining Placida Harbor with Lemon Bay. At **Mile 38.5,** overhead power and telephone cables with minimum clearances of 78 feet cross the waterway at the S end of Lemon Bay. Small-craft facilities E of the waterway at **Miles 38.7 and 38.4** have berths, electricity, gasoline, diesel fuel, water, ice, storage, a launching ramp, and marine supplies. The largest marine railway can haul out craft to 30 feet. In April 1982, depths of 5 feet were reported in the approach channels and basins at the facilities.

Lemon Bay is a shallow lagoon that extends 15 miles NW behind the barrier beach from the head of Placida Harbor to Alligator Creek. There are numerous marinas and service facilities along both sides of Lemon Bay between The Cutoff and Alligator Creek. (See the small-craft facilities tabulation on chart 11425 for services and supplies available.)

Stump Pass, near the S end of Lemon Bay SW of **Mile 41.0,** is discussed in chapter 4.

Rock (Ainger) Creek is about 2 miles N of Stump Pass on the E side of Lemon Bay NE of **Mile 42.8.** A highway bridge with a 27-foot fixed span and a clearance of 9 feet crosses the creek about 0.4 mile above the mouth. Marinas on either side of the creek just below the bridge have berths, electricity, water, gasoline, launching ramps, and a 1-ton lift. A privately marked channel with a reported controlling depth of 3 feet in April 1982, leads to the facilities. Craft to 22 feet can be handled on trailers for engine repairs.

At **Mile 43.5,** about 15 miles NW from Boca Grande, State Route 776 highway bridge, with a bascule span with a clearance of 26 feet at the center, crosses the waterway from the mainland to **Manasota Key** and Englewood Beach.

Englewood Beach is on the W side of the bay just S of the bridge.

Redfish Cove is on the E side of the bay at the N end of State Route 776 highway bridge.

Englewood is on the E side of the bay about 1.5 miles N of State Route 776 highway bridge. A boat basin and marina are here. In April 1982, it was reported that about 5½ feet could be carried to the marina. Berths with electricity, gasoline, diesel fuel, water, storage, marine supplies, and hull and engine repairs are available. A 50-ton mobile hoist and an 8-ton forklift that can handle craft to 24 feet are available. A fish house is about 0.3 mile S of the marina.

At **Manasota, Mile 49.9,** a bascule highway bridge with a clearance of 26 feet at the center crosses the waterway. An overhead power cable at the bridge has a clearance of 88 feet.

At **Mile 52.0,** about 300 yards SE of the entrance to Alligator Creek, a small passenger ferry crosses Lemon Bay.

At **Mile 52.6,** the waterway enters a 5.1-mile landcut that leads into Roberts Bay at Venice.

At **Mile 53.7,** an overhead power cable with a clearance of 85 feet crosses the landcut.

At **Miles 54.9 and 56.6,** highway bascule bridges with center clearances of 25 and 30 feet, respective-

ly, cross the landcut of the waterway. At **Mile 56.9** a highway bascule bridge with a clearance of 16 feet crosses the waterway. (See 117.462a, (a) and (d), chapter 2, for drawbridge regulations and opening signals.)

A marina, on the W side of the landcut just N of the highway bridge, at **Mile 54.9**, has berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage, a 40-ton lift, and a marine railway that can handle craft up to 50 feet; hull, engine and electrical repairs can be made.

Venice Inlet, about 26 miles NW from Port Boca Grande, is described in chapter 4.

Storm warning signals are displayed. (See the charts.)

The city of **Venice** and the towns of **Nokomis** and **Laurel** are on the shores of the three small bays, **Roberts Bay, Dona Bay,** and **Lyons Bay,** inside and to the E of Venice Inlet. A water tank and several large apartment buildings are prominent. In April 1982, reported drafts of about 2 to 5 feet could be taken to the landings at these towns. The channel in Lyons Bay is marked by private daybeacons.

Manatees.–A caution zone for the protection of manatees is in Venice Inlet and Roberts, Dona, and Lyons Bays. (See Manatees, chapter 3.)

Several marinas are at Venice Inlet and on Roberts, Dona, and Lyons Bays. (See the small-craft facilities tabulation on chart 11425 for services and supplies available.)

The waterway continues N from Venice Inlet through **Blackburn Bay, Dryman Bay, Little Sarasota Bay, Roberts Bay, Sarasota Bay,** and **Anna Maria Sound** to the lower part of Tampa Bay. These connecting bodies of water are separated from the Gulf by a line of narrow keys.

Currents, Venice Inlet to Cortez.–In Venice Inlet the average velocity is about 1 knot. At the bridge at the S end of Blackburn Bay, the current floods to the N and ebbs to the S with an average velocity of about 0.8 knot. At Blackburn Point Bridge at the S end of Little Sarasota Bay, the current floods SSE with an average velocity of 1.4 knots and ebbs N with an average velocity of 0.7 knot. One day's observation off the bridge at the N end of Little Sarasota Bay showed very weak currents. In Sarasota Bay at the entrance to Roberts Bay, the currents average only 0.3 knot. At the bridge off Cedar Point the average velocity at strength is about 0.4 knot. In Anna Maria Sound off Cortez, the flood currents set to the NNW and average about 0.6 knot; the ebb current is weak. (See the Tidal Current Tables for predictions.)

A highway bridge crossing **Casey Thorofare,** at **Mile 59.3,** at the S end of Blackburn Bay has a bascule span with a clearance of 14 feet at the center.

At **Mile 63.0,** the **Blackburn Point** highway bridge crosses the waterway. The bridge has a swing span with a clearance of 9 feet. A privately marked channel, with a reported controlling depth of 5 feet in April 1982, leads to a fish camp at the W end of the bridge. Berths, provisions, and a launching ramp are available. Near the E end of the bridge are several small-craft facilities. A privately marked channel with a reported controlling depth of 5½ feet in April 1982, leads to the facilities. Berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. A boatyard has a 50-ton marine lift that can handle craft up to 65 feet for hull, engine, and electronic repairs, or open dry storage.

Midnight Pass, W of **Mile 65.0,** is described in chapter 4.

Osprey is a small settlement on the E side of Little Sarasota Bay. A fish camp here can provide berths with electricity, water, and ice. Marinas and a boatyard are near the S end of Siesta Key just N of Midnight Pass. Berths with electricity, gasoline, water, a launching ramp, marine supplies, a 40-ton mobile hoist, and a forklift that can haul out craft to 23 feet for hull and engine repairs and covered dry storage are available. In April 1982, the reported controlling depth to the boatyard was 3 feet.

A marina is at the head of a long slip on the E side of Little Sarasota Bay at **Mile 67.2.** The channel to the slip is marked by private daybeacons and, in April 1982, was reported to have depths of 3 feet, with 6 feet alongside the berths. Gasoline and marine supplies are available. A forklift at the marina can haul out craft to 24 feet for open and covered dry storage and hull and engine repairs.

At **Stickney Point, Mile 68.6,** at the N end of Little Sarasota Bay, a twin bascule highway bridge with a clearance of 18 feet crosses the waterway. A marina and a fish camp are at the W end of the bridge. Berths, gasoline, water, ice, launching ramps, and marine supplies are available. Lifts up to 2½ tons can handle vessels up to about 26 feet for hull, engine, and electronic repairs.

At the N end of **Roberts Bay, Mile 71.8,** a bascule highway bridge with a clearance of 25 feet crosses the waterway from the mainland to the N end of Siesta Key. A boatyard on the E side of Roberts Bay, S of the bridge, has a marine lift that can handle craft up to 25 feet for hull and engine repairs. Berths, gasoline, and other services are available at the boatyard. In April 1982, the reported controlling depth to the boatyard was 2½ feet.

Big Sarasota Pass, an inlet from the Gulf of Mexico to the S end of Sarasota Bay between Siesta Key and Lido Key, is described in chapter 4.

The **Ringling Causeway, Mile 73.6,** crossing Sarasota Bay from Sarasota to **Lido Key** via **Bird Key, Coon Key,** and **St. Armands Key,** has a bascule span over the waterway with a clearance of 22 feet at the center. (See 117.462a, (b) and (d), chapter 2, for drawbridge regulations and opening signals.) Over the channel between Bird Key and Coon Key there is a 46-foot fixed span with a clearance of 10 feet. The causeway continues W between Coon Key and St. Armands Key. Two fixed highway bridges connect St. Armands Key with the N and S ends of Lido Key. The N bridge has a 27-foot span with a clearance of 7 feet; overhead power and telephone cables on each side of the bridge have a clearance of 19 feet. The S bridge has a 33-foot span with a

clearance of 6 feet. Overhead power cables on the E side of the bridge have a clearance of 25 feet. There are marinas at **City Island** at the NE end of Lido Key where berths, gasoline, water, ice, and marine supplies are available. A 4-ton forklift can haul out craft to 27 feet for hull and engine repairs.

Sarasota, on the E shore of Sarasota Bay at the S end, is a year-round community and winter resort. The Sarasota-Bradenton Airport is N of the city; rail, bus, and highways connect with points in Florida and other states. The town has several hospitals. A number of tall buildings, water tanks, and radio towers show prominently from offshore.

Sarasota has several marinas, boatyards, and yacht basins. A large marina is in the bight just E of **Golden Gate Point.** At **Mile 73.3,** a dredged channel leads NE from the waterway to a turning basin at the marina. In April 1982, 8 feet was reported in the channel and turning basin. The small-craft facilities in Sarasota can provide berths with electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies.

Hudson Bayou, about 0.6 mile SE of Golden Gate Point, provides excellent shelter for small craft. The channel into the bayou had a reported controlling depth of 5 feet in April 1982. The highway bridge over Hudson Bayou, 0.2 mile above the mouth, has a 28-foot fixed span with a clearance of 9½ feet. The overhead power cable at the bridge has a clearance of 65 feet. A highway bridge, 0.4 mile above the mouth, has a 39-foot fixed span with a clearance of 8 feet.

New Pass, an inlet from the Gulf of Mexico into Sarasota Bay, between Lido Key and Longboat Key is described in chapter 4.

At **Mile 74.4,** a dredged channel leads E from the waterway across Sarasota Bay to a turning basin at Payne Terminal. In 1979, the centerline controlling depth was 8 feet to the turning basin, thence in 1975-1979, depths of 5 to 8 feet were available in the turning basin. The basin at Payne Terminal has a Coast Guard Auxiliary berth and a marina at which gasoline, storage, and marine supplies are available. A 3-ton mobile hoist can haul out craft for hull and engine repairs.

Whitaker Bayou, about 0.5 mile N of Payne Terminal, provides excellent shelter for small craft. The channel into the bayou had a reported controlling depth of about 7 feet in April 1982. A highway bridge over the bayou has a 32-foot fixed span with a clearance of 7 feet. A marina and boatyard are near the head of Whitaker Bayou. Berths with electricity, gasoline, water, covered freshwater storage, and marine supplies are available. Craft to 50 tons or 60 feet can be handled for hull and engine repairs.

Bowlees Creek empties into Sarasota Bay NE of **Mile 79.0.** A privately marked channel with a reported controlling depth of 5 feet, in April 1982, leads to the Holiday Inn Yacht Club and a marina inside the creek. Berths with electricity, gasoline, diesel fuel, water, and launching ramps are available. U.S. Route 41 fixed highway bridge and a fixed pipeline bridge cross Bowlees Creek about 0.5 mile above its mouth. Each has a horizontal clearance of 27 feet and a vertical clearance of 10 feet. An overhead power cable close W of the highway bridge has a clearance of 27 feet.

About 0.4 mile NW of the entrance to Bowlees Creek, a privately dredged channel marked by private daybeacons and a lighted range leads to a basin of the Bayshore Gardens Yacht Club and Trailer Estates Marina. In April 1982, depths of 5½ feet were reported in the channel and basin. Berths, gasoline, water, ice, a launching ramp, marine supplies, and outboard motor repairs are available in the basin. A fish haven, marked by private daybeacons, is 0.5 mile W of the channel entrance.

Buttonwood Harbor, on Longboat Key in Sarasota Bay, is SW of **Mile 79.9.** A privately dredged channel marked by private daybeacons leads to the harbor. A branch channel, also privately dredged and marked, leads NW to a private resort about 0.4 mile NW of Buttonwood Harbor. In April 1982, a reported depth of 4 feet could be carried to Buttonwood Harbor.

The town of **Longboat Key** is composed of the entire island of Longboat Key.

Longbeach, the N part of the town of Longboat Key on the S side of Longboat Pass, is a fishing and resort town. About 1.5 miles SE of the pass SW of **Mile 83.7,** a privately marked channel with a depth of about 4 feet leads to a boat basin where berths, gasoline, water, ice, a launching ramp, marine supplies, and engine repairs are available.

Longboat Pass, W of **Mile 85.4** between Longboat Key and **Anna Maria Island,** is described in chapter 4.

At **Mile 87.2,** a highway bridge crosses the waterway from **Bradenton Beach,** near the S end of Anna Maria Island, to Cortez on the mainland. The bridge has a bascule span with a clearance of 22 feet at the center. (See 117.462b, chapter 2, for drawbridge regulations.) There are several fish wharves at the E end of the bridge at which party fishing boats moor; gasoline is available. The Cortez **Coast Guard** Station is near the E end of the bridge. A basin with a large marina is on the E side of the waterway about 0.5 mile N of the bridge. In April 1982, a reported depth of 7 feet could be carried to the marina. Berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. A 50-ton mobile hoist and several smaller lifts can handle craft up to 60 feet for hull and engine repairs or open or covered dry storage.

At **Mile 89.2,** a highway bridge crosses the waterway at the S end of Anna Maria Sound from Anna Maria Island to Perico Island and then to the mainland. The bridge has a bascule span over the waterway with a clearance of 24 feet at the center. (See 117.462b, chapter 2, for drawbridge regulations.) The highway continues E on a bridge over **Perico Bayou** and a causeway and bridge over the N end of **Palma Sola Bay** to the mainland. These two bridges have 46-foot fixed spans with clearances of 10 feet.

A marina on Perico Island at the E end of the

bridge has berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies. A forklift can handle craft up to 22 feet for hull and engine repairs or dry storage. In April 1982, the privately marked channel to the marina had a reported controlling depth of 3½ feet.

Anna Maria is a small village at the N end of Anna Maria Island. A privately marked channel, with a depth of about 4 feet reported in April 1982, leads to a marina and boatyard W of **Mile 90.0** where berths, electricity, gasoline, water, ice, and marine supplies are available. A marine railway that can handle vessels to 50 feet and a 6-ton hoist are available for hauling out craft for hull and engine repairs.

Several marinas and boatyards are at the village of Anna Maria. (See the small-craft facilities tabulation on chart 11425 for services and supplies available.)

Charts 11425, 11414.-The waterway continues N through Anna Maria Sound and enters Tampa Bay at **Mile 92.0.** Anna Maria Sound is marked at its N end by **Anna Maria Sound Light 1** (27°32.1'N., 82°42.8'W.), 12 feet above the water and shown from a dolphin with a square green daymark.

The waterway continues across lower Tampa Bay to the main ship channel at **Mile 97.8,** thence NE to **Mile 102.8,** thence N in the St. Petersburg Channel to **Mile 106.0,** thence W in the dredged channel, close S of Pinellas Peninsula and into Boca Ciega Bay at **Mile 110.8.**

Small craft can also use the dredged **Sunshine Skyway Channel** which extends parallel with and about 600 yards W of the Sunshine Skyway between Maximo Point and Mullet Key Shoal; this channel leads N from the waterway at **Mile 97.8** thence rejoins it at **Mile 110.8,** and saves about 7.5 statute miles. The channel is marked by lights, daybeacons, and a buoy. In 1981, the centerline controlling depth was 8 feet.

Charts 11414, 11410.-Boca Ciega Bay extends 13 miles NW from the lower part of Tampa Bay. New channels have been dredged at several places in the bay. Several of the small keys have been filled in to form large islands, and bridges link many of the keys.

Sunshine Skyway Park is a State recreational area along the skyway E of the channel.

Tidal currents in Boca Ciega Bay seldom exceed 0.5 knot. (See Tidal Current Tables for daily predictions at several locations in these waters.)

At **Mile 110.5,** the twin bascule spans of the Sunshine Skyway Causeway cross the waterway; the spans have clearances of 21 feet at the center.

Maximo Point, opposite **Mile 110.5,** the SW extremity of Pinellas Peninsula, is at the N end of the Sunshine Skyway Causeway. A small-boat basin has covered berths with electricity for over 125 boats to 36 feet long. Gasoline, water, ice, a launching ramp, and some marine supplies are available. In May 1982, the reported controlling depth into the basin was about 3 feet. A 3-ton forklift can haul out small craft for hull and engine repairs. In May 1982, plans were being made to build an interstate highway at the site of the marina.

On Maximo Point, E of the skyway, there is a large prominent apartment hotel and motel which has a boat basin where berths with electricity and water are available. In May 1982, depths of 6 feet were reported in the approach channel with 8 feet reported in the basin.

Cats Point Channel extends N from the waterway at **Mile 110.8,** thence NW along the landfill W of Cats Point, and thence across the upper part of Boca Ciega Bay, and rejoins the waterway at **Mile 115.7.** In 1981, the centerline controlling depth in the dredged channel was 6 feet. The channel is marked by lights and daybeacons.

Frenchman Creek is on the E side of Boca Ciega Bay about 0.3 mile N of Maximo Point. The twin 26-foot fixed spans of the Sunshine Skyway with clearances of 18 feet cross the creek. A marina and boatyard at the head of the creek has a 40-ton lift and a 12-ton forklift that can handle craft for hull and engine repairs and dry open and covered storage. Open and covered berths with electricity for over 200 boats, gasoline, diesel fuel, water, ice, and marine supplies are available. Two overhead power cables with a minimum clearance of 27 feet cross the southwesternmost marina slip. In May 1982, the reported controlling depth was about 8 feet in the privately marked channel leading from Cats Point Channel to the marina and boatyard.

Cats Point is on the E side of Boca Ciega Bay, 1.1 miles N of Maximo Point. A highway bridge of the Pinellas Bayway crossing Cats Point Channel at Cats Point has a 41-foot fixed span with a clearance of 18 feet. A large marina is in the lagoons close N of Cats Point. Gasoline, diesel fuel, water, ice, marine supplies, and open and covered berths with electricity for more than 300 boats are available. A 40-ton mobile hoist can handle craft to 60 feet and a forklift can handle craft to 25 feet for complete repairs. In May 1982, the reported controlling depth in the lagoons was about 5 feet in the privately marked channel.

Pinellas Bayway, a complex system of highways and causeways crossing Boca Ciega Bay, links Pinellas Peninsula at Cats Point to St. Petersburg Beach and Tierra Verde, Cabbage Key, and other keys S of it, including Mullet Key. Clearances of the various bridges of the bayway are given with the description of the various channels which they cross.

A highway bridge of the bayway crossing the channel between two sections of landfill W of Cats Point has a 38-foot fixed span with a clearance of 12 feet.

At **Mile 113.0,** a bridge of the Pinellas Bayway crosses the main channel of the waterway from Tierra Verde to the landfill N of it and has a bascule span with a clearance of 25 feet at the center.

Bunces Pass, Pass-a-Grille Channel, Tierra Verde, Vina del Mar, and St. Petersburg Beach are discussed in chapter 5.

At **Mile 114.0,** a bascule highway bridge of the

Pinellas Bayway with a clearance of 25 feet crosses the waterway.

Gulfport is a city on the N shore of Boca Ciega Bay, opposite **Mile 116.0.** A water tank in Gulfport and a cupola 1 mile to the NW are prominent.

Clam Bayou is on the E side of the city. A privately marked **035°** lighted range and daybeacons mark a dredged cut leading into the bayou and the Gulfport City Marina in the basin close W of the bayou. In May 1982, there was a reported controlling depth of 6 feet in the channel and basin. In January 1984, an obstruction was reported close W of the channel entrance in about 27°44'05"N., 82°41'57"W. A **harbormaster** who assigns berths is at the marina; he can be reached by telephone (813-345-7605). A **speed limit** of 5 m.p.h. is enforced. Gasoline, water, ice, marine supplies, a launching ramp, and berths with electricity are available. Two yacht clubs and a Coast Guard Auxiliary flotilla have facilities in the basin.

A boatyard, on the W side of the entrance to Clam Bayou, has a 7-ton mobile hoist that can handle craft for hull and engine repairs or open or covered storage. Gasoline and marine supplies are available at the boatyard, and electronic repairs can be arranged for.

South Pasadena is a city on the E shore of Boga Ciega Bay about 2 miles NW of Gulfport.

A channel leaves the waterway at **Mile 116.5,** S of **Pasadena Isle,** passes around the S end of the island, then splits into two channels, one leading N to a marina on the W side of the entrance to **Bear Creek,** the other leading W to a marina 0.2 mile W of the creek entrance. The channels, privately marked, had reported controlling depths of 4 feet in May 1982. Gasoline, diesel fuel, water, ice, marine supplies, and open and covered berths with electricity are available for over 300 boats to 48 feet at the two marinas. A 60-ton marine hoist and a marine railway at the marina at the creek entrance can handle craft to 80 feet for hull, engine, and electronic repairs, or dry open or covered storage.

At **Mile 117.3,** the **Corey Causeway** crosses Boca Ciega Bay from St. Petersburg Beach to the mainland at South Pasadena. The bascule span of the causeway crosses the waterway with a clearance of 23 feet. (See 117.466, chapter 2, for drawbridge regulations.) Fixed spans crossing two minor channels to the NE have a least width of 43 feet and clearances of 6 feet.

Blind Pass, a shallow pass from the Gulf to Boca Ciega Bay, is discussed in chapter 5.

The waterway continues N passing South Causeway Isles, Paradise Island, Isle of Palms, and Capri Isle which are land filled residential areas with numerous lagoons and private berths at waterfront homesites.

Chart 11410.-Treasure Island Causeway, at **Mile 119.0,** crosses Boca Ciega Bay from Treasure Island via Paradise Island and South Causeway Isles to the mainland at St. Petersburg. The causeway has a bascule span over the waterway with a clearance of 8 feet. (See 117.466, chapter 2, for drawbridge regulations.) The E and W openings between Treasure and Paradise Islands and South Causeway Isles to the mainland have fixed spans with clearances of 4 and 5 feet, respectively.

At **Mile 121.5,** the channel from **Johns Pass,** discussed in chapter 5, junctions with the waterway.

Long Bayou, an arm of Boca Ciega Bay opposite Johns Pass, extends in a N direction for about 3 miles to a dam which forms **Lake Seminole.** Private daybeacons mark the bayou. Twin fixed highway bridges with clearances of 20 feet cross the bayou about 1 mile above the mouth. An overhead power cable at the bridge has a clearance of 34 feet. A railroad bridge close N of the highway bridges has a 24-foot fixed span with a clearance of 7 feet.

Cross Bayou, with a shoal area across its mouth, enters Long Bayou just above the railroad bridge. An overhead power cable with a clearance of 31 feet crosses the mouth of Cross Bayou and continues across Long Bayou. **Cross Bayou Canal,** principally a drainage ditch, connects Old Tampa Bay with Cross Bayou.

The waterway continues through the N part of Boca Ciega Bay between Sand Key and the mainland.

At **Mile 122.8, Welch (Madeira Beach) Causeway** crosses Boca Ciega Bay from Sand Key to the mainland. The causeway has a bascule span over the waterway which has a clearance of 25 feet at the center. (See 117.466, chapter 2, for drawbridge regulations.) The shallow cove just E of the mainland end of the causeway has been dredged to form a small boat basin adjacent to the Veterans Hospital. A depth of about 4 feet can be taken into the basin. Just S of the causeway, a channel with a reported controlling depth of about 6 feet in May 1982, leads to the municipal marina at Madeira Beach. Gasoline, diesel fuel, water, ice, marine supplies, a launching ramp, and berths with electricity for 120 boats to 40 feet long are available. Just N of the causeway, a small marina on Sand Key has a 10-ton mobile hoist that can handle craft for limited hull and engine repairs. Another basin at the NE end of the causeway on the mainland, with a reported depth of 4 feet, has a marina for the private use of residents of a nearby condominium apartment complex.

The Narrows, entered at **Mile 125.5,** connecting the NW end of Boca Ciega Bay with the S end of Clearwater Harbor, is about 4.5 miles long. On the W side of The Narrows near the S end are rocks that are covered at high water; to avoid them mariners should favor the E bank. A marina and boatel inside the bight on Sand Key, just S of The Narrows, has gasoline, water, ice, berths with electricity, and some marine supplies.

In 1981, a highway bascule bridge with a design clearance of 21 feet was under construction at **Mile 126.0.**

Gasoline, water, marine supplies, storage, and hull and engine repairs are available at several marinas along The Narrows opposite **Indian Rocks Beach** at **Mile 128.8.**

At **Mile 129.3,** a highway bridge with a bascule span with a clearance of 25 feet at center crosses the waterway from the mainland to Indian Rocks Beach on Sand Key.

At **Mile 130.0,** the waterway enters Clearwater Harbor.

Clearwater Harbor extends about 7 miles N from the Narrows to St. Joseph Sound and has an average width of about a mile. The harbor is mostly shoal, except for the waterway and the natural channels varying in depth from 5 to 14 feet. The several channels in the harbor should be followed closely as some sections are quite crooked.

At **Mile 131.8,** the Belleair Causeway crosses the harbor from Sand Key to the mainland. The causeway has a bascule span over the waterway with a clearance of 21 feet. (See 117.466, chapter 2, for drawbridge regulations.) **Belleair,** about 1 mile N of mainland end of the causeway, has a large hotel with a private yacht basin into which a draft of about 4 feet can be taken. The stack at the hotel is conspicuous.

In 1972, pilings of a former pier, exposed at near low water, were reported in the vicinity of **Mile 134.2** between the E edge of the waterway and Belleview Island; mariners are advised to exercise caution in this area.

At **Mile 135.5,** the dredged channel through Clearwater Pass, discussed in chapter 5, junctions with the waterway.

Clearwater, the county seat of Pinellas County on the E shore of Clearwater Harbor opposite Clearwater Pass, is principally a winter resort, but has considerable industry in electric and electronic manufacturing. There are many prominent features including a large white apartment hotel near the N end of Clearwater Beach Island, a tall water tank near the middle of the island, a large hotel on the island on the N side of the Clearwater Memorial Causeway, a prominent hotel in Clearwater, several tall radio towers, and several prominent buildings. The city has three hospitals. The city is served by passenger and freight rail service, and bus and truck lines. The St. Petersburg-Clearwater International Airport is about 7 miles SE of the city. A Coast Guard air station is at the airport.

Tides and currents.–The mean range of tide at Clearwater is 1.6 feet. The tidal current at Clearwater in the vicinity of the Clearwater Memorial Causeway is about 0.4 knot.

At **Mile 135.9,** Causeway Channel, marked by daybeacons, leads W from the waterway to a junction with a dredged channel thence to a turning basin at the W end of Clearwater Memorial Causeway. The dredged channel with which it junctions is the branch channel leading N from the dredged channel through Clearwater Pass and is described in chapter 5.

The city of Clearwater operates the City Pier and Municipal Marina at the turning basin. The marina can provide berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies. The **harbormaster** has his office at the marina and assigns the berths. He can be reached by telephone (813-462-6954) or VHF-FM channel 16 (156.80 MHz) for marine information or berthing instructions. The Clearwater Police Boat is based at the Municipal Marina. The Clearwater Coast Guard Station is at Island Estates Marina on the N side of the causeway about 0.25 mile NE of the Municipal Marina.

Mandalay Channel leads N from the Clearwater Municipal Marina turning basin. Daybeacons mark the critical spots in the channel. The fixed bridge crossing the channel at the W end of Clearwater Memorial Causeway just N of the Clearwater Municipal Marina turning basin has a clearance of 14 feet at its center.

Other small-craft facilities in the Clearwater area are located at the part of Clearwater Beach Island, along the S side of the island N of Clearwater Memorial Causeway, and at Clearwater proper. Berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available; hull, engine, and electronic repairs can be made. At Clearwater just E of **Mile 136.4,** a 50-ton mobile hoist can handle craft up to 70 feet.

Local guides can be hired as pilots.

At **Mile 136.0,** the **Clearwater (Garden) Memorial Causeway** crosses Clearwater Harbor from Clearwater Beach to Clearwater; the bascule span over the waterway has a clearance of 25 feet at the center. (See 117.466, chapter 2, for drawbridge regulations.)

At **Mile 136.4,** a channel marked by daybeacons leads NW to a junction with Mandalay Channel thence to Dunedin Pass. In May 1982, the pass, marked by daybeacons and private buoys, had a reported controlling depth of 2 feet. The buoys are frequently shifted to mark the best water.

The waterway through the harbor passes close alongshore off Clearwater and continues N into St. Joseph Sound.

Dunedin, E of **Mile 139.0,** is a resort town on the E shore of St. Joseph Sound, about 3 miles N of Clearwater. A large apartment building, two tanks, and a stack are conspicuous. The town has a hospital and railway connections.

The mean range of **tide** at Dunedin is 1.9 feet.

The Dunedin Municipal Marina, E of **Mile 139.3,** is in a basin protected by two moles. It has a commercial fish pier and berths with electricity for about 189 boats. Water and a launching ramp are available. A motel is on the N mole, and a boat club is on the S mole. In May 1982, depths of 7 feet were reported in the entrance channel and basin. The entrance to the basin is marked by private daybeacons. A **harbormaster** is in attendance and assigns berths; he can be reached by telephone (813-734-8592).

A privately dredged channel leads into **Seven Mouth Creek,** to a basin on the NE side of Caladesi Island W of **Mile 141.1.** In May 1982, the channel had a reported depth of 4 feet. It is marked by a private light and daybeacons. The basin and island are part of the **Caladesi Island State Park.** Berths and campsites, but no water, are available at the basin. An observation platform near the basin is prominent.

A ferry operates daily between the island and Dunedin Municipal Marina.

Curlew Creek, on the E shore of St. Joseph Sound, E of **Mile 141.4,** has a marina in a basin on the creek. Gasoline, water, ice, covered dry storage and marine supplies are available. A 2½-ton forklift capable of handling boats to 25 feet for hull and engine repairs is available. In May 1982, depths of 2½ feet were reported in the creek channel and basin, but caution should be exercised due to rocks near the channel.

At **Mile 141.9,** the Honeymoon Island Causeway crosses St. Joseph Sound from the mainland to **Honeymoon Island.** A highway bridge in the causeway has a bascule span with a clearance of 24 feet over the waterway. A fixed bridge in the causeway near the W end has a 45-foot fixed span with a clearance of 11 feet. An overhead power cable on the N side of this bridge has a clearance of 28 feet.

Hurricane Pass, to the W of the causeway, is discussed in chapter 5.

Minnow Creek is on the E shore of St. Joseph Sound E of **Mile 142.3.** A privately dredged channel leads from the waterway to basins in **Smith Bayou** at the mouth of the creek. In May 1982, the reported depth in the channel was about 4½ feet. The channel is marked by private daybeacons. There are three boatyards and marinas in the basins, which in May 1982 had reported depths of 4 to 6 feet. There are forklifts and a 15-ton mobile hoist that can handle craft up to 40 feet for hull and engine repairs, or dry open or covered storage. The boatyards can build craft up to 45 feet. Gasoline, diesel fuel, water, ice, marine supplies, and open and covered berths with electricity are available. A fish camp is on Smith Bayou.

At **Mile 143.4,** a dredged channel leads E from the waterway to the pier of a small marina at **Ozona.** In May 1982, the centerline controlling depth was 3½ feet in the channel with 5 feet reported alongside the pier. The channel is marked by a light and daybeacons. In September 1983, rocks, marked by a daybeacon, were reported on the N side of the channel between Daybeacons 7 and 9. Gasoline, a launching ramp, water, ice, and electricity are available at the marina.

A fish camp is in **Sutherland Bayou,** about 0.5 mile N of Ozona. Water and a launching ramp are available.

A **boiling spring** is close to shore just SE of **Crystal Beach,** E of **Mile 144.4.** The boiling water is visible above the surrounding waters in calm weather. Depths of 14 to 20 feet were found in the spring in 1924.

A launching ramp is near the end of a municipally owned causeway on the E side of St. Joseph Sound E of **Mile 148.8.** Another causeway about 0.6 mile to the N is part of the Fred H. Howard County Park.

At **Mile 150.0,** the dredged channel of this first section of the Intracoastal Waterway ends.

From Anclote River N there is no inside route until the E terminus of the second section of the waterway is reached at Carrabelle, Fla., about 140 miles to the NNW. Boats sailing outside may, find refuge during bad weather by entering the Withlacoochee River, about 75 miles N of Clearwater, Cedar Keys Harbor, about 95 miles N of Clearwater, the Steinhatchee River, the Crystal River, the Homosassa River, or Horseshoe Cove; all of which are described in chapter 5.

Mileage.–The second section of the waterway is zeroed at **Harvey Lock,** New Orleans, and measured **eastward (E)** or **westward (W)** along the waterway. Alternate Routes of the Intracoastal Waterway are zeroed to take off from the basic route and are given letter designations such as **A.A.** (Algiers Alternate Route), **L.R.** (Landside Route), **M.P.** (Morgan City-Port Allen Alternate Route), and **A.R.** (Atchafalaya River Route).

Distances along the Intracoastal Waterway are in statute miles to facilitate reference to the small-craft charts; all other distances are in nautical miles. A mileage conversion table is on page T-29.

Channels.–The Federal project for the Intracoastal Waterway Carrabelle, Fla., to Brownsville, Tex., provides for a channel 12 feet deep with a minimum width of 125 feet. Although effort is made to maintain the project depth, the channel may shoal several feet in places between maintenance dredging. (See Local Notice to Mariners for controlling depths.) Additional information can be obtained from the U.S. Army District Engineers offices. (See appendix for addresses.)

Bridges.–Minimum overhead clearances of fixed bridges in this section of the Intracoastal Waterway are 48 feet at **Mile 533.0W** and 50 feet at **Miles 361.4E, 295.4E, 284.6E, 223.1E** and **206.7E.** Minimum horizontal clearance of bridge openings (basic route) is 75 feet.

General drawbridge regulations and opening signals for bridges over this section of the Intracoastal Waterway are given in 117.1b and 117.240, chapter 2. Special drawbridge regulations for certain bridges that supplement the general regulations are referenced with the area description of the waterway.

Overhead cables.–Minimum clearance of overhead cables crossing this section of the Intracoastal Waterway is 61 feet at **Mile 533.0W.** Several others have clearances of 71 to 76 feet.

Locks.–Minimum lock lengths are 415 feet at lock **Mile 0.0** (Harvey); 640 feet (626 feet usable) at lock **Mile 6.5E** (Inner Harbor Navigation); and 797 feet (760 feet usable) at lock **A.A. Mile 0.0** (Algiers). Minimum lock width is 56 feet at lock **Mile 162.7W** (Vermilion). Minimum depth over the sill is 11 feet at Vermilion Lock. The 425-foot Harvey Lock can be avoided by detouring through the 760-foot Algiers Lock in the Alternate Route. (See 162.75, 207.180, and 207.187, chapter 2, for regulations governing use, administration, and navigation of locks and floodgates.)

Cable ferries.–Cable ferries still cross the Intracoastal Waterway at several places.

Note: Generally, the cables are suspended during crossings and dropped to the bottom when the

ferries dock; however, since operating procedures may differ in some cases, mariners are advised to exercise extreme caution and seek local knowledge. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Aids to navigation.-Intracoastal Waterway aids have characteristic yellow markings that distinguish them from aids to navigation marking other waters. (See U.S. Coast Guard Light Lists or Chart 1, Nautical Chart Symbols and Abbreviations, for illustrations of special markings.)

Tides.-Under ordinary conditions the tidal range in this section of the Intracoastal Waterway is from 0.3 to 2.6 feet. In most sections the net change in water level is largely dependent on the force and direction of the wind. Strong N winds that occur principally during winter depress the water surface as much as 3.5 feet below mean low water; S winds have the opposite effect. Severe hurricanes have raised the water surface 10 feet or more above low water in some localities.

Weather.-Storm warning signals are displayed at various places along the Intracoastal Waterway and connecting channels. Display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Chart 11404.-The improved part of the waterway begins at 29°47.5'N., 84°40.4'W., in Carrabelle Ship Channel at **Mile 376.2E.** Waterway depths are available to Carrabelle, 3.7 miles to the N and to the open waters of the Gulf, 3.3 miles to the S. (See chapter 6.)

From Carrabelle channel, the well-marked waterway route is SW for 20.6 miles through **St. George Sound** to 29°39.9'N., 84°58.1'W., in **Apalachicola Bay,** thence N by W for 4.2 miles to Apalachicola.

At **Mile 361.4E,** a highway causeway extends from **Cat Point** on the mainland to St. George Island. The fixed span over the waterway has a clearance of 50 feet. The fixed span over the auxiliary channel 0.8 mile S of Cat Point has a clearance of 26 feet. An overhead power cable close E of the causeway has a clearance of 40 feet over most of the 3.5 miles between the point and the island, but is submerged at the waterway.

Chart 11402.-Apalachicola, Mile 351.4E, is on the W side of the entrance to **Apalachicola River.** The town has several small-craft facilities. (See the small-craft facilities tabulation on chart 11402 for services and supplies available, and chapter 6 for additional information about Apalachicola.)

John Gorrie Memorial Bridge is a 4.2-mile E-W combination of highway bridges and causeways over the entrances to East Bay and Apalachicola River. The swing span over the river at **Mile 351.4E** has a clearance of 28 feet; the overhead power cable 100 yards N of the bridge has a clearance of 84 feet.

The railroad bridge over Apalachicola River at **Mile 347.0E** has a swing span with a clearance of 11 feet. Extreme care is advised in the vicinity of the bridge. Two marinas are at the head of small bayous 0.8 and 0.6 mile SE of the railroad bridge. The southeasternmost facility is accessible through two channels with reported controlling depths of 3½ feet in May 1982, while the other is accessible through a channel with a reported controlling depth of 5 feet. Gasoline, water, ice, limited marine supplies, berths, outboard motor repairs, and a launching ramp are available at each facility.

The waterway leaves Apalachicola River at **Mile 345.6E** and proceeds through Jackson River to **Lake Wimico,** which is entered at **Mile 340.7E.**

Chart 11393.-The waterway leaves Lake Wimico at **Mile 335.3E** through **Searcy Creek** and a long landcut. An overhead power cable with a clearance of 95 feet crosses the waterway at **Mile 331.7E.** An abandoned pontoon bridge at **Mile 330.6E** has a horizontal clearance of 80 feet. A submerged freshwater siphon is at **Mile 329.5E.**

The highway bridge over the waterway at **White City, Mile 329.3E,** has a lift span with clearances of 10 feet down and 80 feet up. Berths, gasoline, electricity, water, a launching ramp, and some supplies are available on the N side of the waterway at White City.

At **Mile 327.7E, Gulf County Canal,** with a controlling depth of 6½ feet (8 feet at midchannel) in October 1983, extends about 5 miles SW to **Port St. Joe,** where fuel and supplies can be obtained. (See chapter 6 for more complete information.) Two overhead power cables, which cross the canal about 3.5 miles SW of the junction with the waterway, have clearances of 85 feet. A bascule highway bridge with a clearance of 10 feet crosses the canal at the entrance of St. Joseph Bay. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) The bridge is equipped with radiotelephone. The bridgetender can be contacted on VHF-FM channels 12 (156.60 MHz), 13 (156.65 MHz), and 16 (156.80 MHz); call sign, KBA-338. An overhead power cable at the bridge has a clearance of 85 feet.

At **Mile 318.9E,** an overhead power cable with a clearance of 85 feet crosses the waterway.

At **Overstreet, Mile 315.4E,** a pontoon drawbridge crosses the waterway. Gasoline in cans, water, and groceries are available at a store near the W end of the bridge. A launching ramp is just S of the bridge.

N of Overstreet, the waterway follows a cut in **Wetappo Creek** for a short distance then enters **East Bay** of St. Andrew Bay at **Mile 312.1E.** The channel through the bay is well marked with lights and buoys.

Chart 11390.-U.S. Route 98 highway bridge (Dupont Bridge) crossing East Bay at **Mile 295.4E** has a fixed span with a clearance of 50 feet over the waterway channel. The swing span, pivot piers, and the four spans of the old highway bridge about 200 yards E have been removed; the ends of the bridge remain and are used as fishing piers.

Panama City, at **Mile 292.3E,** is on the N side of St. Andrew Bay.

Several marinas are along the E and W side of Watson Bayou, and a municipal yacht basin is on the NW side of the entrance to Massalina Bayou at **Mile 290.4E.** (See the small-craft facilities tabulation on chart 11390 for services and supplies available, and chapter 6 for additional information about Panama City.)

Opposite **Mile 285.3E,** a privately dredged channel leads from the waterway into **Alligator Bayou.** In May 1982, the reported controlling depth was 20 feet. The channel is marked by a lighted range and lights. A **Coast Guard** station is on the SE side of the basin. The bayou is within a **restricted area.** (See 207.175d, chapter 2, for limits and regulations.)

The waterway continues through St. Andrew Bay and its NW arm, **West Bay. Hathaway Bridge,** at **Mile 284.6E,** has a fixed span clearance of 50 feet; part of the old highway bridge just S of the bridge remains. There are marinas near either end of the bridge at which gasoline and diesel fuel are available. A 60-ton mobile hoist and berths are available at the marinas on the E side of the bridge. An overhead power cable suspended from two lighted towers N of the bridge has a clearance of 85 feet at the main channel, and 45 feet on the SE and SW sides of the towers.

North Bay extends in a NE direction from **Mile 282.4E.** The controlling depths are 12 feet to the bridge at **Lynn Haven,** 5 miles above the waterway, and thence 4½ feet to a dam, 2 miles above the bridge; oyster bars in the middle of the bay with 5 to 6 feet of water over them should be avoided. State Route 77 highway bridge over the bay at Lynn Haven has a fixed span with a clearance of 18 feet. An overhead power cable with a clearance of 34 feet crosses the bay about 200 yards S of the dam. Several bayous along North Bay afford anchorage for small craft.

A channel with a reported depth of about 13 feet leads from the bay into **Alligator Bayou** to the basin at the Gulf Electric Power Plant. Overhead power cables crossing North Bay about 0.5 mile E of Alligator Bayou have a clearance of 45 feet. The transmission towers in the bay are reported to be unlighted and present a hazard to small craft at night.

Fannin Bayou is on the N side of North Bay opposite Lynn Haven. Channels marked by daybeacons and reported dredged to 5 feet in May 1981, lead through the bayou and its W, N, and E arms. The town of **Southport** is at the head of the N arm.

A marina in the dredged basin on the W side of **Mill Point** at the N end of the bridge has water, ice, limited berths and marine supplies, and a launching ramp. In May 1982, a depth of 7 feet was reported in the stake-marked channel to the basin.

A State park is E of the S end of the bridge. Launching ramps are available in the park. Gasoline in cans and limited marine supplies are available in Lynn Haven.

From West Bay the waterway enters **West Bay Creek,** at **Mile 273.0E.** An overhead power cable across the waterway at **Mile 272.9E** has a clearance of 70 feet. State Route 79 highway bridge over the waterway at **Westbay, Mile 272.1E,** has a lift span with clearances of 10 feet down and 80 feet up. A gasoline station is on the highway near the bridge, and there are limited transient berths with water and electricity available at a fish pier on the SE side of the bridge. Depths of about 4 feet were reported in the approach and 5 feet alongside the pier in May 1982.

Chart 11385.–From West Bay Creek, the waterway follows a long landcut and enters **Choctawhatchee Bay** at **Mile 253.5E.** An overhead power cable crossing the waterway at **Mile 269.2E** has a clearance of 100 feet.

Cable ferry.–A cable ferry crosses the Intracoastal Waterway at **Mile 254.8E.** The ferry carries passengers and vehicles and operates from sunrise to sunset daily. Warning signs are posted about 0.25 mile E and W of the crossing. When underway, the ferry shows flashing amber lights, and flashing red lights are shown from the dock. When the ferry is underway, the unmarked cables extend above the water surface; when not underway, they are dropped to the bottom. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.** A 5-mph **speed limit** is enforced at the crossing.

An overhead power cable at the cable ferry crossing has a clearance of 70 feet.

The channel through the shallow E end of Choctawhatchee Bay is marked with lights and buoys, but the route through the remainder of the bay is in open water with depths greater than 12 feet and only occasional lights marking the shoal areas on the S side. The causeway crossing the bay at **Mile 250.4E** has a bascule span over the waterway channel with a clearance of 10 feet.

The entrance to Choctawhatchee Bay from the Gulf is at **Mile 228.0E.** The bay and its tributaries are described in chapter 6.

The waterway leaves Choctawhatchee Bay at **Mile 223.4E** and proceeds W for 33 miles through **The Narrows** and **Santa Rosa Sound** to Pensacola Bay. The E part of the route is through a well-marked dredged channel; the W part is through open water with depths greater than 12 feet and marked by occasional lights and buoys. **Restricted areas** in The Narrows and Santa Rosa Sound extend from **Mile 218.9E** to **Mile 204.4E.** (See 204.134 and 204.136, chapter 2, for limits and regulations.)

U.S. Route 98 highway bridge over The Narrows at **Mile 223.1E** has a fixed span with a clearance of 50 feet. There are several small-craft facilities along The Narrows in the vicinity of and W of the bridge. (See the small-craft facilities tabulation on chart 11385 for services and supplies available.)

Fort Walton Beach on the N side of The Narrows at **Mile 222.2E** has complete repair facilities; fuel and marine supplies are available. A 5-mph **speed limit** is enforced in The Narrows. A mobile hoist is available

at Shalimar. (See chapter 6 for more complete information on the facility at Shalimar.)

An overhead power cable crossing The Narrows at **Mile 216.8E** has a clearance of 76 feet. State Route 399 highway **Navarre Causeway,** over Santa Rosa Sound at **Mile 206.7E** has a fixed channel span clearance of 50 feet over the waterway.

Chart 11378.-State Route 399 highway bridge over the W end of Santa Rosa Sound, at **Mile 189.1E,** has twin fixed spans with clearances of 65 feet. Immediately E of the fixed bridges, the center span of a former bascule bridge has been removed and the remainder of the bridge is used as fishing piers. An overhead power cable just E of the fixed spans and the fishing piers has a clearance of 70 feet. Gasoline, diesel fuel, water, ice, launching ramps, and berths are available at a marina on **Little Sabine Bay** at Pensacola Beach at the S end of the bridge. In May 1982, the reported controlling depth was 6 feet in the channel leading from the waterway. The channel is marked by private daybeacons.

At **Mile 182.9E,** a 4.1-mile route leads about NNE through deep water in **Pensacola Bay** to **Pensacola.** The city has complete supply and repair facilities. (See chapter 6 for more complete information.)

From Pensacola Bay, the waterway passes through a landcut at **Mile 179.0E** into **Big Lagoon.** At **Mile 178.4E,** three unmarked concrete blocks, one awash and two covered 1 foot, are just outside the S edge of the channel; caution is advised. Several marinas are on the N shore W of **Trout Point, Mile 177.0E.** Gasoline, diesel fuel, water, ice, launching ramps, marine supplies, and berths with water and electricity are available. A mobile hoist can haul out craft to 20 tons for complete repairs.

A Coast Guard station is about 0.8 mile W of Trout Point.

State Route 292 highway bridge over the W end of the lagoon at **Mile 171.8E** has a fixed span with a clearance of 73 feet.

Gulf Beach is a summer resort S of the bridge. A marina is on a basin on the S bank of the waterway about 0.7 mile W of the bridge. Gasoline, water, ice, marine supplies, launching ramps, and open and covered berths with electricity are available at a marina in the basin. A 20-ton mobile hoist can handle craft up to 40 feet long for general repairs or storage. A marine railway at a small boatyard nearby can haul out craft to 60 feet for hull repairs. In May 1982, a reported depth of 4 feet was available in the unmarked channel to the boatyard.

From **Mile 166.8E,** the well-marked waterway extends through the lower part of **Perdido Bay,** thence through **Arnica Bay, Bay La Launch,** and **Wolf Bay.** The Florida-Alabama boundary follows the waterway between **Miles 167.4E** and **169.9E.** (Perdido Bay and its tributaries are described in chapter 6.)

A submerged wreck is at **Mile 165.9E** in about 30°19′03″N., 87°31′00″W.

In May 1982, shoaling to 3 feet was reported to extend about 0.1 mile S from Pensacola-Mobile Light 74 off **Ross Point** at **Mile 165.9E.**

A marina is at a small-boat basin on the S side of the waterway in Arnica Bay at **Mile 165.1E.** Berths with water and electricity, gasoline, diesel fuel, ice, marine supplies, a launching ramp, and limited repairs are available. The approach to the marina is marked by private daybeacons and, in May 1982, had a reported controlling depth of 6 feet. A marina in **Roberts Bayou,** locally known as Pirates Cove, on the N side of Arnica Bay, has gasoline, diesel fuel, water, electricity, a launching ramp, and berths. The channel leading to the marina is marked by private daybeacons and, in May 1982, had a reported controlling depth of about 7 feet. Marine railways and other repair facilities are available at Terry Cove. (See chapter 6 for more complete information.)

From the W end of Wolf Bay at **Mile 160.0E,** the waterway extends through a long landcut to and through **Oyster Bay** and enters **Bon Secour Bay** at **Mile 151.0E.**

The twin fixed spans of the State Route 59 highway bridge cross the cut at **Mile 154.9E** and have a clearance of 73 feet. The overhead power cables in the vicinity of **Mile 154.6E** have clearances of 93 feet. Gasoline, diesel fuel, water, ice, marine supplies, and a launching ramp are available at marinas near the bridge.

The village of **Gulf Shores** is 0.7 mile S of the bridge. The Dixie Graves Highway extends W from Gulf Shores to Fort Morgan on Mobile Point.

The 22.5-mile route of the waterway across the lower part of Bon Secour Bay and **Mobile Bay** is through a well-marked dredged channel, except inside the entrance to Mobile Bay from the Gulf where general depths are greater than 12 feet.

Mobile Bay Channel crosses the waterway at **Mile 133.6E;** **Mobile** is 25.2 miles N. Chapter 7 describes Mobile Bay and its tributaries.

From Mobile Bay, the waterway goes through **Pass aux Herons** to the open water of Mississippi Sound. Dauphin Island Bridge across the waterway at **Mile 127.8E** has a fixed span with a clearance of 83 feet. An overhead power cable on the W side of the bridge has a clearance of 93 feet over the waterway. In 1967, a vessel reported striking a submerged object in the channel at about **Mile 127.3E.** The current velocity is 1.3 knots through Pass aux Herons. It has been reported, however, that greater velocities may be experienced when the wind is SE to E on an ebb tide, or when the wind is SW to NW on a flood tide. With these conditions, Pass aux Herons Buoys 14, 15, and 17 may be towed under. Berthing and repair facilities, supplies, and fuel are available at the town of Dauphin Island.

Charts 11374, 11372, 11373.-The waterway leaves Pass aux Herons Channel at **Mile 119.1E** and enters the open water of Mississippi Sound, which has general depths greater than 12 feet until up to Marianne Channel, **Mile 58.1E** at the W end of the sound.

If bound for **Bayou La Batre,** depart the waterway at the light marking the W end of Pass aux Herons Channel, **Mile 119.1E,** and proceed on a NNW course for about 4.3 miles to Bayou La Batre Light 1, marking the entrance to the dredged channel, thence through the marked channel for about 6 miles to the town. Supply and repair facilities are available. (See chapter 7 for more complete information.)

The entrance to Mississippi Sound from the Gulf through **Petit Bois Pass** is 2 miles S of **Mile 115.4E.** A wreck and two obstructions have been reported between the Intracoastal Waterway and the N entrance to the pass. The Alabama-Mississippi boundary crosses the waterway at **Mile 112.0E.**

At **Mile 104.2E,** the waterway crosses the deep ship channel in Mississippi Sound between Horn Island Pass and **Pascagoula.** The channel to Pascagoula extends N for 1.9 miles, thence NW for 5.8 miles to the turning basin. Berthing and repair facilities, supplies, gasoline, and diesel fuel are available. (See chapter 7 for more complete information.)

Lights at **Miles 98.1E** and **95.9E** mark turning points in the waterway route. At **Mile 89.3E,** a light, 3.4 miles S of low and rounded **Bellefontaine Point,** marks the waterway route.

At **Mile 87.5E,** a dredged channel leads N and NW for 9.4 miles to **Biloxi.** (See chapter 7.)

Chart 11372.–At **Mile 81.0E,** a light, 2.6 miles N of Ship Island, marks the waterway through Mississippi Sound. From the light a N by W course in depths of 15 to 10 feet for 4.7 miles leads to a marked channel which continues N and E for 3.2 miles to Biloxi. A NW course from the light for 6.4 miles leads to a large yacht basin at **Beauvoir.** Berthing and repair facilities, marine supplies, gasoline, and diesel fuel are available. (See chapter 7 for more complete information.)

At **Mile 72.8E,** the waterway crosses the deep **Gulfport Channel** between Ship Island Pass and Gulfport. The channel to Gulfport extends NW for 6.0 miles to the ship basin. Small-boat basins are on both sides of the ship basin. Berthing and repair facilities, marine supplies, gasoline, and diesel fuel are available. (See chapter 7 for more complete information.)

At **Mile 65.3E,** the waterway rounds a lighted buoy in Mississippi Sound and turns sharply to the SW. If bound for **Pass Christian Harbor,** depart the lighted buoy on a WNW course and proceed 5.4 miles through depths of 13 to 7 feet to the entrance to the municipal boat basin at the town of **Pass Christian.** (See chapter 7 for more complete information.)

From **Mile 65.3E,** the SW reach proceeds through natural depths and through dredged **Marianne Channel** to **Mile 53.9E;** thence the route is W through dredged **Grand Island Channel,** to natural depths exceeding 12 feet at **Mile 47.9E** in the E approach to Grand Island Pass.

Chart 11367.–The Mississippi-Louisiana boundary follows the waterway W through **St. Joe (Grand Island) Pass** to **Mile 40.6E,** then turns sharply from the waterway and follows the channel to **Pearl River.**

From **Mile 40.6E,** the waterway continues W through dredged cuts and crosses the **Lake Borgne** end of The Rigolets at **Mile 35.0E. The Rigolets** (see chapter 7) is a comparatively deep passage that connects Lake Borgne with **Lake Pontchartrain,** several miles to the W.

From The Rigolets, the waterway route is SW through nearly 23 miles of **The Rigolets-New Orleans Cut.** Pilots should be on the alert for cross currents at waterway crossings of passes and bayous. **Chef Menteur Pass** (see chapter 7), which is crossed at **Mile 22.9E,** is specially noted for such currents; the pass is another deep link between Lake Borgne and Lake Pontchartrain.

At **Mile 15.0E, Michoud Canal** extends N from the waterway for 1.5 miles to the town of **Michoud,** which has rail connections. A Federal project provides for a depth of 36 feet in the canal and in that part of the Intracoastal Waterway connecting the canal with the Mississippi River-Gulf Outlet Canal at **Mile 14.0E.** (See Local Notice to Mariners and latest editions of the charts for controlling depths.)

Michoud Canal is within a **safety zone.** (See 165.1 through 165.7, 165.20 through 165.25, and 165.801, chapter 2, for limits and regulations.)

Michoud Slip, the basin at the National Aeronautics and Space Administration George C. Marshall Space Flight Center on the N side of the waterway at **Mile 13.5E,** had a centerline controlling depth of 21 feet in October 1983. An overhead power cable with a clearance of 170 feet crosses the waterway close W of the basin. This is the approximate turning point from the E-W reach to SE reach of the deep **Mississippi River-Gulf Outlet Canal.** (See chapter 8.) The waterway continues W through the canal to **Mile 13.0E** where it is crossed by a fixed highway bridge with a clearance of 135 feet.

The Intracoastal Waterway, from Mile 13.5E at the junction with the Mississippi River-Gulf Outlet Canal W to Mile 0.2E at the junction with Harvey Canal No. 1, is within the area of the New Orleans Vessel Traffic Service (VTS). (See chapter 8 for details of the New Orleans VTS.)

The Port of New Orleans Bulk Materials Handling Plant is on the N bank of the waterway at **Mile 9.7E.**

The overhead power cable over the waterway at **Mile 8.2E** has a clearance of 170 feet. The waterway enters the deep **Inner Harbor Navigation Canal (Industrial Canal)** of New Orleans at **Mile 7.5E** and proceeds S through the canal to Mississippi River. (See chapter 8 for more complete information.)

The combination Southern Pacific Railroad and Florida Avenue highway bridge over Inner Harbor Navigation Canal at **Mile 7.5E** has a bascule span with a clearance of zero feet; the overhead power cable on the N side of the bridge has a clearance of 166 feet.

Repair yards on the E side of the canal at **Mile 7.0E** have a 110-foot marine railway, a 150-ton

vetical boat lift, and several floating drydocks with capacities to 2,160 tons. The largest is 180 feet long, 58 feet wide, and has 16 feet over the blocks. Cranes to 50 tons are available.

The highway bridge over the canal at **Mile 6.7E** has a lift span with a clearance of 40 feet down and 156 feet up.

Inner Harbor Navigation Canal Lock, at **Mile 6.5E**, is 640 feet long (626 feet usable), 75 feet wide (74 feet usable), with 31½ feet over the sills, and handles lifts up to 17 feet. The lockmaster can be contacted on VHF-FM channels 14 (156.70 MHz) or 16 (156.80 MHz) or by telephone (504-945-2157). Red and green traffic lights are at each end of the lock. Vessels should enter the lock only on the green light.

The highway bridge over the canal at **Mile 6.2E** at the end of the lock has a bascule span with a clearance of zero feet.

The Intracoastal Waterway leaves Inner Harbor Navigation Canal and enters **Mississippi River,** at **Mile 5.8E.** The basic route follows the **New Orleans** waterfront upriver to **Canal Street, Mile 3.6E,** which is 82.4 miles above the river's Head of Passes. (See chapter 8 for description of New Orleans.) Most of the city's small-craft facilities are behind canal locks or at West End Park on Lake Pontchartrain. (See chapter 7 for more complete information on these facilities.)

From Canal Street, the waterway continues up Mississippi River and passes under an aerial tram at **Mile 3.0E** and the high fixed bridges at **Mile 2.7E**. At **Harvey,** on the S side of Mississippi River, 3.6 miles above Canal Street, the route leaves the river and proceeds S through **Harvey Canal No. 1.**

Harvey Lock, at **Mile 0.0,** is 425 feet long and 75 feet wide, has 12 feet over the sills, and handles lifts to 20 feet. The lockmaster continuously monitors VHF-FM channel 14 (156.70 MHz). The railroad bridge over the canal at **Mile 0.1W** has a bascule span with a clearance of 9 feet. The overhead power cable on the N side of the bridge has a clearance of 90 feet. The highway bridge at **Mile 0.1W** has a bascule span with a clearance of 7 feet. At **Mile 0.8W,** twin fixed highway bridges with a clearance of 95 feet cross the canal.

Supplies and services available at Harvey include gasoline, diesel fuel, water, ice, and marine supplies. Harvey shipyards can handle vessels up to 420 feet, and the machine shops can repair gasoline and diesel engines.

The overhead power cable over Harvey Canal No. 1, at **Mile 1.8W**, has a clearance of 135 feet. At **Mile 2.8W,** a highway bascule bridge with a clearance of 45 feet crosses the canal. (See 117.538, chapter 2, for drawbridge regulations.) The overhead power cable at **Mile 4.1W** has a clearance of 124 feet. The waterway continues S and enters Bayou Barataria at **Mile 6.5W**.

The **Algiers Alternate Route (A.A.)** is zeroed at **Algiers Lock (A.A. Mile 0.0)** where the basic Intracoastal Waterway route enters the Mississippi. The alternate route swings downriver, departs the river about 6 miles below Canal Street, and continues SW through a landcut with the same project dimensions as the basic route.

Algiers Lock, at **Mile 0.0,** is 797 feet long (760 feet usable), 75 feet wide, 13 feet over the sills, and handles lifts up to 18 feet. The overhead power cable crossing the lock has a clearance of 126 feet. The highway bridge over the route at **A.A. Mile 1.0** has a lift span with clearance of 4 feet down and 100 feet up. The bridge is equipped with a radiotelephone and the bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, WDT-574. In April 1982, a fixed bridge was under construction at the site of the lift bridge. Upon completion, it will replace the existing bridge. The overhead power cable on the SW side of the bridge has a clearance of 112 feet.

TheMissouri Pacific Railroad bridge at **A.A. Mile 3.7** has a lift span with clearance of 2 feet down and 100 feet up; the overhead power cables SW and NE of the bridge have clearances of 120 feet. A highway lift bridge is adjacent to the SW side of the railroad bridge; clearances are 40 feet down and 100 feet up. The highway bridge is equipped with a radiotelephone and the bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, WDT-572. (See 117.536, chapter 2, for drawbridge regulations.)

The overhead power cable over the waterway at **A.A. Mile 8.4** has a clearance of 117 feet. The alternate route enters Bayou Barataria and rejoins the basic route at **A.A. Mile 8.9,** which coincides with **Mile 6.5W**.

From **Mile 6.5W**, the waterway continues S and W for several miles through **Bayou Barataria.** At **Mile 10.1W**, an overhead power cable with a clearance of 99 feet crosses the waterway. At **Mile 10.6W** is the town of **Crown Point.** The fixed highway bridge over the waterway at **Mile 11.9W** has a clearance of 73 feet.

The waterway departs Bayou Barataria at **Mile 14.6W** and crosses **Bayou Villars** at **Mile 15.1W.** From the crossing, Bayou Villars extends 1.0 mile W to **Lake Salvador,** which has depths of 5 to 7 feet, and 0.4 mile E to a junction with Bayou Barataria at the town of Lafitte. An overhead power cable crossing Bayou Villars close W of the waterway has a clearance of 185 feet. A 20-mile chain of bayous and canals winds SE from Lafitte to **Barataria Bay.** (See chapter 9 for bridges, overhead cables, and controlling depths.) **Lafitte** has several shipyards that can handle vessels up to 80 feet; gasoline, diesel fuel, water, ice, and marine supplies are available.

At **Mile 20.0W**, the waterway crosses **Bayou Perot** which is another passage from the lakes on the SE to Lake Salvador on the W. An overhead power cable crossing the mouth of the bayou has a clearance of 60 feet. An overhead power cable at **Mile 23.0W** has a clearance of 191 feet.

Chart 11355.–The waterway enters **Harvey Canal No. 2** at **Mile 29.3W,** which is 1.2 miles from the

canal's Lake Salvador terminus, and proceeds SW in the canal to Larose.

The overhead power cables over the waterway at **Miles 34.6W** and **34.8W** have minimum clearances of 90 feet. A fixed highway bridge at **Mile 35.2** has a clearance of 73 feet.

At **Mile 35.4W**, the waterway crosses **Bayou Lafourche** which is described in chapter 9. On the NE side of the crossing is **Larose.** Boatyards in the vicinity have a 1,500-ton floating drydock and other facilities for handling craft to 60 feet; gasoline, diesel fuel, water, ice, and marine supplies are available. Pontoon drawbridges cross Bayou Lafourche E and W of the waterway at Larose. (See chapter 9 for operating details.)

The waterway W from Larose is through the **Larose-Bourg Cutoff**. State Route 1 highway bridge over the cutoff at **Mile 35.6W** has a lift span with clearance of 35 feet down and 73 feet up; the overhead power cable 0.1 mile S of the bridge has a clearance of 90 feet.

At **Mile 40.4W,** an overhead power cable with a clearance of 100 feet crosses the waterway.

At **Mile 48.8W**, the cutoff crosses **Company Canal** which connects **Bourg** on Bayou Terrebonne, with Lockport on Bayou Lafourche. (See chapter 9.) A repair yard is on the S side of the waterway at Company Canal. A 3,000-ton floating drydock can handle vessels to 240 feet long, 86 feet wide, and 12-foot draft; complete hull and engine repairs can be made to steel vessels. Cranes to 150 tons are available. At **Mile 49.8W,** a pontoon highway bridge crosses the waterway. The bridge is operated by cables that are suspended just above the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. Warning signs are posted on the upstream and downstream ends of the bridge fender system. Extreme caution is advised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** The bridge is equipped with a radiotelephone. The bridgetender can be contacted on VHF-FM channel 13 (156.65 MHz); call sign, KJA-544. An overhead power cable on the W side of the bridge has a clearance of 90 feet.

A fixed highway bridge with a clearance of 73 feet crosses the waterway at **Mile 54.4W.**

The overhead power cables over the waterway at **Miles 53.9W, 54.7W,** and **55.7W** have a minimum clearance of 90 feet. The route swings sharply S and crosses an E-W reach of **Bayou Terrebonne** at **Mile 57.5W**; the bayou is described in chapter 9. The highway bridge on the N side of the crossing has a lift span with clearances of 8 feet down and 73 feet up; the overhead power and telephone cables N of the bridge have a clearance of 88 feet. The highway bridge on the S side of the crossing has a bascule span with a clearance of 4 feet; the overhead power cable S of the bridge has a clearance of 106 feet. (See 117.537, chapter 2, for drawbridge regulations.)

In the SW angle of the Terrebonne-Intracoastal Waterway crossing is the town of **Houma (Mile 57.6W)** which is the seat of Terrebonne Parish. Houma is an industrial and agricultural town which is also a petroleum center and a base for commercial fishing. The town has good rail freight and highway connections, a sugar mill, seafood processing, and cold-storage facilities. Gasoline, diesel fuel, water, ice, and marine supplies are available. The Houma shipyard can handle craft up to 225 feet and boatyards can handle craft up to 60 feet, and there are facilities for engine repairs.

The Southern Pacific Railroad bridge over the waterway at **Mile 58.9W** has a vertical lift span with clearances of 70 feet up and 4 feet down. (See 117.1b and 117.240, chapter 2, for drawbridge regulations and opening signals.) Immediately S of the bridge, **Bayou Black** branches W from the waterway and follows a winding 24-mile course through several towns and under numerous bridges and overhead cables to another junction with the waterway at **Mile 83.7W**. Dams have been constructed across the bayou at 0.5 and 4.3 miles W of the E junction of the bayou with the Intracoastal Waterway; this section of the bayou has been declared nonnavigable waters. The bayou has a depth of about 4 feet from the W dam to Gibson; thence about 8 feet to the W junction of the bayou with the Intracoastal Waterway. The minimum channel width of the swing bridges crossing the bayou is about 36 feet and the minimum clearance about 1 foot. U.S. Route 90 highway bridge crossing the bayou at Gibson has a lift span with clearances of 2 feet down and 56 feet up. (See 117.1b, 117.240, and 117.245 (a) through (e) and (j)(7), chapter 2, for drawbridge regulations.) The numerous overhead power cables crossing the bayou have a minimum clearance of 38 feet. An overhead television cable crossing the bayou at Gibson has a clearance of 22 feet. Bayou Black has very little traffic and navigation can be difficult at times because of the many vessels that are moored in the bayou.

U.S. Route 90 runs along the E bank of the bayou and crosses over the W bank at **Gibson,** then continues on to Morgan City. A large shipyard on a basin off the bayou about 3 miles S of Gibson builds barges, crew boats, and offshore oil well structures.

The overhead power cable over the waterway at **Mile 59.0W** has a clearance of 90 feet.

The overhead power cable over the waterway at **Mile 59.7W** has a clearance of 108 feet. A bascule highway bridge with a clearance of 40 feet is 0.1 mile SW of the power cable at **Mile 59.8W.** (See 117.537, chapter 2, for drawbridge regulations.)

The waterway continues W through landcuts to **Mile 73.7W,** where it crosses the SE part of **Lake Hackberry;** the remains of hyacinth booms are on both sides of the lake crossing.

The waterway enters narrow **Lake Cocodrie** at **Mile 76.9W** and departs the lake at **Mile 80.4W**; the channel through the lake is well marked. The next link is **Bayou Cocodrie;** winding Bayou Black, previously described, comes down from the N to join Bayou Cocodrie at **Mile 83.7W.**

Bayou Cocodrie joins the N loop of **Bayou Chene,** which in turn joins **Bayou Boeuf** at Mile 87.2W; this is also **L.R. Mile 0.0** of the **Landside Route,** a lesser channel that winds N through Bayou Boeuf and other waterways for 43 miles to a junction with the latter-described Morgan City-Port Allen Alternate Route.

In 1972, the Landside Route was no longer being maintained. (See Local Notice to Mariners for controlling depths.) U.S. Route 90 highway bridge over Bayou Boeuf at **L.R. Mile 1.3** has a fixed span with a clearance of 73 feet. The Southern Pacific Railroad bridge over the bayou at **L.R. Mile 1.9** has a swing span with a clearance of 6 feet; the overhead power cable 0.5 mile N of the bridge has a clearance of 120 feet. Bayou Boeuf has several oil company marine terminals and shipyards that build supply vessels, barges, and offshore oil-well structures. A small marina on the W side of Bayou Boeuf just above the highway bridge provides berths with water and electricity, gasoline, ice, and a 5-ton lift for covered dry storage.

Chart 11354.–The Landside Route proceeds N through landcuts and through **Bayou Milhomme** to **L. R. Mile 12.0** where the waterway is crossed by a pontoon bridge. Continuing N, the route is through **Bayou Long** and **Belle River** to **L.R. Mile 23.8** where another pontoon bridge crosses the waterway.

The next passages are **Big Goddel Bayou, Little Goddel Bayou, Bay Natchez,** and **Chopin Chute.** A pontoon bridge crosses Chopin Chute at **L.R. Mile 41.3.** The Landside Route then follows a section of **Lower Grand River** and merges with the basic Morgan City-Port Allen Alternate Route at **L.R. Mile 49.2 (M.P. Mile 36.9).**

Pontoon bridges.–The pontoon bridges that cross the Landside Route are operated by cables that are suspended just above the water when the bridges are being opened or closed. The cables are dropped to the bottom when the bridges are in the fully open position, but remain suspended while the bridges are fully closed. Extreme caution is advised in the area of the bridges. **Do not attempt to pass through the bridges until they are fully opened and the cables are dropped to the bottom.**

Chart 11355.–Returning to the main Intracoastal Waterway, the route W and NW from **Mile 87.2W** is through the W reach of Bayou Boeuf. The overhead power cable over Bayou Boeuf at **Mile 90.8W** has a clearance of 130 feet.

That part of the Intracoastal Waterway from Mile 93.0W to Mile 99.0W is within the area of the Berwick Bay Vessel Traffic Service (VTS). (See chapter 9 for a discussion of the Berwick Bay Vessel Traffic Service and other additional information.)

Bayou Boeuf Lock, at **Mile 93.0W,** is 1,156 feet long (1,148 feet usable), 75 feet wide, 13 feet over the sills, and handles lifts up to 11 feet. Daybeacons and red and green traffic lights are at each end of the lock. VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz) are monitored continuously at the lock.

Cable ferry.–A cable ferry crosses Bayou Boeuf at **Mile 94.3W.** Flashing white lights on each bank mark the ferry crossing. The ferry is equipped with navigational lights and a flashing red warning light and operates between the hours of 0530 and 2230 daily. When the ferry is underway, the unmarked cables extend about 2 feet above the water's surface, and are dropped to the bottom when not underway. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Deep **Bayou Shaffer** branches S from **Mile 94.5W.** (See chapter 9 for more complete information.)

At **Mile 95.5W** the westernmost reach of Bayou Boeuf joins **Lower Atchafalaya River,** which is an important outlet to the Gulf. (See chapter 9.) Narrow **Berwick Bay,** a link in the Atchafalaya River System, extends N from the junction for about 2 miles. On the NE side of the junction is the port of **Morgan City (Mile 95.5W).** (See chapter 9 for port facilities, service, supplies, and repairs.)

Chart 11354.–**Mile 95.7W** is **M.P. Mile 0.0** of the **Morgan City- Port Allen Alternate Route** and **A.R. Mile 113.3** of the **Atchafalaya River Route,** both of which wind N to outlets on the Mississippi River near and above Baton Rouge. Both of the alternate routes have the same project dimensions as the basic Intracoastal Waterway. (See Local Notice to Mariners for controlling depths.)

That part of the Morgan City-Port Allen Alternate Route from M.P. Mile 0.0 to M.P. Mile 5.0 is within the area of the Berwick Bay Vessel Traffic Service (VTS). (See chapter 9 for a discussion of the Berwick Bay Vessel Traffic Service and other additional information.)

At **M.P. Mile 0.3,** the Southern Pacific vertical lift railroad bridge crosses the bay; clearances are 4 feet down and 73 feet up. U.S. Route 90 fixed highway bridges at **M.P. Miles 0.5 and 0.6** have clearances of 73 and 50 feet, respectively.

A lighted approach danger range is shown from the W abutment of the fixed bridges. The range is visible only to downbound vessels and is designed to mark the W boundary of the suggested downbound course for approaching the bridges. **The range is not designed to be steered on. Mariners are cautioned not to rely solely on the range to safely navigate through the bridges.**

In order to advise mariners on southbound vessels that special navigation orders are in effect, Berwick Bay Bridges Warning Lights have been established on the railroad bridge in about 29°41.5'N., 91°12.8'W. The private lights, two quick flashing white lights with two orange balls as day signals, are shown from a skeleton tower atop the lift span. The lights will operate 24 hours a day when special navigation orders are in effect.

The bridgetender of the Southern Pacific Railroad bridge is available on VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz) for information regard-

ing the lift span and marine traffic in the vicinity of the bridge.

At **M.P. Mile 1.9**, the Lower Atchafalaya River branches W and joins **Bayou Teche** (Chart 11350) 8 miles from Berwick Bay. (See chapter 9 for depths, locks, bridges, overhead cables, and facilities.)

At **M.P. Mile 2.4 (A.R. Mile 115.7)**, the two alternate routes separate. The Morgan City-Port Allen Alternate Route turns sharply to the E, then follows winding courses N through landcuts and bayous.

Bayou Sorrel Lock, at **M.P. Mile 36.4**, is 800 feet long (797 feet usable) and 56 feet wide, has 14 feet over sills, and handles lifts to 21 feet. Red and green traffic lights and daybeacons are at each end of the lock. The lockmaster monitors VHF-FM channels 12 (156.60 MHz) and 14 (156.70 MHz).

The Landside Route, described previously, comes in from the SE and merges with the Morgan City-Port Allen Route at **M.P. Mile 36.9 (L.R. Mile 49.2)** in Lower Grand River. At **M.P. Mile 37.6**, a pontoon bridge crosses the bayou. The bridge is operated by cables that are suspended just above the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is in the fully open position, but remain suspended while the bridge is fully closed. The approaches to the bridge are marked by signs. The bridgetender monitors VHF-FM channel 13 (156.65 MHz). Extreme caution is advised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.**

The M.P. route continues N through landcuts and bayous. **Jack Miller Store** is on the E side of the waterway at **M.P. Mile 43.6**, and **Indian Village** is on the same side at **M.P. Mile 46.0**. A shipyard is on the E side of the waterway just below Jack Miller Store. A marine railway at the yard can haul out craft to 60 feet long for complete hull and engine repairs. Cranes to 100 tons are available. An overhead power cable with a clearance of 99 feet crosses the route at **M.P. Mile 44.8**.

Bayou Plaquemine branches E from **M.P. Mile 46.5** and leads for 6.6 miles to **Plaquemine**, which is on the W bank of the Mississippi River 98 miles above Canal Street, New Orleans. A swing bridge with a clearance of 2 feet crosses the bayou about 0.6 mile E of its junction with Morgan City-Port Allen Alternate Route. In June 1980, the bayou had a controlling depth of 1 foot. **Plaquemine Lock**, formerly the N terminus of the Morgan City-Port Allen Alternate Route, is permanently closed, and three bridges 0.2 mile W of the lock have a least clearance of 13 feet; the overhead power cables over the bayou have least clearances of 52 feet. It is advised that prior to navigating the bayou information concerning depths and local conditions be obtained from local authorities.

From **M.P. Mile 46.5**, the Morgan City-Port Allen Alternate Route continues N through parts of Bayou Grosse Tete and through the landcuts of the **Port Allen Canal**. State Route 77 highway bridge over the waterway at **M.P. Mile 47.1** has a swing span with a clearance of 2 feet. An overhead power cable with a clearance of 117 feet crosses the waterway at **M.P. Mile 48.3**.

The Texas and Pacific Railroad bridge over Port Allen Canal at **M.P. Mile 56.0** has a lift span with clearances of 7 feet down and 73 feet up. A shipyard on the E side of the canal just below the railroad bridge has a 2,500-ton floating drydock capable of handling vessels for general repairs.

Port Allen Canal turns NE at **M.P. Mile 56.9**. An overhead power cable at **M.P. Mile 57.5** has a clearance of 92 feet. The canal turns again at **M.P. Mile 62.5** and heads SE to Port Allen Lock. The overhead power cable over the canal at **M.P. Mile 63.0** has a clearance of 90 feet. The Texas and Pacific Railroad bridge over the canal at **M.P. Mile 64.0** has a lift span with clearances of 14 feet down and 73 feet up; State Route 1 highway bridge on the SE side of the railroad bridge has a fixed span with a clearance of 65 feet.

Port Allen Lock, at **M.P. Mile 64.2**, is 1,202 feet long (1,200 feet usable) and 84 feet wide, has 14 feet over the sills, and handles lifts to 47 feet. The lockmaster can be contacted on VHF-FM channel 14 (156.70 MHz). Red and green traffic lights and daybeacons are at each end of the lock. Vessels entering the lock should wait for the green signal. The lock is the Mississippi gateway of the Morgan City-Port Allen Alternate Route and is on the W side of the river 115 miles above Canal Street, New Orleans.

Charts 11354, 11352.–Getting back to Berwick Bay, the **Atchafalaya River Route** turns sharply to the NW at **A.R. Mile 115.7 (M.P. Mile 2.4)** and follows improved channels through **Stouts Pass** and **Sixmile Lake**, then winds N to **A.R. Mile 0.0**, which is at **Barbre Landing** 0.5 mile E of the confluence of **Atchafalaya River, Red River**, and Old River.

From **A.R. Mile 0.0**, the route leads for 5.2 miles E in Old River Canal and Old River Lock to a junction with Mississippi River which is 181 miles up the Mississippi from Canal Street, New Orleans, and 64 miles above Baton Rouge.

Old River is a 6-mile-long stream which formerly connected the Mississippi River with the Red and Atchafalaya Rivers. A dam about 1.0 mile from its E entrance prevents the Mississippi from flowing uncontrolled into the Atchafalaya Basin. An outflow channel with a control structure on the W bank of the Mississippi about 9.5 miles upriver regulates and controls the flow into the Red River.

Caution: The outflow channel is not a navigation channel. A flashing amber light on the S point of the channel indicates that the control structure is in operation. Very dangerous currents exist in the area, especially during the high-water season. When in the vicinity of the structure, mariners are advised to steer as close to the E bank as safety permits to avoid dangerous crosscurrents and from being drawn into the structure.

The Old River control structure is within a **safety**

zone. (See 165.1 through 165.7, 165.20 through 165.25, and 165.802, chapter 2, for limits and regulations.)

Old River Navigation Canal and Lock was built to bypass the dam and permit navigation between the Mississippi, Red, and Atchafalaya Rivers. The Federal project provides for a dredged channel 12 feet deep and about 2 miles long from the Mississippi to Old River about 1.4 miles W of the dam, thence 12 feet to the junction at **Barbre Landing** with the Red and Atchafalaya Rivers at **A.R. Mile 0.0.** The lock is 1,200 feet long (1,190 feet usable), 75 feet wide, with 11 feet over the sill. A highway bridge over the lock has a lift span with a clearance of 53 feet up and zero feet down.

Atchafalaya River flows S into the Gulf of Mexico from its confluence with Red and Old Rivers at **A.R. Mile 0.5.** The 101.5-mile section, the confluence to Morgan City, has a Federal project depth of 12 feet. The controlling depths are published periodically in Navigation Bulletins issued by the New Orleans District Corps of Engineers, New Orleans, La.

That part of the Atchafalaya River Route from A.R. Mile 113.0 to A.R. Mile 122.0 is within the area of the Berwick Bay Vessel Traffic Service (VTS). (See chapter 9 for a discussion of the Berwick Bay Vessel Traffic Service and other additional information.) In 1982, the deepest draft carried on the river was 12 feet, with average drafts between 9 and 11 feet. Commerce on the river is in shell, logs, petroleum products, liquid sulfur, alcohol, industrial chemicals, fertilizer, sugar, and molasses.

The minimum clearance of the overhead power cables and pipelines is 51 feet and of a fixed highway bridge 40 feet at high water stage.

A railroad bridge crossing the river at **Simmesport** at **A.R. Mile 4.9** has a swing span with a clearance of 5 feet. A fixed highway bridge at **A.R. Mile 5.3** has a clearance of 50 feet.

Two aerial gas pipelines crossing at **A.R. Mile 28.2** have a clearance of 52 feet.

The Texas and Pacific Railroad bridge at **Melville** on the W bank at **A.R. Mile 29.5** has a vertical lift span with clearances of 3 feet down and 53 feet up.

In July 1982, hazardous currents were reported in the vicinity and just N of the bridge.

A vehicular ferry, operating from 0500 to 2300, crosses the river just S of Melville at **A.R. Mile 29.7.**

U.S. Route 190 highway bridges at **Krotz Springs** on the W bank at **A.R. Mile 40.5** have fixed spans with a least clearance of 40 feet. An overhead telephone cable at the bridges has a clearance of 51 feet. An overhead pipeline with a clearance of 60 feet at the center crosses the river just N of the highway bridges.

The Missouri Pacific Railroad bridge at **A.R. Mile 41.5** has a swing span with a clearance of 6 feet. An overhead power cable crosses on the bridge. A shipyard just S of the bridge has a marine railway that can haul out craft to 65 feet for complete repairs.

At **A.R. Mile 58.0,** an overhead power cable with a clearance of 70 feet crosses the waterway. At **A.R. Mile 58.1,** a fixed highway bridge with a clearance of 52 feet crosses the waterway, and at **A.R. Mile 58.8,** an overhead pipeline with a clearance of 58 feet crosses the waterway. At **A.R. Mile 104.5,** an overhead power cable with a clearance of 75 feet crosses the waterway.

At Morgan City, U.S. Route 90 highway bridge at **A.R. Mile 117.4 (M.P. Mile 0.6)** has two fixed spans with clearances of 50 and 73 feet. The Southern Pacific Railroad bridge 1.3 mile S of the highway bridge has a vertical lift with a clearance of 4 feet down and 73 feet up.

Chart 11355.–Returning to Morgan City and the basic route, the Intracoastal Waterway continues SW in Lower Atchafalaya River. The overhead power cable over the river at **Mile 96.5W** has a clearance of 130 feet.

The waterway departs Lower Atchafalaya River at **Mile 98.2W** and proceeds W in **Little Wax Bayou.** The river entrance to the bayou is marked by a light. The route leaves Little Wax Bayou at **Mile 102.0W** and continues W through a landcut that crosses several other bayous. The bayou sides of most crossings may have remains of hyacinth booms.

Chart 11350.–At **Mile 107.7W,** the waterway crosses **Wax Lake** which is a deep drainage ditch. The alternate **North Channel** and **South Channel** at the crossing are no longer maintained.

The settlement of **North Bend** is at **Mile 113.0W** on the N side of the waterway. State Route 317 highway bridge over the waterway at North Bend has a fixed span with a clearance of 73 feet. The overhead power cables at the bridge have a clearance of 94 feet. Another overhead power cable over the waterway at **Mile 113.1W** has a clearance of 90 feet.

The waterway continues in a cut to **Bayou Bartholomew,** where a cutoff at **Mile 120.8W** leads N through Franklin Canal to Bayou Teche. (See chapter 9 for more complete information.)

At **Miles 121.4W** and **122.6W,** the remains of hyacinth booms block the entrances to **Mud Lake.**

At **Mile 122.9W,** the waterway is crossed by a cut which leads SW through The Jaws to West Cote Blanche Bay (see chapter 9) and NE for 5.5 miles through Charenton Canal to Bayou Teche, 0.5 mile below **Baldwin.**

Charenton Canal (see also chart 11345) had, in May 1982, a controlling depth of 8 feet to Bayou Teche. The canal is crossed at the upper end by a railroad bridge with a swing span clearance of 5 feet and a highway bridge with a fixed span clearance of 50 feet; cables over the canal have clearances greater than 50 feet. Dual fixed highway bridges with a clearance of 50 feet cross the canal about 1.1 miles S of the junction with Bayou Teche.

Cable ferry.–At **Mile 129.7W,** the waterway is crossed by a cable ferry to Cote Blanche Island. Unlighted signs, labeled "Cable Ferry 1,000 Feet," mark the E and W approaches to the ferry crossing. The privately owned ferry, with a 23-passenger

capacity, operates 24 hours, daily. The ferry is equipped with navigational lights and monitors VHF-FM channel 16 (156.80 MHz). When the ferry is underway, the unmarked cables are at or just below the water's surface, and are dropped to the bottom when not underway. Towboat operators are cautioned not to pass too soon after the ferry crosses so as to avoid damaging the cables. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

The **Port of West Saint Mary,** on the N side of the waterway at about Mile 132.3W, is a T-shaped channel with a reported controlling depth of 14 feet in May 1982. The channel and port are under the supervision of the Board of Directors of the West Saint Mary Port, Harbor, and Terminal District.

A highway bridge over the waterway at **Cypremort, Mile 134.0W,** has a swing span with a clearance of 4 feet. The overhead power cable about 0.1 mile E of the bridge has a clearance of 90 feet.

Weeks, on the E side of the waterway at **Mile 137.2W,** is the site of the largest salt mine in Louisiana. Just N of the village, at **Mile 138.6W, Vermilion Bay** is entered through Weeks Bayou; the route N to Port of New Iberia is at **Mile 140.4W** through a cut to **Bayou Jack Canal.** (See chapter 9 for more complete information.)

At **Mile 145.8W,** the waterway is crossed by **Bayou Petite Anse** leading N through connecting canals to Avery Island and Delcambre; Avery Canal connects with the bayou S of the waterway to provide a passage to Vermilion Bay. (See chapter 9 for more complete information.)

Between **Miles 159.0W** and **160.2W,** the waterway passes through a cut in Vermilion River. At **Mile 159.0W,** Vermilion River Cutoff leads SE to Vermilion Bay. Tows using the waterway should use extreme caution because of strong currents in Vermilion River. During flood stages, loaded westbound tows should not attempt to cross the river without assistance. Eastbound tows should hold close to the N bank well before entering the river until past the junction.

Repair facilities are available at **Perry** and **Abbeville,** 19 to 21 miles N of the waterway on Vermilion River. Gasoline is available at Abbeville. (See chapter 9 for more complete information.)

Intracoastal City, on the N side of the waterway at **Mile 160.0W,** is a base for oil-field exploration and development with boatyards and marinas with several boat slips having depths of 7 feet. Available supplies include gasoline, diesel fuel, water, ice, and some marine supplies. (See chapter 9 for more complete information.) State Route 333 highway leads to the settlement.

At Mile **161.0W, Freshwater Bayou Canal** leads SW from the waterway to the Gulf or to White Lake through connecting canals. (See chapter 9 for more complete information.)

Vermilion Lock, at **Mile 162.5W,** is 1,182 feet long, 56 feet wide, 11 feet over the sills, and handles lifts up to 5 feet. The lock prevents saltwater from entering rice fields to the W. Small boats may anchor or tie up alongside the banks in a small dredged slip at each end of the lock. The lockmaster can be contacted 24 hours a day on VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz). Red and green lights and daymarks are at each end of the lock. Vessels should enter the lock only on the green signal.

In July 1982, a replacement lock was under construction at **Mile 163.0W.** The new lock will be 1,200 feet long and 110 feet wide with 15 feet over the sills.

Chart 11348.–A fixed highway bridge with a clearance of 73 feet crosses the waterway N of **Forked Island** at **Mile 170.3W.** An oil company slip and wharves are about 0.3 mile E of the bridge. An overhead power cable with a clearance of 97 feet crosses at **Mile 170.6W.**

Cable ferry.–A cable ferry crosses the Intracoastal Waterway at **Mile 178.4W.** The ferry carries passengers and vehicles and operates during daylight hours. White signs with red lettering, labeled "Warning, Cable Ferry Crossing," are 2,000, 1,000, and 200 feet on each side of the ferry crossing. The ferry shows no special lights or signals while underway. The unmarked ferry guide cables extend above the water surface when the ferry is underway and are dropped to the bottom when the ferry is docked at its landings. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

An overhead power cable over the waterway at **Mile 184.6W,** W of Florence Canal, has a clearance of 90 feet.

A marine fuel and supply facility, at **Mile 193.2W,** monitors VHF-FM channel 16 (156.80 MHz) continuously. Gasoline, diesel fuel, and groceries are available at the facility's pier, which had a reported depth of 12 feet alongside in July 1982. Welding equipment is available for above-the-waterline repairs. Diesel fuel by barge in midstream and a 250-hp tug are also available.

The waterway crosses **Mermentau River** between **Miles 201.6W** and **202.5W** and continues W in a landcut. The Mermentau River is navigable for more than 32 miles N of the crossing. S of the waterway, the river leads through Grand Lake to the Gulf. (See chapter 9 for more complete information.)

Bayou Lacassine (see also chart 11345) crosses the waterway at **Mile 205.1W.** N of the crossing, the bayou had a reported centerline controlling depth of 6 feet in July 1982, for about 15 miles to Hayes. Many of the bends have been cut through to provide a shorter route. A highway bridge over Bayou Lacassine, about 3 miles S of Hayes, has a swing span with a clearance of 5 feet. The Southern Pacific Railroad bridge over the bayou near Hayes has a swing span with a clearance of 3 feet. (See 117.1b, 117.240 and 117.245 (a) through (e) and (j)(19) and (20), chapter 2, for drawbridge regulations.) S of the waterway, Bayou Lacassine flows through **Mud Lake** into Grand Lake.

At **Miles 211.5W** and **212.7W,** a canal on the S side of the waterway leads to **Little Lake Misere,**

thence E through **The Narrows** to **Lake Misere** and **Bayou Misere** to Mud Lake. The waterway arcs to the N in this section. **Bell City Drainage Canal** crosses the waterway at **Mile 212.3W.**

A fixed highway bridge with a clearance of 73 feet crosses the waterway at **Gibbstown, Mile 219.8W.** An overhead power cable 0.1 mile E of the bridge has a clearance of 120 feet.

At **Mile 221.9W,** an overhead power cable with a clearance of 219 feet crosses the waterway.

The loading docks and tanks of an oil company are on the N side of the waterway at **Mile 223.3W;** a cut here leads to **Sweet Lake.**

A pontoon bridge crosses the waterway at **Grand Lake Ridge, Mile 231.5W;** the overhead power cables on the S side of the crossing have a reported least clearance of 85 feet. A loading dock is near the crossing. Another pontoon bridge crosses the waterway at **Mile 238.0W.** The bridges are operated by cables that are suspended just above the water when the bridges are being opened or closed. The cables are dropped to the bottom when the bridges are in the fully open position, but remain suspended while the bridges are fully closed. Warning signs mark the approaches to both bridges. The bridges can be contacted on VHF-FM channel 13 (156.65 MHz). Extreme caution is advised in the vicinity of these bridges. **Do not attempt to pass through the bridges until they are fully opened and the cables are dropped to the bottom.**

Calcasieu Lock, Mile 238.2W, is 1,206 feet long (1,194 feet usable), 75 feet wide, 13 feet over the sills, and handles lifts to 4 feet. Red and green lights and daybeacons are at either end of the lock. Vessels should wait for the green signal before entering the lock. The lockmaster can be contacted on VHF-FM channel 14 (156.70 MHz). The lock prevents saltwater from entering rice fields to the E.

The waterway enters **Calcasieu River** at **Mile 239.2W** and continues N around a bend in the river across deep Calcasieu Channel to Choupique Cutoff. Vessels and tows are advised to use caution at the junctions. A fuel dock, at which diesel fuel is available by barge, and a shipyard with two 2,000-ton floating drydocks are at Calcasieu Landing on the W side of the Calcasieu Landing on the W side of the Calcasieu River just N of its junction with Choupique Cutoff. The fuel dock monitors VHF-FM channel 16 (156.80 MHz) continuously. (See chapter 9 for more complete information on Calcasieu River.)

The Intracoastal Waterway, from Mile 239.0W in Calcasieu River to Mile 241.4W at the entrance to Choupique Cutoff, is within the area of the Lake Charles Vessel Traffic Service (VTS). (See chapter 9 for details of the Lake Charles VTS.)

Lake Charles (chart 11347), 9.8 miles up Calcasieu River from the waterway junction at **Mile 241.2W,** has numerous boat landings along the shore of Lake Charles. Good anchorage in depths of 8 to 10 feet is available in the lake. Berthing and repair facilities, marine supplies, gasoline, and diesel fuel are available. (See chapter 9 for more complete information.)

Chart 11331.–From **Mile 241.2W,** the waterway passes through Choupique Cutoff and the long landcut **Lake Charles Deepwater Channel** for 24 miles to the Sabine River at Orange.

Bayou Choupique (see also chart 11348) is part of the waterway between **Miles 241.8W** and **242.4W.** The 12-foot deep exit leads to Calcasieu Channel while the W exit passes through marshland for many miles. The controlling depth in the W branch is about 8 feet to the highway bridge 2.5 miles above the junction; the bridge has a 45-foot fixed span with a clearance of 15 feet. An overhead power cable just E of the bridge has a clearance of 62 feet.

At **Mile 243.3W, Old Canal** leads E to the Calcasieu Channel. In July 1982, the reported controlling depth was 9 feet.

At **Mile 243.8W,** a highway vertical lift bridge with a clearance of 50 feet down and 135 feet up crosses the waterway. (See 117.540(a) through (d), chapter 2, for drawbridge regulations.) An overhead power cable with a clearance of 139 feet and a pontoon bridge are about 50 yards and 130 yards SW of the bridge, respectively. The pontoon bridge will be left in the open position pending its removal.

At **Mile 245.3W,** an overhead power cable across the waterway has a clearance of 140 feet.

Cable ferry.–A cable ferry crosses the waterway at **Gum Cove Ridge, Mile 254.1W.** Unlighted signs, labeled "Cable Operated Ferry ½ Mile" are posted 0.5 mile on either side of the ferry crossing. Stop signs, similar to vehicular traffic stop signs, 1,000 feet and 500 feet on either side of the ferry, are illuminated by reflective material. The ferry carries passengers and vehicles and operates 24 hours daily. The ferry shows navigational lights and monitors VHF-FM channel 16 (156.80 MHz). When the ferry is underway, the unmarked cables extend ½ to 1 foot above the water's surface, and are dropped to the bottom when not underway. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Vinton Canal crosses the Intracoastal Waterway at **Mile 258.4W.** In January 1983, the canal had a controlling depth of 5 feet to a point about 6.5 miles N of the waterway, thence in April 1982, 4 feet to the highway bridge about 6.8 miles N of the junction with the waterway. An overhead power cable with a clearance of 58 feet crosses the canal just N of the junction. The canal connects with **Black Bayou** S of the waterway.

An overhead power cable with a clearance of 151 feet crosses the waterway at **Mile 260.1W.**

At **Mile 264.8W,** the waterway enters **Sabine River** and continues around the S bend of the river to the deep ship channel.

Orange, 0.9 mile up the Sabine River Ship Channel from the waterway junction at **Mile 266.0W,** has repair facilities, marine supplies, and gasoline. (See chapter 10 for more complete information.)

From **Mile 266.0W,** the waterway continues for 22 miles down the Sabine River Ship Channel and the Sabine-Neches Canal to a junction with Port Arthur Canal at Port Arthur.

Adams Bayou, at **Mile 266.8W,** and **Cow Bayou,** at

Mile 269.5W, both on the N side of the waterway, are described in chapter 10. An overhead power cable with a clearance of 172 feet crosses the waterway at **Mile 267.8W.**

At **Mile 276.5W**, a 15.9-mile channel leads up the **Neches River** to the port facilities at **Beaumont.** (See chapter 10 for more complete information.)

Port Arthur, between **Miles 279.8W** and **288.5W** (junction with Port Arthur Canal), has complete repair facilities, marine supplies, gasoline, and diesel fuel at places along the Sabine-Neches Canal. (See chapter 10 for more complete information.)

A fixed highway bridge across the waterway at **Mile 286.3W** has a clearance of 136 feet.

Taylor Bayou extends 1.6 miles N from **Mile 288.5W** to a point where it is obstructed by a barrier. This portion of the bayou is the site of many of the deep-draft facilities at Port Arthur and is described in chapter 10.

The upper reaches of Taylor Bayou can be reached through **Taylor Bayou Outfall Canal** at **Mile 290.3W** which leads N from the waterway to a junction with Taylor Bayou about 2.6 miles above the waterway. In 1982, the outfall canal had a reported controlling depth of 13 feet. Taylor Bayou has depths of about 4 feet for about 29 miles above its junction with the outfall canal.

Cable ferry.–A cable ferry crosses the outfall canal about 2.2 miles above its junction with the Intracoastal Waterway. Warning signs are posted 0.5 mile on either side of the ferry crossing. The privately owned ferry carries company personnel and vehicles and operates 24 hours daily. The ferry shows navigational lights, and when underway the unmarked cables are above the water's surface. When not underway, the cables are dropped to the bottom. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

A navigation lock, 200 feet long, 30 feet wide and with a depth of 10 feet over the sills is on Taylor Bayou about 0.9 mile above the junction with the outfall canal. (See 207.185, chapter 2, for administration use, and navigation of the lock.) Above the lock the bayou is crossed by fixed bridges with a least channel width of 13 feet and clearances of 32 feet and by overhead power cables with a least clearance of 20 feet.

The waterway leaves the Sabine-Neches Canal at **Mile 288.6W** and continues for about 61 miles through a landcut to Galveston Bay.

State Route 87 highway bridge across the waterway at **Mile 288.8W** has a fixed span with a clearance of 73 feet. The overhead power cable W of the bridge has a clearance of 125 feet.

A small-boat basin on the S side of the waterway at **Mile 288.9W** has berthing facilities for craft drawing up to 5 feet. Berths, electricity, water, and a 15-ton portable lift are available; hull repairs can be made.

A spillway at **Mile 292.4W** contains **Shell Lake** and other lakes S of the waterway. Floodgates on the S side of the waterway at **Mile 305.4W** contain **Star Lake.**

At **Mile 314.1W**, dirt ramps of a cattle crossing are on either side of the waterway.

A fixed highway bridge over the waterway at **Mile 319.3W** has a fixed span with a clearance of 73 feet. Overhead power cables E and W of the highway bridge have clearances of 83 and 110 feet, respectively.

An oil loading terminal is in a slip on the N side of the waterway just E of the highway bridge. **High Island,** on the highway 1.5 miles S of the waterway, is an oil-producing center with numerous oil wells, but has no facilities for passing craft. A landing for shallow-draft boats is at **Mile 321.3W.** At **Mile 322.3W,** an overhead power cable has a clearance of 93 feet.

The waterway passes through two marked cuts in the SE part of shallow **East Bay**between **Miles 325.7W** and **329.7W.** Berthing facilities for shallow-draft boats are in slips on each side of the waterway.

An oil-loading terminal is at **Mile 333.2W** on the SE side of the waterway. The waterway continues SW to Port Bolivar and Galveston Bay. Basins along this part of the waterway have several marinas where berths, gasoline, diesel fuel, water, ice, launching ramps, and marine supplies can be obtained. A marina at **Mile 342.9W,** on the SE side of the waterway can accommodate craft drawing up to 5 feet, and has facilities for handling craft up to 55 feet for hull and engine repairs. A channel leading from Galveston Bay through **Sievers Cove** to the waterway, about **Mile 343.2W,** is marked on both sides by piles. In August 1982, 4 feet was reported available in the channel.

Charts 11326, 11324, 11331, 11322.–Port Bolivar is at **Mile 348.3W** on the SE side of the waterway and is near the SW end of **Bolivar Peninsula.** Gasoline, diesel fuel, and water are available at some of the town landings.

The waterway leaves the Bolivar cut and enters **Galveston Bay** at **Mile 349.3W.** The direct route bypasses Galveston and proceeds SW through the lower part of the bay. **Houston Ship Channel** is crossed at **Mile 350.2W;** the port of **Houston** is 43 miles to the NW. (See chapter 10.) The channel to Texas City is crossed at **Mile 350.8W;** the port is 5 miles to the WNW. (See chapter 10 for more complete information.)

There is a dry storage marina on the end of the Texas City Dike, about 0.6 mile NW of the junction with Texas City Channel. Gasoline, diesel fuel, water, ice, and marine supplies are available. A depth of 6 feet was reported alongside the fuel dock and in the approach channel in August 1982.

The basic route of the waterway continues SW through dredged cuts to the bridges that separate Galveston Bay from West Bay.

An alternate route of the waterway at **Mile 349.3W** swings S in **Bolivar Roads** then SW in Galveston Channel. The port of Galveston at **Mile 353.5A** is on the S side of **Galveston Channel.** (See chapter 10 for port facilities, services, supplies, and repairs.) The **Pelican Island** railroad-highway bridge

over Galveston Channel at **Mile 356.0A** has a bascule span with a clearance of 12 feet. **Caution:** The open bascule span overhangs the channel above a vertical clearance of 75 feet. (See 117.553, chapter 2, for drawbridge regulations.) An overhead power cable close E of the bridge has a clearance of 85 feet. The alternate route leaves the port's deep water at the bridge and proceeds W in dredged cuts to rejoin the waterway at **Mile 356.4W.**

The rail-highway bridge over the waterway at **Mile 357.2W** has a bascule span with a clearance of 7 feet. Mariners may contact the bridgetender on VHF-FM channel 14 (156.70 MHz) or channel 16 (156.80 MHz) for information regarding the operation of the span. The overhead power cable on the SW side of the bridge has a clearance of 99 feet. The two fixed bridges at **Mile 357.3W** have a clearance of 73 feet.

W of the bridges, a marked channel leads SE from **Mile 357.7W** to **Offatts Bayou** which is one of the principal bases for Galveston pleasure and fishing craft. (See chapter 10 for channel depths, services, supplies, and repairs.)

Chart 11322.–The waterway continues W through dredged cuts between **North Deer Island** and **Tiki Island** in the NE part of West Bay. A marina is on Tiki Island. (See chapter 10 for channel depths, services, supplies, and repairs.) At **Mile 362.8W**, the waterway enters a 12-mile cut which is never more than 0.2 mile behind the NW shore of West Bay.

At **Mile 374.7W**, the waterway leaves the landcut and crosses the mouth of Chocolate Bay at the NW end of West Bay through a buoyed channel with range lights at each end. Marked channels to **Chocolate Bay** lead N from the waterway at **Miles 375.7W** and **376.3W.** Gasoline, water, berths, supplies, and repair facilities are available at marinas on Chocolate Bayou. (See chapter 10 for more complete information.)

San Luis Pass and tributaries to the W part of West Bay are described in chapter 10.

From **Mile 377.9W**, the waterway enters a landcut which passes through and across shallow bays, bayous, and rivers for 33 miles to **Mile 411.3W** at the NW end of Cedar Lakes.

Oyster Creek, emptying into the waterway at **Mile 392.2W,** about 2.5 miles NE of Brazosport, is a tortuous stream of no importance used as a storm refuge by small craft. Overhead power cables with clearances of 50 feet and 45 feet cross the creek about 2.3 mile and 3.2 miles, respectively, above the mouth. State Route 523 highway bridge crosses the creek about 2.5 miles above its mouth. The bridge has an 18-foot span with a clearance of 12 feet. A reported depth of about 1 foot could be carried to this bridge in August 1982. Marinas on either side of the creek can provide gasoline, diesel fuel, water, ice, marine supplies, open and covered berths with electricity, and a surfaced launching ramp. A 10-ton mobile lift can handle craft up to 30 feet for general repairs or storage.

The highway bridge across the waterway at **Mile 393.8W** has a fixed span with a clearance of 73 feet. The overhead power cable on the W side of the bridge has a clearance of 97 feet.

There are numerous marinas and boatyards along the waterway between the entrance to Oyster Creek and the Freeport Entrance Channel. Gasoline, diesel fuel, berths, marine supplies, and complete repair facilities are available. Reported depths of from 5 to 12 feet are alongside these facilities. Marine railways and lifts can handle craft up to 65 feet for general repairs.

An overhead telephone cable with a clearance of 74 feet crosses the waterway at **Mile 394.8W.**

At **Mile 394.8W,** the private canal on the N side of the waterway is closed to the public by a gate across the entrance.

Freeport, 2 miles up Old Brazos River from the waterway junction at **Mile 395.1W,** has berthing and repair facilities, gasoline, diesel fuel, and marine supplies. (See chapter 11 for more complete information.)

An overhead power cable with a clearance of 108 feet crosses the waterway at **Mile 395.6W.** A pontoon drawbridge crosses at **Mile 397.6W.** The bridge is opened or closed by cables that are attached to the N shore of the waterway. The cables remain suspended just above or below the water at all times, but cross the navigable channel only when the bridge is in the closed position.

The waterway crosses the **Brazos River** at **Mile 400.8W.** The 75-foot-wide floodgates on both sides of the river control waterway traffic when crossing conditions are hazardous because of strong current velocities. (See 162.75, 207.180, and 207.187, chapter 2, for regulations governing the use, administration, and navigation of the floodgates; local information is issued by the Galveston District Engineer, Corps of Engineers.)

The lockmasters monitor VHF-FM channel 13 (156.65 MHz) continuously and may be reached by telephone (East Gate, 409-233-1251; West Gate, 409-233-5161). Mooring piles are on both sides of the waterway on the canal sides of the floodgates for the mooring of vessels when the floodgates are closed or when tows are limited. Red and green traffic lights and daymarks are at both ends of the floodgates. (Brazos River is described in chapter 11.)

The waterway crosses **San Bernard River** at **Mile 405.0W.** Operators of small craft are advised to be on the lookout for logs and floating debris in the waterway between Brazos River and San Bernard River. A fuel pier on the W side of the river's junction with the waterway had a reported depth of 4 feet alongside in August 1982. Gasoline, diesel fuel, and water are available. (San Bernard River is described in chapter 11.)

Chart 11319.–The waterway continues in a landcut from the N side of Cedar Lakes to **Mile 420.5W** where it follows a cut along the N shores of shallow East Matagorda Bay and Matagorda Bay for 35 miles, thence across the open waters of Matagorda Bay to Port O'Connor. Prolonged E winds will

create a difference in water level between East Matagorda Bay and Matagorda Bay, thus causing strong W currents in the waterway.

The overhead power cable over the waterway at **Mile 417.9W** has a clearance of 73 feet. A pontoon drawbridge crosses at **Mile 418.0W.** The bridge is opened or closed by cables that are attached to the N shore of the waterway. The cables remain suspended just above or below the water at all times, but cross the navigable channel only when the bridge is in the closed position. A hinged apron at the S end of the bridge can be opened to provide a 13-foot-wide small-boat channel. An overhead power cable on the W side of the bridge has a clearance of 94 feet. Ice and limited berths are available at a small marina just W of the bridge. Depths of about 2 feet were reported alongside the facility in August 1982.

The entrance to **Caney Creek** at **Mile 419.9W** was reported closed in August 1982. The creek can be entered through **Caney Creek Cutoff.** The cutoff crosses the waterway through a 0.5-mile canal leading to **East Matagorda Bay** at Mile **420.4W.** In August 1982, shoaling was reported at the junction of Caney Creek and Caney Creek Cutoff. Above the junction, a depth of about 2 feet can be taken up the creek to a bridge 25 miles above the waterway. The fixed highway bridge 9 miles above the waterway and 2 miles below **Sargent,** has a 28-foot fixed span with a clearance of 10 feet. Several fish camps along the creek have gasoline and launching ramps.

Live Oak Bayou crosses the waterway at **Mile 427.8W** and empties into East Matagorda Bay. There is a fish camp on the bayou about 1.0 mile above the crossing at which gasoline, water, ice, and a launching ramp are available. It is accessible by small outboards only.

There is an abandoned boat basin and bulkhead at **Old Gulf** on the N side of the waterway at **Mile 435.7W.** A channel opposite Old Gulf leads S from the waterway into East Matagorda Bay. This channel had a reported controlling depth of about 7 feet in September 1982, with shoaler depths in the bay.

An oil-loading terminal is on the N side of the waterway at **Mile 438.6W.**

The overhead power cable over the waterway at **Mile 440.7W** has a clearance of 71 feet. A pontoon drawbridge crosses at **Mile 440.7W.** The bridge is opened or closed by cables that are attached to the N shore of the waterway. The cables remain suspended just above or below the water at all times, but cross the navigable channel only when the bridge is in the closed position.

Matagorda, a small fishing and oystering fleet base, is on the N side of the waterway at **Mile 440.7W.** Gasoline, diesel fuel, water, ice, marine supplies, and a launching ramp are available. A depth of 3 feet is reported available alongside. A small boatyard at Matagorda can handle craft up to 40 feet.

Colorado River Locks, at **Miles 441.1W** and **441.8W,** are 1,200 feet long, 75 feet wide, with 15 feet over the sills. The locks control the waterway traffic when crossing conditions are hazardous because of strong current velocities. (See 162.75, 207.180, and 207.187, chapter 2, for regulations governing use, administration, and navigation of floodgates and locks; local information is issued by the Galveston District Engineer, Corps of Engineers.)

The lockmaster may be contacted by telephone (713-863-7842) or radiotelephone. The lockmaster monitors VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz) continuously. Red and green traffic lights and daymarks are at each end of the lock. Mooring piles are on both sides of the waterway on the canal sides of the locks for mooring vessels when the locks are closed or when tows are limited.

Colorado River crosses the waterway at **Mile 441.5W** and enters the Gulf through a 5.8-mile flood discharge channel in the isthmus separating East Matagorda Bay and Matagorda Bay. The channel was formerly used by the Matagorda fishing fleet. In September 1982, the entrance from the Gulf was reported closed because of heavy silting and sandbars. The E side of the river has fish camps where gasoline, water, ice, launching ramps, and berths are available.

A dredged channel leads N from the Intracoastal Waterway for 13.5 miles to a turning basin at the Port of Bay City Barge Terminal. In 1980-March 1982, the midchannel controlling depth was 5 feet from the Intracoastal Waterway to the turning basin with 5 to 7 feet in the basin. The head of navigation in the river is just above the turning basin. The channel is marked by daybeacons and buoys as far as the turning basin.

Overhead power cables crossing the Colorado River just above its junction with the waterway and 5.1 miles above the junction have a least clearance of 74 feet.

Another overhead power cable with a clearance of 74 feet crosses the river about 6 miles above the junction. An overhead cable car immediately N of the overhead cable has a clearance of 75 feet. A private ferry crosses the river just N of the cable car. The ferry carries vehicles.

On the E side of the river, a small-craft facility, just N of the ferry, has gasoline, diesel fuel by truck, water, berths with electricity, and a launching ramp. Pilings from a former bridge are reported about 1 mile N of the ferry landing. A highway bascule bridge about 8 miles above the waterway has a clearance of 28 feet. Overhead power cables just above and about 0.9 mile above the bascule bridge have clearances of 76 feet and 75 feet, respectively. Boat operators should be on the lookout for logs and floating debris in the river and discharge channel.

Port of Bay City Barge Terminal Wharf, in a basin on the E side of the river 13.5 miles above the mouth, is 200 feet long with a concrete apron and a transit shed with 32,000 square feet of storage space. The wharf has a barge loading ramp and oil handling pipe connection on a lower level below the main wharf apron. A private petroleum wharf is also in the basin. In August 1982, depths of 9 feet were

reported alongside the facilities. The Port of Bay City Authority of Matagorda County Navigation District No. 2 is in charge of operations.

Bay City, the county seat of Matagorda County, is about 7 miles N of the terminal. It is a center for cattle, cotton, rice, petroleum, natural gas, sulfur, and petrochemicals. The Missouri Pacific, Southern Pacific, and Santa Fe Railroads, and an interstate busline serve the city. Two main State highways pass through the city. Bay City has an inflatable dam in the river which is inflated during the growing season to impound water for irrigation purposes.

At **Mile 455.6W,** the waterway enters the open waters of **Matagorda Bay** through a well-marked channel and continues across the bay for 19 miles to Port O'Connor. Openings are provided through the spoil banks on the N side of the waterway for passage in depths of 4 to 10 feet through the open waters of the bay to Tres Palacios Bay and Lavaca Bay; however, marked channels lead to Tres Palacios Bay and Lavaca Bay at **Miles 466.1W** and **470.9W,** respectively. (See chapter 11 for more complete information.)

Emergency moorings have been established on the S side of the landcut S of Oyster Lake to enable vessels and tows to tie up when it becomes unsafe to proceed through the open waters of Matagorda Bay. These facilities are for temporary use only, and at all other times the fairway must be kept open.

At **Mile 470.9W,** the waterway crosses the Matagorda Ship Channel. Small craft should not anchor in the area between the waterway and the entrance to the landcut through Matagorda Peninsula due to the turbulence reported in the waters in the area.

Charts 11319, 11315.–The entrance channel to Port O'Connor is between jetties with lights off their outer ends at the SW end of Matagorda Bay. Berthing facilities, gasoline, diesel fuel, and marine supplies are available. (See chapter 11.) An overhead power cable with a clearance of 88 feet crosses the waterway at **Mile 473.3W.**

Storm warning signals are displayed. (See chart.)

From Port O'Connor, the waterway passes through a cut along the N shore of Espiritu Santo Bay for about 18 miles to San Antonio Bay.

At **Mile 478.5W, Ferry Channel,** a marked channel across Espiritu Santo Bay, leads to a fish and wildlife reserve at a former military base on Matagorda Island. (See chapter 11 for more complete information.)

Gasoline and a launching ramp are available at a small-boat basin on the N side of the waterway at **Mile 485.2W.** In August 1982, a depth of 2 feet was reported alongside the fuel dock.

Chart 11315.–At **Mile 491.8W,** the waterway enters the open waters of shallow **San Antonio Bay** through a well-marked channel. Marked channels lead N from **Miles 491.8W** and **492.5W** to **Seadrift** and other places in the bay. (See chapter 11 for more complete information.)

At **Mile 500.0W,** the waterway leaves San Antonio Bay and passes through landcuts and channels in shallow bays for about 11 miles to Aransas Bay. The channel is marked by lights and buoys. The **Aransas National Wildlife Refuge** is on the N side of the waterway at the E end of the landcut. With a prevailing S wind, vessels may be set into the shallow depths of the bays through this section of the waterway. Mariners are advised to keep in the channel and favor the aids on the S side.

Chart 11314.–At **Mile 511.1W,** the waterway enters the open waters of **Aransas Bay** and continues across the bay in a well-marked channel. Marked openings in the spoil banks on the NW side of the waterway provide passage in depths of 3 to 12 feet to Rockport and other places in Aransas Bay. (See chapter 11 for more complete information.)

At **Mile 522.7W,** an alternate route of the waterway continues SW and S through Lydia Ann Channel to Aransas Pass. The main route of the waterway swings W and follows a cut along the NW shore of Redfish Bay to Corpus Christi Bay.

Rockport, 1.5 miles NW of **Mile 524.0W,** has berthing and repair facilities, gasoline, diesel fuel, and marine supplies. (See chapter 11 for more complete information.)

Boat operators are advised to stay in the waterway channel throughout the cut in Redfish Bay to avoid rock formations that may project from the channel slopes.

Cove Harbor, Mile 525.6W, is a commercial basin off the waterway about 2.5 miles S of Rockport Harbor. The basin is used by craft engaged in the oil and fishing industries. There are two slips in the basin and berths along the bulkhead of the basin and in the slip. In August 1982, there was about 12 feet reported in the entrance and 10 to 11 feet reported in the basin. Launching ramps are available.

Palm Harbor, Mile 527.5W, is a yacht basin in a dredged slip 0.3 mile long off the waterway about 1.5 miles SSW of Cove Harbor. A depth of 6 feet was reported in the basin and entrance channel in August 1982. Gasoline, diesel fuel, water, ice, open berths, marine supplies, and a launching ramp are available at the basin.

At **Mile 532.9W,** the waterway crosses Aransas Channel which leads W to the town of **Aransas Pass** and E to the Gulf through Aransas Pass. Several small-craft facilities are at the town. (See the small-craft facilities tabulation on chart 11314 for services and supplies available, and chapter 11 for additional information about the town of Aransas Pass.)

Storm warning signals are displayed. (See chart.)

The fixed highway bridge across the waterway at **Mile 533.1W** has a clearance of 48 feet. Overhead power cables just SSW of the bridge have a clearance of 61 feet.

At **Mile 534.0W,** the waterway is crossed by a dredged channel; NW of the waterway, the channel leads to a small-boat basin at the town of Aransas Pass. The channel S leads through Redfish Bay to Corpus Christi Bay.

At **Mile 535.3W,** a boatyard on the NW side of the

waterway has a 170-ton vertical lift and can make hull and engine repairs.

Chart 11308.–At **Mile 539.5W**, the waterway crosses Corpus Christi Channel.

Corpus Christi (charts 11309, 11311), 11 miles W of **Mile 539.5W**, has complete berthing and repair facilities, gasoline, diesel fuel, and marine supplies. Corpus Christi and other places in Corpus Christi Bay are described in chapter 11.

From the junction with Corpus Christi Channel (**Mile 539.5W**), the waterway continues S through a landcut and dredged channel to **Mile 545.4W** in Corpus Christi Bay. From **Mile 545.4W**, the waterway crosses the open water of Corpus Christi Bay in a S direction in depths of 12 feet to Laguna Madre. The channel is marked by lights and daybeacons.

At **Mile 547.6W**, the waterway enters a well-marked channel that extends for 120 miles through shallow **Laguna Madre** to Port Isabel.

At **Mile 549.2W**, an overhead power cable crossing from the mainland to Mustang Island is submerged at the channels into Laguna Madre. An overhead power cable crossing the waterway at **Mile 550.9W** has a clearance of 93 feet.

John F. Kennedy Causeway, extending across Laguna Madre, has a fixed bridge over the waterway with a clearance of 73 feet at **Mile 552.7W.** Another opening in the causeway, 1.8 miles to the W, has a fixed span with a clearance of 11 feet. An overhead power cable crossing the waterway on the N side of the causeway at **Mile 552.7W** has a clearance of 91 feet.

Between **Miles 552.1W** and **562.0W**, on both sides of the waterway, are numerous marked and unmarked private channels which lead through an area obstructed by oil wells and pipelines to private petroleum facilities.

Charts 11308, 11306.–Baffin Bay, extending W from **Mile 579.5W**, is a commercial and sport fishing area, and the site of oil exploration and drilling. A marked private natural channel with reported depths of 2 feet in August 1982, extends W up Baffin Bay for about 14 miles to a small-craft facility at Riviera Beach on the N side of the entrance to Laguna Salada. Minor services and a launching ramp are available at the facility. Strangers are advised to keep in the marked channel because of the many sunken rocks and other obstructions in the bay. A privately marked natural channel with reported depths of 6 feet in August 1982, extends 4 miles farther up Laguna Salada to a boat basin and boatyard. The boatyard that builds boats can handle craft up to 50 feet or 20 tons using a large trailer for hull and engine repairs. Gasoline, diesel fuel, water, electricity, and a launching ramp are available during daylight.

Between **Miles 587.6W** and **611.9W**, the waterway passes through **Land Cut**, a long cut in the sand and mud of Laguna Madre. In this stretch, private short oil company side channels extend on either side of the waterway.

Charts 11306, 11303.–Port Mansfield, 1 mile W of **Mile 629.8W**, has berths, gasoline, diesel fuel, and limited marine supplies. (See chapter 11 for more complete information.)

Storm warning signals are displayed. (See chart.)

At **Miles 643.9W** and **644.5W**, **Arroyo Colorado Cutoff** leads W from the waterway and joins Arroyo Colorado to form a route to **Rio Hondo** and **Port Harlingen.** (See chapter 11 for more complete information.)

Chart 11302.–At **Mile 665.1W** the fixed span of the causeway crossing the waterway has a clearance of 73 feet.

At the S end of Laguna Madre at **Mile 665.9W**, the waterway enters a reverse curve cut between Port Isabel and **Long Island**, and joins deep Brownsville Ship Channel at **Mile 668.4W.**

The pontoon drawbridge across the waterway at **Mile 666.0W** connects Port Isabel with Long Island. The bridge is operated by cables that are suspended above the surface of the water when the bridge is being opened or closed. The cables are dropped to the bottom when the bridge is fully opened or closed. The cables are not marked. Extreme caution should be exercised in the area of the bridge. **Do not attempt to pass through the bridge until it is fully opened and the cables are dropped to the bottom.** The bridge is equipped with radiotelephone; the bridgetender can be contacted on VHF-FM channel 16 (156.80 MHz).

Port Isabel, Mile 666.4W, has several small-craft facilities. (See the small-craft facilities tabulation on chart 11302 for services and supplies available, and chapter 11 for additional information about Port Isabel.)

Storm warning signals are displayed. (See chart.)

From **Mile 668.4W**, the waterway follows the Brownsville Ship Channel for 13 miles to Port Brownsville.

Port Brownsville, at **Mile 681.8W**, the W terminus of the Intracoastal Waterway, and the city of **Brownsville,** 5 miles WSW of the port, are described in chapter 11.

13. PUERTO RICO

This chapter describes the islands of the Commonwealth of Puerto Rico, which includes Puerto Rico, Mona, Vieques, Culebra, and a few smaller islands. Port information is provided for San Juan, Fajardo, Radas Roosevelt (Roosevelt Roads), Yabucoa, Laguna de Las Mareas, Bahia de Jobos, Ponce, Guayanilla, Guanica, Mayaguez, Arecibo, Isabel Segunda, Ensenada Honda, and other smaller ports.

Nine hundred miles ESE of Key West, Fla., is the island of **Puerto Rico,** which was ceded to the United States in 1898. Puerto Rico is the smallest and easternmost of the **West Indies** group known as the **Greater Antilles;** the larger islands are Cuba, Jamaica, and Hispaniola. To the N of Puerto Rico is the Atlantic Ocean, and on the S is the **Caribbean Sea.**

Puerto Rico formerly was administered under the Jones Act of March 2, 1917, which extended United States citizenship to all Puerto Ricans. On July 25, 1952, the island was formally proclaimed a Commonwealth, voluntarily associated with the United States. Puerto Rico is subject to the laws enacted by the Congress of the United States. Under the Constitution of Puerto Rico, the people of the Commonwealth elect a governor and a legislature for 4-year terms. The Legislature has an upper house, or senate, and a house of representatives. The people also elect a Resident Commissioner who speaks in the U.S. House of Representatives but does not vote.

Puerto Rico, the big island, is about 96 miles long, W to E, and about 35 miles wide. The interior of Puerto Rico is mountainous and very rugged. The highest mountains are nearer the S and E coasts and have elevations up to 4,400 feet. There are many fertile valleys, and along the coasts are more or less narrow strips of lowland from which the higher land rises abruptly.

The sea bottom is similar to the land. Close to the island are narrow banks from which the bottom pitches off rapidly to great depths. Under favorable conditions, the shoals frequently are marked by a difference in the color of the water.

Caution.-Mariners are advised that local fishermen commonly mark the position of their fish nets and fishtraps with plastic bleach bottles. Care should be taken to avoid destroying this fishing gear.

Puerto Rico has several hundred streams, some of good size, but none are navigable for anything but small boats. The mouths of the streams generally are closed by bars except during short periods of heavy rainfall. From the location of the mountain divides, the streams on the S and E sides of the island are short and fall rapidly to the sea, whereas those on the N and W sides are longer and slope more gently.

COLREGS Demarcation Lines.-The lines established for Puerto Rico are described in 80.738, chapter 2.

Vessel Traffic Management.-(See Part 161, Subpart A, chapter 2, for regulations requiring notifications of arrivals, departures, hazardous conditions, and certain dangerous cargoes to the Captain of the Port.)

Anchorages.-Under ordinary conditions, the first requirement for anchorage is shelter from the E trade winds. Anchorages are numerous except along the N coast. Strong N winds and heavy seas may occur from November to April. During the hurricane season gales may strike from any direction. The best hurricane harbors are Bahias San Juan, Guanica, Guayanilla, and Jobos, and Ensenada Honda (on Isla de Culebra).

Tides.-The periodic range of tide around Puerto Rico is only about 1 foot. The actual fluctuations in the water level consequently depend largely upon the winds and other meteorological conditions. The tide is chiefly semidiurnal along the N and W coasts of Puerto Rico, whereas it is more or less diurnal along the Caribbean coast.

Currents.-Along the Atlantic and Caribbean coasts of Puerto Rico, the currents are greatly influenced by the trade winds. In general, there is a W drift caused by prevailing E trade winds; the velocity averages about 0.2 knot and is said to be strongest near the island. A decided W set has been noted near the 100-fathom curve along the Caribbean coast from Isla Caja de Muertos to Cabo Rojo. Offshore of Bahia de Tallaboa a current of 0.5 knot has been observed setting NE across and against the E wind. With variable winds or light trade winds it is probable that tidal currents are felt at times along the Atlantic and Caribbean coasts of Puerto Rico. Currents are weak in the passage N of Isla Caja de Muertos and Cayo Berberia.

Predictions of the tidal current in Canal de Guanajibo and at three locations off the E coast of Puerto Rico may be obtained from the Tidal Current Tables. The times of slack water and of maximums of flood and ebb in the middle of Canal de la Mona are 2 to 3 hours later than in Canal de Guanajibo. The times of S and N currents in the passages E of Puerto Rico, as far as Isla Culebrita, are believed to be about the same as the times of W and E currents, respectively, in Pasaje de Vieques.

In Canal de la Mona, on the NW end of the bank about 13 miles W of Punta Guanajibo, there is a current velocity of about 1 knot; slacks and strengths occur about 15 minutes later than in Canal de Guanajibo.

In Sonda de Vieques, there are strong tidal currents over the shoals in the W part and around Isla Cabeza de Perro. In Pasaje de San Juan and Pasaje de Cucaracha, estimated velocities of about 2 knots have been reported. In the wider passages between Cayo Icacos and Cayo de Luis Pena, it is

estimated that the current velocity is less than 1 knot. From Isla de Culebra the S current sets toward Punta Este, Isla de Vieques, around which tidal currents are strong.

In Canal de Luis Pena, the SE current is deflected N of Bahia Tarja and thence sets toward the S end of Cayo de Luis Pena; the current is weak off the entrance to Bahia de Sardinas. The NW current sets directly through the channel. The current velocity is about 2 knots.

Weather.–Puerto Rico is a tropical, hilly island that lies directly in the path of the E trade winds. Bathed by waters whose temperatures seldom drop below 80°F, the coastal climate is mild year round, with a small daily and annual temperature range. The rugged topography does cause a wide variation over short distances in wind, temperature, and rainfall.

The outstanding feature of the marine weather is the steadiness of the E trade winds. NE through SE winds blow about 80 percent of the time year round. Easterlies are particularly dominant in summer when the Bermuda High has shifted N. From November through April, northeasterlies are the secondary direction, but give way to southeasterlies in spring. The trade-wind regime is occasionally interruped by cold fronts that have survived a journey from the United States and by easterly waves. As the cold front approaches, winds shift toward the S, and then as the front passes they gradually shift through the SW and NW quadrants back to the NE. The easterly wave passage is characterized by winds out of the ENE ahead of it, followed by an ESE wind.

Gale-force winds are unlikely but can occur with a strong front, thunderstorm, or tropical cyclone. Summer gales usually blow from the E semicircle, while winter gales are more likely in the NE quadrant. Windspeeds of 17 to 33 knots blow about 30 percent of the time. In summer, the trades tend to strengthen during the day, and average windspeeds are highest during this season. Morning averages of 12 to 13 knots give way to 13- to 15-knot averages during the afternoon.

Near the coast, a land-sea breeze effect helps exert a diurnal influence on the wind. If the pressure gradients are weak, a land breeze may develop during the night; northeasterly on the S coast and southeasterly on the N coast. The sea breeze develops during the morning hours and reinforces the trades on all but the W coast. Along the W coast, it opposes the trades and tends to weaken them.

Seas in the area usually run less than 8 feet. Waters are roughest off the N and W coasts in winter and midsummer. For example, waves of 8 feet or more are encountered off these coasts 10 to 12 percent of the time in July. High seas are usually associated with strong winds out of the NE through SE blowing over a long fetch of water. Extreme wave heights are generated by hurricanes and can reach 40 feet or more in deep water.

The tropical cyclone season extends from June through November. The most active period in this region is from August through the first half of October, although "off-season" storms occasionally brush the area. During the past 92 years, of the 30 hurricanes that have passed within 100 miles of Puerto Rico, 25 of them have occurred in August and September. In August 1919, a hurricane generating 90-knot winds produced a devastating storm tide that destroyed almost all the houses at the port of Humacao; an estimated 3,000 people lost their lives. The hurricane of September 1928 was the most intense storm to strike Puerto Rico in this century. At San Juan, 130-knot winds were recorded before the anemometer blew away. Most tropical cyclones affecting this area develop E of the Lesser Antilles and move toward the W or NW. They usually pass N or S of the island; occasionally they pass directly over it. In addition to strong winds and rough seas, these storms can bring torrential rains and flooding to the island.

Another navigational weather hazard in these waters are thunderstorms. While they can occur in winter, they are most likely from May through November. At sea, they are encountered 2 to 7 percent of the time during this period, while shore stations report thunder on an average of 5 to 15 days each month during the summer. In addition to strong gusty winds, heavy rains may briefly reduce visibilities to near zero. However, visibility problems are infrequent in these waters since fog is a rarity.

(See page T-13 for **San Juan climatological table.**)

Storm warning display locations are listed on the NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Routes.–Vessels bound from Straits of Florida (24°25'N., 83°00'W.) to San Juan can proceed by rhumb lines through the following positions: 23°34'N., 80°26'W.; 22°34'N., 78°00'W.; 22°07'N., 77°24'W.; 20°50'N., 73°43'W.; 19°45'N., 69°50'W.; 18°29'N., 66°08'W.

From the E coast of the United States, the route to San Juan is direct by great circle.

Distances from San Juan are 1,017 miles to Straits of Florida, 1,252 miles to Norfolk, 1,399 miles to New York, and 1,486 miles to Boston.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register when entering or leaving the harbors of Puerto Rico. Coastwise vessels having on board an officer licensed as a pilot for the waters of Puerto Rico and all pleasure yachts are exempt from pilotage unless a pilot is actually engaged. The pilot service at each port is under the supervision and direction of a Commonwealth Captain of the Port; ships' agents should notify his local office in advance so a pilot will be available at the expected time of arrival of a vessel. Pilots provide 24-hour service and board vessels from motorboats. Detailed information on pilotage procedures is given in the text for the ports concerned.

Towage.–Large tugs are available at San Juan, Puerto Yabucoa, and Bahia de Guayanilla; smaller tugs are available at some of the other ports. Arrangements for tugs should be made in advance

by ships' agents. (See the text for the ports concerned as to the availability of tugs.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Customs.–Puerto Rico collects no customs duties on merchandise entering the island from the continental United States or its dependencies. Merchandise entering from foreign countries is subject to the duties of the United States, which are collected at the ports of Puerto Rico by the U.S. Customs Service. Ports of entry are listed in the appendix. At least 24-hours' advance notice of arrival at a port should be given to the local customs officer.

Agricultural quarantine laws are enforced by officials at Ramey Air Force Base, San Juan, Fajardo, Roosevelt Roads Naval Air Station, Ponce, and Mayaguez.

Immigration.–The United States immigration laws apply to Puerto Rico. Passports and visas are required.

Ports Authority.–The control of all the ports of Puerto Rico is vested in the Commonwealth Government whose authority is exercised through the Puerto Rico Ports Authority. Appointed Commonwealth Captains of the Port have administrative charge of the harbors; they collect the port fees and assign vessels to anchorage or to berths alongside wharves.

At ports where commonwealth and federal officials are not stationed, inspectors usually come from the nearest represented port or from San Juan as required.

Wharves.–The ports of San Juan, Yabucoa, Laguna de Las Mareas, Ponce, Bahia de Tallaboa, Bahia de Guayanilla, Ensenada (Bahia de Guanica), Mayaguez, and Aguadilla all have wharves where large vessels can go alongside to load and unload cargo. At the other ports, the wharves are only used by small vessels.

Supplies.–All kinds of supplies are available at San Juan, Ponce, and Mayaguez. Gasoline, water, and marine supplies are available at most of the smaller ports. If necessary, supplies can be trucked from San Juan in a few hours.

Repairs.–San Juan is the only port where major repairs to large ocean-going vessels can be made. Available are a 691-foot graving dock and two marine railways for medium-sized vessels. Ordinary repairs to machinery can be made at Ponce and Mayaguez. Small vessels, motorboats, and yachts can be repaired at some of the marinas around the island.

Communications.–There are good highways to all the principal cities, and roads connect the smaller towns. Regular air service is maintained between San Juan, Ponce, and Mayaguez. Air service is also available from San Juan to the Virgin Islands, the United States, and some foreign countries.

Many steamship lines operate from San Juan, Ponce, and Mayaguez to the United States and foreign ports. Small inter-island vessels operate from most of the ports of Puerto Rico to the Virgin Islands and other West Indies ports.

Telephone and telegraph communications are available through all the ports of Puerto Rico. Radio communication to all points, including ships at sea, is available through commercial systems. The Commonwealth Government maintains radio telegraphic service between San Juan and the islands of Culebra and Vieques.

Currency.–The monetary unit is the United States dollar.

Standard time.–Puerto Rico uses Atlantic standard time, which is 4 hours slow of Greenwich mean time. Puerto Rico does not observe daylight saving time.

Language.–Spanish is the official language of Puerto Rico, although many of the native people are bilingual; most of the island's geographic features have Spanish names. English is a required subject in the schools and is preferred for business purposes by a large part of the commercial community.

Spanish-English Geographic Glossary:

Agua–water	Isleta–islet
Amarillo–yellow	Istmo–isthmus
Anclaje, Anclade-	Lago–lake
Arena–sand	Laguna–lagoon
Arrecife–reef	Laja–flat rock
Arroyo–small stream	Largo–long
Bahia–bay	Mar–sea
Bajo–shoal	Medio–middle
Banco–bank	Meridional–southern
Barra–bar	Montana-mountain
Blanco–white	Morro–headland, bluff
Boca–mouth, entrance	Negro–black
Boqueron-wide mouth	North-north
Cabeza–shoal head	Nuevo–new
Cabezo–summit of hill	Occidental–western
Cabo–cape	Oeste–west
Caleta–cove	Oriental–eastern
Canal–channel	Pantano–marsh
Cano–creek, channel	Pasaje–passage
Castillo–castle	Peninsula–peninsula
Cayo–key	Pico–peak
Cerro–hill	Piedra–stone, rock
Cienaga–marsh	Playa–beach
Cordillera–mountain chain	Pueblo–town
Costa–coast	Puerto–port, harbor
Desembarcadero–landing	Punta–point
Embarcadero–wharf, quay	Rada–roadstead
Ensenada-bay, cove	Rincon-inside corner
Escollo–shelf, reef	Rio–river
Este–east	Roca–rock
Estero–creek, inlet	Rojo–red
Estrecho–strait	Septentrional–northern
Exterior–exterior	Sierra–mountain range
Farallon–rocky islet	Sonda–sound
Golfo–gulf	Sud–south
Gran, Grande–great	Tierra–land
Interior–interior	Verde–green
Isla–island	Viejo–old

Chart 25640.–Canal de la Mona (Mona Passage),

61 miles wide between the W end of Puerto Rico and the E end of Hispaniola, is one of the principal entrances to the Caribbean Sea. Three small islands are located in the passage: Isla de Mona and Isla Monito about midway in the S part, and Isla Desecheo about 12 miles W of the extremity of Puerto Rico in the N part.

On the W side of Canal de la Mona, a bank extends from Cabo Engano, the E extremity of Hispaniola, for 23 miles, with a least depth of 26 fathoms. Depths of 5 to 20 fathoms have been reported on the bank about 7 miles SSE of Cabo Engano (chart *25008). Strong tide rips and heavy swells, caused by the meeting of contrary currents, are visible for many miles and mark the position of this bank. On the E side of the passage, an extensive bank makes off from the W coast of Puerto Rico extending up to 15 miles offshore. The W coast of Puerto Rico is described later in this chapter.

Tidal currents set generally S and N through Canal de la Mona. Varying nontidal flows, depending to a great extent upon the velocity and direction of the wind, combine with the tidal current. An average nontidal current of about 0.2 knot setting approximately NNW is generally experienced during all seasons. In summer, when the trade wind has slackened and blows more from the E and ESE, a strong countercurrent sets E off the S coast of Hispaniola. This countercurrent occasionally induces a N set in the passage.

A 3.5-knot current, setting approximately WSW, has been reported in the passage N of Isla de Mona. Observations made on the NW edge of the bank about 13 miles W of Punta Guanajibo, Puerto Rico, gave a velocity of about 1 knot for both S and N strengths.

The tidal currents also set with considerable velocity, especially near the shore S of Cabo Engano, where they have been reported to set with a velocity of 3.5 knots during the month of May, with ebb currents setting NE for 3 hours and flood currents setting SW for 9 hours. The duration of these currents has also been reported to be the reverse, and at other times to be of the usual duration of 6 hours.

The passage presents little difficulty in navigation, except that caution must be used in the vicinity of Isla Saona off the SE coast of Hispaniola, which is low and foul. This island should be given a berth of at least 6 miles. Heavy squalls may be expected in the passage, particularly in the summertime.

Chart 25671.-Isla de Mona (18°05'N., 67°54'W.), 6 miles long E and W and 4 miles wide, lies in the middle of the S part of Canal de la Mona. Temporary anchorage and landing can be made in places on the S and W sides of the island during good weather, but on many days anchorage and landings are impracticable. The attendants for the Puerto Rico Department of Natural Resources and a State police detachment are the only inhabitants of the island.

The island is composed of limestone and from E appears perfectly flat on top, breaking off abruptly at the water in a vertical whitish cliff about 175 feet high. On the NW and NE coasts are extensive caves that run in every direction but are so obstructed by stalactites and stalagmites in places that it is almost impossible to pass. They were used as hideouts by pirates for nearly three centuries. The W, S, and SE sides of the island are fringed with detached coral reefs through which boat passages lead.

The 100-fathom curve lies about 1 mile offshore, except on the SE side, where it is about 1.7 miles off, and on the SW side, where it is only about 0.3 mile off. With a strong wind from any direction, the sea draws around the island and generally into all the anchorages. **Anclaje Sardinera,** on the W coast, is the best anchorage during SE winds, and **Anclaje Isabela,** just S of Punta Arenas, is good during NE winds. Boat landings can be made at Anclaje Sardinera and Playa de Pajaros.

Currents.-In Anclaje Sardinera the tidal currents set N and S with a velocity of about 0.5 knot. A northerly current with a velocity of 0.5 knot has been experienced off Playa de Pajaros.

Isla de Mona Light (18°06.7'N., 67°54.5'W.), 323 feet above the water, is shown from a 40-foot tower near **Cabo Noroeste** on the N side of the island. The structure of the former Isla de Mona Light on **Cabo Este,** the E extremity of the island, remains.

Vertical cliffs with deep water close to shore extend from Cabo Este N and W to **Cabo Barrionuevo,** the NW cape of the island. Here a mass of rock, shaped like two saw teeth on top, projects from the base of the cliff. This feature can be observed from N and SW.

Playa de Pajaros, about 1.5 miles S of Isla de Mona Light, has a boat harbor with 3 to 8 feet of water inside the reefs. The S and main entrance has reported depths of 7 to 12 feet. The landing place, formerly used by Coast Guard vessels, has 7 to 8 feet alongside, but with S winds a swell sets into the landing.

The southernmost point of the island is surmounted by a large balanced rock. **Punta Arenas (Oeste),** the westernmost point, is a low, narrow ridge, covered with brush, which projects nearly a mile W of the cliffs; a reef extends 0.3 mile W of the point.

Isla Monito, 3 miles NNE of Isla de Mona, is a 213-foot high bare rock 0.2 mile in diameter. The passage between the two islands is deep and clear.

Isla Desecheo, 27 miles NE of Isla de Mona and 12 miles W of Punta Higuero, is a 715-foot high wooded island a mile in diameter. The island is visible for more than 30 miles in clear weather and is one of the best landmarks for Canal de la Mona and the W coast of Puerto Rico. Isla Desecheo is a forest reserve and a native-bird reserve; it is uninhabited and has no anchorages along its shores. The following depths are reported in the vicinity of Isla Desecheo: 15 fathoms about 18 miles to the W in 18°20.0'N., 67°48.0'W.; 10 fathoms about 12 miles to the W in 18°24.7'N., 67°40.1'W.; and 5 fathoms about 9 miles to the SW in 18°15.8'N., 67°34.5'W.

The U.S. Navy has advised that a survey (1974) of

Isla Desecheo and adjacent waters revealed the presence of unexploded ordnance. Mariners are urged to use extreme caution when in this area.

Punta Higuero, the most W point of the mainland of Puerto Rico, is projecting and prominent with the land back of it rising abruptly to rolling hills which ascend gradually to **Pico Atalaya,** 6 miles inland to the SE. A light is shown from a 69-foot gray cylindrical tower at the end of the point.

Steep-to reefs with less than 12 feet of water over them extend up to 0.4 mile offshore from Punta Higuero to beyond Punta Borinquen to the NE.

Bahia de Aguadilla, 7 miles NE of Punta Higuero, is exposed N and W, but with ordinary E trade winds anchorage is smooth. There are frequent rough spells during the winter when the wind is from N.

Aguadilla is on the E shore of the bay. Radio towers S of the town are prominent. The 1,208-foot-high naval communication tower (18°24.0'N., 67°10.6'W.) is the most prominent feature from offshore. The small white shaft of the Columbus Monument is about 1 mile S of city hall, but is completely obscured by palm trees.

Large vessels load raw sugar and molasses at the conveyor pier with mooring buoys and dolphins 1.1 miles N of Aguadilla; depths of 40 feet or more are at the outer end of the pier.

An Air Force fuel pier, with pipelines for handling aviation fuels, is 1.8 miles N of Aguadilla. In 1972, depths of 30 feet were reported alongside the platforms at the outer end of the pier. Depths of 6 feet and less were reported alongside the emergency crash boat basin finger piers that extend off the SE end of the fuel pier.

Pilotage.–Pilots for Bahia de Aguadilla are available at Mayaguez. (See Pilotage for harbors of Puerto Rico at the beginning of this chapter.)

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Aguadilla is a **customs port of entry.**

A Coast Guard air station is at Borinquen Airport, N of Aguadilla.

A fish haven with an authorized minimum depth of 11 fathoms is about 1.8 miles NW of Aguadilla in 18°27'30"N., 67°10'06"W.

Charts 25671.– The **N coast** of Puerto Rico from Canal de la Mona to San Juan extends in an almost E direction for 60 miles. From Punta Borinquen for 27 miles to Arecibo, there are numerous rocky cliffs with sand beaches and dunes between them. The prominent features are the high hills in the interior and high cliffs along the coast. The hills that terminate a mile W of Arecibo are mostly smooth grassy slopes backed by conical wooded hills up to 800 feet high.

Between Arecibo and San Juan, the coast is indented by several coves and bights, although none of them afford sheltered anchorage. The first 17 miles to nearly Punta Puerto Nuevo consists of sandy beaches and dunes with occasional rocky bluffs, then there are numerous hummocks and rocky bluffs with short beaches between them in the 16-mile stretch to San Juan. A line of breakers enclosing numerous rocks lies as close as 0.5 mile offshore. A range of conical hills is W of San Juan.

In addition to the marine and aerolights near Punta Borinquen, the marine lights at Arecibo and San Juan, several stacks, radio towers, and towns are prominent from offshore along the N coast. All dangers will be avoided by staying a mile or more offshore.

Chart 25671.–Punta Borinquen, at the NW end of Puerto Rico, is steep-to with deep water within 0.5 mile of shore, but vessels should stay several miles offshore because of a small arms firing area in the vicinity of the light. The extreme W part of the point is low, but it is backed by steep wooded slopes 0.5 mile inland.

Punta Borinquen Light (18°30.1'N., 67°08.7'W.), 292 feet above the water, is shown from a 60-foot gray cylindrical tower. A 200-foot rock bluff begins 0.8 mile SW of the light and extends NE and E along the N coast of Puerto Rico.

A boat landing may be made in calm weather in the sandy cove on the W side of **Punta Sardina,** 7.3 miles E of Punta Borinquen Light.

Chart 25668.–Punta Penon, 16 miles E of Punta Borinquen Light, is a slight projection with lower land between it and the foothills. A rocky islet lies W of the point and a chain of bare rocks and a small islet extend 0.8 mile E of it.

Puerto Arecibo, 26 miles E of Punta Borinquen Light and 33 miles W of San Juan, is an open bight somewhat protected by the headland of **Punta Morrillos** on the E side with a 1,200-foot breakwater extending from it to **Roca Cocinera.** Only fishing vessels, pleasure craft, and a chemical supply barge use the port. **Arecibo** is along the SW shore of the bight.

Arecibo Light (18°29.0'N., 66°41.9'W.), 120 feet above the water, is shown from a 46-foot white hexagonal tower attached to a dwelling on the hill close to the shore near the W end of Punta Morrillos. Radio towers and stacks are prominent around Arecibo.

A dredged channel, marked by buoys, leads from the Atlantic Ocean to a bulkhead wharf on the S side of the breakwater of Puerto Arecibo. In 1978-October 1982, depths of 25 feet were available in the entrance channel and the basin off the wharf. Care should be taken to avoid the offshore rocks when approaching the port from W and E.

The 600-foot bulkhead wharf had depths of about 18 feet reported alongside in May 1982, except for shoaling toward the inner end.

A pipeline on the wharf is used by barges to supply liquid chemicals to storage tanks of a chemical company. Gasoline can be obtained at the wharf

in an emergency. Fishing vessels and small craft anchor S of the wharf.

Danger zones for artillery and small-arms ranges extend up to 10 miles offshore in the vicinity of **Punta Puerto Nuevo,** 42 miles E of Punta Borinquen Light. (See 204.228, chapter 2, for limits and regulations.)

A boat landing can be made in calm weather inside the rock islets that extend a mile W of Punta Puerto Nuevo. An aero radiobeacon (18°28.2'N., 66°24.8'W.), marked by a flashing red light, is prominent SW of Punta Puerto Nuevo.

Several large dome-shaped structures are prominent on **Punta Salinas,** a narrow projecting point 3 miles W of San Juan. A large blue water tank, 1.9 miles inshore of the point, shows up well from offshore.

Chart 25670.–Bahia de San Juan, the most important commercial harbor in Puerto Rico, is about 60 miles E of Punta Borinquen and 30 miles W of Cabo San Juan. It is the only harbor on the N coast which affords protection in all weather. It is protected on the N by the relatively high land of Isla San Juan, and on the S, E, and W by the adjacent low mangrove swamps of the Puerto Rico mainland.

The bay is about 3 miles long in a SE direction and varies in width from 0.6 to 1.6 miles, but the entire SW side is shoal. The SW shore is divided into two large bights by **Punta Catano,** the point which extends about 0.6 mile NE into the harbor.

Metropolitan **San Juan,** the capital and principal port of Puerto Rico, includes Isla San Juan on the N side of Bahia de San Juan and the communities surrounding the bay. The principal commercial facilities are on the S side of Isla San Juan (Old San Juan). Container cargo terminals are on the N side of **Isla Grande** and at **Puerto Nuevo** in the SE part of the bay.

The principal imports into the harbor include foodstuffs, textiles, building materials, machinery, fertilizers, and petroleum products. Exports include sugar, molasses, fruit, tobacco, coffee, petrochemicals, pharmaceuticals, and alcoholic products. Over half the commerce of Puerto Rico passes through San Juan. Most commercial and government activities are located here.

Prominent features.–Isla de Cabras, on the W side of the entrance to Bahia de San Juan, is low with cliffs 32 to 36 feet high at its N end and is marked by a light on its NW end. **Las Cabritas** are three small islands and rocks 0.1 mile NE of the island. The island is connected to the mainland by a causeway at **Punta Palo Seco.** A small stone structure of **El Canuelo** is on the S extremity of Isla de Cabras.

Isla San Juan, on the E side of the entrance to the harbor, is generally bold and rocky, with a ridge 100 feet high extending along its N side. At each end of the island are large stone forts connected by a continuous high wall. **Fort San Cristobal** is on the summit of the ridge in the E part, and **Castillo del Morro** is on the extreme W point of the island at the entrance to the harbor. The city wall extends from the castle along the channel side of the island to the Governor's Palace.

Puerto San Juan Light (18°28.4'N., 66°07.4'W.), 181 feet above the water, is shown from a 51-foot buff tower on the summit of Castillo del Morro. A radiobeacon is 0.4 mile ESE of the light.

The white marble dome of the capitol building, a mile E of the light, and a white church 0.4 mile farther E are prominent landmarks.

Several tanks and towers are prominent on Isla Grande; an aerolight is shown from a small air traffic control tower about 750 yards SE of its NW end. Many radio towers, stacks, and tanks surround Bahia de San Juan.

COLREGS Demarcation Lines.–The lines established for San Juan are described in 80.738, chapter 2.

Channels.–Bar Channel, the entrance channel to Bahia de San Juan, leads to the deep-draft anchorage SW of Isla Grande, via Anegado Channel; Federal project depths in Bar and Anegado Channels, and the deep-draft anchorage are 45, 36, and 36 feet, respectively. San Antonio Channel, project depth 35 feet, leads from Anegado Channel between Isla San Juan and Isla Grande, to the commercial piers and the Navy berthing facilities on the S side of Isla San Juan, and to the Isla Grande marginal wharf and the Seatrain Lines container terminal on the N side of Isla Grande. The Army Terminal Channel leads S from Anegado Channel to the Army Terminal and turning basin, Puerto Nuevo Terminal bulkhead wharves, and to the oil piers at the S end of the harbor; project depths in the Army Terminal Channel and turning basin are 36 feet. Graving Dock Channel and turning basin, S of Isla Grande, leads from Anegado Channel; project depths in Graving Dock Channel and turning basin are 30 feet. Puerto Nuevo Channel, project depth 32 feet, in the SE part of the harbor, connects Army Terminal Channel with Graving Dock Channel. (See Notice to Mariners and latest editions of charts for controlling depths.)

The entrance channel and the channels inside the harbor are marked by lighted ranges, lights, and lighted and unlighted buoys.

Caution.–When approaching the entrance channel (Bar Channel), with quartering and following seas which are especially predominant in winter, speeds of not less than 10 knots are recommended. This requirement for speed permits sufficient time to commence turning into Anegado Channel while maintaining ship control. An additional cause of confusion and groundings is that the N side Anegado Channel markers are not visible, virtually, until the turn into it should already have been commenced. Positive identification of channel marks is imperative.

Vessels should proceed with caution when dredging is in progress in the channels. (See 162.260, chapter 2, for navigation regulations.)

An unmarked channel leads to a landing pier at the NE end of the causeway between Isla de Cabras and Punta Palo Seco; depths of about 4 feet can be

carried. The channel and pier are used by craft handling dangerous or explosive cargoes.

Cano de Martin Pena, at the SE end of Bahia de San Juan, is a narrow slough that connects with lakes and lagoons which extend E for 7 miles. A channel with a reported depth of 3 feet extends 1.5 miles above the entrance. A fixed bridge at the entrance to the slough has a clearance of 21 feet. Two overhead cables about 0.5 mile above the entrance have a least clearance of 31 feet. Two fixed highway bridges 0.75 mile above the entrance have a least clearance of 22 feet. The bridges 1.5 miles above the entrance, the head of navigation, have a least width of 44 feet and a clearance of 7 feet.

Anchorages.–General and small-craft anchorages are in Bahia de San Juan. (See 110.240, chapter 2, for limits and regulations.) In 1965, a controlling depth of 26 feet was in Anchorage F, on the SW side of Anegado Channel with shoaling to 24 feet in the S 100 yards of the anchorage. A line of mooring dolphins, marked by lights, extends from Isla Grande to just outside the E end of Anchorage E.

Dangers.–Bajo Colnas, on the W side of the entrance to Bahia de San Juan, has depths of 18 feet and less extending 700 yards from Isla de Cabras. The shoal area is usually defined by breakers.

Bajo Santa Elena, on the E side of the entrance, has depths of 7 to 18 feet extending 200 yards from shore.

Inside the harbor, the areas outside the channel limits marked by buoys are shallow with depths varying from 4 to 18 feet with many shoals having less than 1 foot over them.

Tides.–The mean range of tide is 1.1 feet; the wind causes considerable variations in the depth. Daily predictions for Bahia de San Juan are given in the Tide Tables.

Currents.–The currents along the N shore of Puerto Rico are greatly influenced by the direction and strength of the winds. The prevailing E trade winds generally cause a W drift. In Bahia de San Juan a slight W flow prevails. When N seas set into the harbor entrance, an undertow and surge may be felt as far as San Antonio Channel.

Weather.–San Juan is located on the NE coast of the island of Puerto Rico in 18°28′N., 66°07′W. It is surrounded by the waters of the Atlantic Ocean and Bahia de San Juan. Santurce, directly to the E of Bahia de San Juan, is the urbanized section of San Juan. The surrounding terrain is level with a gradual upslope inland. Mountain ranges, with peak elevations of 4,000 feet, extend E and W through the central portion of Puerto Rico, and are located 15 to 20 miles E and S of the capital city. This mountain range has a decided influence on the rainfall in the San Juan area, especially summertime thunderstorms.

The climate is tropical marine, slightly modified by insular influences when land breezes blow. Radiational cooling frequently causes land winds at night, consequently, somewhat lower nightime temperatures occur than would normally be experienced with sea breezes. This air drainage from the higher altitudes in the interior of the island to the coastal areas gives delightfully invigorating night temperatures, especially during December to March, inclusive. Minimum temperatures during this period are frequently 2° to 3° higher within the city than at Isla Verde Airport, which is located 6.5 miles E and slightly inland. By the same token, maximum temperatures are 1° to 2° lower in the city.

San Juan has a small annual temperature range, which is a characteristic of all tropical marine climates. The difference between the average temperatures of the warmest and coolest months is about 5.7°F in San Juan, 6.5°F at Isla Verde Airport, and is representative of most of the coastal localities in the island. This is also true concerning the absolute range of temperature. For the San Juan-Isla Verde Airport area, the highest temperature of record is 96°F and lowest, 60°F at the airport.

San Juan's average annual rainfall is near 60 inches, with fairly even distribution throughout the year. At Isla Verde Airport, about 12 miles W of this mountain range, the annual rainfall is about 64 inches. The heavier monthly amounts normally occur during the period from May to December, inclusive. Rainfall is generally of the showery type except for the continuous rains which occur in connection with the passage of tropical storms, or when the trailing edge of a cold front which has swept across the continental United States penetrates far enough S to have a definite effect upon Puerto Rico rainfall. This infrequently occurs from November to April. Sunshine is plentiful, with only an average of 5 days a year entirely without sunshine, although there is an average of 209 days a year with measurable precipitation. The average duration of the showers is not more than 10 to 15 minutes, although on many occasions, especially in the summer a series of intermittent showers will extend over a period of an hour or two. Being marine, the climate is naturally humid. Relative humidity averages about 85 percent in the nighttime and 65 percent near midday. Dense fogs never occur in the San Juan area.

The E trade winds, aided by the daily recurrence of the land and sea breezes constitute the most characteristic feature of the climate for San Juan throughout the year. The wind is almost constantly from the ocean during daylight. Usually, after sunset the wind shifts to the S or SE, off the land. This daily variation in the circulation pattern of surface winds is a contributing factor to the delightful climate of the island. The seawater temperature about San Juan ranges from a minimum of 78°F in March to a maximum of about 83°F in September.

Heavy N winds pile up heavy seas and breakers in the harbor entrance.

Puerto Rico is in the tropical hurricane region of the E Caribbean where the season for these storms begins June 1 and ends November 30. Several hurricanes affect this area every season, but weather records show that only six of these storms have caused winds of hurricane intensity in the San Juan area during the past 60 years. In 1928, the National

Weather Service's anemometer blew away after recording an extreme wind speed of 160 m.p.h., the highest value in Puerto Rico to date. The last hurricane that caused considerable loss of life and great property damage in San Juan occurred in September 26, 1932; however, on August 12, 1956, Hurricane Betsy passed over Puerto Rico. Hurricane winds were felt at San Juan, but there was no loss of life reported, and property damage was not great.

Mild temperatures, refreshing sea breezes in the daytime, plenty of sunshine, and adequate rainfall make the climate of San Juan enjoyable and exceptionally favorable for tourists and visitors.

The National Weather Service maintains an office at Isla Verde International Airport; **barometers** may be compared there.

(See page T-13 for **San Juan climatological table**.)

Routes.-Owing to the swells and currents on the coast of Puerto Rico, especially during the winter northerlies, inbound vessels should steer for a point about 4 miles N of **Punta del Morro**, the NW point of Isla San Juan, before lining up on the entrance to Bahia de San Juan. This precaution permits early adjustments to course and speed while still having sea room to do so. A **187°45'** lighted range and lighted buoys mark the entrance channel into the harbor.

From W, Punta Salinas (chart 25668) will appear as an island when first sighted and must not be mistaken for Isla de Cabras.

The harbor is easy of access in ordinary weather, but it should not be entered at night without local knowledge. During winter northers, dangerous conditions may prevent entering the harbor. The bend inside the entrance can be difficult when the NE trades are blowing strongly, as they may force a vessel almost broadside to swells. Vessels outbound should avoid getting too close to Bajo Colnas; this is particularly so with long vessels in a strong N breeze.

Signal Station.-It is advised by the Puerto Rico Ports Authority that the signalling station at Fort San Cristobal (18°28.2'N., 66°06.7'W.) is manned around the clock. All vessels equipped with radiotelephone approaching to enter Bahia de San Juan shall, at a safe distance not less than 3 miles N of the sea buoy, use the call and reply VHF-FM channel 16 (156.80 MHz) and the working channel 14 (156.70 MHz) to call the signal station and obtain clearance to proceed inside the harbor.

Vessels about ready to leave their berths and proceed out to sea shall, prior to departure, call the signal station on the regular call and reply channel, then switch over to the working channel to obtain clearance to depart.

All vessels, particularly tugs with a tow, are cautioned to closely follow the procedure herein above indicated to avoid close quarters and risk of collision situations in the Bar and Anegado Channels.

The Commonwealth Captain of the Port also maintains a visual signal station at Fort San Cristobal; communication is by International Code signals.

Traffic signals.-The alphabet flag **N**, when displayed from either yardarm of the signal mast at Fort San Cristobal, will govern entry and departure of vessels at Bahia de San Juan:

(a) When flag N is displayed from the NW yardarm, all incoming vessels must remain a safe distance outside the entrance.

(b) When flag N is displayed from the SE yardarm, all outgoing vessels must remain at a safe distance inside the harbor entrance or at the anchorages or berths.

Pilotage.-(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Pilot services are generally arranged for at least 24 hours in advance through the ships' agents. If advance arrangements have not been made a minimum of 2 hours' notice is required.

Pilots board vessels 3 miles off the harbor entrance from motorboats which are painted black with white tops and have the word PILOT or the letter "P" in white on both sides of the bow; 24-hour service is available.

Vessels requiring pilot services are advised to navigate with caution and maintain a safe distance, never closer than 3 miles in a generally N direction from the harbor entrance, and hold that distance until boarded by the pilot. When small-craft warning signals are displayed, with heavy seas breaking outside, the harbor is difficult and dangerous to negotiate and the arrival of the pilot on board may be considerably delayed. Pilot boats communicate over the same frequencies as the signal station at Fort San Cristobal via individual walkie-talkie sets; i.e., call and reply frequency Channel 16 (156.80 MHz) and working frequency Channel 14 (156.70 MHz). When there are no English speaking people on board the pilot boat, messages may be relayed through the signal station at Fort San Cristobal.

Towage.-Tugs up to 6,000 hp are available for docking, undocking, and up to 9,000 hp for long-distance towing and salvage. Use of tugs is compulsory for docking and undocking vessels of 8,000 tons displacement and over unless equipped with bow or side thrusters.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) San Juan has several hospitals.

San Juan is a **customs port of entry**.

Coast Guard.-A **marine safety office** is in San Juan. (See appendix for address.)

Storm warning signals are displayed. (See chart.)

Harbor regulations.-The Commonwealth Captain of the Port enforces the local rules and regulations for Bahia de San Juan. His office is located on Isla Grande.

Wharves.-The port of San Juan has numerous wharves and piers of all types, most of which are

owned by the Puerto Rico Ports Authority. Only the major deepwater facilities are described, and these are located on the S side of Isla San Juan, the N and S sides of Isla Grande, along the S side of Puerto Nuevo Channel, and alongside the Army Terminal Turning Basin at the S end of the harbor. The port has over 700,000 square feet of transit sheds, 1 million square feet of open storage, and 73 acres of marshalling yards. All the piers have freshwater connections, access to highways, and most have electrical shore power connections. Cargo is generally handled by ships' tackle; special cargo handling equipment, if available, is mentioned in the description of the particular facility. The alongside depths given for each facility described are reported; for information on the latest depths, contact the operator.

S side of Isla San Juan:

Pier 1 (26°27′50″N., 66°06′50″W.): 770 feet of berthing space E and W sides; 27 feet alongside; berthing for cruise ships; operated by Puerto Rico Ports Authority.

Pier 3: 200 yards E of Pier 1; 905 feet long; 25 feet alongside W side, 37 feet alongside E side; berthing for cruise ships; operated by Puerto Rico Ports Authority.

Wharf 5: immediately E of Pier 3; marginal wharf, 695 feet long; 30 feet alongside; general and bulk cargoes from interisland vessels; operated by Puerto Rico Ports Authority.

Wharf 6: 300 yards E of Pier 3; marginal wharf, 955 feet long; 30 feet alongside; 43,600 square feet of covered storage; general and bulk cargoes; operated by Puerto Rico Ports Authority.

Pier 7: N of Wharf 6; 472 feet long; 18 feet alongside; 15,000 square feet of covered storage; general cargo; operated by San Juan Dock Corp.

Pier 8: 100 yards E of Pier 7; 400-foot face, E and W sides 590 feet long; 22 feet alongside face and E and W sides; 175,000 square feet of covered storage, 40,000 square feet of open storage; conveyors; general and bulk cargoes, containers; operated by Puerto Rico Ports Authority.

Pier 9: 100 yards E of Pier 8; face 350 feet, E and W sides 600 feet long; 23 feet alongside W side, 22 feet alongside face, and 27 feet alongside E side; 133,000 square feet covered storage, 40,000 square feet open storage; general cargo and containers; operated by Puerto Rico Ports Authority.

Pier 10: 50 yards E of Pier 9; W side 480 feet long; 27 feet alongside; bulk cargo, molasses pipeline; operated by Porto Rico Lighterage Co.

Wharf 11: 150 yards E of Pier 10; marginal wharf, 580 feet long; 27 feet alongside; 100,000 square feet covered storage; general and bulk cargoes, containers; operated by Gulf-Puerto Rico Steamship Co.

Wharf 12: joining Wharf 11 to the E; marginal wharf, 550 feet long; 29 feet alongside; 15,000 square feet covered storage, 37,000 square feet open storage; general cargo; operated by Puerto Rico Ports Authority.

Wharf 13: joining Wharf 12 to the E; marginal wharf, 500 feet long; 27 feet alongside; 28,000 square feet covered storage, 55,000 square feet open storage; general cargo; operated by Puerto Rico Ports Authority.

Wharf 14: joining Wharf 13 to the E; marginal wharf, 446 feet long; 26 feet alongside; 40,000 square feet covered storage; general cargo; operated by Puerto Rico Ports Authority.

Frontier Base Pier: 300 yards E of Wharf 14; marginal wharf, 888 feet long; 27 feet alongside; cruise vessels and general cargo; owned by the U.S. Navy and operated by the Puerto Rico Ports Authority.

N side of Isla Grande:

Navieras de Puerto Rico Terminal (18°27′41″N., 66°06′12″W.): 1,320-foot marginal wharf; 25 feet alongside; trailer marshalling yard; two 45-ton cranes; container and trailer cargo; operated by Puerto Rico Ports Authority.

Isla Grande Terminal Berths E, D, and C (Pan American Docks): immediately E of Navieras de Puerto Rico Terminal; 1,500-foot marginal wharf; 18 feet alongside; 32,000 square feet covered storage, 240,000 square feet open storage; general, bulk, and container cargo; operated by Puerto Rico Ports Authority.

S side of Isla Grande:

U.S. Navy Tender Pier (18°26′58″N., 66°05′28″W.): E side 950 feet long, 26 to 30 feet alongside; W side 450 feet long, 17 to 22 feet alongside; owned and operated by U.S. Navy.

Pier 15: 150 yards E of Navy Tender Pier; 1,000 feet long; 30 feet alongside; 25-ton floating crane, four 45-ton mobile cranes; floating drydock, graving dock, machine and electrical shops, foundry; ship repair facility; U.S. Navy installation under lease to Puerto Rico Drydock and Marine Terminals, Inc.

Pier 16 (18°27′01″N., 66°05′15″W.): marginal wharf, 600 feet long; 28 feet alongside; open and covered storage; general and bulk cargoes, containers; operated by Gulf-Puerto Rico Steamship Co.

S side of Puerto Nuevo Channel:

Puerto Nuevo Docks and Trailership Terminal:

Berths A and B (18°25′50″N., 66°06′22″W.): 1,000 feet long; alongside drafts limited to 29 feet by the Captain of the Port, San Juan; 102,000 square feet covered storage; general cargo; operated by Puerto Rico Ports Authority.

Berth C, Puerto Rico Maritime Shipping Authority Roll-on/Roll-off Terminal: joining Berths A and B to the E; 600 feet long; 23 to 28 feet alongside; movable roll-on/roll-off ramps; marshalling yard; receipt and shipment of roll-on/roll-off cargo.

Berths D, E, F, G, H, J, K, L, and M: 5,700 feet long; 26 to 31 feet alongside; 100,000 square feet covered storage; trailer marshalling yards; five 25-ton cranes serve Berths E, F, G, and H; general and containerized cargo; operated by Puerto Rico Ports Authority.

Catano Navy Fuel Pier; immediately W of Berth A; E and W sides 350 feet long; 24 feet alongside; receipt of petroleum products, bunkering vessels, loading barges for bunkering vessels; operated by various oil companies.

Army Terminal Pier: 150 yards W of Catano Fuel Pier; face 200 feet long, E and W sides 600 feet long; 20 feet alongside W side, 25 feet alongside E side; 50,000 square feet covered storage; 75-ton fixed crane, 20-ton mobile crane; roll-on/roll-off ramp; general cargo; operated by Puerto Rico Ports Authority.

Caribbean Refining Co. Oil Pier: 200 yards W of Army Pier; 400 feet long; 34 feet alongside; receipt of petroleum products; operated by Borinquen Refinery.

Puerto Rico Mills Wharf: 375 yards N of Caribbean Refining Co. Pier; offshore wharf, 600 feet with dolphins; 30 feet alongside; pneumatic unloaders and conveyor; receipt of grain; operated by Puerto Rico Mills, Inc.

Master Mix Mills Wharf: 100 yards N of Puerto Rico Mills Wharf; offshore wharf, 400 feet with dolphins; 30 feet alongside; pneumatic unloaders and conveyor; receipt of grain; operated by Master Mix Mills, Inc.

Caribe Feed Mills Wharf: 200 yards N of Puerto Rico Mills Wharf; offshore wharf, 200 feet with dolphins; 30 feet alongside; pneumatic unloaders and conveyors; receipt of grain; operated by Caribe Feed Mills, Inc.

California Rice Growers Assn., Wharf: 300 yards N of Puerto Rico Mills Wharf; offshore wharf, 600 feet with dolphins; 30 feet alongside; pneumatic unloader and conveyor; receipt of grain; operated by California Rice Growers Assn., Inc.

Foreign-Trade Zone No. 61 is in San Juan. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–All types of marine supplies are available at San Juan. Water can be obtained at all piers and at anchorage from barges. Bunker fuel oil is available at the Catano Navy Fuel Pier and at anchorage from barges. Gasoline and diesel fuels are available by tank truck.

Repairs.–San Juan is equipped to make major repairs to ocean-going vessels. A graving dock on Isla Grande is 691 feet long overall, with a docking space of 632 feet, with a width of 83 feet at the bottom and 96 feet at the top, and has a depth over the sill of 25 feet. The largest floating drydock, near the graving dock, has a capacity of 1,400 tons. The largest marine railway, at Punta Catano, can haul out vessels up to 1,400 tons, 225 feet in length, with a draft of 18 feet. Machine and electrical shops and a foundry are available.

Small-craft facilities.–The Club Nautico de San Juan, at the SE end of Isla San Juan, has limited nonmember berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies. A 40-foot marine railway and a 35-ton lift can handle craft for hull, engine, and electronic repairs.

About 200 yards S of the club is a marina which has berths, gasoline, diesel fuel, and some marine supplies.

Small craft usually anchor NW of La Puntilla inside the harbor entrance and E of San Antonio Channel.

Charts 25668, 25650.– The **N coast** of Puerto Rico from San Juan to Cabo San Juan trends in an E by S direction for 30 miles. The shore is low and sandy except for occasional bluffs. The low land extends 2 to 4 miles inland and then the mountains rise to three prominent peaks toward the E part of the island. The coast is indented by many coves with reefs and rocky islets extending 0.5 to a mile offshore; breakers show at many of the reefs. All dangers will be avoided by staying 2 miles or more offshore.

Chart 25668.– The 7.3-mile stretch of coast from San Juan to **Punta Cangrejos** is bold and rugged with outlying rocks and reefs. A shallow inlet with least depths of 2 to 4 feet is W of the reef off Punta Cangrejos. The entrance to the inlet is marked by a lighted buoy and a private **146°30′** lighted range. The privately dredged entrance to **Laguna La Torrecilla,** in the NE part of the inlet, had a reported controlling depth of 7 feet in 1982. The channel is crossed by a fixed bridge with a clearance of 15 feet. A private yacht club is on the S side of the entrance to the lagoon and a public marina on the N side. Berths, electricity, gasoline, diesel fuel, water, ice, a launching ramp, and minor hull, engine, and electronic repairs are available.

Storm warning signals are displayed. (See chart.)

Chart 25650.–Punta Vacia Talega, 12 miles E of San Juan, is a 60-foot-high brush covered ridge with low bluffs at the water's edge. **Rio Grande de Loiza,** 14 miles E of San Juan, shows as a wide gap in the trees. It is the largest river in Puerto Rico but cannot be entered because of the sandbar across the entrance.

A rocky patch with a least depth of 2½ fathoms is 1.5 miles N of **Punta Picua,** 21 miles E of San Juan. The patch breaks in a moderate swell and is marked by a lighted buoy.

Three tall apartment buildings are prominent at **Luquillo** just E of Punta Embarcaderos, 24 miles E of San Juan.

Sierra de Luquillo, the mountains in the NE part of Puerto Rico, are prominent features in clear weather for this part of the coast. **Roca El Yunque,** the westernmost of the three closely connected peaks 5 miles inland and 10 miles from the E end of the island, is the highest and most prominent.

Chart 25667.–Cabo San Juan, the NE point of Puerto Rico, is a bluff hill 200 feet high. **Cabezas de San Juan,** two 100-foot clifflike heads, are at the N end of the cape. **Cabo San Juan Light** (18°23.0′N., 65°37.1′W.) 260 feet above the water, is shown from a 45-foot cylindrical tower on the front of a white rectangular dwelling on the highest part of the cape.

Storm warning signals are displayed. (See chart.)

Charts 25667, 25663, 25650.– Beginning 1.5 miles N of Cabo San Juan, a chain of islands, islet, rocks, and reefs extends SE for 20 miles to Isla de Culebra. The chain is nearly steep-to on the N and S sides; the dangers will be avoided by giving both sides a berth

of 0.5 mile. Several passages are between the groups of rocks and reefs, but they should be used only with extreme caution because many reefs with little water over them are near the limits of the channels.

Las Cucarachas, a group of rocks up to 15 feet high, a mile N of Cabo San Juan, lie at the NW end of the chain. A light is shown from a skeleton tower, with a green and white diamond-shaped daymark, on a cylindrical concrete base on one of the rocks. A shoal with depths of 14 to 30 feet extends 0.9 mile NW of the light and a rock awash is 0.2 mile from the light in the same direction.

Pasaje de San Juan, between Cabo San Juan and Las Cucarachas, is 0.7 mile wide and has depths of 32 to 65 feet. The passage is one of the principal channels leading into Sonda de Vieques.

Los Farallones, a group of rugged bare rocks 30 feet high, are 0.8 mile E of Las Cucarachas. Deep water is close to the N and W sides of the rocks, but a shoal with several bare rocks extends to Cayo Icacos. A reef on which the sea breaks is 0.2 mile S of Los Farallones and continues about 0.4 mile W from the NW end of Cayo Icacos. The W end of the reef should be given a berth of 300 yards or more.

Pasaje Cucaracha, between Las Cucarachas and Los Farallones, is 0.3 mile wide. Depths of 17 to 23 feet extend about 350 yards SE from Las Cucarachas, and a 23-foot spot is 200 yards W of Los Farallones. A **218°** course for Cabo San Juan Light will lead through the passage over a least depth of 36 feet. It is the best passage for sailing vessels entering the NW end of Sonda de Vieques with the usual E trade winds.

Cayo Icacos, 1.3 miles E of Cabo San Juan and the second largest of the chain, is a 40-foot hummocky island covered with a scrubby growth. A small wharf and buildings of a former limestone quarry are near the SW point of the island. A prominent tower is in about the center of the island.

Cayo Ratones, 250 yards E of Cayo Icacos, is 60 feet high; the E summit is a large bare ledge. A number of bare rocks are off its N side, and a reef awash is between the island and Cayo Icacos.

Cayo Lobos, 0.5 mile ESE of Cayo Ratones, is 25 feet high with several bare rocks and islets up to 75 feet high off the N side. A chain of bare rocks and islets up to 30 feet high continues SE for 2.2 miles to Cayo Diablo. A 300-yard-wide channel with depths of 15 to 40 feet is between Cayo Ratones and the bare rocks NW of Cayo Lobos. A tourist resort and private landing field occupy Cayo Lobos. A concrete pier is on the W side of the island with a lighted gasoline sign located on the pier. A 7-foot-deep unmarked channel leads to the pier from about 0.25 mile W with shoal coral areas to the N and S of the channel.

Cayo Diablo, 5 miles SE of Cabo San Juan, is low with a 40-foot grassy hummock at its E end. White beaches are on the N and S sides.

Between Cayo Diablo and Cayo Lobito, 8 miles ESE, are two groups of rocks 2 to 15 feet high known as **Arrecife Hermanos,** and **Arrecife Barriles,** with numerous reefs either awash or with little water over them in the chain. **Pasaje de Hermanos,** a 2-mile-wide passage 3.3 miles ESE of Cayo Diablo, has shoals of 15 to 30 feet and is not recommended for strangers. **Pasaje de Barriles,** a 1.5 mile-wide passage 6.7 miles ESE of Cayo Diablo and 1.3 miles W of Cayo Lobito, has depths of 36 to 48 feet and may be used by large vessels. Best water is on the E side of the passage. A 28-foot shoal is 1.8 miles W of Cayo Lobito.

Chart 25653.–Cayo Lobito, 13 miles E of Cabo San Juan, is the westernmost of the chain of islands extending for over 3 miles NW of Isla de Culebra. **Cayo Tuna** and a bare ledge are close to the NW end of the island. **Roca Columna** is a detached 75-foot bare pinnacle rock on the S end of the island.

Cayo Lobo, a mile SE of Cayo Lobito, is a triangular island covered with scrub grass, the highest part being at the W end. The three points of the island are high with rocky bluffs.

La Pasa de los Cayos Lobos, the 0.5-mile-wide passage between Cayo Lobito and Cayo Lobo, has depths of 60 feet or more.

Cayo Lobito Light (18°20.1'N., 65°23.5'W.), 110 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on Cayo Lobito.

El Mono, 0.5 mile SE of Cayo Lobo, is a small irregular 15-foot ledge with several heads. The 0.4-mile-wide passage between Cayo Lobo and El Mono has depths of 36 feet or more.

Las Hermanas, 1.3 miles off the W coast of Isla de Culebra, consist of three islets. **Cayo Yerba,** the northernmost, 66 feet high, has a smooth grassy slope on the E side, and rocky bluffs on the W side. **Cayo Raton,** the southwesternmost and smallest, 46 feet high, is grassy on top and rocky on the sides; a low rock is close to its SE side. **Cayo del Agua,** the southeasternmost, is low in the middle and 39 feet high at its E part. The islet is rocky with many large boulders scattered over and near it. A shoal with 5 feet at its end extends nearly 0.1 mile W. The passage between Cayo Raton and Cayo del Agua should be avoided.

Cayo de Luis Pena, off the W side of Isla de Culebra and the largest island of the chain, rises to a peak in about the center with the S and N ends joined to the island by low necks. **Punta Cruz,** the SW point of the island, has a prominent white-washed cliff. The 0.3-mile passage between Cayo del Agua and Cayo de Luis Pena has depths of 30 feet or more.

Isla de Culebra, 16 miles E of Puerto Rico, is about 6 miles long E and W. The island is fairly high, with broken and ragged terrain. **Monte Resaca,** a mountain about in the center, rises to 650 feet, and **Cerro Balcon,** about 1.5 miles ESE of it, is 551 feet high. The island is barren and brown in appearance. The N shore is steep-to, with the 20-fathom curve extending about 1.5 miles off and nearly parallel to it.

Isla de Culebra is a former **Naval Defensive Sea Area and Airspace Reservation. A danger area** for

aerial gunnery and bombing extends from off the S to off the N sides of the island. (See 204.230, chapter 2, for limits and regulations.)

In December 1975, the U.S. Navy reported that it ceased all active gunnery and bombing exercises and weapons training activities within the danger area as of July 1, 1975, and September 30, 1975. The Navy further reported, however, that it will continue to use the observation post on Punta Flamenco from which to periodically conduct helicopter operations. In addition, the Navy advises that since Isla de Culebra and the islands in the vicinity were once used as naval sea and air weapons targets, unexploded ordnance remaining from previous target practice presents a hazard on the NW peninsula of Isla de Culebra, N of a line running between 18°19′55″N., 65°18′58″W., and 18°19′31″N., 65°14′34″W., and within the immediate offshore vicinity including Alcarraza, Cayo Botella, Cayo Lobo, Cayo Tiburon, Cayos Geniqui, Los Gemelos and Cabo del Pasaje. **Mariners are advised to exercise extreme caution in the area.**

The principal industry of the island is raising cattle. Vegetables and some tropical fruits are grown in quantities sufficient only for local consumption. The rainy season lasts from June to October, but the rainfall is much lighter than in Puerto Rico. There are no freshwater streams, and rain water stored in cisterns forms the principal water supply. No freshwater is available for vessels. The principal harbor is Ensenada Honda, one of the most secure in the Leeward Islands.

Punta Noroeste, the NW point of Isla de Culebra, is at the end of a prominent projecting ridge. A reef extends 200 yards NW from the high bare rock close to the point.

A shoal area with several rocks extends 2.2 miles NW from Punta Noroeste. **Cayo Botijuela,** 2 feet high, and **Roca Lavador,** awash, are the northwesternmost rocks of the group.

Alcarraza, 1.6 miles NW of Punta Noroeste, is a 144-foot bare round rock with perpendicular sides and a whitish appearance. **Pasaje Lavador,** between Roca Lavador and Alcarraza, is a 0.5-mile-wide passage with depths of 45 feet or more.

Los Gemelos, 1.1 miles NW of Punta Noroeste, consists of a 20-foot rock 50 yards in diameter with a low rock close to its SW side and another small rock 100 yards NW. **La Pasa de la Alcarraza,** between Alcarraza and Los Gemelos, is a 0.3-mile-wide passage with depths of 38 feet or more.

El Ancon, 0.9 mile NW of Punta Noroeste, is a rock with 7 feet over it that breaks when there is considerable sea.

Piedra Stevens, 0.6 mile NNW of Punta Noroeste, is a 30-foot rock 100 yards in diameter with a 27-foot shoal extending 100 yards S of it.

La Pasa de Los Gemelos, between Los Gemelos and El Ancon on the W and Piedra Stevens on the E is a 0.5-mile-wide passage with depths of 45 feet or more; it is the safest passage NW of Punta Noroeste.

Canal Piedra Stevens, between Punta Noroeste and Piedra Stevens, is a 0.3-mile-wide passage with depths of 35 feet or more.

The **N coast** of Isla de Culebra has sandy beaches between rocky bluffs for 2 miles, then the shoreline becomes generally bold and rocky, with sand beaches in the coves and occasional coral reefs fringing the shore. A 23-foot shoal is 1.0 mile E by N of Punta Noroeste and a 17-foot spot is the same distance E of the point; otherwise depths of 30 feet or more are 0.4 mile off the N coast.

A **danger area** for aerial gunnery and bombing extends 6.5 miles off the coast; limits and regulations are given in 204.230, chapter 2.

Bahia Flamenco, 1.8 miles SW of Punta Noroeste, is constricted by reefs.

Cayo Matojo, 3.2 miles E by S of Punta Noroeste, is a 20-foot-high island off **Punta Resaca,** a projecting point separating Bahia de Marejada and Bahia de Oleaje.

Roca Speck, 100 yards off **Punta Manchita,** 4.8 miles SE of Punta Noroeste, is low and bare. **Punta Garay** is a projecting point 0.8 mile SE of the rock.

Cabeza de Perro, the E point of Isla de Culebra, is a pointed rocky bluff. A break in the reef 0.3 mile N of the point leads to a boat landing. **Pela,** 0.5 mile SW of the point, is a 30-foot-high cay that presents a prominent bluff facing SE.

Cayo Norte, 0.5 mile off the NE shore of Isla de Culebra, is somewhat oval in shape and covered with a thick scrubby growth. The highest peak, 338 feet high, is in the W part of the island. **Cayo Sombrerito,** a 59-foot rocky islet, extends about 300 yards N of the E end of the island.

Several rocky islets and islands extend up to 1.0 mile NE from Cayo Norte. **Cayo Ballena** and **Cayo Tiburon,** the northwesternmost group, are 10 to 20 feet high with foul ground between. **Cayos Geniqui,** the southeasternmost group, are two connected islands; the 79-foot W island is flat and grass covered on top, the 82-foot E island is pointed on top.

Isla Culebrita, 0.6 mile off the E coast of Isla de Culebra, is irregular in shape and about a mile in length. The island is formed by three hills with low land between them, and is covered with a scrubby forest growth. **Isla Culebrita Light** (18°18.9′N., 65°13.7′W.), 305 feet high, is shown from a 43-foot cylindrical tower and building on the summit of the island. A Coast Guard boat landing is on the W side of the island. The E end of the island is a bare high cliff. **Cayo Botella** is a grass-covered 30-foot island on an extensive coral reef that extends 0.5 mile NW of Isla Culebrita.

The islands, islets, and reefs on the E and S sides of Isla de Culebra form a protected passage and several well-protected anchorages.

Canal de Cayo Norte, between Cayo Norte and the Isla de Culebra, is a 0.5-mile-wide passage with depths of 28 feet or more through the middle.

Canal Tiempo, between Cayo Norte and the reefs NW of Isla Culebrita, is a 180-yard-wide passage with depths of 30 feet or more. The narrow passage should not be attempted by strangers because of the 7- to 12-foot shoals on either side. The approach to

Canal Tiempo can be made between Cayo Norte and Cayo Tiburon, or between Cayo Tiburon and Cayos Geniqui. The passages are at least 0.3 mile wide with depths of 30 feet or more.

Tierra a Medio, between Isla de Culebra and Isla Culebrita, is a shoal area with depths of 13 to 29 feet that obstructs the S end of Canal de Cayo Norte.

Canal de Culebrita and **Canal del Sur** are a continuation of the protected passage on the E and SE side of Isla de Culebra. The passages have a least width of 0.2 mile and depths of 26 feet or more. **Arrecife Culebrita,** extending nearly 3 miles SW from Isla Culebrita, protects the inside passage from S. The SW limit of the reef is marked by a buoy. **Cabezas Puercas** and **Cabezas Crespas,** shoal areas with depths of 2 to 28 feet and nearly awash in places, obstruct the SW part of Canal del Sur. A buoy marks the SW end of Cabezas Puercas, and a lighted buoy marks the E side of Cabezas Crespas.

Anchorages.–The best anchorage is in Canal de Culebrita in 60 feet of water with the extreme W end of Cayo Botella in line with the E side of Cayo Sombrerito, and the SE extremity of Isla Culebrita bearing 067°. Vessels can anchor closer under the lee of Isla Culebrita according to draft.

Puerto del Manglar, at the SE end of Isla de Culebra, is a small but well-sheltered bay. The entrance is constricted to a width of 100 yards by reefs, but once inside vessels can anchor in depths of 18 to 37 feet near the middle of the bay; sand and mud bottom. The sides and head of the bay are shallow.

Bahia de Almodovar, on the S side of Puerto del Manglar, is a small bight, well sheltered from all winds, where small boats can anchor in depths of 20 to 24 feet. The bight is entered from Puerto del Manglar over a 10-foot bar 0.2 mile NW of Pela.

Currents.–The current velocity is 1.5 knots between Cayo Norte and Cayos Geniqui and sets S and N, and 2 knots in Canal del Sur and sets SW and NE.

Routes.–To enter Canal de Cayo Norte from N, steer **132°** between Cayo Norte and Isla de Culebra until 300 yards off Punta Garay, then draw in toward the Culebra side to avoid the middle ground, heading **146°** between Tierra a Medio and Isla de Culebra. The fringing reef off Cabeza de Perro may be avoided by giving the shoal a berth of more than 300 yards.

To enter Canal Tiempo from N, steer toward Cayo Norte and, having passed 150 yards W of Cayo Tiburon, bring the W extremity of Cayo Botella in line with Cabeza de Perro and steer **186°** until Cerro Balcon on Isla de Culebra bears **240°**, then make a sharp turn and head for Cerro Balcon on **241°**, passing midway between the 23-foot spot on the N side and the 12-foot spot on the S side of the channel; continue SW, swinging to get on course **146°**, passing 300 yards off Punta Garay.

If going through Canal del Sur, after leaving Canal de Culebrita, steer about **224°** with Isla Culebrita Light astern, passing 150 to 200 yards off the NW side of Cabezas Puercas until WNW of Buoy 4, then either swing left to pass midway between Buoys 3 and 4, and thence to Sonda de Vieques, or continue on **237°** with Buoy 3 astern. A clear depth of 35 feet is on the course line, but vessels drawing more than 30 feet should attempt the passage only in calm weather because of frequent swells.

Bajos Grampus comprises a group of small coral heads rising from a bank of 60 feet lying 2 to 4 miles from the SE extremity of Isla de Culebra. The S head, on which there is a depth of 23 feet, lies with Punta del Soldado in range with the S extremity of Cayo de Luis Pena bearing 293°. A lighted buoy is on the S side of Bajos Grampus. A 23-foot spot at the NW extremity of Bajos Grampus is 2.4 miles NNW of the buoy. Virgin Passage is discussed in chapter 14.

Canal de Grampus is a channel between this W knoll and Arrecife Culebrita; it is a clear navigable unmarked channel about 0.6 mile wide. The tidal current sets diagonally across Canal de Grampus SW and NE.

To pass S of Bajos Grampus, keep on or S of the line of Sail Rock and Signal Hill on St. Thomas Island until Cayos Geniqui show E of Cabo del Pasaje, the NE point of Isla Culebrita. Bajos Grampus will then be cleared, and the course can be shaped as desired.

Chart 25654.–Ensenada Honda, on the S side of Isla de Culebra between bluff **Punta Vaca** on the E and Punta del Soldado on the W, is the most secure anchorage in the area. The harbor is about 1.5 miles long and in some parts 0.5 mile wide, but of irregular shape with several small shallow bays indenting the shore. The land around the bay is hilly and partly covered with a scrubby forest growth.

Channels.–The entrance to Ensenada Honda is obstructed by shoals with depths of 4 to 26 feet, but the entrance channels are marked by buoys and unlighted ranges. The controlling depth into the harbor is 27 feet.

Dangers.–Bajo Amarillo, 0.8 mile E of Punta del Soldado, is a 0.3-mile-long shoal with a least depth of 7 feet. The SW end is marked by a lighted buoy.

Bajo Grouper, 0.2 mile N of Bajo Amarillo, is 0.3 mile in length with a least depth of 4 feet. A buoy marks the E extremity of the shoal.

Bajo Camaron, 0.2 mile S of Punta Vaca, has a least depth of 9 feet over the 0.2-mile-long shoal. A buoy is at the S end.

Bajo Snapper, 0.3 mile W of Punta Vaca, has a least depth of 6 feet over the shoal about 300 yards in diameter.

Many other shoals with depths of 18 feet or less are near the limits of the entrance channels.

Routes.–From S, bring the left tangent of Punta Vaca to bear **008°** before the S end of Cayo de Luis Pena closes behind Punta del Soldado and steer for Punta Vaca close up to Bajo Camaron; then swing on to the entrance range bearing **296°**. After passing Buoy 8, avoid approaching the 17-foot shoal on the W side of the channel too closely, and steer in on the inner range bearing **323°** until abeam of Buoy 12,

then open the range to the W and anchor according to draft.

From SE, bring Punta Vaca in range with Monte Resaca, bearing about **322°**, and continue on this course past the buoy marking Cabezas Crespas until the entrance range comes on; then continue as directed in the preceding paragraph.

From W, when 0.5 mile S of Punta del Soldado Light, steer **064°** for about 1.3 miles until the left tangent of Punta Vaca bears **008°**, then head in on that course and follow directions above.

San Ildefonso is on the NE side of Ensenada Honda. A house on a small hill above the wharf is prominent. The wharf is a concrete L-shaped boat landing pier extending about 100 feet offshore. Depths of about 12 feet are alongside.

Only small boats can make a landing at the W end of Ensenada Honda. Vessels calling at Culebra use Bahia de Sardinas.

Charts 25653, 25654, 25655.-The 5.5-mile-long **SW Coast** of Isla de Culebra from Punta del Soldado to Punta Noroeste is indented by small coves and reefs, but the dangers are within 0.4 mile of the shore. The coves between Punta Melones and Punta Tamarindo Grande are sheltered by Cayo de Luis Pena.

Punta del Soldado, the S point of Isla de Culebra, is wooded and terminates in a rocky bluff. A light is on the W side of the point.

Bahia de Sardinas, 1.5 miles NW of Punta del Soldado, is the harbor for the towns of Culebra and Clark Village. The boat and ferry landing at **Playa de Sardinas** has a depth of 8 feet at the end. Fishing boats use the harbor.

Culebra, locally known as **Dewey,** and **Clark Village,** both located on the neck of land between Bahia de Sardinas and the head of Ensenada Honda, are the only towns on Isla de Culebra. A local person is designated to handle insular immigration and customs traffic. Available supplies include gasoline in drums and groceries. Telephone and telegraph communications are available. A ferry service for both passengers and cargo operates between Isla de Culebra, Isla de Vieques, and the town of Fajardo; commercial air transport is available to Puerto Rico.

Punta Melones, the NW point of Bahia de Sardinas, is low and narrow, terminating in a small pinnacle rock. A light is on the tip of the point.

Punta Tamarindo Grande, 1.7 miles NW of Punta Melones, consists of a 75-foot hill with reddish bluffs at the end and a low neck behind it. Two low detached rocks are off its end.

Cayo de Luis Pena and the chain of islands and reefs to the NW have been described previously in this chapter.

Canal de Luis Pena, between the N end of Cayo de Luis Pena and Isla de Culebra, is a 0.3-mile-wide passage with depths of 21 to 65 feet. Strong currents and baffling winds render the passage hazardous for sailing vessels.

Anchorages.-Good anchorage with ordinary trade winds can be found between Cayo de Luis Pena and Isla de Culebra in depths of 30 to 79 feet. The rocky patch with depths of 42 to 53 feet, 0.6 mile W of Punta Melones, should be avoided in anchoring. A comfortable anchorage for small vessels in depths of 20 to 30 feet is in the entrance to **Bahia Tamarindo,** a mile NW of Punta Melones. A fair anchorage in depths of 40 to 55 feet is about 0.3 mile off the NW side of Cayo de Luis Pena.

Currents.-In Canal de Luis Pena the SE current is deflected N of **Bahia Tarja,** just N of Punta Melones, and thence sets toward the S end of Cayo de Luis Pena; it is weak at the entrance to Bahia de Sardinas. The NW current sets directly through the passage. The current velocity is about 2 knots.

Charts 25650, 25663.-Sonda de Vieques extends from the E coast of Puerto Rico to Virgin Passage between the chain of islands and reefs including Isla de Culebra on the N and Isla de Vieques on the S. The sound is about 20 to 22 miles long and from 8 to 15 miles wide. The E part is clear with depths of 7 to 17 fathoms, except for Bajos Grampus SE of Isla de Culebra. The W part has numerous shoals and reefs extending as much as 8 miles off the E coast of Puerto Rico.

A **danger area** for aerial gunnery and bombing extends 9 miles S and SW of Isla de Culebra. (See 204.230, chapter 2, for limits and regulations.)

Explosives anchorages are in Sonda de Vieques N of Isla de Vieques. (See 110.245, chapter 2, for limits and regulations.)

Isla Palominos, 3.5 miles SE of Cabo San Juan, is a small 165-foot-high island with a rounded grassy summit and surrounded by steep-to reefs up to 0.6 mile from shore. A lighted buoy is on the NE side.

Good anchorage is afforded about 0.5 mile off the W side of the island in about 40 feet on the following bearings: Cabo San Juan Light 313°; Las Cucarachas Light 331°; and Punta Aguila, the extreme NW point of Isla Palominos, 037°. (See chart 25667.)

Bajo Blake, 2 miles E of Isla Palominos, is 0.4 mile in diameter and has a least depth of 20 feet. The S side is marked by a buoy.

Bajo Hodgkins, 7 miles SE of Isla Palominos, is a narrow 0.8-mile-long ridge with a least depth of 27 feet; the S end is marked by a lighted buoy.

The area between Bajo Hodgkins and the E coast of Puerto Rico is full of shoals and should be used only with local knowledge. Many of the shoals have rocks awash or reefs on which the sea breaks while others have rocks that show 1 to 15 feet.

Anchorages.-Deep-draft vessels can find good anchorage in 28 to 60 feet during ordinary weather in **Rada Fajardo,** in the NW end of Sonda de Vieques between Cabo San Juan and Isla Palominos.

Routes.-Vessels bound from San Juan to Isla de Culebra and E frequently enter Sonda de Vieques through Pasaje de San Juan and proceed S of the chain of islands and reefs to gain comparatively smooth water.

A buoyed N-S route along the E coast of Puerto Rico is used by vessels with a draft of 22 feet or less.

Large deep-draft vessels bound for the S coast of Puerto Rico usually enter Sonda de Vieques through Pasaje de San Juan and continue around the E coast of Isla de Vieques. Vessels from NE points use Virgin Passage and pass S of Isla de Vieques to go to ports on the S coast of Puerto Rico.

Charts 25650, 25664.-Isla de Vieques, 6 miles off the nearest point of the E coast of Puerto Rico, forms the S side of Sonda de Vieques. It is 18 miles long E and W and 3.5 miles wide near its middle. A range of hills extends the entire length of the island with a prominent hill at each end-**Monte Pirata** near its W end and **Cerro Matias Jalobre,** 3 miles from the E end. The island is wooded in places, especially its E half and around Monte Pirata.

Principal products are horses and cattle. Vegetables and tropical fruits are grown for local consumption. The rainy season lasts from May to October, but the rainfall is less than in adjacent parts of Puerto Rico. The island is subject to drought; the principal watersource is rainfall stored in cisterns.

Boats carrying supplies and passengers dock at Isabel Segunda on Bahia de Mulas on the N coast. When the trade wind is N of E a heavy surf runs and landing is difficult on the open N coast.

Naval restricted areas extend 1,500 yards offshore around the W part of the island. (See 207.815, chapter 2, for limits and regulations.)

Explosives anchorages are off the N and W coasts of the island. (See 110.1 and 110.245, chapter 2, for limits and regulations.)

Pasaje de Vieques is the strait lying between Puerto Rico and Isla de Vieques. **Radas Roosevelt** is the open-water portion of the passage lying within the shoals and banks N of the W end of Isla de Vieques and between that island and Puerto Rico. The current velocity is about 0.7 knot in the passage and floods SW and ebbs NE.

Punta Arenas, at the NW end of Isla de Vieques, is low and covered with a scrubby growth, with a white spit at its end. The point changes shape continually; at times the outer coconut trees are in the water.

At the W end of Isla de Vieques, S of Punta Arenas, there is a smooth anchorage with E winds but exposed to the S and W.

Escollo de Arenas is a continuation NW of a shoal which fringes the N side of Isla de Vieques to a distance of about 1 mile and extends E nearly to Punta Mulas. The W edge of the shoaler part of the bank extends 3.3 miles NNW from Punta Arenas to its outer end, where it is marked by a lighted buoy. Spots with depths of 5 feet are on the bank for 0.8 mile N of Punta Arenas, and thence to the lighted buoy, the bank is steep-to with about 40 feet on each side. The bank sometimes shows by discolored water and rips.

Currents.-A strong SW set is noted frequently N of Escolla de Arenas. The bank itself is generally indicated by the tide rips.

A 1.2 mile causeway extends from shore at **Desembarcadero Mosquito,** 3.9 miles E of Punta Arenas. A pier extends from the W side of the causeway about 350 yards from the seaward end. The causeway and pier are marked at the outer ends by Navy-maintained lights. In 1965, a depth of 37 feet was available on either side of the pier; however, there are spots with lesser depths in the approaches, and the chart is the best guide.

Arrecife Mosquito, a reef awash, is 1.9 miles to the NE of Desembarcadero Mosquito. The reef is steep-to, and the sea always breaks on it. A shoal with a depth of 17 feet is about 0.5 mile WNW from the reef. During ordinary weather a fairly smooth anchorage is 0.3 mile S of Arrecife Mosquito, in 40 feet, sandy bottom. Several spots with a least depth of 9 feet are in the approaches to the anchorage, and vessels drawing more than that depth should use it only with local knowledge.

Arrecife Corona, a reef awash, is about 0.3 mile long and about 0.3 mile E of Arrecife Mosquito. Several shoals are around the reef, including a 9-foot spot 0.2 mile S. **Bajo Merail,** a shoal with least depth of 2 feet lies 0.8 mile S of Arrecife Corona.

Caballo Blanco, a low grassy islet, is 1.7 miles NW of Punta Mulas. Several shoals surround the islet, the outer of which are 0.6 mile N and 0.2 mile S. **Bajo Comandante,** a shoal about 600 yards in extent with a least depth of 7 feet, lies about midway between Caballo Blanco and the shore. There are spots with a least depth of 23 feet in the channel between Caballo Blanco and Bajo Comandante.

Bahia de Mulas, 8 miles E of Punta Arenas and 10 miles W of Punta Este, is an open bight on the N coast of Isla de Vieques. **Isabel Segunda** (P.O. Vieques), the principal town on the island, is on the SE side of the bay.

Punta Mulas Light (18°09.4′ N., 65°26.6′ W.), 68 feet above the water, is shown from a 32-foot white octagonal tower on a dwelling on a low bluff point on the NE side of the bay. An old Spanish brick fort and building is prominent on a hill 0.5 mile SE of the light. A depth of 12 feet can be taken to the 300-foot pier on the E side of the bay. Depths of 4 to 12 feet are along the pier.

Small vessels and schooners anchor N and S of the pier at Isabel Segunda according to draft. Large vessels anchor 0.5 mile or more offshore in the bay. The outer anchorage is exposed, but the small-boat anchorage affords fair shelter during ordinary weather. With N winds a heavy sea makes into the bay causing small craft to drag anchor. The nearest hurricane anchorages are Ensenada Honda (Isla de Culebra) and Ensenada Honda (E coast of Puerto Rico).

The approach to Bahia de Mulas is obstructed by numerous unmarked shoals with depths of 5 to 30 feet. The chart is the best guide.

A local person is designated to handle insular immigration and customs traffic. Supplies and passengers are landed at the pier. Some cattle are exported. Available supplies include gasoline in drums and groceries. Telephone and telegraph communications are available. A ferry carries passengers

and supplies between Isabel Segunda, Isla de Culebra, and Fajardo; the mail is delivered by airplane.

A **danger area** of a bombing and target area is off the NE and SE coasts of Isla de Vieques. (See 204.234, chapter 2, for limits and regulations.) The NE corner and the W boundaries of the N and S parts of the area are marked by buoys.

Schedules of all operations by the U.S. Marine Corps and the Navy on Isla de Vieques and vicinity are promulgated weekly and distributed to local authorities on Isla de Culebra, Isla de Vieques, and Fajardo by the Commanding Officer, Atlantic Fleet Weapons Training Facility, Roosevelt Roads, P.R.

Cabellos Colorados, 3.1 miles E of Punta Mulas, is rocky and steep-to. **Puerto Negro** is a boat landing 4.8 miles E of Punta Mulas Light. It can be entered only by small craft with local knowledge. The entrance through the reefs is about 100 yards wide, with depths of 6 to 18 feet, and is generally indicated by breakers on either side. Anchorage space is limited; most of it is foul. **Punta Brigadier,** 0.6 mile W of the entrance, is marked by **Roca Roja,** a large bare rock close-in. **Punta Goleta** is the E entrance point.

Roca Cucaracha, 3.4 miles WNW of Punta Este Light, consists of two small rocks, close together, about 3 feet high. The rocks are about 0.3 mile from shore, and the depths inside them are 6 to 14 feet.

Cano Hondo extends 0.6 mile E of Roca Cucaracha to the reefs forming Bahia Salinas. It is open N and has depths of 18 to 42 feet. It has no sheltered anchorage except for small craft, which can anchor at its SE end. A narrow channel with a depth of 8 feet S of an islet about 15 feet high and 250 yards from shore leads from Cano Hondo to Bahia Salinas.

Bahia Salinas, 1.6 miles W of Punta Este, has an anchorage with depths of 12 to 24 feet. It is the best landing along the N coast E of Bahia de Mulas. It affords good shelter for small craft with local knowledge, but should not be attempted by strangers. The bay is protected on the N by a reef 0.6 mile long, the highest part of which is awash. The entrance from E is between the reef and those reefs which fringe the shore. About 1.5 miles NW of Punta Este is a high bluff point with bare white cliffs to the E.

Punta Este, the E point of the island, is moderately low and grassy, with rocky bluffs at the water. A light, 58 feet above the water, is shown from a tower with a red and white diamond-shaped daymark on the point.

The S coast of Isla de Vieques is irregular and indented by sandy bays. **Bahia Salina del Sur,** 2 miles W of Punta Este, is 0.5 mile in diameter and affords a boat landing with the wind N of E. **Roca Alcatraz** consists of several rocks 10 to 15 feet high, 0.4 mile from the points at the entrance. A larger islet about 40 feet high, wooded on top and with a large bare rock close to its SE end, lies 0.3 mile off the W entrance point. Anchorage is in the W half of the bay in 18 to 24 feet, sheltered from winds N of E. The clearer entrance is between Roca Alcatraz and the island off the W point of the bay. For 1 mile W of the island, shoals with 18 feet and less extend nearly 0.5 mile from shore.

Ensenada Honda, about 6 miles W of Punta Este, is 1.2 miles wide, and has several bare rocks and reefs awash. The bay is rough with SE winds, but with the wind N of E it affords a good boat landing. Owing to the foul ground in the bay, it should be avoided by strangers. A reef bare at low water is off the entrance 0.8 miles ENE from **Punta Conejo,** the W entrance point. A light is on the E side of the point. **Cayo Jalovita** and **Cayo Jalova** are small Islands on the E side of the harbor.

In April 1978, three submerged rocks were reported to be about 1.4 and 1.9 miles SSW of Punta Conejo.

Bahia de la Chiva is a shallow bight on the W side of Punta Conejo. **Isla Chiva,** about 30 feet high, is a cay in the entrance to the bight. A reef with 2 to 18 feet of water over it extends nearly 0.5 mile from shore 1.5 to 2.1 miles W of Punta Conejo. **Bahia Tapon,** a bight N of the reef, has depths of 2 to 3 feet.

An offshore fueling line, marked by buoys, extends about 700 yards from the tank W of Bahia de la Chiva.

A naval **restricted area** is off the S shore of Isla de Vieques. (See 207.815, chapter 2, for limits and regulations.)

Puerto Ferro, 9 miles W of Punta Este, is a boat harbor with 6 to 8 feet of water at the entrance and 7 to 15 feet inside. Its entrance is 250 yards wide, with high land on both sides, and is prominent. **Puerto Ferro Light** (18°05.9′N., 65°25.4′W.), 56 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on a point S of the SW entrance point. A sunken rock lies about 0.5 mile inside the entrance in 18°06′21″N., 65°25′30″W.

Puerto Mosquito is a boat harbor about 1 mile W of Puerto Ferro Light. Least depths in the narrow entrance are 2 to 3 feet. A sunken rock is on the W side of the entrance in 18°05′43.5″N., 65°26′32.5″W.

Ensenada Sun Bay, 2.3 miles W of Puerto Ferro Light, is about 0.6 mile wide. It offers anchorage in 18 to 24 feet exposed to winds from SE to SW. A shoal extends 200 yards W from the E point of the bay, and a shoal with 17 feet over it lies W from the middle of the entrance. The depths in the S half of the bay are 17 to 27 feet. Several sunken rocks are about 100 and 250 yards W and SW, respectively, off the E entrance point.

Puerto Real, on the S coast of Isla de Vieques 3 miles W of Puerto Ferro Light, provides good anchorage in ordinary weather. The port is somewhat protected by **Punta de Tierra** on the E and **Cayo Real** on the S; depths are 15 to 25 feet. A pier in the NE part of Puerto Real has 10 feet alongside and is marked on the seaward end by a private light. The radio tower lights 0.3 mile inshore are prominent.

The principal outlying danger is a shoal covered 13 to 17 feet, with 30 to 50 feet around it, lying 0.7 mile from shore and 0.9 to 1.3 miles WSW from the S end of Cayo Real; its E and W ends are each marked by a buoy. A spot with 23 feet is about 0.4

mile SW from the S end of Cayo Real. A shoal with 15 feet of water is 0.2 mile from shore and 0.6 mile W from the N point of Cayo Real.

Vessels can anchor in 35 feet about 550 yards W of Cayo Real. The approach to the anchorage is between the buoy marking the E end of the principal offshore danger and a 23-foot spot nearly 0.4 mile SW of Cayo Real.

Punta Vaca, 3 miles W of Puerto Real, is the southernmost point of the island. Outlying rocks are a short distance offshore.

A **267°31'-087°31' measured nautical mile** is off Punta Vaca; the front and rear markers are shown from poles.

Punta Boca Quebrada, 2.9 miles WNW of Punta Vaca, is a low wooded point which terminates in a dry ledge outside of a white sand beach. From Punta Boca Quebrada the coast trends N for 1 mile to Punta Arenas.

Charts 25650, 25663.-The **E coast** of Puerto Rico extends 10 miles S from Cabo San Juan to Punta Puerca and then 22 miles SW to Punta Tuna. The coast is very irregular with projecting rocky bluffs separating the numerous small shallow coves and bays, and with grass-covered or mangrove hills within a mile of the shore. Reefs awash or bare at low water and shoals with less than 10 feet over them extend more than a mile offshore in places. A depth of 24 feet can be carried through a partially buoyed channel from 2 to 5 miles off the E coast, but entrance caution is necessary to avoid the shoals near the route. The principal ports on the E coast are Fajardo and the private oil-handling facilities at Puerto Yabucoa. Ensenada Honda is the site of the Roosevelt Roads Naval Station ship base.

Chart 25667.-Playa Canalejo, 0.2 mile SSE of Cabo San Juan Light, is a shallow indentation leading to the ruins of a small pier.

Punta Gorda, 1.4 miles S of Cabo San Juan Light, is a conspicuous high head. A 360-foot hill, 0.4 mile WNW from the point, is the N end and highest part of a high ridge which extends SW nearly to Playa de Fajardo.

Punta Bateria, 2.2 miles S of Cabo San Juan Light, is a rocky 70-foot cliff from which a grassy ridge makes inland.

Bahia de Fajardo, 2.5 miles S of Cabo San Juan Light, affords good shelter for medium-draft vessels. It is somewhat protected on the E and S by two islands and surrounding reefs. Ferry service for both passengers and cargo operates between Playa de Fajardo, Isla de Culebra, Isla de Vieques, and the Virgin Islands. Commercial air transport is available to the Virgin Islands. Small interisland vessels trade in general cargo, building materials, and livestock.

Prominent features.-Cabo San Juan Light is the principal landmark in making the approach to Bahia de Fajardo. A hotel with two cupolas, each marked by a red light, just S of Punta Gorda, and two stacks of a sugar central, and a radio tower near Fajardo are prominent.

Storm warning signals are displayed. (See chart).

Channel.-The principal entrance to Bahia de Fajardo is from N through the unmarked channel W of Bajo Laja, although small vessels can enter from E and S with local knowledge. The N entrance has a controlling depth of 23 to 30 feet to Buoy 3, thence 11 feet to the public pier. The controlling depth from E is 17 feet to Buoy 3, and from S, 9 to 11 feet to the public pier.

Anchorages.-Large vessels anchor NE of Punta Bateria according to draft. During ordinary weather the protection is fair and the holding ground is good. Small vessels anchor inside the bay on either side of the entrance channel.

The hurricane anchorages for large vessels are Ensenada Honda (Isla de Culebra) and Ensenada Honda, 10 miles S of Fajardo. Small vessels can anchor S of Isleta Marina.

Dangers.-The approaches to Bahia de Fajardo have reefs that usually show breakers and shoals with 7 to 18 feet over them. Inside the bay depths range from 3 to 24 feet.

Bajo Laja, with least depths of 7 to 10 feet over it, lies on the E side of the N entrance and is unmarked.

Isleta Marina, with surrounding reefs up to 0.5 mile, is on the E side of the bay.

Storm warning signals are displayed. (See chart.)

Arrecife Corona Carrillo and a long reef to the W obstruct the S entrance to the bay. **Bajo del Rio,** a bank with depths of less than 5 feet, extends more than 0.2 mile offshore along the S entrance to the bay.

Currents.-The current velocity is 0.3 knot in the SSE direction on the flood and 1.1 knot in a NNW direction on the ebb in the channel in Bahia de Fajardo.

Pilotage.-A local pilot is available. (See Pilotage for harbors of Puerto Rico at the beginning of this chapter.)

Towage.-Tugs are not available at Fajardo.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Fajardo is a **customs port of entry.** A deputy collector of customs handles customs matters and acts as immigration inspector. The customhouse is on the waterfront at Playa de Fajardo.

Harbor regulations.-Local regulations are enforced by a Commonwealth Captain of the Port.

Wharves.-The landing facilities are at **Playa de Fajardo** on the SW side of Bahia de Fajardo. The westerly 300-feet public pier has 12 feet at the outer end and 8 feet alongside; two private lights are off the outer end of the pier. An 80-foot bulkhead pier with 12 feet alongside for the ferry boat is 100 yards W of the public pier.

A privately owned pier 125 yards E of the public pier is 400 feet long with 5 feet at the outer end. The former limestone pier to the E is in ruins.

Supplies and repairs.-Water is available and gaso-

line can be trucked in. Groceries can be obtained from **Fajardo,** 1.5 miles inland. Limited facilities are available for repairs. The principal source of marine supplies is San Juan, 38 miles by highway from Playa de Fajardo.

Small-craft facilities.–A marina on Isleta Marina, on the E side of Bahia de Fajardo, has facilities for small craft. Depths of 8 to 12 feet can be taken to the marina. Berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available at the finger piers. Lifts to 100 tons and a 100-foot marine railway can haul out vessels for hull, engine, and electronic repairs. Vessels to 65 feet long can be accommodated at the marina.

A private marina 0.3 mile NE of Playa Sardinera, N of Playa de Fajardo, has facilities for small craft. A depth of 12 feet can be taken to the berths inside a 700-foot breakwater that is marked on the seaward end by a fixed red light. Gasoline, diesel fuel, water, ice, and marine supplies are available.

A marina at the hotel just S of Punta Gorda has berthing facilities inside a manmade basin. A depth of 12 feet can be taken through the lighted entrance and then 12 to 7 feet to the berths. Berths, electricity, gasoline, diesel fuel, water, and ice are available.

Chart 25663.–Isla de Ramos, 4 miles S of Cabo San Juan Light, is 0.2 mile in diameter and covered with palm trees except on its summit which is a grassy 35-foot knoll with a house on top. A reef surrounds the island to a distance of 200 to 300 yards. A buoyed shoal with a least depth of 16 feet is 0.6 mile ESE of the island.

Cayo Largo, 1.5 miles E of Isla de Ramos, consists of a narrow 1.8-mile-long ridge steep-to on all sides. The S half is awash at low water, and the sea always breaks on it; the N half has depths of 4 to 15 feet. Buoys mark the W side. The velocity of the current is 0.5 knot in the channel W of Cayo Largo; it floods S and ebbs NW.

Isla Pineros, 8 miles S of Cabo San Juan Light, is a 1-mile long wooded island with a 249-foot peak near the middle. **Isla Cabeza de Perro,** just E of Isla Pineros, has a large detached rock off the rocky bluff NE end. **Cabeza de Perro Light** (18°15.1′N., 65°34.6′W.), 90 feet above the water, is shown from a 30-foot skeleton tower with a red and white diamond-shaped daymark on the E point of the island. **Pasaje Medio Mundo,** W of Isla Pineros, is foul, but a depth of 15 feet can be taken through the narrow crooked channel by small boats with local knowledge.

Punta Puerca, 10 miles S of Cabo San Juan, is a prominent bold wooded head with a high rock bluff at the shoreline. The highest point, 0.3 mile inland, is the site of several large white dish-shaped radar tracking units. The units show up well from offshore.

Chart 25666.–Ensenada Honda, 11 miles S of Cabo San Juan, is the site of the **Roosevelt Roads United States Naval Station.** The harbor is well protected by the circular shore and the reefs which constrict the entrance to 0.3 mile. The harbor is included in a **restricted area** which extends from **Punta Figueras** (see chart 25663), 3.5 miles N of Ensenada Honda, to 2 miles W of the entrance. (See 207.815, chapter 2, for limits and regulations.)

Bahia de Puerca, a mile NE of Ensenada Honda, has depths of 37 feet or more, leading to a pier with 37 feet alongside at the head of the bay. A 26-foot spot is 150 yards SW of the pier. The 1,000-foot pier consists of a series of caissons connected by walkways; a large inactive graving dock is inshore of the pier.

Isla Cabras, on the E side of the entrance to Ensenada Honda, has a rocky bluff on the E side. **Vieques Southwest Channel Range Front Light** (18°12.9′N., 65°36.0′W.), 70 feet above the water, is shown from a skeleton tower with a rectangular white daymark with a central red vertical stripe near the E end of the island. The island is connected to the mainland by a causeway. **Cabra de Tierra** is the southernmost point of a low neck covered with mangroves and palms separating Ensenada Honda from Bahia de Puerca.

Punta Cascajo, the W point at the entrance to Ensenada Honda, has rocky cliffs on the S side and a bare reef 250 yards off the SE side. Many houses are on the high part of the point, and trees fringe the shoreline. An unnamed cove just NW of the point is blocked at the entrance by a permanent shark net.

The SW approach to Ensenada Honda is marked by a **025°24′** lighted range. (The front range light is on Isla Cabras and the rear range light is on Punta Puerca.)

Channels.–A dredged channel, marked by lighted and unlighted buoys, a light, and a **315°** lighted range, leads to a large turning basin in Ensenada Honda. Vessels anchor inside the harbor according to draft; the holding ground is soft mud, which may cause some dragging during a hurricane. In 1965-68, a controlling depth of 40 feet was available in the channel and turning basin.

Wharves.–Pier 1, U.S. Navy fuel pier, the more W pier on the NE side of Ensenada Honda, is 450 feet long with 32 feet along the W side and 36 feet along the E side; water is available. A small boat landing with about 15 feet alongside is inshore of the E side of the fuel pier.

Pier 2, U.S. Navy cargo pier, SE of Pier 1, is 398 feet long with 32 feet alongside; water is available. An LST landing ramp is about 400 yards SE of the cargo pier.

Pier 3, a 1,200-foot-long U.S. Navy aircraft carrier pier marked at its seaward end by fixed red lights, is 0.25 mile S of Pier 2. Depths of about 39 feet are alongside.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Customs and immigration, services are handled by representatives from Fajardo.

An **agricultural quarantine** official is at the Roosevelt Roads Naval Station.

Chart 25665.-Puerto de Humacao, 19 miles S of Cabo San Juan, affords some shelter for medium-draft vessels. The port is exposed SE and S, and a heavy sea sometimes makes in with SE winds. The port is inactive and the piers and cargo handling facilities of Playa de Humacao are in ruins. Small boats can make a landing at the ruins of the old sugar central pier during good weather.

Prominent features.-Punta Lima, 3 miles NE of Puerto de Humacao, is a projecting wooded hill with low land back of it. A reef 0.5 mile E of the point usually shows breakers on it.

Cayo Santiago, 0.7 mile SE of the waterfront at **Playa de Humacao,** is the most prominent feature when approaching the port. The island is low at the N end, rising to 162 feet at the S end. The Caribbean Primate Research Center maintains a monkey colony for experimental purposes on the island; no visitors are permitted.

El Morrillo, 1.8 miles SW of the port, is a small rocky hill which rises abruptly from the water and the lowland around it.

Morro de Humacao, 3.5 miles SW of the port, is a 100-foot rocky point with higher ground inland. Grass-covered **Cayo Batata** is 0.4 mile off the point. A bare ledge, with five rocks and a reef, awash and steep-to, extends up to 0.2 mile E and S of Cayo Batata.

Channels.-The principal entrance to Puerto de Humacao is from S through an unmarked channel leading W of **Bajo Parse** and **Bajo Evelyn;** small vessels can enter from N.

Anchorages.-Large vessels can anchor within 2.3 miles S of Cayo Santiago, as close inshore as draft permits.

Ensenada Honda, 10 miles NE, is the nearest hurricane anchorage.

Small vessels anchor in depths of 3 to 10 feet in the NE part of **Puerto de Naguabo,** 2 miles NE of Puerto de Humacao. Good anchorage is afforded except with SE or S winds. A boat landing in about 7 feet of water can be made at a small pier SE of Puerto de Naguabo. Gasoline is available nearby.

Dangers.-Several shoal spots with depths of 12 to 18 feet are in the approaches to Puerto de Humacao. The 12-foot shoal 1.2 miles E of Cayo Santiago and the shoals at the S entrance are unmarked. The chart is the best guide. A shoal area with depths of 1 to 6 feet extends for 0.4 mile from Cayo Santiago towards the waterfront at Playa de Humacao. A wreck reportedly covered 8 feet is 300 yards SE of the ruins of the long pier.

Small-craft facilities.-Berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. A 50-foot marine railway and a 35-ton lift can handle craft for hull and engine repairs. Some groceries are available at Playa de Humacao, but most supplies must be obtained from **Humacao,** 6 miles inland. (See chart 25650.) The principal source of marine supplies is San Juan, 44 miles by highway from Playa de Humacao.

Humacao is a **customs port of entry.**

Chart 25661.-Puerto Yabucoa, 23.5 miles SW of Cabo San Juan Light and 6 miles NE of Punta Tuna Light, is an open bay with numerous reefs and sunken rocks with depths of less than 5 feet between rocky **Punta Guayanes** on the N and **Punta Quebrada Honda** on the S. The port is the site of a deep-draft oil-handling facility. Large tankers call here to deliver crude petroleum and load petroleum and petrochemical products.

Channels.-A privately dredged 500-foot channel leads from deepwater to a turning basin and petroleum wharf. A jetty extending about 200 yards from the NE side of the basin entrance is marked by a light. The channel is marked by private lighted buoys, lights, and a **296°50′** lighted range. In 1976-1981, the controlling depth was 34 feet (49 feet at midchannel), thence 43 to 50 feet in the basin except for shoaling along the edges; in 1971, 25 feet was available in the smaller basin to the W of the main basin. In November 1983, shoaling was reported in the vicinity of the turning dolphin in the N part of the main basin.

The storage tank farm and several tall stacks are conspicuous NW of the turning basin.

Anchorages.-A suitable anchorage is available for several deep-draft vessels SE of Punta Guayanes.

Dangers.-The area seaward of the dredged channel is relatively open and free from dangers, but care should be exercised in approaching the channel as depths shoal extremely rapidly at the channel entrance. Outcrops of hard seafloor material exist close to the edges of the channel; give the edges of the channel a good berth. A shoal area that is partially bare with breakers is 0.5 mile SW of the channel. Prevailing winds from ESE cause a good swell in the basin most of the time.

Pilotage.-(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Local pilots are available. Pilots board in-bound vessels about one mile seaward of the channel entrance.

Towage.-The use of a tug is compulsory for arriving and departing vessels. Tugs up to 3,800 hp are available.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Harbor regulations.-Local regulations are enforced by the local Commonwealth Captain of the Port.

Wharves.-The petroleum wharf on the N side of the main basin is 450 feet long with turning and berthing dolphins extending off the ends. Depth alongside is 50 feet. The barge and dry cargo wharf on the S side of the basin just inside the entrance is 200 feet long with a depth of 10 feet reported alongside.

A pipeline trestle pier in ruins, formerly used for loading molasses, is at **Playa de Guayanes** in the N part of Puerto Yabucoa.

Supplies and **repairs.**–Bunker C, diesel oils, and water are available at the petroleum wharf. Limited marine supplies are available in Puerto Yabucoa. Stores and supplies can be ordered through the ship agents for delivery to the vessel with at least 48-hours advance notice.

No repair facilities are available.

Chart 25659.–Punta Yeguas, 1.2 miles S of Punta Quebrada Honda, is a low point with a rocky bluff at the end, which rises gradually in a smooth grassy ridge that joins the E end of Cuchilla de Panduras.

Punta Toro, the point 1.4 miles WSW of Punta Yeguas, is a 500-foot-high spur of **Cuchilla de Panduras,** which has elevations of over 1,800 feet to the N.

Punta Tuna Light (17°59.4'N., 65°53.1'W.), 110 feet above the water, is shown from a 49-foot white octagonal tower on a dwelling, near the end of the point. A radiobeacon is at the light. **Storm warning signals are displayed.** (See chart.) The point projects as a high cliff; a 400-foot hill 0.5 mile N is prominent.

Arrecife Sargent, 0.5 mile SE of Punta Tuna is 1.8 miles long and 0.3 mile wide at its widest point. Because it breaks the force of the SE swell, the reef affords some protection from the SE for vessels anchored well in by Punta Tuna where the reef is from 0.3 to 0.2 mile from shore. A bare part of the reef, 0.7 mile E of the light, has the appearance of a rowboat and black can buoy. Other parts of the steep-to reef have depths of 5 to 17 feet. The break on the reef does not show well except when there is considerable sea, and on parts of it the sea rarely breaks. The natural channel between the reef and the shore is not recommended for strangers.

Charts 25671, 25677.–The **S coast** of Puerto Rico from Punta Tuna to Cabo Rojo extends in an almost W direction for 75 miles. The coast is very irregular with projecting brush-covered points between shallow coves and bays; fringing reefs close to shore make landing difficult and often dangerous in most places. Except at the E and W ends of Puerto Rico, the land is generally low near the shore with prominent high hills in the interior. Many reefs and islands are from 2 to 5 miles offshore, then the bottom increases rapidly to great depths, making soundings of little use to indicate danger or distance from shore. Numerous lights and other prominent features along the coast can be used for position determination. Safety will be ensured by giving a berth of at least 3 miles to the coast and to Isla Caja de Muertos. Small vessels with local knowledge sometimes hug the coast inside the outer reefs to avoid heavy seas outside.

In 1967, a rock pinnacle, covered 6 fathoms, was reported about 12.5 miles ESE of Isla Caja de Muertos Light in 17°50'35"N., 66°18'14"W.

Chart 25689.–Puerto Arroyo, 11 miles W of Punta Tuna Light, is an open bay exposed to S winds.

Punta Figuras is a projecting point on the E side of Puerto Arroyo. **Cerro Range,** 3 miles N of Punta Figuras, is a distinct sharp conical hill. The stacks of several sugar centrals are also prominent.

The principal entrance channel is from SW. Several shoals with depths of 24 to 30 feet are in this approach, and the bottom is irregular. There is a small- boat passage from E between Punta Figuras and Arrecife Guayama; the passage should be used only with local knowledge. Depths of 24 to 30 feet can be taken to the anchorage area, thence about 5 feet to the private pier at **Arroyo.** The E passage has depths of 13 to 30 feet to the anchorage.

The best anchorage is in 23 to 30 feet a mile WSW of Punta Figuras. The prevailing SE wind is always felt in the anchorage, although the force is somewhat broken by the outlying reef. Some small fishing vessels anchor near Arroyo according to draft. Bahia de Jobos, 10 miles W, is the nearest hurricane anchorage.

Arrecife Guayama, 1 to 1.5 miles off Punta Figuras, is nearly 3 miles long and is dangerous to approach. Its E part is awash, and the sea usually breaks on it; the middle part has little water on it with patches awash on which the sea breaks. The SW end of the reef is marked by a lighted buoy. **Arrecife Corona,** 1.4 miles W of Punta Figuras, has a least depth of 5½ feet.

Arrecife Algarrobo, 2.3 miles W of Punta Figuras, has 1 foot or less over it. Several shoals with depths of 6 to 18 feet extend up to 2 miles offshore S of **Punta Barrancas,** a point on the W side of Puerto Arroyo 3.8 miles W of Punta Figuras.

Small-craft facilities.–Berths, gasoline by truck, water, some marine supplies, and engine repairs are available at Arroyo.

Local harbor regulations for Puerto Arroyo are enforced by a Commonwealth Captain of the Port.

Chart 25677.–Laguna de Las Mareas about 6.5 miles W of Punta Figuras is the site of a deep-draft oil-handling facility. Large tankers call here to deliver crude petroleum products and load petrochemicals and motor fuels.

Channels.–A privately dredged channel and landcuts lead through the reefs from deepwater to the facilities' basin and pier in Laguna de Las Mareas. The breakwater extending from the E entrance point, **Punta Ola Grande,** is marked at the seaward end by a light. The channel is marked by private lighted aids and a **025°04'36"** lighted range. In October 1977, the controlling depth was 33 feet in the entrance channel, thence in 1976, 37 feet in the basin except for shoaling along the edges. In May 1981, shoaling to 33 feet was reported in several places in the harbor. Extreme caution is advised when entering the harbor.

The 1,100-foot pier in the basin extends from the N shore and consists of a series of connected mooring and breasting dolphins with a 90-foot

loading platform (pierhead) near its center. In 1968, depths of 38 feet were reported alongside.

Pilotage.-(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Pilots board vessels 1 mile off the entrance to the harbor. A 48-hour and a 24-hour notice of time of arrival are requested.

Towage.-Tugs up to 1,800 hp are available for docking vessels. The tugs monitor 2182 kHz and VHF-FM channel 16 (156.80 MHz).

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

A hospital is at nearby Guayama.

Repairs.-The nearest port for major repairs is San Juan; limited emergency above-the-waterline repairs are available at Ponce.

Supplies.-No bunkers are available; in emergencies bunkers and lube oils may be delivered from Ponce. Limited quantities of water and facilities for offloading waste water are available at the pier. Marine supplies are available on 48-hour notice.

Tides.-The reported mean range of tide is 0.8 foot.

Chart 25687.-Bahia de Jobos, 20 miles W of Punta Tuna Light, is a good hurricane anchorage. The harbor is formed by **Punta Pozuelo,** a projecting point on the E side, and many islands on the S and SW sides. The shore and islands are low and are covered with thick brush and mangroves. **Central Aguirre,** on the NW side of the bay, is one of the largest sugar centrals of Puerto Rico. The E part of the bay is shoal and is used only by local fishing boats.

Prominent features.-A light on the E end of **Cayos de Ratones** marks the entrance to Bahia de Jobos. The stacks at Central Aguirre and the water tank at **Salinas** show up well from offshore.

Channels.-The principal entrance to Bahia de Jobos is from the W between **Cayo Morrillo** and Cayos de Ratones, and thence through a marked dredged channel that leads to a turning basin and facilities of a powerplant, and to a 1,000-foot-long pier at the head of the channel at Central Aguirre. In 1975, the dredged channel had a controlling depth of 26 feet for a midwidth of 150 feet to the turning basin and pier. In 1977, the basin, marked by private lighted buoys, had depths of 26 feet except for shoaling to 18 feet on the N and W sides. Shoaling to 7 feet exists NE of the basin.

Boca del Infierno, a small-boat entrance into Bahia de Jobos between **Cayos Caribes** and **Cayos de Barca,** has a depth of 11 feet over the bar which breaks with a heavy sea. This passage should be used only with local knowledge.

A privately dredged and marked channel leads E from **Punta Rodeo,** the NW extremity of Punta Pozuelo, along the N side of Punta Pozuelo to a private basin and barge receiving wharf of an oil company. In 1975, the channel had a controlling depth of 9 feet, with 9 to 16 feet available in the basin.

Anchorages.-Vessels sometimes anchor just inside the entrance between Cayo Morrillo and Cayos de Ratones to await daylight. There is a good anchorage in depths of 24 to 35 feet with grassy bottom NE of **Cayos de Pajaros.** The anchorage inside the bay is S of the pier at Central Aguirre in depths of 19 to 24 feet with soft mud bottom. A slight swell makes in through Boca del Infierno with S winds.

Dangers.-Numerous wooded islands with reefs awash and steep- to surround the S and SW part of Bahia de Jobos up to 1.5 miles from the mainland. There are passages between some of the island groups, but only the principal entrance E of Cayos de Ratones should be used by large vessels and small boats without local knowledge.

Pilotage.-Pilots from Ponce serve this harbor. (See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Vessels are boarded off Cayos de Ratones.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Puerto Jobos is a **customs port of entry.**

Wharves.-The 1,000-foot-long pier at the head of the dredged channel at Central Aguirre was reported, in 1975, to be in poor condition and not usable. The fuel oil barge loading platform of the powerplant, on the NW side of the turning basin, has about 300 feet of berthing space with dolphins. In June 1976, depths of 17 feet were reported alongside.

Supplies and repairs.-Supplies have to be obtained from inland towns; San Juan is 67 miles by highway. Some above-the-waterline emergency repairs can be made by the machine shop at Central Aguirre.

Small-craft facilities.-A small-craft facility is on the S side of Bahia de Jobos about 0.7 mile E of Punta Rodeo. The entrance channel to the facility is very narrow and should be navigated with caution. Gasoline, water, ice, and a launching ramp are available.

Bahia de Rincon, 26 miles W of Punta Tuna Light, is a 5-mile-wide bay used only by local fishing boats that anchor near **Playa de Salinas** in the NE part. There is a good anchorage in depths of 24 to 30 feet in the E part of the bay during ordinary weather. The bay shoals to 18 feet and less within 1 mile of the shore in some places.

Arrecife Media Luna and **Cayo Alfenique** obstruct the entrance to Bahia de Rincon from S. The reefs are partly bare or awash, steep-to, and the sea breaks on them. The W side is obstructed by **Cayos de Caracoles** and **Cayos Cabezazos.** Reefs awash or bare and nearly steep-to surround the islands, and the sea always breaks on their S sides. Foul ground with depths of 1 to 6 feet extends N to **Punta Petrona,** the W point of the bay.

Depths of 23 to 28 feet can be taken to anchorage in Bahia de Rincon on either side of Arrecife Media

Luna; avoid the 12-foot shoal 0.4 mile NW of Cayos de Ratones. Small vessels with local knowledge also use the narrow channel N of Cayos de Ratones.

In 1967, a rock pinnacle, covered 6 fathoms, was reported in about 17°50.6'N., 66°18.3'W., about 5 miles S of the light on the E end of Cayos de Ratones. (See chart 25677.)

Chart 25685.-The 15-mile indentation in the coast between Bahia de Rincon and Bahia Ponce is obstructed by islands and shoals up to 5 miles offshore. The stacks of several sugar centrals and several water tanks are prominent along the coast line. Anchorage in depths of 15 to 30 feet can be found within 0.5 mile of the shore during ordinary weather. Small local fishing boats anchor near the settlements along the shore.

Playa Santa Isabel, 31 miles W of Punta Tuna Light, is a small settlement near the beach where water can be obtained. A depth of 4 feet can be taken to the landing. Gasoline, groceries, and some supplies are available at **Santa Isabel,** 0.7 mile inland.

Cayo Berberia, 33 miles W of Punta Tuna Light, is 2 miles offshore and is surrounded by a reef and shoals. The fringing reef, on which the sea breaks on the S and E sides, extends up to 0.4 mile from the island. A shoal with depths of 2 to 12 feet extends for 0.2 mile N of the island and over a mile W of it. In ordinary weather, a good anchorage in 45 to 60 feet of water 1 mile NW of the island was reported by the NOAA Ship MT. MITCHELL. Care must be taken when approaching the area because of shoals with depths of 15 to 18 feet, 2 miles NW of the island.

Isla Caja de Muertos, about midway of the 75-mile stretch of coast between Punta Tuna Light and Cabo Rojo, is 5 miles offshore and prominent. The SW end is low except for a 170-foot steep hill at the extreme SW end. When viewed from a distance the 170-foot hill appears to be a separate island. At such times the hill is easily mistaken for Isla Morrillito. Care should be taken when shooting tangents to these islands. Landings can be made on the W side of the island during ordinary weather. **Isla Morrillito** is a small 31-foot flat-topped island 200 yards off the SW point.

Isla Caja de Muertos Light (17°53.7'N., 66°31.3'W.), 297 feet above the water, is shown from a 63-foot gray cylindrical tower on the summit of the island.

Shoal water with depths of 3 to 18 feet extends up to 0.5 mile from the shore of Isla Caja de Muertos and Isla Morrillito. A reef extends about 0.4 mile seaward in all directions from a point on the NE end of Isla Caja de Muertos in 17°54.0'N., 66°30.6'W. A bar with a least depth of 13 feet extends NE from Isla Caja de Muertos gradually curving E and joins the shoal area W of Cayo Berberia. The sea rarely breaks on the bar; it is dangerous to approach.

A passage N of Cayo Berberia and Isla Caja de Muertos is used in the daytime by small coasting vessels with local knowledge. There are several shoals with depths of 14 to 17 feet along the route.

A good anchorage in ordinary weather in 90 to 115 feet of water about 0.8 mile NW of the center of Isla Caja de Muertos was reported by the NOAA Ship MT. MITCHELL. The island offers a good lee.

Isla del Frio (see chart 25683), 4.3 miles NNW of Isla Caja de Muertos and 0.4 mile offshore, is surrounded by a 0.4-mile-long reef that is steep-to on the S edge.

Chart 25683.-Bahia de Ponce, 43 miles W of Punta Tuna Light and 32 miles E of Cabo Rojo Light, is the most important commercial harbor on the S coast and one of the three leading ports of Puerto Rico. The harbor is protected from the prevailing E trade winds by Punta Penoncillo and Isla de Gata with their surrounding reefs, but it is exposed to the S causing a swell at times in the anchorage. The port facilities are in the E part of the 3.5-mile-wide bay, which is surrounded by shoals and reefs; the N part of the bay shoals to less than 18 feet within 0.4 mile of the shore in places.

Ponce, the second largest city in Puerto Rico, is 2 miles inland from the port at **Playa de Ponce,** and 71 miles by highway from San Juan. Most cargo is landed at the municipal pier and bulkhead on Punta Penoncillo. The principal imports include foodstuffs, textiles, building materials, and machinery. Exports include sugar, cement, and canned fish.

Prominent features.-(See also chart 25677.) Isla Caja de Muertos with the light on its summit is the most prominent feature in the approach. The stacks of the cement factory W of Ponce, the large microwave tower in Ponce, the hotel on the hill back of Ponce, and the radio towers and stacks surrounding the bay can be seen from well offshore. Also prominent is the aerolight at Mercedita Airport, about 2.5 miles E of Ponce.

Isla de Cardona, in about the middle of the entrance to Bahia de Ponce, is marked by a light shown from a white tower near the middle of the island. **Isla de Gata,** S of the municipal pier on **Punta Penoncillo** is connected by a dike to **Punta Carenero.**

Channels.-The principal entrance is E of Isla de Cardona, where in March 1977, the controlling depth was 22 feet in the buoyed approach to the municipal pier and bulkhead except for shoaling to 6 feet at the NE end of the municipal pier. Lesser depths exist N of the inner harbor basin buoys and NE of the municipal pier and bulkhead. The channel is also marked by a **015°** lighted range; do not confuse the rear range light with the flashing red radio tower lights back of it. A 0.2-mile-wide channel between Isla de Cardona and Las Hojitas is sometimes used by small vessels with local knowledge.

Anchorages.-The usual anchorage is NE of Isla de Cardona in depths of 30 to 50 feet, although vessels can anchor in 30 to 40 feet NW of Las Hojitas. A small-craft anchorage is NE of Las Hojitas in depths of 18 to 28 feet. (See 110.1 and 110.255, chapter 2, for limits and regulations.) A well-protected anchorage for small boats in depths of 19 to 30 feet is NE of

the yacht club on Isla de Gata. A comfortable anchorage with little swell during ordinary weather in depths of 18 to 30 feet can be found in **Caleta de Cabullones,** the bight E of Isla de Gata.

Bahia de Ponce is not safe as a hurricane anchorage because it is exposed to the S. The nearest hurricane anchorages are at Bahia de Jobos, 28 miles E, Bahia de Guayanilla, 8 miles W, and Bahia de Guanica, 16 miles W.

Dangers.-Bajo Tasmanian, an extensive bank on the E side of the principal harbor entrance, is about a mile long with several spots of 16 to 18 feet. Vessels should pass 200 yards or more W of the buoy to clear the W limit of the bank.

The bank on the W side of the entrance extends almost to Isla de Cardona and has general depths of 28 to 48 feet, but there are several spots of 18 to 23 feet within an area 0.5 mile SW of the island.

Bajo Cardona extends 600 yards ESE from Isla de Cardona with depths of 12 to 16 feet. A bare reef on which the sea breaks extends 300 yards NE of the island; depths of 11 to 14 feet continue in the same direction for 200 yards.

A reef bare at low water and steep-to extends 300 yards W and SW from Isla de Gata. The sea always breaks on the outer side of this reef.

It is reported that with an E wind of 25 knots or more, the mud from the reef off Isla de Gata discolors the water across the channel to Isla de Cardona and beyond making the channel off the piers at Punta Penoncillo appear shoal.

Other unmarked shoals and reefs are dangerous in approaching Bahia de Ponce through any of the inshore passages. A reef with four islets extends 0.4 mile from shore to Punta Cabullones, 2.5 miles E of Isla de Cardona. The reef is steep-to, and the sea breaks on the S side. **Roca Ahogado,** a bare rock in the middle of Caleta de Cabullones, has shoal water of 4 to 18 feet extending up to 0.2 mile from it.

Las Hojitas, NW of Isla de Cardona, is 0.8 mile long in a NE direction with a small patch awash near the SW end. The reef has depths of 2 to 11 feet and is steep-to E and NE of this patch.

Cayo Viejo, 0.8 mile W of Isla de Cardona, is about 0.3 mile in diameter and awash at its shoalest point.

Isla de Ratones, on the W entrance to Bahia de Ponce and a mile offshore, is a low island with a reef that bares at low water extending a mile ESE of it. **Cayo Arenas,** 0.5 mile E of Isla de Ratones, is surrounded by a reef and shoals that extend up to 200 yards from its shore. Crooked channels with a least depth of 10 feet are between these islands and the shore; they should be used only with local knowledge.

Weather.-The tropical climate of Bahia de Ponce features average rainfall of less than 35 inches annually, a small diurnal and annual temperature range, and pleasant summer sea breezes. Most of the rain is in the form of showers or thunderstorms, which are frequent from May through November. Thunder is heard on about 6 to 12 days each month; September is the most active month. Maximum temperatures range from the mid-80's (°F) in winter to around 90°F in August and September; summer highs climb to 90°F or more on only 7 to 10 days each month, thanks to the sea breeze. Winds are usually out of the SE and E from spring to fall, and NE and E the remainder of the year. Windspeeds of 17 knots or more blow up to 2 percent of the time in March, April, and July. Visibilities are generally good, except in showers.

Storm warning signals are displayed. (See chart.)

Routes.-From E: When 3 miles S of Isla Caja de Muertos Light steer **303°** for 8 miles until Isla de Cardona Light bears 005°, distant 2.5 miles, then head in on the lighted range bearing **015°.** From W: When 5 miles S of Guanica Light steer **079°** for 15.4 miles to the position off the entrance of Bahia de Ponce.

Pilotage.-(See Pilotage for the harbors of Puerto Rico at the beginning of this chapter.) Pilots board vessels at the entrance buoys.

Towage.-Vessels enter and clear the harbor under their own power. Two tugs are available in emergencies and may be contacted by calling the Coast Guard station at Ponce.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Ponce is a **customs port of entry.** The customhouse is at Playa de Ponce. The deputy collector of customs and his inspectors act as immigration inspectors.

Harbor regulations.-A Commonwealth Captain of the Port with an office at Playa de Ponce enforces the local rules and regulations for Bahia de Ponce.

Wharves.-The municipal pier and wharf on Punta Penoncillo are administered by a board with a dock superintendent in charge. The municipal pier on the SE side is 450 feet long and has depths of 26 to 30 feet along both sides; transit sheds and pipelines for water, molasses, and bulk cement are on the pier. Immediately NW of the pier is a 63-foot-wide loading ramp which slopes to about 1 foot above the water.

On the N side of Punta Penoncillo is a 1,900-foot bulkhead wharf, locally known as Alcoa Pier and has depths of 17 to 28 feet alongside; transit sheds and pipelines for water and diesel oil are on the wharf; general cargo is received.

About 300 yards N of the Alcoa Pier, the 610-foot Trailer Terminal pier has reported depths of 36 feet alongside.

About 350 yards E of the municipal pier is a L-shaped pier with a 350-foot face which in 1972 had reported depths of 30 feet alongside and 31 feet in the approach. Pipelines on the pier handle water and vegetable oil, and unload polluted water from fishing vessels.

A maneuvering basin extends 250 yards N of the municipal wharf, the northerly limits marked by

buoys. In September 1971, the basin had depths of 24 to 30 feet with shoaling to lesser depths in the E end.

Supplies.–Most supplies are available at Ponce. If necessary, additional supplies can be brought in by truck from San Juan in a few hours. Freshwater, bunker C oil, and diesel oil are available at the municipal pier; gasoline is available by truck.

Repairs.–Above-the-waterline repairs and minor electrical and small-engine repairs are available in Ponce. There is no drydock or large marine railway available at the port.

Small-craft facilities.–Berths with electricity, gasoline, diesel fuel, water, ice, and a launching ramp are available. A 65-foot marine railway and a 50-ton lift can handle craft for hull, engine, and electronic repairs.

Chart 25681.–Bahia de Tallaboa, 27 miles E of Cabo Rojo Light, is an open bay somewhat protected by islands and surrounding reefs. The shoreline is heavily industrialized; large vessels call here to deliver and load petroleum and chemical products.

Prominent features.–The beach is intensely developed with tank farms, cracking towers, buildings, and stacks. The most prominent objects in 1972 were two large cracking towers topped by red and white checkered tanks which constantly emit smoke, a large elevated water tank SE of the cracking towers, and a castlelike house on a hill above the extreme W edge of the bay. The two red and white striped stacks of the South Coast Steam Plant on the NE shore of Bahia de Guayanilla and the large sugar mill stack NW of Bahia de Guayanilla are also prominent from offshore.

Channels.–The principal entrance channel, marked by buoys, leads into Bahia de Tallaboa between **Cayo Caribe** on the E and **Cayo Maria Langa** and **Cayo Palomas** on the W. It is recommended that inbound vessels when abeam of Buoy 4, steer directly for Buoy 6 until Buoy 5 is abeam to the W. This avoids the danger of being set onto the 15-foot bank W of the channel by strong prevailing E winds. Shoals and reefs with depths of 10 feet and less extend from the islands nearly to the buoyed channel.

It is reported that depths of 32 feet or more can be taken to the offshore loading platform W of **Cayo Rio** and 37 feet can be taken to the oil pier NE of Cayo Rio. Private aids mark the best approach to each facility.

Ponce Salt Industries maintain a small harbor in the NE part of Bahia de Tallaboa. A channel leading to a riprap salt unloading area is marked by a private **013°** unlighted range and by buoys. Depth in the channel is about 5 feet. The approach across the bay to the harbor is marked by a private **057°** unlighted range with a depth of about 29 feet to the point where the 013° range is intersected. A mooring buoy, in about 13 feet of water, is just outside and to the E of the 5-foot channel leading to the inner harbor.

There are numerous private piers and boathouses for yachts and small craft along the NE shore of Bahia de Tallaboa extending from 66°42.2'W., to 66°43.0' W. This area is mostly foul with unmarked coral heads and reefs. Small craft should not attempt passage without local knowledge.

Anchorages.–Holding ground in Bahia de Tallaboa, charted as sticky, is poor, and dragging should be expected in winds greater than 25 knots. Bahia de Guayanilla, 1.5 miles W, is a good hurricane anchorage.

Pilotage, towage, quarantine, customs, immigration, and **agricultural** quarantine services and **harbor regulations** for Bahia de Tallaboa are the same as for Bahia de Guayanilla which is discussed later in this chapter.

Wharves.–The Commonwealth Oil Refining Company, Inc., maintains a 2,100-foot pier, marked by a light at the seaward end, in the N part of the bay, about 0.3 mile NE of Cayo Rio. In February 1971, a reported controlling depth of 38 feet was available along the outer 1,100 feet of the E side. Crude petroleum and chemicals are received, and petroleum products are shipped.

Union Carbide Caribe Company, Inc., has a 60-foot-long offshore tanker loading platform with dolphins about 700 yards SW of Cayo Rio. A reported depth of 32 feet can be taken to the platform. The platform is used to load bulk chemicals. The corners of the platform are marked by lights.

A 35-foot-long barge wharf with dolphins is at the mouth of a 100-yard-wide outlet canal about 0.6 mile N of the tanker loading platform. Two buoys about 600 yards NW of the platform mark the best approach to the canal. In December 1977, the controlling depth was 20 feet in the approach to the canal, thence in 1970, about 3 feet reported in the canal. The mouth of the canal is subject to silting.

Anchorage should not be attempted shoreward of the loading platform as there is a possibility of rupturing the submerged chemical lines leading to the platform.

Bahia de Guayanilla, 25 miles E of Cabo Rojo Light, is the largest hurricane harbor and one of the best in Puerto Rico. The reefs and islands to the SE break the sea but not the wind; some dragging can be expected. The harbor, between low and wooded **Punta Guayanilla** on the E and bluff-faced **Punta Verraco** on the W, is protected at its entrance by extensive reefs which extend 1 mile or more offshore. The E part of the bay is a continuation of the industrial complex at Bahia de Tallaboa; large vessels call here to deliver and load petroleum and bulk chemical products.

Prominent features.–The features discussed for Bahia de Tallaboa are also prominent approaching Bahia de Guayanilla. The rectangular container lift structure of the Union Carbide Caribe Company off **Punta Gotay,** on the W side of Punta Guayanilla, and the tank farms to the E of Punta Gotay are also prominent. The tanks of Punta Pepillo and a large stack S of **Guayanilla** are conspicuous. A square white tower and a large white bulk storage tank bear 356° directly down the channel from the entrance.

Cerro Toro, on the SW side of Punta Verraco, has a 100-foot hill with a bluff head at its W end and a gentle slope NE to the low part of Punta Verraco. There is a bright yellow spot in the bluffs on the SE side. A low break separates the hills from **Punta Ventana,** 0.4 mile to the SW. The hill and point usually show well.

Channels.–The entrance channel, marked by lighted and unlighted buoys and a **358°** lighted range, leads into Bahia de Guayanilla between the shoals extending 0.4 mile from Cayo Maria Langa on the E and the shoals extending 1.4 miles from Punta Verraco on the W. Reported depths of about 40 feet can be taken from the entrance buoy to the privately dredged channel leading to the PPG Industries pier in the N part of the bay. In 1975-October 1978, a controlling depth of 35 feet was reported in the privately dredged and marked channel. A least depth of 31 feet can be taken to the Commonwealth Oil Refining Company piers E of the PPG channel entrance. Another privately dredged channel leads from the PPG channel entrance to the Texaco Terminal wharf off Punta Pepillo. In October 1982, the channel had a reported controlling depth of 37 feet.

Anchorages.–The usual anchorage is 0.5 to 1 mile NE of Punta Verraco in depths of 35 to 50 feet, although vessels can anchor any place in the bay according to draft. There is good holding bottom of thick mud. Small fishing boats anchor in the N end of the bay. A good hurricane anchorage for small craft drawing less than 10 feet can be had in the center of the cove about 1 mile 035° from Punta Gotay. The approach channel to the cove is about 200 yards N of Cayo Mata, thence E between two jutting points of land; the channel is privately marked and maintained; local knowledge is required.

Dangers.–Cayo Maria Langa, marked by a light on the NW end, is surrounded by reefs on which the sea breaks. The 30-foot curve is 0.3 mile S and about 0.6 mile ESE from the island, descending abruptly to great depths.

Arrecife Fanduco, the SW end of the shoal that extends 0.6 mile S of Punta Guayanilla and 0.4 mile W of Cayo Maria Langa, is partly bare at low water, and the sea always breaks on it. A shoal with a depth of 13 feet extends 0.2 mile SSW from **Punta Gotay,** the W end of Punta Guayanilla.

Arrecife Guayanilla and **Arrecife Unitas,** on the W side of the entrance to Bahia de Guayanilla, form the S and SE sides of the reefs which extend 1.1 miles from Punta Verraco. The reefs are mostly bare at low water, and the sea always breaks on them. The 30-foot curve is about 0.2 mile from the S side, and the slope is abrupt to great depths. It has been reported that several deep-draft vessels have grounded on the 30-foot and shallower banks off the SE end of Arrecife Guayanilla while approaching the harbor entrance.

Inside the bay, the water is shoal with depths of less than 5 feet up to 0.5 mile or more from shore. The least depth inside the limit of the buoys is 30 feet.

Routes.–Vessels approaching in the daytime from E or W can follow the coast at a distance of 2.5 miles until the entrance to Bahia de Guayanilla is recognized, then follow the channel marked by buoys into the harbor. At night vessels should keep well offshore to avoid the reefs off the entrance until the entrance buoys are identified.

Pilotage.–(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Vessels are usually boarded 1 mile outside the entrance buoys for Bahia de Guayanilla and Bahia de Tallaboa. Pilots can be contacted on 2182 and 2738 kHz. At least 2 hours' advance notice of arrival should be given.

Towage.–Tugs up to 2,200 hp are available for Bahia de Guayanilla and Bahia de Tallaboa. The tugs monitor 2182 kHz and VHF-FM channel 16 (156.80 MHz).

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Harbor regulations.–Local regulations are enforced by a Commonwealth Captain of the Port whose office is at Playa de Guayanilla.

Wharves.–The Union Carbide Caribe Company offshore wharf, on the W side of Punta Guayanilla at Punta Gotay, is 100 feet long with dolphins and had a reported depth of about 38 feet alongside in 1972.

The Commonwealth Oil Refining Company oil piers at the end of a causeway, 0.4 mile SW of Punta Pepillo, provide about 2,700 feet of berthing space. Depths alongside are reported to be about 36 feet. The ends of the piers are marked by private lights. There are pipelines on the piers for water and petroleum products. A 250-foot work-barge wharf with dolphins 0.1 mile E of the N pier has a reported depth of about 16 feet alongside.

Texaco's distributing plant wharf off Punta Pepillo is about 820 feet long with dolphins. In October 1982, depths of 37 feet were reported alongside. Private lights mark the wharf.

The PPG Industries (Caribe) Company has a 1,100-foot pier in the N part of the bay. The privately dredged approach channel leading to the pier is marked by private lighted buoys and a private **014°** lighted range. In 1975-1978, a controlling depth of 35 feet was reported in the approach channel, thence in 1972, depths of 39 feet were reported alongside the pier. A 200-foot-long tug pier is about 0.1 mile E of the pier.

A private 150-foot-long marginal barge wharf is at the N end of the large cove, known as **Cano de Los Placeres,** about 0.8 mile NE of Punta Gotay. A privately dredged channel leads from the entrance to the cove to the wharf; the channel has reportedly been dredged to 10 feet.

Supplies.–Bunker C, light diesel oil, other petroleum products, and at times marine diesel oil are available at the Commonwealth Oil Refining Company piers; 3 days advance notice is required to obtain the marine diesel oil. Water is available at the

piers of the Union Caribe Company and the Commonwealth Oil Refining Company. Groceries and marine supplies can be obtained from Ponce, 12 miles by highway from Bahia de Guayanilla.

Repairs.-No repair facilities are available. Above-the-waterline and minor electrical and small engine repairs can be made in Ponce.

Chart 25679.-Bahia de Guanica, 16 miles E of Cabo Rojo Light, is small but one of the best hurricane harbors in Puerto Rico. The bay is protected by the steep, high, and wooded shores on the E and W sides. Large vessels call to load fertilizer, sugar, and molasses at the ports of **Guanica** and **Ensenada.**

Prominent features.-Guanica Light (17°57.2'N., 66°54.3'W.), 132 feet above the water, is shown from a 40-foot white skeleton tower on **Punta Meseta,** on the E side of the entrance to Bahia de Guanica. An abandoned lighthouse tower just SE of the light is prominent in the daytime. Power transmission towers located on either side of the channel and a 39-foot water tower NW of Guanica Light are visible from seaward. Once inside the harbor, the most prominent objects are: two stacks at the sugar mill, a cupola at a large house near the sugar mill, and a fixed crane at the fertilizer wharf 0.5 mile N of Guanica Light.

Channels.-Bahia de Guanica is entered through a buoyed approach channel, about 0.8 mile SE of **Punta Brea** (17°56.0'N., 66°55.2'W.), thence through a privately dredged channel, marked by a **354°30'** lighted range and buoys, which leads to a turning basin on the E side of the bay, and thence to the sugar mill at the W end of the bay. In 1970, the controlling depths in the dredged channel were 26 feet to the turning basin, thence 21 feet in the N half, and 27 feet in the S half of the channel to the W end of the bay.

An overhead power cable with a clearance of 150 feet crosses the channel about 0.4 mile inside the entrance.

Anchorages.-The usual anchorage is 0.6 mile E of the sugar mill pier in depths of 20 to 28 feet, although vessels may anchor any place in the bay according to draft. The bottom is soft and holding ground is good, except in the entrance. Small fishing boats anchor off Playa de Guanica.

Dangers.-Cayos de Cana Gorda, 2 miles E of the entrance to Bahia de Guanica, extend 0.8 mile SW from **Punta Ballena.** They are low, covered with mangrove, and do not show well from seaward. Reefs partly bare at low water surround them to a distance of 0.3 mile.

Arrecife Coral, a mile E of the entrance, is an extensive coral reef partly bare at low water. The W end of the reef is nearly a mile SE from Guanica Light. Foul ground is between it, the N shore, and Cayos de Cana Gorda.

Corona La Laja, 0.9 mile S of Guanica Light, is about 0.2 mile in diameter with 8 to 17 feet over it; the sea seldom breaks on the shoal. A ridge with depths of 22 to 24 feet extends over 0.3 mile W of the shoal almost to the buoyed channel.

On the W side of the entrance, a shoal with 11-foot and 12-foot spots extends 0.2 mile SE of Punta Brea.

A detached shoal, 0.6 mile NE of Punta Brea, has depths of 20 to 29 feet near the W side of the entrance channel. Other spots with depths of 25 to 28 feet are near the limits of the channel leading into the bay. A 29-foot depth is between entrance Buoys 2 and 3, and 24-foot depths are about 0.85 mile SE of the buoys.

Ensenada las Pardas, an open bay N of Punta Brea, is fringed with reefs, mostly bare at low water on which the sea breaks; the reefs make out as much as 0.4 mile from the shore.

Routes.-From a position 2.5 miles S of Guanica Light, pass Entrance Lighted Buoy 2, thence steer to pass midway between Buoy 3 and Lighted Buoy 4, thence pass Buoy 5 and steady on the **354°30'** lighted entrance range into the harbor. Care should be taken to avoid 20-foot shoals W of Buoy 3 and E of Lighted Buoy 4.

Pilotage.-(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Pilots from Bahia de Guayanilla serve Bahia de Guanica. Vessels are usually boarded 0.5 mile S of the entrance buoy. Pilots may be contacted on 2182 and 2738 kHz. Several hours' notice must be given to allow the pilot to come from Guayanilla.

Towage.-Tugs from Bahia de Guayanilla are available if necessary.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Guanica is a **customs port of entry.**

Harbor regulations.-Local regulations are enforced by a Commonwealth Captain of the Port whose office is near Playa de Guanica.

Wharves.-A 440-foot fertilizer bulkhead wharf with a conveyor, 0.5 mile N of Guanica Light, has 28 feet reported alongside. A chemical pier with dolphins, 0.7 mile N of Guanica Light, has 25 feet reported alongside; a conveyor system and pipelines are available.

The sugar mill on **Punta Pera** at the W end of the bay has two small wharves on the S side of the point which are used by small vessels for loading and have 28 feet alongside; pipelines for water, fuel oil, and molasses, and a conveyor system for bulk sugar are at the wharves. The Dominican Dock, extending off the E end of the point and marked by private lights on the outboard corners, has 25 feet alongside and is equipped for handling sugarcane.

Supplies.-Water is available at the sugar mill pier. Some marine supplies can be obtained at **Ensenada** and **Guanica.** Fuels are available by truck from Guayanilla.

Repairs.-Some emergency repairs can be made by the machine shop of the sugar central at Ensenada.

Chart 25671.-The 13.5-mile stretch of coast between Punta Jorobado and Cabo Rojo includes numerous cays, islets, and reefs, some of which extend as much as 4 miles offshore. The area is important as a commercial fishing ground; many small fishing boats base in the coves and fishing villages.

A range of high hills shows up inland for virtually the whole distance. The highest points are **Cerro Vertero,** 4.4 miles NW of Punta Jorobado, and **Cerro Mariquita,** 6 miles NE of Cabo Rojo.

Punta Jorobado, 2 miles W of Punta Brea, is a small projecting point with a hummock 92 feet high. **Arrecife Baul** is a reef lying 0.7 mile SE of the point. **Turrumote II,** a mile W of Punta Jorobado, is a sandy islet 300 yards wide surrounded by reefs. **Bahia Montalva,** the bay about 2.8 miles NW of Punta Jorobado, offers some protection behind **Arrecife Romero** and **Arrecife Enmedio** for craft drawing up to 12 feet, but care is required in entering. **Turrumote I,** an islet 3.6 miles W of Punta Jorobado, is small and sandy, with shoals of 9 to 21 feet deep extending SE and SW.

At **La Parguera,** 8.5 miles E of Cabo Rojo Light, there is a somewhat protected harbor for small boats. Depths of 6 to 10 feet can be taken to the landing. Berths, electricity, gasoline, and some groceries are available. A small marine railway can handle craft up to 60 feet for hull repairs only.

Arrecife Margarita, 9 miles W of Punta Jorobado, is 1.5 miles S of **Punta Tocon,** and its W end is about 2 miles SE of Cabo Rojo. Rocks awash and depths up to 28 feet are on this reef, which extends nearly 4.5 miles in an E-W direction.

Cabo Rojo, the SW point of Puerto Rico, is a low neck 1.5 miles long at the S end of which are two hills with yellow bluff faces; the E hill is 118 feet high, and the W hill is 75 feet high. **Cabo Rojo Light** (17°56.1'N., 67°11.5'W.), 121 feet above the water, is shown from a 46-foot gray hexagonal tower attached to a flat-roofed dwelling on the SE point of the cape.

The **W coast** of Puerto Rico extends 26 miles N from Cabo Rojo to Punta Higuero and then 11 miles NE to Punta Borinquen. The coast is irregular with projecting wooded points between shallow bays. Places for small boat landings can be found in ordinary weather, but landing is dangerous in rough weather. In the S part the land is low near the shore with prominent high hills in the interior. Between Cabo Rojo and Bahia de Mayaguez reefs with depths of 30 feet or less extend up to 13 miles offshore; lighted buoys mark the extension of the shoal area. N of Bahia de Mayaguez the dangers are within 1 to 2 miles of the shore. Small vessels with local knowledge use an 18-foot buoyed passage 1 to 2 miles offshore between Cabo Rojo and Bahia de Mayaguez.

Punta Aguila, 1.7 miles NW of Cabo Rojo Light, consists of 2 small bluff heads with lower land behind them. A shoal with depths of 12 to 16 feet extends 1 mile W from the point. Water and gasoline are available at a fishing village a mile N of the point.

Bajo Casabe is a shoal that makes off between Punta Aguila and Punta Melones. The 18-foot curve is about 0.4 mile from shore at Punta Melones. Depths of 24 to 42 feet are near the W edge, which is fairly steep-to. A shoal with 22 to 28 feet extends W from the S part of Bajo Casabe, its W end lying about 2.7 miles WNW from Punta Aguila.

Chart 25675.-Bahia de Boqueron, 6 miles N of Cabo Rojo, is a good harbor for vessels passing through Canal Guanajibo. It is easily entered but is rarely used, except by small local boats. The better hurricane anchorage is at Guanica. The bay is 2.6 miles wide at the entrance between Punta Melones and Punta Guaniquilla, and extends 2 miles to its head where it is a mile wide. There are two entrances, N and S of **Bajo Enmedio,** the latter a rocky area with depths of 4 to 17 feet which lies across the middle of the bay. A lighted buoy marks its S edge.

Punta Melones, the S point, is a bluff at the water's edge, backed by a 230-foot hill. Punta Guaniquilla, the N point, is sharply projecting and prominent.

For 0.6 mile inside Bajo Enmedio the depths are 27 to 35 feet. A ridge with depths of 19 to 23 feet extends in a N and S direction near the middle of the bay between Bajos Roman and Ramito. The depths E of the ridge decrease gradually from 26 to 12 feet.

Canal Norte is the channel leading into the bay between Punta Guaniquilla and the N end of Bajo Enmedio. It has a least width of about 350 yards, with depths of 21 to 28 feet. Owing to its nearness to the shore, this channel is easily followed and is the better one for strangers. **Canal Sur,** the S channel, leads between Bajos Enmedio and Palo. It is 350 yards wide between the 30-foot curves, with depths of 36 to 40 feet in the middle.

Anchorage can be had with soft bottom anywhere in Bahia de Boqueron, except on the shoals where the bottom is hard.

Bajo Palo is a shoal that extends nearly 0.7 mile N from the S shore of the bay, between 0.4 and 0.8 mile NE of Punta Melones. A depth of 5 feet is 0.3 mile from shore, and N of this the water deepens gradually from 8 to 13 feet at its N end. The W side of the shoal is steep-to.

Bajo Ramito is a small shoal with a depth of 8 feet and 20 to 24 feet close-to, 0.5 mile from the S side of the bay, and 1.7 miles NE from Punta Melones. **Roca Velasquez,** a rock which should be avoided by all vessels, lies nearly 0.2 mile W from the village of Boqueron. **Bajo Roman** is a small patch on which the least depth is 18 feet, with a surrounding depth of 27 feet. It lies about 0.4 mile from the N shore and 1 mile SE from Punta Guaniquilla.

Boqueron, a small fishing settlement on the N side at the head of the bay, is principally a bathing resort for Mayaguez. A private boating club has depths of 3 to 5 feet alongside. Berths, electricity, gasoline, diesel fuel, water, ice, a launching ramp, and some marine supplies are available.

Chart 25671.-Canal de Guanajibo, a buoyed passage inside the reefs between Punta Aguilla and Bahia de Mayaguez, has a least depth of 18 feet at its N end on the ridge extending NE from Escollo Negro. The least depth at the S end of the channel is 23 to 24 feet on a bank making W from Bajo Casabe. The current velocity is about 1 knot and sets N and S in the channel.

Bajos Resuello, the shoals off the entrance to Bahia de Boqueron, consist of three shoals separated by channels having depths of 24 to 36 feet; the S extremity of the shoals is W from Punta Melones and is marked by a buoy.

Bajo Corona Larga consists of two shoals with depths of 25 to 54 feet between them. The NW shoal, 1.3 miles long, is 4.5 miles W from Punta Guaniquilla; it has a least depth of 12 feet at its N end. The SE shoal is 1 mile long and has depths on the coral heads of 16 to 18 feet.

Punta Carenero, the N point at the entrance to Puerto Real, is low with many coconut trees, and at the water is a fringe of mangrove. **Punta La Mela,** the S point of Puerto Real, is low and covered with coconut trees that extend S to **Punta Boca Prieta.** A good anchorage in 36 feet is 0.5 mile W of Punta La Mela.

Cerro Buena Vista, an 850-foot hill 3.4 miles E of Puerto Real, is a prominent and useful landmark for many miles, especially from W. From that direction it shows a knob at the summit, with a steep convex slope on its N side.

Puerto Real, 8 miles N of Cabo Rojo, is a circular basin 0.7 mile in diameter used by local fishing vessels and small pleasure craft. Depths in the basin are 6 to 15 feet with shoal water toward the E end. **Puerto Real,** a small fishing community, is on the N shore of the basin. Water, gasoline, and some groceries are available. A small marine railway can haul out craft for minor repairs.

Escollo Media Luna, a rocky patch with a least depth of 25 feet, is 12 miles NW of Cabo Rojo and 6.5 miles offshore. **Las Coronas** consists of a shoal of numerous heads with depths of 9 to 14 feet, the S end of which is 3.2 miles NW of Punta Guaniquilla. The shoal extends 1 mile N and 2.5 miles ENE toward Punta Ostiones and, together with the shoals extending off that point, forms a ridge across Canal de Guanajibo. The depths are 9 to 15 feet on the shoalest section of this ridge 3 miles WSW from Punta Ostiones, and depths of 13 to 17 feet are along the center portion of the ridge.

Escollo Negro is the N shoal on the W side of Canal de Guanajibo. It is about 2.2 miles long in a NE direction and about 1.3 miles wide. Depths are 7 to 12 feet. A buoy marks an 18-foot passage across the ridge into Canal de Guanajibo.

Arrecife Tourmaline extends 5 miles W from Escollo Negro, with a width of 2.7 miles, its NW end lying 9.2 miles W from Punta Guanajibo. On the W and S parts of the reef are depths of 30 to 42 feet, decreasing to 18 and 24 feet on its NE part. A 30-foot spot off the NW end of the reef is marked by a lighted buoy.

Punta Ostiones, 9.5 miles N of Cabo Rojo and 1.3 miles N of the entrance to Puerto Real, is projecting and prominent, especially as seen from S. **Cayo Fanduca,** 0.8 mile SW from Punta Ostiones and about 0.5 mile from shore, consists of a few bare rocks. A narrow channel between it and the shore has a depth of about 3 feet, but it should not be attempted by strangers.

Chart 25673.-Bahia de Mayaguez, about halfway along the 34-mile stretch of the W coast between Cabo Rojo and Punta Borinquen, is one of the three leading ports of Puerto Rico. The open roadstead is easy to enter day or night and is a good harbor in all but hurricane weather. The shipping terminal is in the N part of the 3.8-mile-wide bay which is protected somewhat by the shoals that extend across the entrance. Depths of 30 to 60 feet are in the N part of the bay, but the S part is shoal.

Mayaguez, the largest city on the W coast of Puerto Rico, is a mile S of the terminal and 101 miles by highway from San Juan. The principal imports include foodstuffs, building materials, machinery, fertilizers, textiles, and some petroleum products. Exports include clothing, fruit, vegetables, and tuna fish.

Prominent features.-Punta Guanajibo, 14 miles N of Cabo Rojo Light, is a 165-foot flat-topped ridge on the S side of Bahia de Mayaguez. A reform school on the point shows well from S.

Cerro Anterior, a 433-foot saddle-shaped hill 1.5 miles inshore at Mayaguez, is conspicuous, and **Pico Montuoso,** a dome-shaped peak 9 miles eastward of the bay is readily identified from W.

The city hall clock tower and a church are conspicuous above the other buildings at Mayaguez. Several red and white radio towers (seven in 1972) are visible along the S shore of the bay. A tall blue water tank is prominent behind the radio towers.

Storage tanks and two closely positioned stacks are visible back of a prominent marine crane at the shipping terminal pier.

A group of storage tanks and a tall boom on a conveyor pier are prominent about 750 yards SE of **Punta Algarrobo.**

Channels.-The principal entrance channel is between the lighted buoys marking Manchas Grandes and Manchas Interiores. Federal project depths in the Approach and Terminal Channels are 30 feet. (See Notice to Mariners and latest editions of charts for controlling depths.) The approach to the terminal is marked by a lighted **092°** range, and the approach to the anchorage is marked by a daybeacon 0.2 mile S of Punta Algarrobito.

A secondary channel with depths of 18 feet or more leads into the bay from N inside of Manchas Exteriores and Manchas Interiores and W of Arrecife Algarrobo.

Anchorages.-The usual anchorage is SW of the shipping terminal in depths of 30 to 50 feet; the holding ground is good. The nearest hurricane anchorage is on the S coast of Bahia de Guanica, a distance of 60 miles.

Small fishing boats anchor in depths of 3 to 12 feet along the shore S of the shipping terminal. Pleasure craft anchor in depths of 7 to 12 feet along the shore 1.2 miles S of the terminal. Some small boats use Puerto Real, 10 miles S of Bahia de Mayaguez, as a hurricane anchorage.

Dangers.–**Escollo Rodriguez,** a bank with depths of 3 to 18 feet extending N for 2.5 miles from Punta Guanajibo, has a reef at the W end which is awash and always breaks. **Roca Blanca,** 0.7 mile NE of the reef, has 9 feet over it with deep water close-to.

Manchas Grandes, on the S side of the principal entrance, has depths of 10 to 20 feet and extends S to Escollo Rodriguez.

Manchas Interiores and **Manchas Exteriores** with depths of 12 to 18 feet extend in a NW direction for 2 miles on the N side of the principal entrance. The W side of the shoals are steep-to, but broken ground on the E side extends to within a mile of the shore; some spots have depths of 18 feet.

Arrecife Algarrobo, a mile NW of the terminal, has a few heads which bare at low water; the sea frequently breaks on the reef.

Bajo Mondongo, 500 yards SW of the terminal, is a small shoal partly awash. A sunken wharf is off **Punta Algarrobito,** 0.4 mile S of the terminal.

When winds are out of the W or SW, a surge is felt in the harbor causing vessels to pound against the terminal wharf. Smaller vessels are forced to anchor off under such conditions.

Tides and currents.–Since the range of tide is about 1 foot, the variation in the water level depends considerably upon the wind.

The current velocity is about 1 knot and sets N and S across the entrance to Bahia de Mayaguez.

Weather.–The tropical climate of Bahia de Mayaguez features average rainfall of more than 78 inches annually, a small diurnal and annual temperature range, and a sea breeze that opposes the trade winds. About 8 to 11 inches of rain falls on 11 to 14 days each month from May through October. Thunder is heard on 12 to 15 days each month during this period. Maximum temperatures range from the mid-80's (°F) in winter to around 90°F in summer and climb to 90°F or above on 10 to 19 days each month from April through October. Winds mainly blow out of the ENE, and sea breezes are not common. Visibilities are good, except in showers.

Routes.–From S: When abeam of Arrecife Tourmaline Lighted Buoy 8, steer **060°** for about 7.5 miles, then head in on the lighted entrance range bearing **092°.** Note that this range leads to the N edge of the Approach Channel. If proceeding to the shipping terminal leave the range when abeam of Lighted Buoy 5 and steer **096°** to line up with the Terminal Channel. If proceeding to anchorage leave the range just after passing between the buoys marking Manchas Interiores and Manchas Grandes and head for the daybeacon 0.2 mile S of Punta Algarrobito, then anchor according to draft.

From N: When Punta Higuero Light bears 120°, distant 2.3 miles, steer **153°** for about 10.7 miles and enter on the lighted range.

Pilotage.–(See Pilotage for harbors of Puerto Rico at the beginning of this chapter.) Vessels are boarded 1 mile W of the entrance buoys.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Mayaguez is a **customs port of entry.** The deputy collector of customs and his inspectors act as immigration officers.

Agricultural quarantine officials are stationed in Mayaguez. (See appendix for address.)

Harbor regulations.–A Commonwealth Captain of the Port with an office on the Ports Authority shipping terminal wharf enforces the local rules and regulations for Bahia de Mayaguez.

Wharves.–The Ports Authority Terminal, in the N part of the bay, is under the control of the Puerto Rico Ports Authority.

The 1,280-foot bulkhead wharf, (18°13'12"N., 67°09'39"W.), has a reported depth of about 28 feet alongside. Covered transit sheds, pipelines for water, fuel oil, molasses, and conveyors are available. General cargo is received.

About 750 feet NW of the terminal wharf, a bulkhead wharf extends about 1,300 feet with wharves operated by three fish packing companies:

The Star-Kist Cannery Packing Company wharf, the easternmost one, is about 500 feet long with 28 feet alongside; covered storage, pipelines for water, and diesel fuel are available.

The Del Monte Cannery Packing Corporation wharf, immediately NW of the Star-Kist wharf, is 595 feet long with about 30 feet alongside; freshwater is available.

The Ibec Cannery Packing Company wharf, immediately NW of the Del Monte wharf, is 200 feet long with about 30 feet alongside; freshwater is available.

The Pecuarias de Puerto Rico conveyor pier (18°13'27" N., 67°10'10"W.) is a 31-foot pier with dolphins with depths of 30 feet reported alongside. A conveyor system is used to receive bulk grains.

Foreign-Trade Zone No. 7 and Subzone 7A are in Mayaguez. (See chapter 1, Foreign-Trade Zones, and appendix for address.)

Supplies.–Most supplies are available at Mayaguez. If necessary, supplies can be brought in from San Juan by truck in a few hours. Water and diesel oil are available at the terminal; gasoline can be trucked in.

Repairs.–Machine shops in Mayaguez can make above-the-waterline repairs to vessels.

Chart 25671.–Bahia de Anasco, 4.5 miles NW of Bahia de Mayaguez, is somewhat foul in the N part for about a mile from shore. There are shoals with 16 to 17 feet over them inside the 10-fathom curve. A tall stack, 1.8 miles inland, is prominent, and the entrances to the several rivers that empty into the bay show as breaks in the coconut groves.

Punta Cadena, together with the **Cerros de San Francisco** extending E, is quite prominent. The dome-shaped hills slope upward to **Pico Atalaya,** 3 miles inland. From the point to Punta Higuero many rocks and coral reefs extend up to 0.6 mile offshore, then the bottom increases rapidly to great depths, making soundings of little use to indicate danger or distance from shore.

Canal de la Mona and the W coast of Puerto Rico N of Punta Higuero has been described previously in this chapter.

Chart 26194.-Navassa Island (18°24'N., 75°01'W.), a United States possession claimed in 1857, formally annexed by presidential proclamation in January 1916, and under the jurisdiction of the U.S. Coast Guard, is about 527 miles SE of Key West and about 30 miles W of Hispaniola. The island is about 1.9 miles long and 1.1 miles wide. The shoreline consists of steep, jagged, undercut rock formations that rise as much as 50 feet from the sea. The interior comprises about 1.8 square miles of terrain sloping steeply upward to a lofty, undulating tableland with scattered trees and cactus. The island is uninhabited except for a few wild goats. There is no water on the island, and the terrain is extremely rugged. The island, reported visible on radar at 22 miles, is marked by a light 395 feet above the water and shown from a gray cylindrical tower.

Lulu Bay, a small indentation on the SW side, fronts the ruins of a former phosphate mining operation. Small craft can anchor here, but caution should be exercised due to the close proximity of the undercut rock and the frequent surge which has been observed to be as much as 7 to 10 feet. Vessels can anchor about 0.4 mile WSW of Lulu Bay with the light bearing about 080°; sand and coral bottom.

Requests to visit Navassa Island should be made to the Commander, Seventh Coast Guard District, Miami, Fla. (See appendix for address.)

Navassa Island is also described in Pub. No. 144, Sailing Directions (Enroute), Caribbean Sea, published by the Defense Mapping Agency Hydrographic/Topographic Center.

14. VIRGIN ISLANDS

This chapter describes the United States Virgin Islands, which include the islands of St. Thomas, St. John, and St. Croix, and about 40 small islets or cays. Information is given on the ports and harbors of the islands including Charlotte Amalie, Christiansted, Krause Lagoon, Cruz Bay, and Frederiksted. A general description of the British Virgin Islands is also included; more complete information is given in Pub. No. 144, Sailing Directions (Enroute), Caribbean Sea, published by the United States Defense Mapping Agency Hydrographic/Topographic Center, and West Indies Pilot, Volume II, published by the United Kingdom Ministry of Defense Hydrographic Department.

The **United States Virgin Islands**, separated from the easternmost island of the Puerto Rico group by 8-mile-wide Virgin Passage, were purchased from Denmark in 1917, and United States citizenship conferred upon the islanders in 1927. Under the revised Organic Act of 1954, legislative powers are vested in a Senate, whose members are elected by the islanders for 2-year terms. The Governor, who has certain veto powers, is elected by the people of the U.S. Virgin Islands. The capital is Charlotte Amalie, on the island of St. Thomas.

The **British Virgin Islands** are N and E of the United States group. The United States-Great Britain boundary extends SE between Hans Lollik and Little Tobago Islands, thence through the narrows between St. John and Tortola Islands, and thence S through Flanagan Passage between Flanagan and Norman Islands.

Prominent features.-Making the Virgin Islands from the N, Virgin Gorda (British) will be seen on the extreme left, rising in a clear, well-defined peak about 1,400 feet high. Next to Virgin Gorda, Tortola (also British) will appear most conspicuous; the highest mountain appears flattened and elongated from N but rises to an elevation of about 1,800 feet. Immediately W of Tortola will be seen the rugged, pointed peaks of Jost Van Dyke (British), rising to about 1,100 feet, and behind them the irregular small peaks rising from the tableland of St. John (U.S.) to heights of 800 to 1,300 feet.

From about 20 miles N of the islands, a separation will be observed between St. Thomas and St. John, but St. John, Jost Van Dyke, Tortola, and Virgin Gorda will appear to be one large island. St. Thomas is less rugged in outline than the other islands, but it may be recognized from its large midisland saddle which has horns nearly 1,600 feet high; the saddle is equally conspicuous from the S.

COLREGS Demarcation Lines.-The lines established for the Virgin Islands are described in 80.738, chapter 2.

Vessel Traffic Management.-(See Part 161, Subpart A, chapter 2, for regulations requiring notifications of arrivals, departures, hazardous conditions, and certain dangerous cargoes to the Captain of the Port.)

Routes.-From Charlotte Amalie to the Straits of Florida, proceed through Virgin Passage and thence as direct as safe navigation permits along the N coasts of Puerto Rico and Hispaniola, and then along the N coast of Cuba through Old Bahama and Nicholas Channels to destination. The distance is 1,086 miles.

Bound to Baltimore, New York, or Boston, pass W of Sail Rock and, when clear of Virgin Passage, take a great circle course direct to destination. Distances from Charlotte Amalie are 1,418 miles to Baltimore, 1,435 miles to New York, and 1,517 miles to Boston.

Tides.-The range of tides around the Virgin Islands is only about 1 foot. Along the coasts bordering the Atlantic Ocean the tide is chiefly semidiurnal, and along the Caribbean shores it is mostly diurnal.

Currents.-The currents among the Virgin Islands, although of considerable importance to navigators, are not well established by observation. The tidal current is said to set SE and NW. In the general vicinity of the islands there is an oceanic current with a velocity of about 0.2 knot that sets in a direction varying from NW to W.

Weather.-The following description of weather conditions in the Virgin Islands was prepared by the Office of Climatology, Environmental Data and Information Service. (See page T-14 for **St. Croix climatological table.**)

Wind.-One of the outstanding features of the climate in the Virgin Islands is the steadiness of the trade winds. They blow almost without exception from an E direction, or between NNE and SSE. The highest mean maximum wind speeds usually occur in July. Superimposed on the trade winds are the land and sea breezes, which are important in most coastal areas. Night winds are lighter than the daytime winds. About daybreak the wind speed begins to pick up, reaching a maximum late in the morning or early afternoon. A return to the lighter nighttime winds begins during the late afternoon, usually about 1600. It must be remembered that these islands are located in the path of occasional tropical storms or hurricanes and extremely high winds may be experienced during such passages.

Precipitation.-The time of maximum rainfall expectancy is roughly from May through November or December, with showers providing most of the rain. The heavier rains have usually been associated with tropical cyclones and hurricanes that are most likely to reach the area during the months of August, September, and October; or with frontal systems or E waves which may reach the area in

these or other months. (See chapter 3 for information about hurricanes.)

Storm warning display locations are listed on NOS charts and shown on Marine Weather Services Charts published by the National Weather Service.

Pilotage.-Vessels of and above 100 gross registered tons and those vessels carrying explosives and dangerous cargo must engage for the services of an Insular Government pilot in order to enter, leave, or shift berths in a U.S. Virgin Islands port. Vessels of less tonnage, and vessels of the United States or foreign governments and pleasure craft are exempt from pilotage unless a pilot is actually employed. Exempted vessels when requiring the services of a pilot will be charged the regular rate. Pilots will take vessels in or out, day or night, unless otherwise noted. Arrangements for pilots are generally made in advance by ships' agents.

Quarantine.-National quarantine laws are enforced in the U.S. Virgin Islands by officers of the U.S. Public Health Service. All vessels from foreign ports, vessels with sickness on board, and vessels from domestic ports where certain quarantinable diseases prevail are subject to inspection. (See Public Health Service, chapter 1.)

Customs.-The customs collection district of the U.S. Virgin Islands is under the jurisdiction of the U.S. Treasury Department but has its own customs laws. Imports manufactured in the United States enter free of duty. All foreign goods coming into the islands are subject to an import duty of 6 percent, ad valorem, unless specified as free of duty, even if imported from continental United States.

Agricultural quarantine laws are enforced by officials at Charlotte Amalie and Christiansted.

Immigration.-The United States immigration laws apply in the U.S. Virgin Islands. Passports and visas are required by persons other than U.S. citizens.

Wharves.-Deep-draft facilities are at Charlotte Amalie, St. Thomas Island, and on St. Croix Island at Frederiksted, and at the private facilities at Krause Lagoon and in Limetree Bay. Vessels drawing up to 16 feet can go alongside Gallows Bay Dock at Christiansted, St. Croix Island. At other places only small craft go alongside the wharves.

Supplies.-Bunker fuels, diesel oil, and gasoline are available only at Krause Lagoon on an emergency basis. Diesel fuel, water, and marine supplies are available at Charlotte Amalie. Limited marine supplies can be obtained at Christiansted and Frederiksted. Gasoline, diesel fuel, and marine supplies for small craft are available at the marinas around the islands.

Repairs.-There are no facilities at any of the ports for major repairs to deep-draft vessels. Machine shops at Charlotte Amalie, Christiansted, and Frederiksted can make minor above-the-waterline repairs.

Communications.-The islands of St. Thomas, St. John, and St. Croix have good highways. Regular air service is maintained between St. Thomas Island, St. Croix Island, San Juan, United States, and some foreign ports. Steamship lines call at Charlotte Amalie and Frederiksted. Small interisland vessels operate from United States Virgin Island ports to the British Virgin Islands, Puerto Rico, and other West Indies ports.

Telephone, radio, and cable service facilities are available on the islands of St. Thomas, St. John, and St. Croix.

Currency. The monetary unit is the U.S. dollar.

Standard time.-The U.S. Virgin Islands use Atlantic standard time, which is 4 hours slow of Greenwich mean time. The U.S. Virgin Islands do not observe daylight saving time.

Chart 25640.-Most of the Virgin Islands are situated on the S side of **Virgin Bank** which extends in an E and ENE direction for 86 miles from the E end of Puerto Rico. For about 50 miles the bank trends E, averaging 25 miles in width, and then swings slightly ENE, increasing in width to 32 miles. It terminates close beyond the SE extremity of Anegada Island in a point several miles wide.

The bank is an ocean shelf, with abrupt drops in depths near its edges. On the N side of the island group, W of 64°40′W. and within half a mile of the islands, the general depths range from 18 to 40 fathoms except for the outlying banks. E of this line, the depths gradually decrease until soundings of 6 fathoms are found about 0.8 mile off the W end of Anegada Island. On the S side of the island group, the depths differ considerably from those on the N side. The S side is bold and wall sided, and lies from 1 to 7 miles off the islands; general depths of 8 to 33 fathoms are found in this area. Close within the outer edge of the bank is a narrow ledge of coral that extends almost unbroken from Horse Shoe Reef, at Anegada Island, to Isla de Vieques. This ledge, about 200 yards wide, has depths of 11 to 19 fathoms.

Whale Banks, about 13 miles N of Tortola Island and 15 miles W of Anegada Island, are two patches with depths of 12 to 20 fathoms on the N bank and a least depth of 10 fathoms on the S bank. **Turtle Head,** a coral reef covered 6 fathoms, is about 10 miles N of Jost Van Dyke Island and 13 miles NW of Tortola Island. **Barracouta Banks** about 8 miles NW of Jost Van Dyke, consist of several patches covered by 11 to 20 fathoms. **Kingfish Banks,** about 5 miles NNE of Jost Van Dyke Island, are two coral patches with 8 fathoms over them.

Chart 25650.-Virgin Passage is 8 miles wide between Savana Island and Isla Culebrita, with depths of from 11 to 17 fathoms in the S part and up to 27 fathoms in the N part. It is clear except for Bajos Grampus on the SW side and Sail Rock on the SE side.

Tidal currents.-In the middle of the passage the current velocity is about 0.5 knot and sets S and N. On the E side of the passage near Savana Island the velocity increases to about 2 knots.

Charts 25641, 25650.-Sail Rock, on the E side of Virgin Passage about 7.6 miles ESE of Isla Culebri-

ta, is so called from its resemblance to a vessel under sail. It rises precipitously from the sea to a height of 125 feet. It is about 100 yards in diameter, quite barren, and light gray in color. It is steep-to on all sides, but a rock awash is about 200 yards W of the islet. A lighted buoy is about 0.5 mile W of the islet.

St. Thomas Island, commercially the most important of the U.S. Virgin Islands, is 34 miles E of Puerto Rico. It is 12 miles long and from 1 to 3 miles wide. A lofty ridge extends along its whole length. **Signal Hill,** nearly in the center of the island, is 1,504 feet high, and **Crown Mountain,** 1.7 miles to the W, is 1,550 feet high. Lights are shown from towers on the summit of each.

The W half of St. Thomas presents the appearance of a steep ridge sloping precipitously to the N and the S, with numerous ravines widening at their lower ends into small tracts of level land on the seacoast. Between these level tracts the coast is usually bold with rocky promontories of considerable height. The higher hills are flat-topped and plateaulike, whereas the lower ones are for the most part dome shaped. The country is almost entirely wooded; the region W of Perseverance Bay presents a forestlike appearance of a thick growth of trees, shrubs, and vines.

The E end of St. Thomas has the appearance of two main ridges, separated by a large basin and sloping to the N and S with numerous smaller ridges and spurs making off from them. St. Thomas is almost surrounded by small islands and cays, in general, bold and steep-to, with very few hidden dangers to guard against.

Savana Island, 2 miles WSW from the W end of St. Thomas, is nearly a mile long and 0.5 mile wide. **Savana Island Light** (18°20′22″N., 65°05′00″W.), 300 feet above the water, is shown from a white tower at the SW end of the island. The island is covered with a dense growth of vines, small trees, and underbrush. The entire NW shore is bold and precipitous with rock cliffs rising abruptly from the water's edge to as much as 120 feet. **Din Point** is a bold dark headland, with cliffs 80 to 100 feet high, at the NW extremity of the island. The SE shore of the island is generally rocky with short stretches of gravel beach in the bights. Depths of 34 feet and less extend up to 0.5 mile from the E side of the island. Just N of **Virgin Point,** the SW extremity of the island, the cliffs are of crushed rock and sandstone formation and from offshore appear as red cliffs. Detached rocks extend 200 yards S of Virgin Point. **Domkirk Rock,** a crag with twin steeple-shaped pinnacles which resemble a cathedral, is 100 yards SE of Virgin Point. Some rocks 8 to 10 feet high and steep-to are on a sunken ledge which extends about 700 yards off the NE point.

The currents in the vicinity of the NE point of Savana Island are very strong, and small boats should give the reef a wide berth. Boat landings may be made in smooth weather.

Kalkun Cay, in the middle of **Savana Passage,** is a narrow islet, 275 yards long and about 20 to 30 yards wide, which is covered with grass and small underbrush. About 0.5 mile SE of the cay is **Saltwater Money Rock,** 8 feet high, steep-to, with a clear channel between.

Little St. Thomas is a low grass-covered peninsula connected with the W end of the island of St. Thomas by a sandspit. A 50-foot hill is near the NE point and a 21-foot bluff is at the S end. **Mermaids Chair,** 15 feet high, is a conspicuous rock that has the shape of a chair at the apex of a triangular coral reef projecting from the SW point of Little St. Thomas. Small boats stay in the small gravel cove S of the peninsula when the sea is too rough to land at Sandy Bay or Botany Bay. A boat passage is between Little St. Thomas and a 42-foot islet 100 yards to the N.

Big Current Hole is a passage separating West Cay from Little St. Thomas. There are rocks awash extending E from West Cay; the outer one, **Drum Rock,** 2 feet high, constricts the channel, the strong currents and heavy tide rips render the passage difficult. Small boats using this passage, when passing through from S, head for Drum Rock and leave it close-to on the port hand.

West Cay, 0.2 mile NW of Little St. Thomas, consists of 2 hills, 121 and 114 feet high, connected by a neck of low land. The small stretch on the E side of the cay is gravel. Landing may be made in the bight on the S side.

Salt Cay, 242 feet high and 0.6 mile NW of Little St. Thomas, is generally rocky and rugged, particularly on the N coast where cliffs rise precipitously to 100 and 150 feet high. Many rocks awash are close-to on the SW, W, and E sides of the cay. The channel between Salt Cay and West Cay is shallow, and breakers extend across it.

Salt Cay Passage is about a mile wide, with deep water in the channel, and is free of dangers.

Dutchcap Cay, a mile NW of Salt Cay, rises abruptly from the sea to 278 feet high, with cliffs 100 feet high on the N shore.

Cockroach Island, 3.3 miles NNW from the west end of St. Thomas Island, is 151 feet high and of irregular shape. The south shore is bold and precipitous with white rocky cliffs rising abruptly from the water's edge to a height of 120 feet. The N shore is rocky with cliffs back from the shore rising to a height of 80 feet, and indented by numerous small bights and crevices. **Cricket Rock,** 0.5 mile ENE from Cockroach Island, is 46 feet high, bold, and steep-to, with sharp pinnacle rocks on top.

Dutchcap Passage, just S of these islands, is free of dangers.

Currents.–In navigating the passages between this group of islands, it is necessary to guard against the tidal currents, which in Savana Passage run with a velocity of 3 knots and in the others about 1 knot. Sailing vessels beating up against the northgoing current should stand well to S of Savana Island, so as to avoid the strength of the inshore current.

The **N coast** of St. Thomas Island is very irregular with rocky cliffs and sandy beaches in the shallow bays. Much of the beach is fringed with coral reef making landing difficult in most places. The bays in the E half of the island are open to the prevailing E

trade winds. Islands, rocks, and shoals are as much as 3 miles from the shore.

Sandy Bay and **Botany Bay** are shallow bights separated by a rocky point at the W end of St. Thomas Island. Small-boat landings can be made during calm weather.

Santa Maria Bay, 2.5 miles E of Botany Bay, has depths of 20 feet or more and is a fair shelter, but it is seldom used because of rollers.

Inner Brass Island and **Outer Brass Island** are off the N side of St. Thomas about 4 miles from the W end. A 22-foot channel is between St. Thomas and Inner Brass Island; **Brass Channel,** between the two small islands, has a depth of 48 feet.

Inner Brass Island has a generally rocky shore, with reefs extending as much as 300 yards off the E side. There are detached rocks and rocks awash within that area. NW of the S tip is a fine sand beach with a fringing coral reef. The reef has several breaks through which small-boat landings can be made. A well-sheltered anchorage for local boats is off the SW side of the island.

The E shore of Outer Brass Island is bold and precipitous with rocky cliffs rising vertically from the water. The W shore is rocky and slopes up uniformly. **Cave Cove,** in about the middle of the W shore, has a large cave opening into it. **Rough Point,** the N extremity of the island, is sharp and jagged, and, on calm days, landings can be made on its W side. A 15-foot spot is about 330 yards W of Rough Point.

Landings may be made on St. Thomas Island through breaks in the fringing coral reef in **Caret Bay** and **Neltjeberg Bay** SW and S of Inner Brass Island. **Hull Bay,** SE of Inner Brass Island, is shoal, but it is used to some extent by fishermen.

Lizard Rocks, 0.7 mile offshore and 0.8 mile W of Inner Brass Island, are a group of bare rocks and rocks awash. **Ornen Rock,** with 6 feet over it, is a mile E of Inner Brass Island. Waves do not ordinarily break over Ornen Rock even during a heavy ground swell.

Magens Bay is the only important bight on the N shore of St. Thomas. It is 1.6 miles long and 0.6 mile wide. Its E side is formed by a long, narrow tongue of land, which terminates to the NW at **Picara Point,** nearly midway between Hans Lollik and the Brass Islands, and its W side by St. Thomas Island and **Tropaco Point.** Prominent are several gray square buildings built over a 50-foot cliff at the end of Tropaco Point. The bay, safe only for small vessels, is open to the NW and consequently exposed to rollers. Entering from the N or NW, avoid Ornen Rock and from the E, during calm seas, the rocks 30 yards NE of Picara Point. During heavy ground swells, a confused sea exists in the area of these rocks, and the point should be given a wide berth.

The depth in Magens Bay varies from 5 to 12 fathoms, but the S portion has a bank of 1¼ fathoms, extending 0.3 mile from the shore, surrounded by depths of 2 to 3 fathoms. A fine sand beach is at the head of the bay. **Reseau Bay** and **Lerkenlund Bay,** small bights on the W shore of Magens Bay, are used by fishermen to beach their boats.

Hans Lollik Island, 713 feet high, 1.3 miles long, and about 0.8 mile wide, is 1.8 miles NE of Picara Point. The W side of the island is precipitous and rocky, except in a bay on the W side which has a gravel beach. **Coconut Bay,** on the SE face, is protected by off-lying **White Horseface Reef.** This bay is a protected anchorage for small boats and may be entered through a channel SW of the reef. **Hansa Rock,** close inshore at the S point, is 19 feet high and S of a small bay that is accessible to small boats in calm seas. **Hans Lollik Rock,** awash and on which the sea always breaks, is over 0.3 mile ESE of the S point of Hans Lollik Island.

Little Hans Lollik Island is 0.2 mile N of Hans Lollik Island and connected with it by a coral ledge over which the sea breaks. There is an opening in the reef. The shoreline consists mostly of rocky cliffs from 20 to 60 feet high. **Steep Rock,** the only detached rock on the E shore of the island, is 25 feet high.

Pelican Cay, 200 yards N of Little Hans Lollik Island, is a 20-foot grassy islet accessible in calm seas. Between the two are several rocks awash, and a reef over which the sea breaks is close NE of Little Hans Lollik Island. Except for these dangers, the channels on either side of the Hans Lollik group are clear.

Chart 25647.–Mandal Bay, 3 miles E of Picara Point, is shoal, with a sandy beach at its head. **Mandal Point,** just E of the bay, is 277 feet high, with cliffs 100 to 120 feet high at the water's edge. An unmarked channel, W of the point, leads through the reefs and a landcut to a small dredged harbor. On the E side of the bay, a rubble mound breakwater extends 270 feet from shore on the N side of the channel entrance, and a smaller rubble mound jetty extends 70 feet from shore on the S side. A depth of about 10 feet was reported in the channel in 1972.

Water generally breaks on a reef close NE of Mandal Point. A 23-foot spot is 0.3 mile E of the point.

Coki Point, 1.9 miles ESE of Mandal Point, is 47 feet high and foul with coral on the N and E sides. It forms the N shore of **Water Bay.** A conspicuous 235-foot cone-shaped hill is just S of Water Bay. **Turtleback Rock,** 2 feet high, is off the entrance to Water Bay 0.3 mile SE of Coki Point. **Cabes Point** is a low rocky hook 1 mile SE of Coki Point. **Shark Island,** 32 feet high, is about 0.3 mile ESE of Cabes Point. Foul ground encircles the island with several visible rocks 125 yards off the NE end.

Redhook Bay, at the E end of St. Thomas Island, consists of a S arm called **Muller Bay** and the W arm, **Vessup Bay.** Ferry boats to St. John Island use a small L-shaped pier in the NE part of Vessup Bay. In 1972, a depth of 9 feet was reported at its face. The channel through Redhook Bay into Vessup Bay is marked by private buoys. A marina is 200 yards W of the L-shaped pier. Berths, gasoline, electricity, water, ice, and marine supplies are available. Repairs

can be made to gasoline or diesel engines and to some electronic equipment. The National Park Service maintains a L-shaped pier on the S side of Vessup Bay; in 1972, depths of about 6 feet were reported alongside.

Cabrita Point, the E end of St. Thomas, rises to a height of 210 feet. A neck of land joins the remainder of St. Thomas. A 24-foot spot lies 0.6 mile ESE of Cabrita Point.

Pillsbury Sound is the body of water between St. Thomas, St. John, and the cays which bound the sound on the N side, forming an excellent roadstead about 2 miles in extent E and W and 1.5 miles N and S. This area is quite secure against rollers and all winds except from the S which blow only in the hurricane months, but the area can become quite rough. The current attains a velocity of 2 knots.

The depths in the sound are somewhat irregular, varying from 41 to 111 feet. All the main passages leading to it are deeper than the mean depth of the sound itself.

Thatch Cay, at the NW end of Pillsbury Sound, is 1.6 miles long. The island is in the form of a ridge, 482 feet high near the E end.

Bull Point and **Mother East Point** are prominent projecting points on the N side. **Lee Point** is the W point and **Grouper Point** the E point of the island. **Grass Cay,** 0.5 mile E of Thatch Cay, is 0.8 mile long. The N shore consists of rocky cliffs in places 150 feet high. A narrow rocky ledge, covered 12 feet at its E end, is close to shore near the W end, and a rock awash is 150 yards W of the same point.

Mingo Cay, E of Grass Cay, is 186 feet high. Between Mingo and Grass Cays is a narrow shoal passage with a bare rock 15 feet high close to the middle. Several bare rocks are E of this rock. **Lovango Cay** is E of Mingo Cay and separated from it by a shoal passage 300 yards wide; the tidal current is strong in the 13-foot boat channel. Several houses and two private piers are in the bight along the S shore between **Murder Rock** and the SW point. **Blunder Rocks,** 250 yards E of Lovango Cay, are 4 feet high. **Congo Cay,** a narrow pointed cay N of Lovango Cay, is separated from it by a channel with depths of 13 feet. **Carval Rock** is 0.3 mile E of Congo Cay. There are several smaller rocks between it and the cay.

Two Brothers are two small 12-foot-high barren rocks lying in the middle of Pillsbury Sound; a light 23 feet above the water is shown from the larger rock. A ledge extends off their NE side, deepening to 30 feet at a distance of 250 yards. Vessels can anchor in depths of 40 to 65 feet about 0.5 mile NE of Two Brothers on sand and mud bottom.

Windward Passage extends between Lovango and Durloe Cays; it is 0.3 mile wide. **Durloe Cays,** within the entrance, cannot be mistaken. On the W side of the channel are Carval Rock and Blunder Rocks. Vessels of deep draft may take the passage between Lovango and Durloe Cays. If the wind dies, sailing craft may anchor at any time; the bottom is coral and broken shell in less than 60 feet. With the NE current running against the wind, this channel has a race that looks like broken water. Through Durloe Cays and between them and Hawksnest Point on St. John Island are deep and clear passages, but these are not recommended.

Middle Passage, between Grass and Thatch Cays, is about 0.3 mile wide and presents no difficulties to powered vessels, the only dangers being a small rock awash nearly 150 yards W from the W end of Grass Cay, which is easily seen. Sailing vessels generally use this passage in leaving the sound. It may be entered from the N even on the ebb, provided the trades have not too much of a S slant.

Leeward Passage, between Thatch Cay and the N side of St. Thomas, is about 0.4 mile wide, with general depths of 60 feet or more. A privately marked fish haven, covered at least 60 feet and centered in 18°21′12″N., 64°51′21.5″W., is near the E end of Leeward Passage.

Currents.–Tidal currents with velocities up to 4 knots in Middle Passage and Windward Passage, and weaker currents in Leeward Passage, have been reported.

Three islands and several rocks extend SE for 2 miles from the E end of St. Thomas. The islands are rugged, with cliffs fronting much of the shores. **Dog Rocks,** 9 feet high, are the most E danger of the group close off the E point of **Dog Island.** Current velocities up to 4 knots have been reported in the vicinity of Dog Island. Other rocks are as much as 0.35 mile from the shores of the islands.

Dog Island Cut, between Dog Island and **Little St. James Island,** has depths of 17 to 55 feet. Two submerged rocks are in midchannel at the N entrance to the cut in about 18°18′08″N., 64°49′11″W. The cut should be used only by small boats with local knowledge. **St. James Cut,** between Little St. James Island and **Great St. James Island,** has depths of 15 to 22 feet, but caution is necessary to avoid **Welk Rocks** in the E approach and **The Stragglers,** on the W side. A rock awash is about 125 yards NW of the NE point of Little St. James Island. A reef extends from this point almost to the rock.

St. James Bay, between Great St. James Island and the E end of St. Thomas Island, provides secure anchorage in depths of 23 to 50 feet, except in hurricanes. Small craft can anchor securely in Christmas Cove either N or S of the small cay 300 yards offshore. **Cow Rock,** 7 feet high, is the W of a group of rocks in the S approach to the bay. **Calf Rock,** 5 feet high, is the E rock of the group.

Current Hole, at the N end of St. James Bay, provides a passage from the S coast of St. Thomas Island to Pillsbury Sound. **Current Rock,** 13 feet high and marked by a light, is in about the center of the passage. A depth of 24 feet can be carried through the 100-yard-wide channel E of the rock. The current velocity reaches a maximum of 3 knots through Current Hole and sets N and S. To stem the current, sailing vessels using the passage should await a N current and a steady breeze.

Cowpet Bay, in the N part of St. James Bay, is 0.3 mile wide between **Water Point** and **Deck Point.** The bay has depths of 8 to 21 feet. The St. Thomas Yacht

Club has a pier and other private facilities at the head of the bay.

Jersey Bay, W of Cowpet Bay, is 1.4 miles wide between Deck Point and the cays E of **Long Point.** The bay has several cays and dangerous rocks scattered throughout the W part. A 7-foot spot is about 0.25 mile E of the E point of Cas Cay. **Benner Bay,** locally known as **The Lagoon,** is a smaller bay in the N part of Jersey Bay. It is one of the most protected small-boat harbors on St. Thomas Island. Several yacht clubs and marinas along the N shore of the bay have complete facilities for small craft. Berths, gasoline, diesel fuel, water, and some marine supplies are available. A 50-ton mobile hoist can handle craft up to 65 feet for hull, engine, and electronic repairs. To reach the facilities, pass E of the buoy off **Red Point,** the E point of **Cas Cay,** and follow the best charted water toward the white-washed area on **Rotto Cay.** Pass Rotto Cay keeping it 100 yards on your starboard and proceed past **Grassy Cay** keeping it close by on the starboard. Proceed past Grassy Cay to within 100 yards of **Bovoni Cay** then head in a N direction to the facilities. The channel leading into Benner Bay is privately maintained and marked. In January 1981, severe shoaling was reported in the channel; the extent of shoaling is unknown. Mariners should seek local knowledge. Also, it was reported that submerged pilings may exist in the area. The waters between Cas Cay and Patricia Cay are shoal with prominent breakers and entry in this area could be hazardous.

The S **coast** of St. Thomas is very irregular with projecting rocky cliffs between coves and bays that are obstructed by rocks and shoals. Dangerous rocks extend up to a mile from shore.

Long Point, the SE extremity of St. Thomas Island, is the terminus of a high prominent ridge with rocky cliffs 50 feet high.

Packet Rock, a coral shoal about 100 yards in extent with a depth of about 5 feet, lies 0.7 mile WSW of Long Point. The sea breaks over the rock only in heavy weather, and it cannot be seen until close-to. A buoy is 300 yards SSE of the rock.

Capella Islands, of which the westernmost is **Buck Island,** lie 1.7 miles SW of Long Point, and constitute a prominent landfall for making St. Thomas Harbor. The two small islands, of irregular outline, are partially covered with a scrubby growth and separated by a narrow channel almost closed by numerous uncovering rocks. A light, 125 feet above the water, is shown from a white tower on the highest point of Buck Island, near its E end. A shallow ledge extends 100 yards off the W end, and off the N side the depth is 30 feet. A fish haven, covered 40 feet and marked by private buoys, is on the N side of a bight at the SW end of Buck Island in about 18°16'42"N., 64°53'55"W. A small wharf and boat landing are at the head of the bight.

Between Capella Island and St. Thomas Island the currents are weak.

Chart 25641.–Frenchcap Cay is about 3.6 miles SE of Buck Island, and, like Buck Island, is a useful landfall for making St. Thomas Harbor. It is 350 yards long and 183 feet high, and is covered with grass and steep-to. The shoreline for the most part consists of high rocky cliffs.

Chart 25649.–St. Thomas Harbor, in about the middle of the S coast of St. Thomas Island, is the only sheltered harbor in the Virgin Islands that can be entered by large vessels. Although the oval-shaped harbor is small and open to the S, it is well protected by the high hills surrounding the other sides and provides safe anchorage except during a hurricane.

Charlotte Amalie, along the N shore of St. Thomas Harbor, is the most important city and capital of the U.S. Virgin Islands. Tourism comprises most of the commerce. Rum and bay rum are manufactured, and handicraft articles are made from raw materials imported from nearby islands.

The port facilities are at the West Indian Dock on the S side of **Long Bay,** the E part of St. Thomas Harbor, and at the Ports Authority piers and bulkhead on the N side of West Gregerie Channel. The principal imports include foodstuffs, textiles, clothing, building materials, machinery, and petroleum products. Exports include rum, perfumes, and sundry articles.

Prominent features.–Muhlenfels Point, the E entrance point to St. Thomas Harbor, is high and steep at the shoreline. A large hotel on the point is conspicuous.

Hassel Island, on the W side of the harbor entrance is indented by shallow coves and has several high wooded hills. **Cowell Point** is the S end of a ridge sloping up to **Cowell Battery,** the highest point on the island.

Signal Hill, about a mile NW of St. Thomas Harbor, is the second highest peak on the island with a lighted tower on top. From it the main ridge extends ESE, passing less than 0.5 mile N of Charlotte Amalie. The town is built around the three spurs that extend S from the ridge. **Frenchman Hill** is the W spur. **Berg Hill,** in the center, has a square white building on its S slope near the top. On **Government Hill,** the E spur, stands **Blackbeard Castle,** a remarkable 47-foot stone tower.

To the E of Government Hill, **Bluebeard Hill** rises abruptly from the shore at **Frederiksberg Point** to a 224-foot summit on which **Bluebeard Castle,** an old 34-foot stone tower, is located.

Water Island, SW of the entrance to St. Thomas Harbor, is indented by several small shallow bays, and the hilly land is covered by small trees and dense underbrush. **Flamingo Point,** the S end consists of brown rocky 100-foot cliffs. N of Flamingo Point on the W shore is **Flamingo Bay** which leads to **Flamingo Pond** and a small boat harbor and marina. A water tower is on a 203-foot hill 0.2 mile NE of the point, and a square tower is on 256-foot **Providence Hill,** 0.8 mile N of the point. There is a small pier on Providence Point that is used by the ferry serving Water Island. **Red Point,** a mile NW of Water Island,

is a rugged red cliff at the S end of a peninsula with a 218-foot flat-topped crest that has an aerolight on the summit.

Channels.–The 30-foot channel leads W of Muhlenfels Point and close E of Scorpion Rock to the West Indian Dock. The entrance channel is marked by a lighted range and buoys. In April 1976, it was reported that depths of 10 to 14 feet could be taken to the waterfront at Charlotte Amalie.

East Gregerie Channel, between Hassel Island and Water Island, has depths of 26 to 48 feet for the 350-yard center width. An 18-foot spot is on the W side of the channel in about 18°19′47″N., 64°56′30″W. **Haulover Cut,** between Hassel Island and St. Thomas Island, has a least depth of 12 feet through the center of the narrow passage. At the SW entrance, a reef that uncovers extends about 80 yards into the cut from Hassel Island. Rocks, submerged and awash, border the N side of the channel. East Gregerie Channel is marked by lighted buoys. **Caution** is advised for all vessels traversing this area since it is an active seaplane landing area.

West Gregerie Channel, between Water Island and St. Thomas Island, has depths of 26 to 60 feet for a 250-yard center width to the junction with East Gregerie Channel N of Water Island. The channel is marked by buoys and a light. A dangerous sunken wreck is in the channel in about 18°19′48″N., 64°57′06″W. A lighted radio tower at the base of Careen Hill has been reported to be an excellent mark to steer for when entering West Gregerie Channel.

Ruyter Bay, a shoal bay on the NW side of Water Island, has a privately owned L-shaped dock, about 100 feet long with a 30-foot length at the outer end; in 1972, depths of about 6 to 10 feet were reported alongside. A depth of about 8 feet can be carried with local knowledge when approaching the dock from the NW.

Anchorages.–General, small craft, and arrival inspection anchorages are in St. Thomas Harbor and off Lindbergh Bay. (See 110.250, chapter 2, for limits and regulations.) Use of the mooring buoy in Anchorage A–2 is restricted to the Coast Guard patrol boat stationed in St. Thomas Harbor.

A wreck covered 40 feet is in the anchorage area E of Water Island in about 18°18′48″N., 64°56′06″W.

Krum Bay, NW of Water Island, has depths of 35 feet in the entrance, shoaling to 11 feet near the head. An oil company maintains a lighted T-head pier and a barge dock on the W side of Krum Bay, about 0.1 mile and 0.4 mile, respectively, N of **Mosquito Point,** on the W side of the entrance. The bay affords excellent anchorage for small vessels during a hurricane. An overhead power cable with a reported clearance of 44 feet crosses the narrow part of the bay.

Lindbergh Bay, close W of Krum Bay, is used as an anchorage by small sloops and motorboats. The entrance depths are 30 feet, gradually decreasing to a fine sand beach and several small piers at the head of the bay.

Dangers.–**Green Cay,** 1 mile SE of Muhlenfels Point, is a small 24-foot islet covered with low underbrush. The islet is near the center of a coral reef that extends about 450 yards SW from shore. Another islet is 50 yards S of Green Cay.

Triangle is a group of dangerous rocks between Green Cay and Muhlenfels Point. The N and SW parts of the group are partly awash. **Barrel of Beef,** 2 feet high, is the E foul area of the group. A detached coral rock covered 16 feet and marked by a lighted buoy is nearly 0.7 mile SSE of Muhlenfels Point.

Point Knoll, a coral head with several submerged rocks, extends 50 yards SW from Muhlenfels Point; a depth of 20 feet is about 90 yards SW of the coral head. **Rohde Bank,** 0.2 mile NW of Muhlenfels Point, has a least depth of 17 feet.

Scorpion Rock, in the entrance between Muhlenfels Point and Cowell Point, is a small coral rock with a least depth of 26 feet surrounded by depths of 27 to 29 feet. A lighted buoy marks the rock.

Rupert Rock, 0.5 mile N of Muhlenfels Point at the narrowest part of the entrance channel, is 12 feet high and white on top. A drying reef and foul ground with less than 6 feet over it extends 100 yards W from the rock. A lighted buoy and a daybeacon are W of the rock.

Foul ground with depths less than 6 feet surround Hassel Island and Water Island up to 300 yards from shore.

Porpoise Rocks, a mile W of the S end of Water Island, consists of three reefs with rocks bare or awash and depths of 2 to 17 feet. A buoy is on the SW side.

An unmarked fish haven is off the S side of Porpoise Rocks.

A rocky ledge extends 0.4 mile S of Red Point. A steep-to rock at the outer end has a least depth of 2 feet over it.

In 1980, an airport runway extension was under construction on the E side of **Brewers Bay** 0.6 mile NW of Red Point. The construction area extends about 800 yards W from shore and is surrounded by a rock dike. Caution is advised in the area.

Sandy Point Rock, an elongated shoal extending 300 yards NW from the N end of Water Island, has a least depth of 3 feet and is marked by a light at the NW end.

Care should be taken when navigating in the main harbor of Charlotte Amalie, Haulover Cut, and East Gregerie and West Gregerie Channels, because of their use as seaplane operating areas. The seaplanes generally take off on a SE heading from Cay Bay to Rupert Rock, and occasionally from Crown Bay through the East Gregerie Channel, also on a SE heading. The seaplanes generally land on a NE heading between the light in West Gregerie Channel and Haulover Cut, then proceed into Cay Bay. The seaplanes, when landing, usually traverse the narrow Haulover Cut area at a high rate of speed. Vessels navigating in these waters should remain alert to the presence of seaplanes when operating in the areas defined above.

Tides and currents.–The tide in St. Thomas Har-

bor is chiefly diurnal; the diurnal range is about 0.8 foot. Water depths have decreased several feet after a severe tropical storm. The tidal current in the entrance is noticeable.

The current velocity in East and West Gregerie Channels is about 0.5 knot, although a greater velocity has been reported in the vicinity of Little Krum Bay. Caution should be exercised to avoid being set onto the piers in the bay, particularly with a strong E wind.

Routes.-From W: pass 0.5 mile or more off the S end of Water Island, then steer for Muhlenfels Point until on the entrance range, and then proceed into the harbor on a heading of **344°**. The prominent white catchment area on the W side of Berg Hill helps in picking up the range in the daytime. From S: pass a mile or more W of Buck Island and enter on the range. From E: set a course to pass about midway between Buck Island and St. Thomas Island and enter on the range.

Pilotage.-(See Pilotage for U.S. Virgin Islands at the beginning of this chapter.) Vessels are boarded by a pilot from a pilot boat with PILOT painted on the deck house, about 1 to 3 miles S of Hassel Island.

Vessels should not proceed into the narrow entrance until previous arrangements have been made with the harbormaster. Radio communication can be established with the marine operator, WAH, on VHF-FM channels 16 (156.80 MHz) and 28 (162.00 MHz), and 2182 kHz and 2670 kHz from 0600 to 2100.

Towage.-Tugs are normally not required for docking, however, if required, tugs up to 1,000 hp operated by the West Indies Transport Company, Inc., may be available upon 24-hour advance notice.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Seamen requiring emergency hospital attention are taken to the municipal hospital.

Charlotte Amalie is a **customs port of entry.** Vessels are boarded at anchorage or at their berths. The customs office is in the Post Office Building.

Coast Guard.-The Coast Guard maintains a **vessel documentation office** in Charlotte Amalie. (See appendix for address.) A Coast Guard patrol boat moors on the N side of Kings Wharf at Charlotte Amalie.

Harbor regulations.-Local rules and regulations for the Port of St. Thomas are enforced by a **harbormaster** whose office is in the Senate Building on the point E of the waterfront at Charlotte Amalie.

Wharves.-The West Indian Company Dock, along the S side of Long Bay, is the primary deepwater commercial terminal at Charlotte Amalie. The well-protected 2,234-foot marginal wharf has depths of 30 feet reported alongside except for 27 feet alongside the easternmost 300 feet. Open and covered storage is available; one 90-ton mobile crane and a 25-ton swing crane are available for receipt of general and container cargo.

The waterfront of Charlotte Amalie, is a concrete marginal wharf with depths of 7 to 15 feet alongside. It is used by small sailing vessels and motor launches trading with the nearby islands.

Kings Wharf, a 300-foot finger pier extending from the point E of the waterfront, is used by Coast Guard vessels. In 1982, depths of 9 feet were reported along the N side and 13 feet along the S side. A 3-foot depth is about 200 yards ESE from the outer end of the pier in 18°20′27″N., 64°55′49″W.

The waterfront of Crown Bay is a curved concrete marginal wharf operated by the Virgin Islands Port Authority. Depths of 14 to 15 feet are reported alongside. The wharf is used primarily for receipt of general cargo.

In 1983, the slips in **Little Krum Bay** were being filled in, and a pier for cruise ships was under construction on the S side of the bay. Tender and Fuel Pier, on the N side of the bay, is about 400 feet long with lighted mooring dolphins positioned 100 and 300 feet off each side at the face. Depths alongside the pier shoal from 30 to 28 feet; depths alongside the dolphins shoal S to N from 36 to 27 feet. The pier is used as a pipeline transfer point for commercial tankers supplying the island's fuel needs. When space is needed, cruise ships tie-up along the dolphins.

Supplies.-Groceries and some marine supplies are available at Charlotte Amalie. When available, water can be delivered from pipelines at the West Indian Dock or at anchorage from a barge.

Repairs.-There are no facilities for making major repairs or drydocking deep-draft vessels; the nearest drydocks and repair facilities are at San Juan and the Panama Canal. Machine shops can make minor above-the-waterline repairs.

Small-craft facilities.-A marina on the E side of Long Bay has finger piers with 10 to 12 feet alongside. Berths, water, electricity, and marine supplies are available. A fuel pier with 28 feet alongside has gasoline and diesel fuel.

A marina on the W side of Cay Bay, N of Hassel Island, has berthing and mooring facilities in about 15 feet of water. Gasoline, electricity, water, ice, and marine supplies are available. A marine railway can handle craft up to 65 feet long for hull and engine repairs. The approach to the marina is in a seaplane operating area so be alert for aircraft.

Chart 25641.-Saba Island, 202 feet high and triangular in shape, is 2.4 miles W of Flamingo Point. The N part of the island is low, but the S part has precipitous red cliffs 150 feet high along the S shore. Two small lagoons surrounded by mangroves are near the N end. A landing can be made on the sand beach along the NW shore. About 150 yards E of the island is a reef with a bare rock 5 feet high, and numerous rocks awash over which the sea always breaks. Another reef awash lies 100 yards S of the W end of the island.

Turtledove Cay, 50 feet high, 100 yards N of Saba

Island, is connected with Saba Island by a reef bare at low water. About 0.1 mile W of the cay is a cluster of rocks awash. Between these rocks and the cay is a boat channel. **Dry Rock,** about 0.5 mile SW of Saba Island, comprises a group of rocks bare and awash; the highest rock is 2 feet high. **Flat Cays,** 0.8 mile NE from Saba Island and 1.3 miles SW from Red Point, consist of two small islets, 32 and 11 feet high, respectively. About 300 yards E of the S cay is a rock awash, surrounded by a breaking reef.

Currents.–Inshore the current is weak, but between Flat Cays and Saba Island, a tidal current sets ESE and WNW with velocities up to 1 knot.

Southwest Road, between Flat Cays and Perseverance Bay, affords an excellent anchorage with the wind as far S as ESE.

Vessels may anchor as convenient after entering through any of the channels between the islands and shoals S. Sailing vessels should enter from the E between Water Island and Porpoise Rocks, favoring Water Island and pass between Flat Cays and the shoal S of Red Point.

Range Cay, an islet 21 feet high, lies close to the shore 0.7 mile NW of Red Point. **Black Point,** 1.2 miles NW of Red Point, terminates in rocky cliffs 40 to 50 feet high.

Perseverance Bay, between Black Point and **Lucas Point** to the W, has depths of 13 fathoms, about 0.4 mile from the shore. Coral reefs, bare at low water, fringe the beach. Lucas Point rounding and rocky, is marked by 60-foot cliffs.

Fortuna Bay, between Lucas Point and **David Point,** consists of two small bays separated by a broad point that is high and faced by precipitous cliffs 200 feet high. The shore is generally rocky with cliffs up to 70 feet high.

St. John Island, about 2 miles E of St. Thomas Island, is 8 miles long, and up to 4 miles wide. Its E end for 3 miles is formed by a narrow neck of land from 1 mile to less than 0.5 mile across, and from its inner end the coast turns sharply S, forming a deep bight which terminates at Ram Head, the S point of the island. The central and W portions are comprised of irregular hills, the highest of which is **Bordeaux Mountain,** 1,277 feet high. The hills and mountains are mostly covered with trees, brush, and some patches of grass.

Most of the population of St. John Island is located in two small settlements, Cruz Bay at the W end and Coral Bay at the E end. Tourism is the principal commerce; foodstuffs and building material are brought into Cruz Bay by small interisland vessels.

Some groceries, gasoline, diesel fuel, and water can be obtained at the settlement. Small ferryboats carry passengers and mail between St. Thomas Island and St. John Island; float planes operate between St. John and St. Croix from Cruz Bay. Land transportation is mostly by taxi or by small sightseeing buses. Telephone and radiotelephone services are available.

The Government administration is at Cruz Bay.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Chart 25647.–Moravian Point, on the end of a peninsula S of Cruz Bay, is the westernmost part of St. John Island. **Mingo Rock,** which is awash and breaks, is 175 yards WSW of Moravian Point. A group of four rocks awash, with surrounding depths of 17 to 30 feet, is about 0.1 mile WSW of Mingo Rock.

Steven Cay, 0.4 mile W of Moravian Point, is 28 feet high and marked by a light. A 31-foot rock is just S of **May Point,** the S extremity of Steven Cay. **Skipper Jacob Rock** is 0.1 mile E of the S end of Steven Cay.

Cruz Bay, on the W side of St. John Island, is a small cove used by small interisland vessels bringing supplies and tourists to the island. The entrance is marked by a light 12 feet above the water, and private buoys mark the channels through the cove. Depths of 10 feet can be taken to the public pier in the SE part of the bay. The Government House on the peninsula extending to **Battery Point** is a prominent landmark. A marina of the National Park Service is in the cove E of Battery Point; a depth of 6 feet can be taken to the 80-foot pier and bulkhead. **Storm warning signals are displayed.** (See chart.)

Caneel Bay, 0.8 mile NE of Cruz Bay, is the site of the Caneel Bay Plantation resort development. A line of private marker buoys restricts the use of boats in the bay except for the channel leading to a small pier at the head of the bay. Motorboats provide transportation for tourists to St. Thomas from the pier.

Durloe Cays are three islets W of Hawksnest Point. **Henley Cay,** the largest, is 70 feet high and about 300 yards wide, and has a small pier on the S side. **Ramgoat Cay,** 310 yards NE of Henley Cay, is 30 feet high, and **Rata Cay,** the smallest is 0.2 mile WNW of Henley Cay.

Hawksnest Point, a projecting point forming the W shore of Hawksnest Bay, is wooded. In the N part is a circular hill 130 feet high. Off the extreme point is **Hawksnest Rock,** bare and 25 feet high. **Hawksnest Bay,** E of the point, is small and of no commercial importance. Off its S shore are numerous rocks.

Perkins Cay is an islet close to the E point of Hawksnest Bay. **Trunk Cay,** a grass-covered islet 48 feet high, is about 0.5 mile E of Perkins Cay. **Trunk Bay,** between the two cays, is used extensively by skindivers. An area in the bay in which boats are restricted is marked by private buoys.

Johnson Reef, a coral formation 0.4 mile NE of Perkins Cay, is 500 yards long and over 0.2 mile wide; it breaks except in very smooth weather. A ledge, over which is a 30-foot passage, connects this reef with the mainland to the SE. The reef is marked by a lighted buoy at its N end and by an unlighted buoy at its S end.

Cinnamon Cay, 32 feet high and covered with tall

grass and cactus, is about 0.7 mile E of Trunk Cay. An underwater reef, SW of Cinnamon Cay, is marked by a private buoy. Private buoys also mark an area in which boats are restricted from Cinnamon Cay to America Point to the E. **America Point** is 2 miles E of Hawksnest Point; back of America Point rises **America Hill,** 526 feet high, which separates Cinnamon Bay from **Maho Bay.** The head of Maho Bay is shoal and has a fine sand beach. **Maho Point** is the tip of a short peninsula between Maho and Francis Bays, formed by the spur of a 198-foot hill 300 yards E.

Francis Bay, S of Mary Point, is somewhat protected to the N by Whistling Cay, and affords good anchorage in 50 feet, sandy bottom.

Whistling Cay, the 202-foot islet 300 yards W of Mary Point, is covered with trees. Its N shore is precipitous, with cliffs 130 feet high. A gravel beach is along the SE side. **Fungi Passage,** between the cay and Mary Point, has a least depth of 21 feet, but on account of the baffling winds from the adjacent high land it is difficult for sailing vessels.

Chart 25641.–Mary Peninsula, a 578 foot-high headland in the form of a ridge, is connected with St. John by a low divide, separating Francis Bay from Mary Creek. **Mary Point,** the W end of the peninsula, has bluffs 135 feet high. The N shore consists of high weatherbeaten cliffs with large boulders along the waterline.

The Narrows, a channel about 0.3 mile wide between the 10-fathom curves, is the W entrance to the passage between the N coast of St. John and the SW coast of Tortola. This passage leads into Flanagan Passage and Sir Francis Drake Channel. Tidal currents in The Narrows and the passage E attain velocities of 2 to 4 knots.

Leinster Bay is a double indentation between Mary Peninsula on the W and **Leinster Point,** 48 feet high, on the E; it is about 0.8 milee in length. **Mary Creek,** the W part of this bight, makes well in behind high land to N. The E part, **Waterman Bay,** is partially protected by **Waterlemon Cay,** 30 feet high, 250 yards W of Leinster Point. The cay is bold, and is separated from St. John Island by a channel 200 yards wide with 12 feet of water. Vessels may anchor under the cay about 200 yards from shore. **Annaberg Point,** 96 feet high, SW of Waterlemon Cay, is faced by a conspicuous landslide.

Threadneedle Point, 0.5 mile E of Leinster Point, is precipitous, with cliffs up to 70 feet high. From Threadneedle Point the coast trends in a general ESE direction for 3.5 miles to **East End Point,** the E extremity of the island. **Haulover Bay,** 3 miles SE of Leinster Bay, offers the best anchorage of the small bights along the N coast.

Privateer Point, 0.4 mile S of East End Point, is a projecting point 164 feet high, separating **East End Bay** from **Privateer Bay,** two small bights open to the SE. **Red Point,** a headland W of Privateer Bay, is the S end of a high ridge.

Flanagan Island, 127 feet high, lies 0.7 mile SE of Privateer Point. A rock off the W side is 45 feet high.

Flanagan Passage, the westernmost of the passages leading into Sir Francis Drake Channel from S, consists of a group of channels separating St. John and Norman Islands. The channel between Privateer Point and Flanagan Island is 0.7 mile wide; that between Flanagan Island and the Indians is about 1.2 miles wide; and that between Flanagan and Norman Islands is 1.4 miles wide.

Approaching Flanagan Passage from E, haul close around the W side of Norman Island, inside Santa Monica Rock, which may be done at a distance of 300 yards. From W, line up the Indians and Mount Bellevue, the highest hill on the E end of Tortola, and enter W of Santa Monica Rock on a heading of about **016°.**

Coral Bay, the large bay extending N into St. John between Red Point and Ram Head, is open to the SE. The narrowest part of the entrance, between Moor Point and Lagoon Point, is 1.2 miles wide. **Leduck Island,** 85 feet high, lies in the entrance to Coral Bay, midway between Red Point and Ram Head. **Storm warning signals are displayed.** (See chart.)

Currents.–The current velocity is about 0.7 knot and sets SW and NE across the entrance to Coral Bay; between Flanagan Island and Privateer Point its velocity is reported to be 1.5 knots. In the bay there is no current, and the range of tide is about 1 foot.

Moor Point is the thin rocky SW extremity of East End Peninsula. **Turner Point** is the knob at the end of the peninsula separating Round Bay and Hurricane Hole. **Fortberg Hill,** N of Harbor Point, is nearly circular in shape, 426 feet high, covered with trees, and very prominent. **Lagoon Point,** the S entrance point of Coral Harbor, is fringed by a coral reef 200 yards wide and bare at low water. **Sabbat Point,** 0.5 mile S of Lagoon Point, is the end of a long high rock forming the buttress of **Sabbat Hill,** 101 feet high.

Storm warning signals are displayed. (See chart.)

Ram Head, the S point of St John is a bold headland, with two conspicuous hills. The E side of the head has rocky cliffs 100 to 150 feet high. A heavy sea generally runs off the point.

The only danger in the approach to Coral Bay for vessels drawing less than 18 feet is **Eagle Shoal,** about 0.7 mile S of Leduck Island. The shoal consists of three round patches of coral; the least depth is 1½ feet. Close to and around them the depths are 6 to 7 fathoms, and 13 fathoms a little over 100 yards to the S. Coral Bay has no towns; the community is scattered among several points along the shore.

Round Bay, the NE of the three arms of Coral Bay, is 0.9 mile wide at the entrance. The several shoal patches of about 2¼ fathoms should be avoided. **Pelican Rock,** 7 feet high, is in the NE part of the bay. The best anchorage in Round Bay is off Moor Point.

Hurricane Hole, the N arm of Coral Bay, is 0.6

mile wide at the entrance W of Turner Point. The shoreline is indented by several small bays that afford protection from almost any direction for small vessels. A shoal with rocks awash extends out 100 yards on the W side of Hurricane Hole.

Coral Harbor, the NW arm of Coral Bay, is narrow, and the deep part of the bay is restricted to a width of 100 yards or less by encroaching shoals from the side and head of the harbor. The anchorage ground, although smooth with ordinary winds, is narrow, and being on a lee shore it is available only for small vessels. A small-boat wharf with 3 feet alongside is at the head of the bay.

Coral Bay is a **customs port of entry.**

The S coast of St. John is very irregular with bold projecting points terminating in cliffs over 100 feet high between the small bays and coves that have fringing reefs and shoals near the shores. The dangers are within 0.5 mile of the coast.

Lameshur Bay, 1.5 miles NW of Ram Head, is divided into three smaller bays by projecting points. The easterly one affords good shelter for small vessels in 6 fathoms about 0.2 mile offshore. The middle bay has a good anchorage generally used by sailboats, and a sand beach.

The shore for 0.6 mile W of Lameshur Bay consists of very prominent 150-foot white cliffs.

Chart 25647.-Reef Bay, 2.7 miles W of Ram Head, is a large open bight, but the shores are fringed by coral reefs. A passage leads through the reefs to a protected small-boat harbor in **Genti Bay.**

Great Cruz Bay, 5.5 miles W of Ram Head, affords good shelter for small vessels. The depth is 21 feet in the entrance, decreasing to 9 feet in the middle of the bay.

Chart 25641.-St. Croix Island, 32 miles S of St. Thomas and St. John Islands and 50 miles SE of the mainland of Puerto Rico, is the largest of the U.S. Virgin Islands. The island is 19 miles long and averages about 3.5 miles wide. The N side is somewhat mountainous, particularly in the W part. **Mount Eagle,** 1,165 feet high and about 5 miles from the W end, is the highest point on the island. Southward from the mountains, the land is composed of fertile undulating valleys. The S side is nearly straight and generally low.

Water commerce with St. Croix Island is handled through Christiansted on the N coast, Frederiksted on the W coast, and the industrial complexes in Krause Lagoon and Limetree Bay along the central S coast. Tourism accounts for a good part of the commerce on the N, E, and W coasts; a petroleum refinery and a bauxite ore and alumina plant are the major commerce on the S coast. Some cattle are raised for export to nearby islands.

Tides and currents.-The tides are chiefly diurnal and are small; the diurnal range is about 0.8 foot. There is usually a slight W current between St. Croix Island and St. Thomas Island. No perceptible current has been observed at Christiansted Harbor, but a moderate W flow is reported outside the light at Fort Louise Augusta.

National Ocean Service parties have reported that off East Point tidal currents of about 1 knot set NW and SE in calm weather. Close to East Point strong currents set N and S. Trade winds increase the NW flow and decrease the SE flow. A very strong W current setting around East Point and through Buck Island Channel was noted when the trade wind was blowing. A strong NW current was noted off Southwest Cape.

In 1982, the NOAA Ship MT. MITCHELL reported a prevailing W current with a drift of 1 to 1½ knots on the S side of St. Croix, with a countercurrent inside the reef along the shore.

Weather.-Rainfall is irregular, causing droughts at times. For a 37-year period annual rainfall varied from 26 to 70 inches.

There is no regular land breeze at St. Croix Island, but when the trade wind is light during the day it generally falls calm in the night. From June to September, when the trade wind is usually light, occasionally strong winds from the SW blow across the island with much rain. The ground swell accompanying northers is especially heavy in the vicinity of White Horse.

Local regulations.-Local rules and regulations for St. Croix are enforced by the U.S. Virgin Islands Port Authority, Gallows Bay, Christiansted, St. Croix, U.S. Virgin Islands 00820. No radio watch is maintained at the Port Authority but contact may be made through the marine operator.

Hams Bluff, the NW extremity of St. Croix Island, is a conspicuous 100-foot cliff with the land back of it rising to high hills. **Hams Bluff Light** (17°46.3'N., 64°52.3'W.), 394 feet above the water, is shown from a white cylindrical tower.

From Hams Bluff the N coast of St. Croix Island has slightly jutting rocky points with sandy beaches between for 5.5. miles to Baron Bluff.

Baron Bluff is the sea front of the triple spurs of a 395-foot hill. From Baron Bluff E to **Salt River,** the shore consists of low rocky cliffs.

Salt River Point is 1.7 miles E of Baron Bluff. W of the point a narrow passage with depths of 6 feet leads through a reef to **Salt River Bay.** The shores of the bay are mostly mangrove swamps with several openings leading to boat landings. A marina with berths, electricity, water, ice, and a launching ramp is in the bay; minor repairs can be made.

An underwater habitat is off the mouth of Salt River in about 17°47'12"N., 64°45'30"W. An 18-foot supply boat showing a strobe light is moored above the habitat.

White Horse, 400 yards N of Salt River Point, is a rock over which the sea always breaks. A boat channel with a depth of about 11 feet leads between the rock and the shore.

From Salt River Point the coast turns abruptly SE for 3 miles to Christiansted. In this area the hills near the coast are covered with grass and low bushes, and the low shoreline has a narrow sand beach.

Chart 25645.-Christiansted Harbor, on the N coast of St. Croix Island 10 miles E of Hams Bluff and 7.7 miles W of East Point, is a port of call for vessels drawing up to 16 feet. The harbor is protected by a reef and bank that extends clear across the entrance, except for the channel opening. **Gallows Bay** is in the SE part of the harbor. Most of the harbor is shoal.

Christiansted, on the S shore of the harbor, is the largest town on St. Croix Island. The principal imports include foodstuffs, building materials, petroleum products, and clothing. Exports include rum and cattle.

Storm warning signals are displayed. (See chart.)

Prominent features.-Fort Louise Augusta, on the E side of the harbor entrance, is an old battery on a projecting point. Christiansted Harbor Channel Entrance Range Front Light, 45 feet above the water, is shown near the fort. The radio tower adjacent to the front range light is prominent.

Protestant Cay, an islet in the harbor, is surmounted by an old stone building and a hotel. The ruins of Fort Sofia Frederika are at the N end of the cay.

Channels.-The entrance is N of Fort Louise Augusta through a crooked dredged channel marked by buoys, lights, and a **164°** lighted entrance range, thence E and S of Protestant Cay to a turning basin and to Gallows Bay Dock. In March 1981, the controlling depth was 18 feet except for shoaling to 13 feet along the SE limit of the basin and to 9 feet on the NE side of the basin in the vicinity of Buoy 15. Shoaling has occurred close to the edges of the marked channel into Christiansted Harbor; extreme caution is advised in transiting the channel.

Inside the harbor, a privately dredged channel with private aids leads W of the main channel to facilities in the SW part of the bay. In 1981, a depth of 17 feet was reported in the channel and alongside the berthing facilities.

A 15-foot passage over the S portion of Scotch Bank is used by small vessels coming from E; local knowledge is necessary. A 13-foot channel E of Round Reef is sometimes used by schooners and small boats with local knowledge.

Anchorages.-Vessels anchor ENE of Protestant Cay in depths of 9 to 30 feet according to draft. Holding ground in this area is reported to be hard; caution is advised to ensure against dragging. Small boats anchor in Gallows Bay and along the E side of the harbor. A yacht anchorage, supervised by the U.S. Virgin Islands Port Authority, is on the W side of Protestant Cay. During a hurricane or gale vessels anchor in Gallows Bay and small boats sometimes anchor in Salt River Bay.

Dangers.-Scotch Bank, a 1.8-mile-long sand shoal extending NE from Fort Louise Augusta, is on the E side of the harbor entrance. Depths of 2 to 20 feet are on the shoal, which is easily seen except when the sun is ahead.

Long Reef, a 2-mile-long strip nearly awash in places, forms the NW side of the harbor. Shoal water extends E from the reef to the channel marked with buoys.

Round Reef, W of Fort Louise Augusta, is circular with a spot bare at low water near its center and several spots with depths of 1 foot.

The harbor is shoal with depths less than 6 feet outside the circuitous channel marked by buoys. Several visible wrecks and submerged obstructions are along the E side of the harbor.

Routes.-Approaching Christiansted Harbor from NE, give Buck Island a berth of 2 miles or more to avoid the bar N of it. From W, all dangers will be avoided by staying 1 mile or more off the N coast. The entrance is marked by a lighted **164°** range, and buoys, lights, and daybeacons mark the entrance channel into the harbor.

Pilotage.-(See Pilotage for U.S. Virgin Islands at the beginning of this chapter.) Vessels are boarded from a motorboat just outside the sea buoy (Buoy 1, 17°45.9'N., 64°41.8'W.). Strangers are advised to take a pilot and should not attempt to enter at night without one.

Quarantine, customs, immigration, and agricultural quarantine.-(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A municipal hospital is at Christiansted.

Christiansted is a **customs port of entry.**

Harbor regulations.-Local rules and regulations for Christiansted harbor are enforced by the **harbormaster,** whose office is on the waterfront.

Wharves.-Gallows Bay Dock (17°44'57"N., 64°41'57"W.), in the E part of Gallows Bay, has berthing space of 400 feet on the W side and 300 feet on the E side; depths of 16 feet are reported alongside. A roll-on/roll-off ramp with 16 feet alongside is E of the dock. Forklifts, mobile cranes up to 70 tons, and covered and uncovered storage are available. General cargo is received and shipped.

Kings Wharf, the 600-foot bulkhead stone quay about 300 yards W of Gallows Bay Dock and W of the fort, has depths of about 8 feet alongside; this bulkhead is used occasionally by auxiliary powered schooners engaged in the interisland trade.

A 380-foot-long pier, 0.9 mile W of Gallows Bay Dock, is operated by the Virgin Island Cement Company. Pipelines for handling raw cement and fuel oil are on the pier. A reported depth of 17 feet is alongside.

An L-shaped pier, just W of the long pier, has about 200 feet of berthing space with 17 feet reported alongside and is operated by Masonry Products, Inc. A pipeline for handling raw cement is on the pier.

Supplies and **repairs.**-Some marine supplies and limited amounts of water are available at Christiansted. Gasoline and diesel fuel are available near the waterfront; bunkers can be trucked in from the S side of the island. Facilities for repairs to oceangoing vessels are limited to minor above-the-waterline repairs.

Small-boat facilities.-St. Croix Marine Inc., NE of Gallows Bay Dock, has four finger piers; two, 100

feet long, and two, 200 feet long; depths of 10 feet are reported alongside. A marine railway at the facility can haul craft to 75 feet long and 10-foot draft; a transfer lift can handle craft to 40 tons, 60 feet long, and 10-foot draft. A lift can handle craft to 50 tons. Berths with electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. Hull, engine, electronic, and refrigeration repairs are available.

Chart 25641.–Beyond Fort Louise Augusta, the N coast trends E for 7.3 miles to East Point, the E end of the island. The coast is fringed by coral reefs, behind which in several places small vessels may find protection.

Punnett Point (chart 25645) 1.4 miles E of Fort Louise Augusta, forms the E side of **Punnett Bay,** a semicircular cove 0.2 mile wide. NE of Punnett Point, at a distance of about 0.4 mile, is **Green Cay,** an islet 55 feet high at its S end. S to the beach and between Green Cay and Pull Point, the area has depths of only 6 to 18 feet with numerous coral heads.

A marina is in **Southgate Pond** 0.2 mile E of Punnett Point. The entrance channel is protected on the W side by a breakwater. In 1982, 10 feet was reported in the entrance channel, with 8 to 10 feet available in the basin. Berths, gasoline, and diesel fuel are available.

Pull Point, 2.3 miles ENE of Fort Louise Augusta, is a small projecting point terminating in cliffs 35 feet high. A stone house is visible at the point. **Chenay Bay** is the bight W of the point.

Buck Island, 340 feet high, is 4.3 miles ENE of Fort Louise Augusta and about 1.5 miles off St. Croix. The island is on the S edge of a coral bank which extends W about 0.8 mile, then sweeps around a mile N of the island. This forms **Buck Island Bar,** 1.5 miles long. Shoals extend about 1.8 miles E of Buck Island. The island lies on the route from E to Christiansted Harbor. A light, 360 feet above the water, is shown from a red skeleton tower on the summit of the island. Buck Island lies within the Buck Island Reef National Monument, the boundary of which is marked by private buoys.

Diedrichs Point, the S extremity of Buck Island, is low. Several spots with 12, 17, and 20 feet lie from 1 mile E of the island to 1.7 miles ESE of it. **Buck Island Channel** lies between Buck Island and the adjacent reefs and St. Croix. Moderate-draft vessels may approach it from either N or E. **Channel Rock,** awash, lies 1.8 miles W of East Point.

The N coast of St. Croix from Pull Point to East Point is fringed by a coral reef. Behind this reef are several anchorages for small boats, but local knowledge is necessary to use them. Entrance is made at **Coakley Bay,** a bight 0.8 mile E of Pull Point. The opening in the end of the reef can be entered by steering **180°** with Coakley Mill directly ahead. A light in about 17°46.1′N., 64°38.2′W., marks the E side of the opening and should be kept close aboard when entering. In May 1982, a large coral head, covered 7 feet, was reported about 100 to 150 yards W of the light.

Pow Point, 1.5 miles E of Pull Point, is rocky with a 130-foot hill 250 yards inland. **Tague Point,** 1.1 miles E of Pow Point, is sharp and rocky with a 155-foot hill 0.2 mile SSW. **Tague Bay,** 0.7 mile wide between the bluffs at Tague Point and **Romney Point,** has a curving beach of sand and shingle. The bay provides anchorage for light-draft vessels entering behind the reef through a break NE of Tague Point. A private yacht club and the West Indies Laboratories of Fairleigh Dickinson University research pier are along the shore. Water and ice are available.

Cottongarden Point, a prominent rocky point with a 55-foot knoll, is 1.6 miles E of Tague Point and opposite the E end of the long reef paralleling the coast. **Cramer Park,** a public beach and park operated by the Insular Government, is W of the point.

East Point, the E extremity of St. Croix, is a bluff. A 225-foot hill is 100 yards WNW, and **Morne Rond,** 380 feet high, is a conspicuous round hill near the point.

Lang Bank, an extensive bank 3 to 5 miles wide stretches 9 miles NE from the E end of St. Croix Island. Along its edge is a wall-sided narrow coral ledge which, commencing about 3 miles E of Buck Island, sweeps around in a convex form for about 14 miles, terminating 2 miles S from East Point. Its N part is from half a mile to 1 mile wide, with depths of 5½ to 10 fathoms. The S portion is about 100 to 600 yards wide, with 7 to 10 fathoms on it. The shoalest part of Lang Bank breaks in heavy weather and should be given a wide berth.

From East Point, the S coast of St. Croix Island trends WSW for 20 miles to Southwest Cape. This coast is bordered by a dangerous broken coral reef which extends from East Point to nearly abreast of Long Point, 3.6 miles E of Southwest Cape. Behind this reef are several anchorages suitable for small local boats. Along the coast are many small bights and indentations, but all are shallow and do not afford anchorage except for small craft. Many old mills and the aerolight on the SW part of the island are prominent.

Point Cudejarre, a sharp point with a 25-foot bluff and a 120-foot hill NNW, is 0.3 miles SW of East Point. **Grass Point,** 3 miles WSW of East Point, is a long narrow point marked by a 43-foot knob.

Mount Fancy, about 4.7 miles W of East Point, is a conspicuous double hill, 245 feet high, which forms the E point of **Great Pond Bay.** Good anchorage for vessels of 10-foot draft, in hard sand bottom, can be had in this bay. An entrance range is the E tangent of Milord Point in line with Sight Mill; when about 100 yards off the point haul around to **064°**, pass W of a 7-foot shoal 200 yards E of Milord Point, and run for 0.3 mile, anchoring in 13 to 14 feet. **Milord Point,** the west entrance point of the bay, is a promontory of **Fareham Hill,** 192 feet high and prominent.

Vagthus Point, sharp and rocky, is 9.5 miles WSW

of East Point. **Canegarden Bay,** 1.2 miles wide, forms an irregular crescent to the W of Vagthus Point.

In 1980, an offshore oil wharf was under construction 1.4 miles S of Vagthus Point. When completed, the facility will provide 3,000 feet of berthing space along both the N and the S face. Submerged pipelines extend NW from the dock to an oil refinery at the head of Canegarden Bay.

Limetree Bay, close W of Canegarden Bay, is the site of a private deep-draft oil-handling facility operated by Hess Oil Virgin Islands Corporation (HOVIC) and a container terminal owned by the Virgin Islands Port Authority. Large tankers call here to deliver crude oil and to load petroleum and petrochemical products.

Channels.–Limetree Bay Channel, privately dredged, leads from deep water to a large turning basin with E and W basins. The channel is privately marked by a **334°** lighted range visible 4° on each side of the channel centerline and by an auxiliary **334°** lighted range, close E of the first range, visible 4° on each side of the channel centerline, and by lights and lighted buoys. In 1978, the reported controlling depth in the channel was 60 feet with a draft limit of 55 feet.

In 1976, Limetree Bay and vicinity was undergoing extensive modification and dredging. Mariners are advised to exercise caution while navigating the inner harbor area.

Pilotage.–(See Pilotage for U.S. Virgin Islands at the beginning of this chapter.) Pilotage is compulsory. Pilots board vessels about 2.5 miles SSE of Limetree Bay Channel Lighted Buoy 1. Vessels are requested to call HOVIC Marine on VHF-FM channel 9 (156.45 MHz), 10 (156.50 MHz), 11 (156.55 MHz), or 16 (156.80 MHz) for approach procedures and docking instructions. Night entry is limited to vessels not over 100,000 deadweight tons. There are no restrictions on sailings.

Towage.–HOVIC maintains a large fleet of tugs capable of handling vessels to 300,000 deadweight tons.

Quarantine, customs, immigration, and agricultural quarantine matters are handled by representatives from Christiansted who board vessels at their berths. Documents required are the same as at U.S. ports.

Wharves.–A total of nine oil-handling docks are on the E and W sides of a 0.7-mile-long causeway that extends into the basin from the N shore, and a roll-on/roll-off dock is on the N side of the E basin. Reported depths alongside are from 38 to 55 feet at the oil docks and 12 feet at the roll-on/roll-off dock.

A 1,400-foot container wharf and two roll-on/roll-off ramps are 0.3 mile W of the causeway. Depths of 32 feet are reported alongside. Deck heights are 12 feet at the container wharf and 3 feet and 6 feet at the roll-on/roll-off ramps. A 30-ton container crane, 52 acres open storage, and 30,000 square feet covered storage are available.

Supplies.–Dry goods and food supplies are handled by local ship chandlers. Bunker fuels and diesel oil are supplied by the refinery. Limited amounts of fresh water are available.

Krause Lagoon indents the S shore of St. Croix Island immediately W of Limetree Bay and about 12.3 miles WSW of East Point. The bauxite ore and alumina plant at the head of the lagoon, known as **Port Alucroix,** is owned and operated by the Martin Marietta Aluminum Corp. Large vessels call here to deliver bauxite ore and coal fuel supplies, and load alumina.

Channels.–Krause Lagoon Channel, a privately maintained dredged 35-foot channel with dikes paralleling it on either side in the N part, leads from deep water through the reefs to a turning basin and two wharves at the head of Krause Lagoon. The channel is privately marked by lighted buoys, lights, and a **349.5°** lighted range. In 1982, the reported controlling depth was 35 feet with a maximum acceptable draft of 33 feet. Navigation in the channel is limited to daytime only.

Currents.–The current in Krause Lagoon is reported to set W and to vary in velocity with the wind. The current does not completely dissipate until inside Port Alucroix.

Pilotage.–(See Pilotage for U.S. Virgin Islands at the beginning of this chapter.) Vessels are boarded 2.5 miles SSE of Krause Lagoon Channel Entrance Lighted Buoy 1. Vessels desiring a pilot should contact HOVIC Marine on VHF-FM channel 9 (156.45 MHz), 10 (156.50 MHz), 11 (156.55 MHz), or 16 (156.80 MHz) for approach procedures and docking instructions.

Towage.–Tugs are supplied by HOVIC Marine.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Wharves.–The concrete bulkhead wharves on the E and W sides of the terminal each have 1,000 feet of berthing space. The berths on the W side of the terminal are used for discharging bauxite and coal, and those on the E side are used for loading aluminum. A Government pier, open to the public for launching small craft, is on the E side of the entrance channel opposite the turning basin.

Supplies.–Emergency supplies of bunker fuels, diesel oil, and freshwater are available. The terminal has no ballast disposal facilities.

Dumping of waste oil in the harbor is prohibited. Masters are cautioned that the discharge of any oil, oily waste, or other refuse in the harbor can result in serious damage to the shore plant cooling water intakes and every precaution should be exercised to prevent such an occurrence.

Cross Channel, privately dredged, connects Limetree Bay and Krause Lagoon Channel. In 1982, the reported controlling depth was 35 feet with a maximum acceptable draft of 33 feet. In 1982, a container terminal was reported under construction on the N side of the channel.

Chart 25644.–Long Point, 3.6 miles E of Southwest Cape, is a low projecting point covered with

grass. W of the point is **Long Point Bay,** which is shoal. **Southwest Shoal,** 1.2 miles S of Long Point, has only 6 feet of water over it, and E to Krause Point the outlying reefs are the most dangerous along the S coast. They generally break, but as several shoal spots are S, the area should be approached with caution.

The area out to the 100-fathom curve between Long Point and Southwest Cape and between Long Point and the entrance to Krause Lagoon Channel and Limetree Bay Channel is used extensively by recreational and commercial trap and line fishermen, both day and night. Most of the trap and line fishing is done in water less than 15 fathoms. Large vessels are requested to exercise caution and to consider these fishing activities when approaching and departing from the industrial complex in Krause Lagoon and Limetree Bay.

A channel, privately marked and entered about 2.2 miles 118° from Southwest Cape, leads in an E direction to mooring buoys about 1.1 miles E of Long Point; channel and mooring buoys are maintained by Texaco Caribbean Inc., St. Croix, Virgin Islands. The channel is primarily for the use of tankers arriving at the mooring buoys.

Southwest Cape, the SW extremity of St. Croix Island, is a low point projecting 1.2 miles in a SW direction. The point is covered by low bushes and trees. A shoal area, sand and coral, extends S, with a least depth of 9 feet, at a distance of 0.8 mile from the shore. A buoy marks the SW extremity of this shoal. The 5-fathom curve is 1.6 miles S of Long Point and nearly a mile S of Southwest Cape, but W of the point it is only 200 yards off. The 100-fathom curve lies nearly 2.5 miles SW of Southwest Cape. **Southwest Cape Light** (17°40.8′N., 64°54.0′W.), 50 feet above the water, is shown from a red skeleton tower near the tip of the cape.

Caution is necessary in approaching Southwest Cape. The point, fringed by shoals, is low for some 3 or 4 miles to the high land of the interior. This may cause the mariner to overestimate his distance from the coast, especially at night.

Sandy Point, the W extremity of the island, is 0.5 mile NNW of Southwest Cape.

The W coast of St. Croix Island trends NNE from Southwest Cape for 2.4 miles to Frederiksted, thence NW for 2 miles, and then curves NE for 2 miles to Hams Bluff. The coast consists mostly of sand beach with the land back of it sloping gently upward in the S part and the hills gradually working W to the shore in the N part. The slopes are covered by grass and bushes. The beach is steep-to with the 10-fathom curve lying 0.5 mile or less offshore.

Frederiksted, on the W coast of St. Croix Island 2.4 miles N of Southwest Cape and 3.7 miles S of Hams Bluff, is a port of call for cruise ships, Government vessels, and occasionally for small cargo vessels. Large vessels can dock at the long municipal pier in the 4-mile-wide open roadstead. Imports include building materials and vehicles.

Prominent features.–Frederiksted Harbor Light (17°43.0′N., 64°53.1′W.), 42 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark at the inner end of the municipal pier. **Fort Frederik** is a red brick structure 125 yards NE of the light.

A radar tracking station (17°43′13″N., 64°51′18″W.), illuminated at night, is on **St. George Hill** about 1.5 miles E of Frederiksted. The station is prominent, especially at night, when it is visible for over 20 miles.

Anchorages.–Vessels anchor in depths of 30 to 60 feet NW and SW of the municipal pier according to draft. Small boats anchor near the waterfront. Anchorage between the municipal pier and the warping buoys to S is prohibited.

Currents.–The Frederiksted harbor pilot reports that a westerly current from 225° to 315°, with a set of not more than 1 knot, and 2 knots in extreme cases, may be experienced when approaching the pier. In addition, the pilot reports that there seems to be an almost ever present circular current beginning about 0.25 mile off the pier with an initial set to the S and a final set to the N when abeam of the pier's end.

Restricted areas have been established off the W coast of St. Croix Island, N and S of Frederiksted Harbor. (See 207.817, chapter 2, for limits and regulations.)

Routes.–From S, the shoals S of Southwest Cape will be avoided by staying a mile or more offshore. At night stay in the white sector of Frederiksted Harbor Light on the approach to the pier.

Pilotage.–(See pilotage for U.S. Virgin Islands at the beginning of this chapter.) Vessels are boarded 1 mile off the municipal pier.

Quarantine, customs, immigration, and agricultural quarantine.–(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A municipal hospital is at Frederiksted.

Harbor regulations.–Local rules and regulations for Frederiksted harbor are enforced by a **dockmaster,** whose office is on the shoreward end of the municipal pier. Copies of the regulations may be obtained from the Virgin Islands Port Authority, Gallows Bay, Christianstead, St. Croix, U.S. Virgin Islands 00820.

Wharves.–A 1,600-foot pier extends from the waterfront at Frederiksted. A 242-foot loading platform (pierhead) is about 250 feet inshore of the outer end. Depths along both sides of the pier decrease from about 42 feet at the outer end to 30 to 26 feet alongside the loading platform, and thence lesser depths inshore of the E end of the loading platform. In heavy winds, large vessels sometimes drop their outboard anchor to assist in maneuvering alongside.

The pilot advises that with strong winds from the W, and especially from the NW, the pier is not a safe berth because of the unusual rise and fall of the water at dockside. Under these conditions, a strong wind-driven current with an easterly set can be expected. Mariners should approach the pier at a 45°

angle to avoid damage resulting from scraping along the pier.

A roll-on/roll-off facility with landing ramp is on the S side and about 400 yards E of the seaward end of the municipal pier. A line of pilings and dolphins extends about 80 yards SW from the ramp. Depths in the approach and alongside the ramp are about 14 feet.

A 125-foot-long by 20-foot-wide landing platform for ships' tenders on the S side of the municipal pier about 90 yards E of the roll-on/roll-off facility has reported depths of 10 feet alongside.

Supplies and repairs.–Water, bunker fuels, diesel oil and gasoline can be trucked in from nearby. Limited above-the-waterline repairs are available.

Submarine cables extend WSW to the 100-fathom contour from **Sprat Hole,** 1.6 miles N of Frederiksted. Mariners are requested not to anchor in this area.

Chart 25641.–A general description of the **British Virgin Islands** is included in this chapter for a convenient reference to both the United States and British groups. Complete information is included in Pub. No. 144, Sailing Directions (Enroute), Caribbean Sea, published by the Defense Mapping Agency Hydrographic/Topographic Center, and West Indies Pilot, Vol. II, published by the British Ministry of Defense Hydrographic Department.

Little Tobago Island, 3.5 miles NE of Hans Lollik Island, is nearly 0.5 mile long and 279 feet high. It is steep-to except on its SE side. **Tobago Island,** 1 mile NE of Little Tobago Island, is 0.8 mile long and about 538 feet high. A small rock, awash and steep-to, is about 100 yards off the N point. The SE side of the island is fringed with coral, but elsewhere the coastal cliffs are steep-to. A few rocks lie close off the NW point.

Watson Rock, steep-to and 89 feet high, is about 0.3 mile W of the SW point of Tobago Island. **King Rock,** 0.6 mile S of the SW point, is awash and steep-to. It is near the S end of a bank, over which are general depths of 6 to 9 fathoms, extending about 0.7 mile S of Tobago Island.

Mercurius Rock, 0.8 mile E of the N end of Tobago Island and the only danger between that island and Jost Van Dyke Island, is small and steep-to. It is covered 7 feet. When using the passage between Tobago and Jost Van Dyke Islands, the east side should be favored.

Jost Van Dyke Island, about 2 miles E of Tobago, is 3.5 miles long, lofty, rugged, and steep-to. Near the middle of the N part a summit rises to 1,070 feet. **Great Harbor** and **Little Harbor,** on the S side of the island, are suitable only for small vessels. Great Harbor is about 0.5 mile in extent, with depths of 4 fathoms to about 0.2 mile from its head, and Little Harbor has depths of about 8 fathoms inside the entrance.

Little Jost Van Dyke Island, connected by a shallow ledge to the NE end of Jost Van Dyke Island, is 367 feet high. **Green Cay,** 108 feet high, is a small islet close E of Little Jost Van Dyke Island. **Sandy Cay,** nearly 1 mile S of Green Cay, is 66 feet high at its E end. It is surrounded by shoal water, and foul ground extends 200 yards from the E and W ends. The channel between it and Jost Van Dyke Island is 0.6 mile wide; the island shore must be favored.

Tortola, the largest of the British Virgin Islands, is 10 miles in length and 3.5 miles wide. **The West End,** the W extremity, is about 2 miles NE of Mary Point, St. John. The highest summit in the Virgin Islands is 1,740-foot **Mount Sage** in the W part of the island; rugged hills rise somewhat abruptly from the shores on all sides.

Great Thatch Island, about 0.6 mile N of Mary Point from which it is separated by The Narrows, is 1.7 miles long, and near its center rises to a peak 613 feet high. The E point is bold and steep-to. **Thatch Island Cut,** the channel between Great Thatch and The West End, is deep. Sailing vessels should not attempt Thatch Island Cut from the N except with a S current, as the eddies and currents are very strong.

The Narrows, between St. John Island and Great Thatch Island, give access to the channel which extends between Tortola and St. John and leads to Sir Francis Drake Channel and Flanagan Passage. Tidal currents in The Narrows and the passage E attain velocities of from 2 to 4 knots.

Little Thatch Island, 0.4 mile S of The West End, is about 0.5 mile long. **Frenchman Cay,** about 0.3 mile E of Little Thatch Islet, is 400 feet high. **Sopers Hole** is a deep little basin, 1 mile long and about 0.3 mile wide, between Frenchman Cay and Little Thatch Island, on the S, and the W end of Tortola, on the N side. At the E end of Sopers Hole the muddy bottom is the best holding ground. There is a small pier on the N side of Sopers Hole.

In the center of Sopers Hole is a depth of 13 fathoms which gradually decreases to 6 fathoms at 100 yards from the shore; the bottom is sandy. The passage between Little Thatch Island and Frenchman Cay is from 6 to 7 fathoms deep.

Vessels from S may enter Sopers Hole by the passage between Frenchman Cay and Little Thatch Island, or by that between the latter island and the W end of Tortola. These passages are not difficult, but the W ends of Tortola and Little Thatch Island must be given a berth of more than 200 yards.

Sailing vessels taking Thatch Island Cut should approach it with a S current, which will shoot a vessel into it. A vessel coming from the E will find the passage E of Little Thatch Island the best, as she will have a leading wind, can luff up closer under the W end of Frenchman Cay, which is steep-to, and shoot into Sopers Hole with either a S or N current. When leaving, pass out to the N through Thatch Island Cut, or, if bound into Sir Francis Drake Channel, round the W end of Little Thatch Island at a distance of somewhat more than 200 yards and haul to the wind. With the E tidal current of 3 or 4 knots on the lee beam, she will have a fair set through the channel between St. John and Tortola. The W tidal current has a similar velocity. There is no danger on either shore. A vessel must be pre-

pared to meet the gusts and baffling winds which rush out from the valleys of Tortola.

On the NW side of Tortola are numerous small bays or bights, of which Cane Garden Bay, the largest, is the only one on the N side of the island that affords anchorage even for small vessels. Across its entrance is a bar with 12 feet of water, inside of which are depths of 18 to 24 feet. A 5-fathom shoal lies in the approach to the bay, about 0.4 miles N of the S entrance point.

Chart *25611.-Road Harbor, on the S side of Tortola 6 miles east of its W end, is the only port of entry in the British Virgin Islands for all vessels. Sopers Hole at the W end of Tortola is a limited port of entry. The harbor is exposed SE, but the other sides are surrounded by high hills with their spurs reaching the shores.

Road Town, on the W shore of Road Harbor, is the capital of the British Virgin Islands. Imports include foodstuffs, building material, and general merchandise. Livestock are exported.

Prominent features.-There are four prominent landmarks in Road Town, these being Fort Burt Hotel, a group of four pink buildings, situated on the W side of the harbor on Burt Point, the Administration Building (Customhouse), a white flatroofed building standing behind the main wharf, and about midway between these two positions stands the Administration Residence (Commissioner's House), an isolated, white concrete building standing on a low knoll. To the N of the Administration Building, the white belfry of the Anglican church shows above Wickham Cay, a low mangrove-covered islet, in the NW part of the harbor. The floodlighted oil tanks on Shirley Point on the E side of the harbor N of Scotch Bank are reported to be conspicuous.

Channels.-The principal channel into Road Harbor is between Scotch Bank and Lark Bank, thence on the lighted range to the pier at Road Town. Small vessels also enter the harbor between the lighted buoy marking the outer limits of the coral reef about 400 yards E of Burt Point and Lark Bank. The controlling depth is 36 feet to the anchorage area, but only 7½ feet to the dock.

Anchorages.-Deep-draft vessels anchor in depths of 8 to 12 fathoms inside of Scotch and Lark Banks. Anchorage may also be obtained in the N part of the harbor, N of Harbor Rock, in about 8 fathoms. Vessels proceeding to the deep-draft. anchorage should steer **321°** from a point about 1.5 miles 180° from Half Moon Point until the lighted buoy off Burt Point is abeam. Ships desiring to make the N anchorage should proceed as to the deep-draft anchorage until the Commissioner's House is abeam. Ships desiring to anchor S of Harbor Spit should proceed as previously mentioned until the range lights come in line 290°, which will lead to a depth of about 9 fathoms between Burt Point and Harbor Spit. The best berth is just S of the range line.

Careening Cove, in the lee of the dry reef off Burt Point, is small but well sheltered, with depths of 4 to 6 feet.

Dangers.-Although depths of 36 to 48 feet can be taken to the anchorage areas in Road Harbor, irregular bottom, and many patches of rock and coral, with depths of 13 to 36 feet lie within about 1.5 miles of Hog Valley Point (Hog Point) and 2 miles of Slaney Point.

Depths of from 22 to 25 feet will be found over extensive shoals with limits of about 1.1 miles S of Hog Valley Point and 1.1 miles S of Slaney Point. A 17-foot patch is about 0.5 mile SE of Hog Valley Point, and a 18-foot patch is about 0.75 mile SW of Slaney Point.

A coral reef about 250 yards wide and partially covered by mangrove extends NE from Slaney Point to Burt Point; a lighted buoy marks the outer limits of the reef at Burt Point.

Denmark Banks, 0.5 mile SE of Burt Point, has two rocky patches with a least depth of 13 feet. The Bluff, bearing 073° and open S of Nora Hazel Point, leads S of these banks. **Lark Bank,** 0.4 mile E of Burt Point, has a least depth of 15 feet over a coral head. **Scotch Bank,** 0.8 mile E of Burt Point and marked by a buoy at its S edge, has a least depth of 10 feet.

Harbor Spit, 0.4 mile N of Burt Point, is an extension of the shoal water in the NW part of the harbor. Depths on the spit are from 4 to 17 feet; a buoy marks the SE end of the spit. **Harbor Rock,** 250 yards SE from the end of the spit, has a least depth of 20 feet.

Tides.-The tides in Road Harbor are chiefly diurnal, and the range is small.

Pilotage.-No licensed pilots are available, but reliable mariners are available to bring ships into the harbor.

Wharves.-A 180-foot cargo pier at Road Town has depths of 7½ feet at the head and on the sides. A 106- foot passenger pier to the S has depths of 7 feet alongside. Small sloops are used for lighterage when necessary.

Supplies.-Limited amounts of groceries and water are available. Gasoline and diesel fuel can be obtained from offshore pipelines on the NE side of Road Harbor.

Repairs.-A small marine railway in Careening Cove can handle boats about 40 feet in length and 6 feet in draft. Another marine railway in **Bauger Bay,** on the NE side of Road Harbor, can handle small boats of 6-foot draft for repairs.

Communications.-Daily passenger launch service is maintained between Road Harbor and St. Thomas. Radiotelephone and radiotelegraph communications are available. There is air service between other islands.

Chart 25641.-Guana Island, 810 feet high and 1.7 miles long, is about 0.3 mile N of Tortola. The passage between these islands has a depth of about 29 feet in the fairway. On the W headland separating **White Bay** and **Muskmelon Bay** is a large rock shaped like an Iguana's head, known locally as **Lizard Head Rock.** A safe anchorage in 7 to 12 fathoms is in the entrance to White Bay.

Great Camanoe , a mile E of Guana Island, is

about 2.5 miles long. It consists of two parts connected by a low narrow neck of land between **Lee Bay** and **Cam Bay. Scrub Island** is close E of Great Camanoe, from which it is separated by a narrow channel with many shoals and rocks.

Little Camanoe and **Marina Cay** are SW and SE, respectively, of the S end of Great Camanoe. They are all connected to the N side of Beef Island by a shoal bank on which are several rocks and reefs. The channel N of Beef Island is quite open and easily navigated by large yachts. **Shallow Rock** is a 3-foot shoal off the W point of **Trellis Bay** on the N coast of Beef Island. A light is shown from **Bellamy Cay** in the middle of the bay. A small marine railway is in the bay.

A hotel is on Marina Cay; launches, yachts, air compressors for aqualungs and other diving equipment are available.

Beef Island, about 2.4 miles long and 660 feet high in its E part, is separated from the E end of Tortola by a narrow shoal channel which should be used only with local knowledge. In 1973, a bascule bridge with an unknown clearance was constructed across the channel. **The Bluff,** the S extremity of the island, is a good landmark for vessels bound to Road Harbor. During strong NE winds excellent anchorage will be found in the lee of Beef Island, about 0.7 mile W of The Bluff. An airfield is on Beef Island. **Buck Island,** 1.1 miles SW of Beef Island and close off the SE side of Tortola, is 170 feet high at its SE end.

Sir Francis Drake Channel is a passage bounded on the NW by Tortola and the islands off its E end, and on the SE by the chain of islands extending between Virgin Gorda and St. John. It can be entered by most vessels through any of the passages in the latter chain of islands or the passages on either side of **Dog Islands.**

E of Buck Island the depths are regular, about 13 to 14 fathoms, but W of that island the bottom is very irregular, especially in the approach to Road Harbor. In the S portion of the W part, the general depths are 17 to 27 fathoms, but there are several coral patches with depths of 4 to 10 fathoms. Anchorage is found anywhere in this channel E of Buck Island, but the bottom is hard, being a thin bed of sand over coral, and therefore requires a good scope of chain.

In Sir Francis Drake Channel there is scarcely any current except close inshore, where small vessels may gain some advantage from it when beating to windward during the NE flow.

Flanagan Passage, the westernmost of the passages leading into Sir Francis Drake Channel from the S, is a group of channels between St. John and Norman Islands. It and connecting passages have been described previously in this chapter.

Norman Island, 1.6 miles E of Flanagan Island, is about 2.3 miles long and 440 feet high near its SW extremity. Foul ground is close off its NE and SW ends. **Ringdove Rock,** covered by 2 fathoms, is about 300 yards W of the NW point of Norman Island. **Santa Monica Rock,** 0.7 mile SW of Norman Island, is a small patch 1¾ fathoms deep.

Pelican Island, 180 feet high, is about 0.5 mile N of Ringdove Rock. About 200 yards W of it are **The Indians,** four remarkable small pinnacle rocks, 50 feet high. A 6½-fathom shoal lies 0.7 mile NNW of Pelican Island.

The Bight, a small inlet in the W side of Norman Island, provides excellent anchorage. The shores are steep-to, and Ringdove Rock is the only danger when entering. The wind in the lee of the island, however, is so baffling that sailing vessels may have to anchor at the entrance and warp in. Although the bight is open to NW, St. John Island prevents any sea from setting in, and holding ground is good. Safe anchorage with the regular trade wind may also be found in **Privateer Bay,** on the W side of Treasure Point.

Peter Island, NE of Norman Island, is in the form of an elbow, 440 feet high at its W part. **Carrot Rock,** 84 feet high, lies about 0.3 mile off the S end of the island, and **Carrot Shoal,** covered 1¾ fathoms, is about 0.4 mile SW of the rock. Some 6-fathom patches lie within 0.5 mile of the N side of the island.

Great Harbor, a small bight on the N side of Peter Island, is about 0.5 mile in extent. It may be entered easily at any time. Deep water is close to shore, and the holding ground is excellent. **Little Harbor,** a short distance W of Great Harbor, is smaller and more exposed, but has characteristics very similar to the latter.

Owing to the shape of Peter Island, the passage between it and Norman Island is rather crooked, but has a least depth of 6 fathoms. It is seldom taken by sailing vessels. Carrot Shoal can be avoided by keeping Norman Island abroad.

Dead Chest, nearly 0.5 mile off the NE end of Peter Island, is an islet 200 feet high; a group of rocks extends about 0.2 mile S from its E end. A 4½-fathom patch lies about 0.7 mile NW of the islet.

Blonde Rock, covered 1 1/2 fathoms, is about 0.6 mile ENE of Dead Chest. **Salt Island Passage,** 1.5 miles wide between Dead Chest and Salt Island, is generally smooth. Blonde Rock can be avoided by keeping 0.5 mile from the E side of the passage.

Salt Island, about 2 miles NE of Peter Island, rises to a height of 380 feet in its N part. A rock awash lies close off its NE end. The passage between Salt and Cooper Islands is constricted to a width of about 0.3 mile by the rocks and an islet off the nearest point of Cooper Island. This passage should never be attempted by a sailing vessel. **Cooper Island,** NE of Salt Island, is 1.7 miles long and 530 feet high at its S end. **Dry Rocks** are 300 yards off the NE side of Cooper Island, and **Carval Rock,** 110 feet high and steep-to, is 0.8 mile ENE of **Markoe Point,** the S point of Cooper Island.

Ginger Island, about 1 mile E of Cooper Island, is 500 feet high and steep-to at its NE and SE ends. Some rocks lie close off its W end. The passage between Ginger and Cooper Islands may be taken by powered vessels, but sailing vessels may meet trouble.

Round Rock, 220 feet high, is the southernmost of a chain of islets and rocks extending SSW from the SW end of Virgin Gorda. **Round Rock Passage,** between Ginger Island and Round Rock, is the easternmost of the passages leading into Sir Francis Drake Channel from S. It is the best for vessels coming from S. The passage is about 0.7 mile wide and easily located from its position in relation to Fallen Jerusalem, 1.2 miles to the NE. Sailing vessels will find it advantageous to use this passage as the islets on the weather side offer no obstruction to the prevailing winds. The SE and NW tidal currents attain a velocity of about 1 knot.

Chart *25609.–Virgin Gorda is easily distinguished on making the land, as it rises gradually to the distinct summit of 1,370-foot **Virgin Peak.** The island, extremely irregular in outline, consists of a central portion from which there are peninsulas extending E and SSW. The E peninsula consists of irregular rugged hills which terminate at **Pajaros Point** in an astounding pinnacle rock 120 feet high. The SW peninsula is more regular in outline and 250 to 450 feet high, but it is joined to the central portion by an isthmus only 200 yards wide.

The W side of the SW peninsula consists of immense granite blocks which lie scattered about on the shore. **Colison Point** is the NW extremity of the peninsula. The islets and rocks to the S as far as Round Rock, 2 miles distant, are also of granite; the largest, about 140 feet high, nearly 0.5 mile from the S end of the island, is named **Fallen Jerusalem** because of its resemblance to a town in ruins.

Several islets are in the N part of Sir Francis Drake Channel. **Great Dog,** the southeasternmost, is 270 feet high and steep-to at its W end; rocks fringe its N and S sides. **George Dog,** the northernmost, is 250 feet high and has some detached rocks about 0.2 mile N of it. **Cockroach Rock** lies about 0.2 mile W of it. **West Dog,** the westernmost, is 150 feet high, with its W side bold and steep-to.

Tow Rock, 1.2 miles WNW of West Dog, has a depth of 2½ fathoms over it but is steep-to; it may be avoided by passing close to West Dog or Scrub Island.

Seal Dogs, 1.3 miles NE of George Dog and 1 mile W of **Mountain Point,** the NW extremity of Virgin Gorda, are a cluster of three small islets. The N islet is the smallest and only 6 feet high, the southeasternmost is 74 feet high, and the westernmost and largest is 100 feet high. The passage is clear on either side of the group.

In **Western Roads,** off the W side of Virgin Gorda, are two excellent anchorages for vessels of any draft. The N is situated in the bight between Mountain and Colison Points, and is partially protected to the NW by Dog Islets. It seldom, however, blows hard to the W of N, and the only thing to be prepared for is the ground swell in the winter when it is better to anchor in about 13 fathoms of water, midway between Great Dog and Virgin Gorda. Here, with good ground tackle and a long scope of chain, there will be nothing to fear, as the rollers seldom are accompanied by much wind.

The S anchorage, in 13 fathoms, between Colison Point and Fallen Jerusalem, is the best for sailing vessels because, if necessary, they can weigh and run out to W with more ease than from the N anchorage. The holding ground is good at both places, and the water is usually smooth. A small patch of 4¼ fathoms lies 0.4 mile W of Colison Point, and **Burrow Rock,** with 1½ fathoms, is 1 mile S of Colison Point. The anchorages may be approached from either N or S as the passages are clear except between West Dog and Scrub Island, where Tow Rock lies. On the N side of Virgin Gorda are several small slightly wooded islets and cays.

Chart *25610.–Mosquito Island, about 0.6 mile long and 290 feet high, the highest of the islets off the N side of Virgin Gorda, is 1 mile ENE of Mountain Point. The channel separating it from **Anguilla Point,** on Virgin Gorda, is shoal and only 175 yards wide. The NE end is fringed by a reef, and a chain of small detached rocks extends 300 yards NNE. **Mosquito Rock,** the outermost, is 23 feet high.

Colquhoun Reef, which dries in patches, extends nearly 0.6 mile SE from Mosquito Rock, and is steep-to on its NE side. On the SW side is a small sandy islet, about 2 feet high and sparsely covered with coarse grass. **Prickly Pear Island,** the largest of the islets off the N side of Virgin Gorda, is about 0.8 mile E of Mosquito Island. It is 1 mile long and 237 feet high. **Asbestos Point,** its E end, is 0.2 mile from the nearest part of a small peninsula of the E arm of Virgin Gorda, and the channel between is shallow and foul. In the middle of it is **Saba Rock,** 15 feet high.

Cactus Reef, extending 300 yards W of Cactus Point, the NW end of Prickly Pear Island, is steep-to on its N side; the sea breaks on it even with a slight swell.

Gorda Sound, is an excellent and roomy harbor between Virgin Gorda on the S and Mosquito Island, Colquhoun Reef, and Prickly Pear Island on the N. It is sheltered from all winds and protected from rollers. As there is no health officer or other Government representative, vessels before visiting it should obtain pratique at Road Harbor, Tortola.

In the approach are uniform depths of 9 to 12 fathoms. The entrance between the 3-fathom curves of Colquhoun and Cactus Reefs is 200 yards wide with depths of 19 to 35 feet. Deeper water is inside the entrance.

The W portion of the sound is foul, with several shoals of 2 to 3 fathoms and some coral patches of less than a fathom. **Gorda Rock,** 0.3 mile SE of Colquhoun Reef, has a least depth of 30 feet. **Creek Shoal,** off the S side of the entrance to **Gun Creek,** is of coral sand with a least depth of 21 feet.

Oyster Rock, about 150 yards off the S shore in the approach to Biras Creek, is a pinnacle rock with only 2 feet of water on it, surrounded by a shallow patch. **Biras Creek** is in the SE corner of Gorda Sound.

The tide in Gorda Sound is chiefly diurnal. The tidal currents at the entrance are seldom more than 0.5 knots, but the inward current sets toward Prickly Pear Island. Between Mosquito Island and Anquilla Point, the eastgoing current has a velocity of from 1 to 1.5 knots.

Routes.–Powered vessels coming from the E approach Gorda Sound by Necker Island Passage, which lies between Virgin Gorda and Herman Reefs. The approach is dangerous at night. Bring Virgin Peak to bear **261**°and steer for it on that bearing until the N extremity of Necker Island bears 279°, distant 6.8 miles. Then alter course to pass at least 0.5 mile N of Necker Island. When Virgin Peak bears 211°, steer for it until Gnat Point bears 177° and Mosquito Rock bears 255°, then steer for the center of the entrance channel between Cactus and Colquhoun Reefs, which should be entered on a **170**° course; no marks can be given for this narrow channel, but with a favorable light no difficulty should be experienced in passing safely through it.

Coming from N it is better to pass W of Anegada and approach with Virgin Peak on a bearing between 132° and 155°.

Sailing vessels can follow the direction for powered vessels, but if coming from the N and passing E of Anegada, they should not attempt to pass close to windward of Horse Shoe Reef. This has caused many disasters.

Eustatia Island, on the shoal bank E of Prickly Pear Island, is 172 feet high and 0.3 mile long. Its N side is foul for 300 yards off, from which a barrier reef extends to Pajoros Point. Outside this foul ground there are two detached patches with depths less than 3 fathoms, one about 0.6 mile ENE and the other about 0.5 mile E of the E extremity of Eustatia Island. These patches lie on an extensive bank with depths of from 3 to 5 fathoms.

In the lee of this barrier reef is **Eustatia Sound,** in which small vessels will find safe anchorage. The main entrance is through a small cut in the reef about 0.5 mile E of Eustatia Island; there are also several other small passages through the reefs which can be used, but these should be avoided by strangers because the ground is foul for some distance outside the entrance. Several rocks and shoals are in the sound.

Virgin Sound, a channel 0.2 mile wide, extends between the reefs and shoals N of Prickly Pear and Eustatia Islands and those S of Necker Island. It affords good temporary anchorage in 7 to 8 fathoms, but care must be taken to avoid the reefs on either side. The tidal currents set E and W with a velocity of about 0.5 knot.

Necker Island, 0.7 mile N of Eustatia Island, is nearly 0.5 mile long and 107 feet high at its N part. The NE side is fairly bold and steep-to, with depths of 6 to 10 fathoms within 300 yards. The SE and W sides are foul and dangerous up to 0.5 mile offshore. Foul ground, near which is a reef that dries, extends about 0.3 mile S of Necker Island.

The Invisibles, about 0.8 mile E of Necker Island, are three small rocky heads covered 4 to 5 feet. Depths of 5 to 8 fathoms are between the Invisibles and the reefs on the E side of Necker Island; greater depths are close off the E end. Caution is required when navigating in this area as the rocks do not always break and are hard to see.

Chart *25609.–Anegada, the northeasternmost island of the Virgin Group, lies with **East Point,** its SE end, about 12 miles NNE of Pajaros Point. Anegada is 9 miles long, about 30 feet high, and covered with brushwood except at a few places cleared for cultivation. Numerous saltwater lagoons are in the W interior. The principal settlement is on the S side, 2.5 miles from East Point.

The island is about 1.5 miles within the edge of the Virgin Bank, but the depths decrease so rapidly that sounding is of little help. The island is low, and owing to the strength and irregularity of the tidal currents in the vicinity, it is extremely dangerous to approach at night.

Anegada is skirted on its N side by a narrow barrier reef which is about 0.1 mile off at **Soldier Point,** the N point, and 1.5 miles E at East Point. Thence **Horse Shoe Reef,** a most dangerous reef upon which many vessels have been lost, extends SE for nearly 8 miles. From its SE end detached coral heads and shoal ledges extend 4.5 miles SW, where they terminate in Herman Reefs, which break only with a swell or a strong breeze. Horse Shoe Reef breaks in any weather.

The White Horse is a heap of white dead coral, 3 feet high, 2 miles W of the elbow of Horse Shoe Reef.

The edge of the bank is 2.5 miles E of the elbow of Horse Shoe Reef. Here are depths of 34 fathoms close within the 100-fathom curve, and 10 fathoms about 1 mile farther in. Abreast Herman Reefs, the edge of the bank is little more than a mile distant. The S end lies 5.5 miles ENE of Pajaros Point. A detached 5-fathom patch is 0.7 mile S of the reefs.

Robert Reef, 3.5 miles W of Herman Reefs, is a small rocky patch with 4½ fathoms on it. Another small rocky head, with 3¾ fathoms, is 1.1 miles NNE of this reef. **Hawks Bill Bank,** about 2 miles NNW of Robert Reef, is a small rocky ledge with 2¾ to 5½ fathoms.

The reef skirting the N side of Anegada terminates about 300 yards off **West End,** but the S side of the island is foul with detached coral patches lying up to 3.5 miles offshore. A 5-fathom patch is 3.3 miles W of West End.

Good temporary anchorage may be found in 5 to 6 fathoms about 1 mile off West End. During the period of rollers, October to May, however, it is advisable to anchor S of the island. The bank W of Anegada is chiefly fine sand, and in good weather vessels may anchor on it in safety, taking care to avoid the dangers.

APPENDIX

Sales Information.–National Ocean Service publications and nautical charts are sold by NOS and its authorized sales agents in many ports of the United States and in some foreign ports. Mail orders should be addressed to National Ocean Service, Distribution Branch (N/CG33), 6501 Lafayette Avenue, Riverdale, Md. 20737, and accompanied by a check or money order payable to NOS, Department of Commerce. Remittance from outside of the U.S. should be made either by an International Money Order or by a check payable on a U.S. bank. Chart catalogs, which include a listing of authorized sales agents, are free upon request. The National Ocean Service maintains over-the-counter cash sales offices at 6501 Lafayette Avenue, Riverdale, Md. 20737; at 6001 Executive Boulevard, Room 526, Rockville, Md. 20852 (small orders only); at 439 West York Street, Norfolk, Va. 23510; at 1801 Fairview Avenue East, Seattle, Wash. 98102; and at 701 C Street, Box 38, Room F106, Anchorage, Alaska 99513.

National Ocean Service Offices

District of Columbia (Headquarters): Assistant Administrator, National Ocean Service, NOAA, Herbert C. Hoover Bldg., Room 5805, Washington, D.C. 20230.

Rockville: Director, Charting and Geodetic Services, National Ocean Service, NOAA, 6001 Executive Boulevard, Rockville, Md. 20852.

Norfolk: Director, Atlantic Marine Center, National Ocean Service, NOAA, 439 West York Street, Norfolk, Va. 23510.

Seattle: Director, Pacific Marine Center, National Ocean Service, NOAA, 1801 Fairview Avenue East, Seattle, Wash. 98102.

Charts and Publications-National Ocean Service

Nautical Charts (See Chart Catalogs)

United States Coastal and Intracoastal waters, and possessions.

Great Lakes, Lake Champlain, New York State Canals, and the St. Lawrence River–St. Regis to Cornwall, Canada.

Publications (See Chart Catalogs for latest editions and prices)

Coast Pilots

U.S. Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod.

U.S. Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.

U.S. Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry.

U.S. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West.

U.S. Coast Pilot 5, Atlantic Coast-Gulf of Mexico, Puerto Rico, and Virgin Islands.

U.S. Coast Pilot 6, Great Lakes, Lakes Ontario, Erie, Huron, Michigan and Superior, and St. Lawrence River.

U.S. Coast Pilot 7, Pacific Coast and Hawaii.

U.S. Coast Pilot 8, Alaska-Dixon Entrance to Cape Spencer.

U.S. Coast Pilot 9, Pacific and Arctic Coasts, Alaska-Cape Spencer to Beaufort Sea.

Distance Tables

Distances Between United States Ports, Sixth (1978) Edition.

Tide Tables

Europe and West Coast of Africa.

East Coast, North and South America.

West Coast, North and South America.

Central and Western Pacific Ocean and Indian Ocean.

Supplemental Tidal Predictions–Anchorage, Nikiski, Seldovia, and Valdez, Alaska.

Tidal Current Tables

Atlantic Coast, North America.

Pacific Coast, North America and Asia.

Tidal Current Charts

Boston Harbor.

Narragansett Bay to Nantucket Sound.

Narragansett Bay.

Long Island Sound and Block Island Sound.

New York Harbor.

Delaware Bay and River.

Upper Chesapeake Bay.

Charleston Harbor, S.C., including the Wando, Cooper, and Ashley Rivers.

Tampa Bay.

San Francisco Bay.

Puget Sound, Northern Part.

Puget Sound, Southern Part.

Tidal Current Diagrams

Boston Harbor.

Long Island Sound and Block Island Sound.

New York Harbor.

Upper Chesapeake Bay.

Charts and Publications-Other U.S. Government Agencies

A partial list of publications and charts considered of navigational value is included for the ready reference of the mariner. In addition to the agents located in the principal seaports handling publication sales, certain libraries have been designated by the Congress of the United States to receive the publications as issued for public review.

Nautical Charts

U.S. Waters:

Apalachicola, Chattahoochee and Flint Rivers Navigation Charts, Alabama River Charts, and Black Warrior-Tombigbee Rivers River Charts: Published and for sale by U.S. Army Engineer

District Mobile, P.O. Box 2288, 109 St. Joseph Street, Mobile, Ala. 36628.

Flood Control and Navigation Maps of the Mississippi River, Cairo, Ill. to the Gulf of Mexico: Published by Mississippi River Commission and for sale by U.S. Army Engineer District Vicksburg, P.O. Box 60, U.S. Post Office and Courthouse, Vicksburg, Miss. 39180.

Upper Mississippi River Navigation Charts (Mississippi River, Cairo, Ill. to Minneapolis, Minn.): Published by U.S. Army Engineer North Central Division and for sale by U.S. Army Engineer District St. Louis, 210 N. Tucker Boulevard, St. Louis, Mo. 63101.

Charts of the Illinois Waterway, from Mississippi River at Grafton, Ill. to Lake Michigan at Chicago and Calumet Harbors: Published and for sale by U.S. Army Engineer District Rock Island, Clock Tower Bldg., Rock Island, Ill. 61201.

Foreign Waters: Published by Defense Mapping Agency Hydrographic/Topographic Center; for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Marine Weather Services Charts: Published by the National Weather Service; for sale by NOS Distribution Branch (N/CG33), 6501 Lafayette Avenue, Riverdale, Md. 20737.

Publications

Sailing Directions (Foreign Countries): Published by Defense Mapping Agency Hydrographic/Topographic Center; for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Notices to Mariners may be obtained free from the following: Local Notices to Mariners–District Commander of the local Coast Guard district; Weekly Notice to Mariners, coasts of the United States, Possessions, and foreign–Defense Mapping Agency Office of Distribution Services; Local Notice to Mariners, Great Lakes–Commander, Ninth Coast Guard District, Cleveland, Ohio.

Special Notice to Mariners are published annually in Notice to Mariners 1. These notices contain important information of considerable interest to all mariners. Interested parties are advised to read these notices.

Light Lists (United States and Possessions): Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Light Lists (Foreign Countries): Published by Defense Mapping Agency Hydrographic/Topographic Center; for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Radio Navigational Aids, Atlantic and Mediterranean Area (Pub. 117A), Pacific and Indian Oceans Area (Pub. 117B): Published by Defense Mapping Agency Hydrographic/Topographic Center; for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Selected Worldwide Marine Weather Broadcasts: Published by the National Weather Service; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The **Nautical Almanac,** The **Air Almanac,** and **Astronomical Almanac:** Published by U.S. Naval Observatory; for sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

American Practical Navigator (Bowditch) (Pub. No. 9) and **International Code of Signals** (Pub. No. 102): Published by the Defense Mapping Agency Hydrographic/Topographic Center; for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Navigation Rules: Navigation Rules, International-Inland (COMDTINST M16672.2): Published by the U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Port Series of the United States: Published and sold by Corps of Engineers, U.S. Army, Water Resources Support Center, Port Facilities Branch, Casey Bldg., Fort Belvoir, Va. 22060.

Official U.S. **Coast Guard Recreational Boating Guide** (CG-340): Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Marine Radiotelephone Users Handbook: Published and sold by Radio Technical Commission for Maritime Services, P.O. Box 19087, Washington, D.C. 20036.

Corps of Engineers Offices

Jacksonville District: Federal Bldg., 400 West Bay Street, Jacksonville, Fla. 32232. Coastal waters and tributaries of Florida from Fernandina to the Aucilla River in Apalachee Bay and the waters of Puerto Rico and the Virgin Islands. The Atlantic Intracoastal Waterway between Fernandina and Key West and the Gulf Intracoastal Waterway between Key West and St. Marks.

Mobile District: 109 St. Joseph Street, Mobile, Ala. 36602. Coastal waters and tributaries of Florida W of Aucilla River, Alabama, Mississippi, and Louisiana to, but excluding, Pearl River. Gulf Intracoastal Waterway from St. Marks, Fla. to Lake Borgne Lighted Buoy 29, at the mouth of Pearl River.

Vicksburg District: U.S. Post Office and Courthouse, Vicksburg, Miss. 39180. Pearl River and West Pearl River.

New Orleans District: Foot of Prytania Street, New Orleans, La. 70160. Coastal waters and tributaries of Louisiana W of West Pearl River. The Mississippi River and Passes from the Gulf to Mile 325.5 AHP. Gulf Intracoastal Waterway from Lake Borgne Lighted Buoy 29, at the mouth of Pearl River, to Sabine River.

Galveston District: 110 Essayons Bldg., 400 Barracuda Avenue, Galveston, Tex. 77550. Coastal waters and tributaries of Texas. Gulf Intracoastal Water-

way from Sabine River to the vicinity of Mexican border.

Environmental Protection Agency (EPA) Offices.–Regional offices and States in the EPA coastal regions:

Region I (New Hampshire, Vermont, Maine, Massachusetts, Connecticut, Rhode Island): J.F. Kennedy Federal Bldg., Room 2203, Boston, Mass. 02203.

Region II (New Jersey, New York, Puerto Rico, Virgin Islands): 26 Federal Plaza, Room 900, New York, N.Y. 10278.

Region III (Delaware, Maryland, Virginia, District of Columbia, Pennsylvania): Curtis Bldg., 6th and Walnut Streets, Philadelphia, Pa. 19106.

Region IV (Alabama, Florida, Georgia, Mississippi, South Carolina, North Carolina): 345 Courtland Street, NE., Atlanta, Ga. 30365.

Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin): 230 South Dearborn Street, Chicago, Ill. 60604.

Region VI (Louisiana, Texas): First International Bldg., 1201 Elm Street, Dallas, Tex. 75270.

Region IX (California, Hawaii, Guam): 215 Fremont Street, San Francisco, Calif. 94105

Region X (Alaska, Oregon, Washington): 1200 Sixth Avenue, Seattle, Wash. 98101.

Coast Guard District Offices

Commander, Second Coast Guard District, 1430 Olive Street, St. Louis, Mo. 63103. Mississippi River N of the Louisiana-Arkansas border; Illinois River from Grafton, Ill. to latitude 41°N.

Commander, Seventh Coast Guard District, Federal Bldg., 51 Southwest First Avenue, Miami, Fla. 33130. Coastal waters and tributaries of South Carolina, Georgia, Florida E of longitude 83°50'W., Puerto Rico, U.S. Virgin Islands, and the adjacent islands of the United States.

Commander, Greater Antilles Section, U.S. Coast Guard, P.O. Box S 2029, San Juan, P.R. 00903.

Commander, Eighth Coast Guard District, Hale Boggs Federal Building, 500 Camp Street, New Orleans, La. 70130. Coastal waters and tributaries of Florida W of longitude 83°50'W., Alabama, Mississippi, Louisiana, and Texas.

Note.–A Marine Safety Office combines the functions of the Captain of the Port and Marine Inspection Office.

The symbol (D) preceding an office indicates that a Documentation Office is at the same address.

Coast Guard Marine Safety Offices

Corpus Christi, Tex.: 400 Mann Street 78401.

Galveston, Tex.: Post Office Bldg., Room 313, 601 Rosenberg 77550.

Mobile, Ala.: Suite 1900, First National Bank Bldg. 36652.

Port Arthur, Tex.: Federal Bldg., 2875 75th Street & Highway 69, 77640.

San Juan, P.R.: Coast Guard Base 00904.

Tampa, Fla.: 155 Columbia Drive 33606.

Coast Guard Captains of the Port

Houston Captain of the Port, P.O. Box 446, Galena Park, Tex. 77547.

New Orleans Captain of the Port, 4640 Urquhart Street, New Orleans, La. 70117.

Coast Guard Marine Inspection Offices

(D) Houston, Tex.: 7300 Wingate Street 77011.

(D) New Orleans, La.: F. Edward Herbert Bldg., 600 South Street 70130.

Coast Guard Stations.–The stations listed are in the area covered by this Coast Pilot. They have search and rescue capabilities and may provide lookout, communication, and/or patrol functions to assist vessels in distress. The National VHF-FM Distress System provides continuous coastal radio coverage outwards to 20 miles on channel 16 (156.80 MHz). After contact on channel 16, communications with the Coast Guard should be on channel 22 (157.10 MHz). If channel 22 is not available to the mariner, communications may be made on channel 12 (156.60 MHz). Selected stations guard the International Radiotelephone Distress, Safety and Calling Frequencies.

Puerto Rico:

San Juan Base (18°27.7'N., 66°07.0'W.). N side of San Juan Harbor at La Puntilla.

Borinquen Air Station (18°30.0'N., 67°08.0'W.). At Borinquen Airport, N of Aguadilla.

Florida:

Key West (24°33.9'N., 81°48.0'W.). NW side of Key West.

Fort Myers Beach (26°27.7'N., 81°56.8'W.). SW side of San Carlos Island.

Cortez (27°28.1'N., 82°41.3'W.). Near E end of highway bridge at Cortez.

St. Petersburg (27°45.7'N., 82°37.7'W.). W side of Tampa Bay, 1.4 miles N of Lewis Island.

Clearwater Air Station (27°54.6'N., 82°41.6'W.). At St. Petersburg-Clearwater International Airport, W side of Old Tampa Bay.

Clearwater (27°58'44"N., 82°49'12"W.). N side of causeway 0.2 mile NE of the W end of the causeway.

Yankeetown (29°01.9'N., 82°42.1'W.). About 4 miles above the mouth of Withlacoochee River.

Panama City (30°10.2'N., 85°45.2'W.). SE side of Alligator Bayou.

Destin (30°23.5'N., 86°31.6'W.). About 0.5 mile W of E end of Santa Rosa Island.

Pensacola (30°19.5'N., 87°22.0'W.). N side of Big Lagoon.

Alabama:

Mobile Base (30°39.0'N., 88°03.6'W.). At W end of Arlington Channel.

Mississippi:

Pascagoula (30°20.7'N., 88°33.8'W.). E side of Pascagoula River about 1 mile above the entrance.

Louisiana:

Venice Aids to Navigation Team (29°15.5'N., 89°21.2'W.). W side of Tiger Pass.

Grand Isle (29°15.9'N., 89°57.4'W.). Just inside Barataria Pass at the NE end of Grand Isle.

New Orleans Base (29°58.1'N., 90°01.6'W.). On W

side of Inner Harbor Navigation Canal, just N of the locks.

New Orleans Air Station (29°49.7'N., 90°01.2'W.). At Naval Air Station, Alvin Callender Field.

New Canal (30°01.6'N., 90°06.8'W.). E side of New Canal entrance, on Lake Pontchartrain.

Texas:

Sabine (29°43.7'N., 93°52.3'W.). W side of Sabine Pass, about 5.6 miles NNW of Sabine Pass East Jetty Light.

Galveston Base (29°20.0'N., 94°46.2'W.). E side of Galveston Channel, about 4 miles W of Galveston Jetty Light.

Houston Air Station (29°37'N., 95°10'W.). At the Ellington Air Force Base.

Houston Port Safety Station (29°43.7'N., 95°15.4'W.). N side of Houston Ship Channel about 2.5 miles below Houston Turning Basin.

Freeport (28°56.5'N., 95°18.2'W.). NE side of Freeport Harbor entrance.

Port O'Connor (28°26.0'N., 96°25.6'W.). N bank of Intracoastal Waterway about a mile W of Port O'Connor.

Port Aransas (27°50.2'N., 97°03.5'W.). NE end of Mustang Island at E end of Corpus Christi Channel.

Corpus Christi Air Station (27°42.1'N., 97°16.5'W.). At Naval Air Station, Corpus Christi.

Port Isabel (26°04.3'N., 97°09.8'W.). S end of Padre Island, at Brazos Santiago Light.

Coast Guard Radio Broadcasts.–Urgent, safety, and scheduled marine information broadcasts are made by Coast Guard radio stations. In general, these broadcasts provide information vital to vessels operating in the approaches and coastal waters of the United States including Puerto Rico and U.S. Virgin Islands. Transmissions are as follows:

Urgent and safety broadcasts:

(1) **By radiotelegraph:** (a) Upon receipt , except within 10 minutes of the next silent period, for urgent messages only; (b) during the last 15 seconds of the first silent period after receipt: (c) repeated at the end of the first silent period which occurs during the working hours of one-operator ships unless the original warning has been cancelled or superseded by a later warning message.

(2) **By radiotelephone:** (a) upon receipt; (b) repeated 15 minutes later, (for urgent messages only); (c) text only on the first scheduled broadcast unless canceled; (d) additional broadcasts at the discretion of the originator.

(3) Urgent broadcasts are preceded by the urgent signal; XXX for radiotelegraph; PAN for radiotelephone. Both the urgent signal and message are transmitted on 500 kHz, 2182 kHz, and channel 16 (156.80 MHz). respectively. Safety broadcasts are preceded by the safety signal: TTT for radiotelegraph; SECURITY for radiotelephone. After the preliminary signal on 500 kHz and 2182 kHz, the station shifts to its assigned working medium frequency for the radiotelegraph broadcast and 2670 kHz for the radiotelephone transmission. Those stations broadcasting on VHF will announce on channel 16 (156.80 MHz) shifting to channel 22 (157.10 MHz).

Scheduled broadcasts.–The following Coast Guard radio stations make scheduled broadcasts, preceded by a preliminary call on 500 kHz, 2182 kHz, and VHF-FM channel 16 (156.80 MHz), at the times and frequencies indicated:

Radiotelegraph:

NMA, Miami, Fla., 440 kHz, 1000 and 1950 e.s.t.

NMG, New Orleans, La., 432 kHz, 0950 and 1900 c.s.t.

NMR, San Juan, P.R., 466 kHz, 1030 and 2030 A.s.t.

Radiotelephone:

NCF, Miami Beach, Fla., 2670 kHz, 1050, and 2250 e.s.t.; and channel 22 (157.10 MHz), 0730 and 1730 e.s.t.

NOK, Key West, Fla., channel 22 (157.10 MHz), (antennas at Plantation Key, Vaca Key, and Sugarloaf Key, Fla.), 0700 and 1700 e.s.t.

NMA-21, St. Petersburg, Fla., 2670 kHz, 0920 and 2220 e.s.t.; channel 22 (157.10 MHz) (antennas at Everglades City, Naples, Venice, St. Petersburg, Tarpon Springs, Crystal River, and Hines (29°43.8'N., 83°14.3'W.), Fla.), 0800 and 1800 e.s.t.

NOQ-7, Panama City, Fla., 2670 kHz, 0405, 0605, 1005, and 1605 c.s.t.; and channel 22 (157.10 MHz), (antennas at St. Marks, Cape San Blas, and Panama City, Fla.), 0435, 1035, and 1635 c.s.t.

NOQ, Mobile, Ala., 2670 kHz, 0420, 0620, 1020, and 1620 c.s.t.; and channel 22 (157.10 MHz) (antennas at Fort Walton Beach, Fla., Spanish Fort, Ala. (30°40'N., 87°54'W.), and Pascagoula and Gulfport, Miss.), 0420, 0620, 1020, and 1620 c.s.t.

NMG-2, New Orleans, La., 2670 kHz (antennas on W bank of Inner Harbor Navigation Canal and at Belle Chasse, La.), 1150 and 2350 c.s.t.; VHF-FM channel 22 (157.10 MHz) (antennas at Chalmette, Plaquemine Point, and Venice, La.), 0450, 1050, and 1650 c.s.t.

NMG-15, Grande Isle, La. (antennas at Leeville and South Bend, La.), channel 22 (157.10 MHz), 0435, 1035, and 1635 c.s.t.

NOY, Galveston, Tex., 2670 kHz (antennas at Galveston and Sabine, Tex.), 0445, 0645, 1045 and 1645 c.s.t.; and channel 22 (157.10 MHz) (antennas at Pecan Island and Cameron, La., and Sabine, Galveston, Morgans Point, and Freeport, Tex.), 0445, 0645, 1045, and 1645 c.s.t.

NOY-8, Corpus Christi, Tex., 2670 kHz (antennas at Corpus Christi and Port Isabel, Tex.), 0440, 0640, 1040, and 1640 c.s.t.; and channel 22 (157.10 MHz) (antennas at Port Isabel and Robstown (27°39'N., 97°34'W.), Tex.), 0500, 1100, and 1700 c.s.t.

NMR-1, San Juan, P.R., 2670 kHz, 1105 and 2305 A.s.t.; and channel 22 (157.10 MHz), 0810 and 1810 A.s.t.

Customs Ports of Entry and Stations

Vessels may be entered and cleared at any port of entry or customs station, but at the latter only with advance authorization from the Customs Service district director.

Southeast Region

Miami District:

Port of Entry: Key West, Fla.

Tampa District:

Ports of Entry: Tampa, Apalachicola, Boca Grande, Carrabelle, Panama City, Pensacola, Port St. Joe, and St. Petersburg, Fla.

San Juan District:

Ports of Entry: San Juan, Aguadilla, Fajardo, Guanica, Humacao, Jobos, Mayaguez, and Ponce, P.R.

Charlotte Amalie, St. Thomas, District:

Ports of Entry: Charlotte Amalie, St. Thomas; Christiansted, St. Croix; Coral Bay, St. John; Frederiksted, St. Croix.

South Central Region

Mobile District:

Ports of Entry: Mobile, Ala.; Gulfport and Pascaguola, Miss.

New Orleans District:

Ports of Entry: New Orleans, Gramercy, Baton Rouge, and Morgan City, La.

Customs Station: Galliano, La. (supervised by Morgan City port of entry)

Southwest Region

Port Arthur District:

Ports of Entry: Port Arthur, Beaumont, Orange, and Sabine, Tex.; Lake Charles, La.

Houston-Galveston District:

Ports of Entry: Houston, Galveston, Corpus Christi, Freeport, and Port Lavaca-Point Comfort, Tex.

Laredo District:

Port of Entry: Brownsville, Tex.

Foreign-Trade Zones

Foreign-Trade Zone No. 79, City Hall Plaza, 8th Floor, 306 Jackson Street, Tampa, Fla. 33602.

Foreign-Trade Zone No. 65, P.O. Box 15095, 5321 West Highway 98, Panama City, Fla. 32401.

Foreign-Trade Zone No. 82, City of Mobile, Office of Economic Development, P.O. Box 1827, Mobile, Ala. 36608.

Foreign-Trade Zone No. 2, P.O. Box 60046, New Orleans, La. 70160.

Foreign-Trade Zone No. 87, Port of Lake Charles, Lake Charles Harbor & Terminal District, P.O. Box AAA, Lake Charles, La. 70602.

Foreign-Trade Zone No. 84, Port of Houston Authority, P.O. Box 2562, Houston, Tex. 77001.

Foreign-Trade Zone No. 36, P.O. Box 328, Galveston, Tex. 77550.

Foreign-Trade Zone No. 62, P.O. Box 3070, Brownsville, Tex. 78520.

Foreign-Trade Zone No. 61, P.O. Box 4943, San Juan, P.R. 00936.

Foreign-Trade Zone No. 7 and Subzone 7A, Mayaguez, G.P.O. 2350, San Juan, P.R. 00936.

National Weather Service Offices.–The following offices will provide forecasts and climatological data or arrange to obtain these services from other offices. They will also check barometers in their offices or by telephone; refer to the local telephone directory for numbers.

Apalachicola, Fla.: Municipal Airport.

Baton Rouge, La.: Ryan Airport.

Boothville, La.; Route 1, P.O. Box 186, Buras, La.

Brownsville, Tex.: International Airport.

Corpus Christi, Tex.: International Airport.

Fort Myers, Fla.: Federal Building, First Street.

Galveston, Tex.: 515 Post Office Bldg.

Houston, Tex.: Intercontinental Airport; Route 6, Box 1048, Alvin, Tex.

Key West, Fla.: International Airport.

Lake Charles, La.: Municipal Airport.

Mobile, Ala.: Bates Field, Municipal Airport.

New Orleans, La.: 701 Loyola Avenue; International Airport.

Pensacola, Fla.: Naval Air Station, Bldg. 3479.

Port Arthur, Tex.: Jefferson County Airport.

San Juan, P.R.: Isla Verde International Airport.

Slidell, La.: 1120 Old Spanish Trail.

Tampa, Fla.: 1408 24th Street, S.E.; International Airport.

Victoria, Tex.: Victoria County Airport.

Radio Weather Broadcasts.–Taped or direct broadcasts of marine weather forecasts and storm warnings are made by commercial and Coast Guard radio stations in the area covered by this Coast Pilot. These broadcasts are usually made several times a day. Transmission schedules are shown on the **Marine Weather Services Charts** for the following areas:

Savannah, Ga., to Apalachicola, Fla.

Apalachicola, Fla., to Morgan City, La.

Morgan City, La., to Brownsville, Tex.

Puerto Rico and the Virgin Islands.

The weather broadcasts schedules of Coast Guard radio stations are also listed in the description of Coast Guard marine services found elsewhere in this appendix.

NOAA Weather Radio.–National Weather Service VHF-FM radio stations provide mariners with continuous FM broadcasts of weather warnings, forecasts, radar reports, and surface weather observations. These stations usually transmit on 162.55 or 162.40 MHz. Reception range is up to 40 miles from the antenna site, depending on the terrain, type of receiver, and antenna used. The following VHF-FM radio stations with location of antenna are in or near the area covered by this Coast Pilot:

WXJ-95, Key West, Fla. (24°39′N., 81°32′W.), 162.40 MHz.

WXK-83, Fort Myers, Fla. (26°37′N., 81°48′W.), 162.475 MHz.

KHB-32, Tampa, Fla. (27°50′N., 82°15′W.), 162.55 MHz.

KIH-24, Tallahassee, Fla. (30°25′N., 84°16′W.), 162.40 MHz.

KGG-67, Panama City, Fla. (30°08′N., 85°42′W.), 162.55 MHz.

KEC-86, Pensacola, Fla. (30°26′N., 87°14′W.), 162.40 MHz.

KEC-61, Mobile, Ala. (30°36′N., 88°11′W.), 162.55 MHz.

KIH-21, Gulfport, Miss. (30°22'N., 89°05'W.), 162.40 MHz.

WXL-41, Buras, La. (29°21'N., 89°31'W.), 162.475 MHz.

KHB-43, New Orleans, La. (29°56'N., 90°04'W.), 162.55 MHz.

KHB-46, Baton Rouge, La. (30°36'N., 91°10'W.), 162.40 MHz. (On the hour and at 10 minute intervals thereafter, 24 hours a day.)

KIH-23, Morgan City, La. (29°41'N., 91°10'W.), 162.475 MHz.

WXK-80, Lafayette, La., (30°02'N., 91°59'W.), 162.55 MHz.

KHB-42, Lake Charles, La. (30°18'N., 93°20'W.), 162.40 MHz.

WXK-28, Beaumont, Tex. (30°04'N., 94°07'W.), 162.475 MHz.

KHB-40, Galveston, Tex. (29°18'N., 94°49'W.), 162.55 MHz.

KGG-68, Houston, Tex., (29°45'N., 95°22'W.), 162.40 MHz.

WXK-34, Victoria, Tex. (28°46'N., 96°57'W.), 162.40 MHz.

KHB-41, Corpus Christi, Tex. (27°47'N., 97°23'W.), 162.55 MHz.

KHB-33, Brownsville, Tex. (25°54'N., 97°30'W.), 162.55 MHz.

WXJ-68, San Juan, P.R., (18°16'N., 66°05'W.), 162.40 MHz.

WXJ-69, Maricao, P.R. (18°09'N., 66°59'W.), 162.55 MHz.

National Weather Service Forecast Offices (WSFO's).-Scheduled marine forecasts are issued four times daily by Weather Service Forecast Offices. (See National Weather Service, chapter 1, for further details.) Individual WSFO's and their specific areas of broadcast coverage are as follows:

Miami, Fla.: (1) From Key Largo to Dry Tortugas including the Straits of Florida, and Florida Bay; (2) Cape Sable to and including Tarpon Springs, out 50 miles; (3) From Tarpon Springs to but not including Apalachicola, out 50 miles.

New Orleans, La.: (1) Apalachicola to but not including Biloxi, out 50 miles; (2) Biloxi to but not including Morgan City, out 50 miles; (3) Morgan City to but not including Port Arthur, out 50 miles.

San Antonio, Tex.: (1) Port Arthur to and including Port O'Connor, out 50 miles; (2) From Port O'Connor to and including Brownsville, out 50 miles.

San Juan, P.R.: Puerto Rico and Virgin Island waters, out 20 miles.

National Weather Service Port Meteorological Officers (PMO's).-Port Meteorological Officers provide assistance on matters of weather chart interpretation, instruments, marine weather communications, and requirements affecting ship operations. (See National Weather Service, chapter 1, for further details.) PMO offices in the area covered by this Coast Pilot are as follows:

Miami, Fla.: 1600 Port Boulevard 33132.

Slidell, La.: 1120 Old Spanish Trail 70458.

Alvin, Tex.: Route 6, Box 1048, 77511.

Public Health Service Quarantine Stations.-Stations where quarantine examinations are performed:

Miami, Fla.: U.S. Quarantine Station, International Airport, 59-2335, 33159.

At other ports, quarantine and/or medical examinations are usually performed by Public Health Service contract personnel or by quarantine inspectors from the nearest quarantine station. Inquiries concerning quarantine matters should be directed to the nearest quarantine station.

Food and Drug Administration (FDA) Regional Offices

Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont): 585 Commercial Street, Boston, Mass. 02109.

Region II (New Jersey, New York, Puerto Rico, Virgin Islands): 830 Third Avenue, Brooklyn, N.Y. 11232.

Region III (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia): U.S. Customhouse, Room 900, 2nd & Chestnut Streets, Philadelphia, Pa. 19106.

Region IV (Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina): 1182 W. Peachtree Street, N.W., Atlanta, Ga. 30309.

Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin): 1410 CNA Building, 55 E. Jackson Boulevard, Chicago, Ill. 60604.

Region VI (Louisiana, Texas): 3032 Bryan Street, Dallas, Tex. 75204.

Region IX (California, Hawaii): Federal Office Bldg., Room 568, 50 U.N. Plaza, San Francisco, Calif. 94102.

Region X (Alaska, Oregon, Washington): Federal Office Building, Room 5003, 909 First Avenue, Seattle, Wash. 98174.

Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) Offices.-Listed below are ports covered by this volume where APHIS inspectors are available to inspect plants, and plant and animal products, and locations of Animal Import Centers where livestock and birds are inspected.

Information on importation of plants, animals, and plant and animal products is available from APHIS, Department of Agriculture, Federal Building, 6505 Belcrest Road, Hyattsville, Md. 20782. The specific offices to contact are as follows: for plants, including fruits and vegetables, and plant products, Plant Protection and Quarantine, Regulatory Services Staff, Room 643, (telephone, 301-436-8247); for animal products, Plant Protection and Quarantine, Veterinary Medical Office, Room 656, (telephone, 301-436-7633); and for live ruminants, swine, equines, and poultry and other birds, Veterinary Services, Import-Export Staff, Room 838, (telephone, 301-436-8170).

Alabama:

Mobile: Federal Bldg., Room 147, 113 St. Joseph Street 36601.

Florida

Key West: Federal Bldg., Room 226, 301 Simonton Street 33040.

Pensacola: Federal Bldg., Room 105, 100 North Palafox Street 32573.

Tampa: 700 Twiggs Street, Room 504, 33601.

Louisiana:

Baton Rouge: Federal Bldg., Room 321, 750 Florida Boulevard 70821.

New Orleans: U.S. Customhouse, Room 148, 423 Canal Street 70176.

Puerto Rico:

Mayaguez: El Mani Airport 00708.

Ponce: U.S. Customs House, Comercio Street, Playa de Ponce 00731.

Roosevelt Roads: Roosevelt Roads Naval Station, Air Operations, Ceira 00635.

San Juan: Federal Office Bldg., Room 206, C. Chardon Avenue, Hato Rey 00918.

Texas:

Brownsville: Border Services Bldg., Room 224, East Elizabeth and International Boulevard 78520.

Corpus Christi: 807 Petroleum Tower, 811 Carancahua Street 78403.

Galveston: U.S. Post Office Bldg., Room 402, 601 Rosenberg Street 77553.

Houston: U.S. Appraisers Stores Bldg., Room 210, 7300 Wingate Street 77011.

Port Arthur: Federal Bldg., Room 201, Fifth Street and Austin Avenue 77640.

Virgin Islands:

Charlotte Amalie, St. Thomas: Federal Bldg., Room 227, 00801.

Christiansted, St. Croix: P.O. Box 1548, Kingshill 00850.

Animal Import Centers:

Honolulu, Hawaii: 300 Ala Moana Boulevard, Room 4320, 96850.

Miami, Fla.: 8120 NW 53rd Street, Suite 102, 33166.

Rock Tavern, N.Y.: New York Animal Import Center, Stewart Airport, Rural Route 1, Box 74, 12575.

Immigration and Naturalization Service Offices

Alabama:

Mobile: Commerce Bldg., Room 504, 118 North Royal Street, P.O. Box 1526, 36633.

Florida:

Key West: 301 Simonton Street, Room 215, P.O. Box 86, 33040.

Pensacola: Post Office Bldg., Room 312-C, Box 604, 32502.

Tampa: 500 Zack Street, Room 539, 33602.

Louisiana:

Baton Rouge: Federal Bldg.-U.S. Courthouse, Room 116, 707 Florida Boulevard 70821.

Lake Charles: Federal Bldg., Room 2308, 70601.

New Orleans: Postal Services Bldg., Room T-8005, 701 Loyola Avenue 70113.

Mississippi:

Gulfport: One Government Plaza 39501.

Puerto Rico:

Ponce: Playa Station, P.O. Box 173, 00734-3173.

San Juan: GPO Box 5068, 00936.

Texas:

Brownsville: 1500 East Elizabeth Street, Room 2120, 78520.

Corpus Christi: 600 Leopard Street, Room 1224, 78403.

Galveston: Post Office Bldg., P.O. Box 388, 77553.

Harlingen: 2102 Teege Road 78550.

Houston: 2627 Caroline Street 77004.

Port Arthur: Customhouse, Room 222, P.O. Box 369, 77640.

Virgin Islands:

Charlotte Amalie, St. Thomas: New Federal Bldg., Room 117, P.O. Box 610, 00801.

Christiansted, St. Croix: P.O. Box 1270 Kingshill 00850.

Cruz Bay, St. John: P.O. Box 27, 00801.

Federal Communications Commission Offices

District Field Offices:

Houston, Tex.: New Federal Office Bldg., Room 5636, 515 Rusk Avenue 77002.

New Orleans, La.: F. Edward Hebert Federal Bldg., Room 1009, 600 South Street 70130.

San Juan, P.R.: Federal Bldg., Room 747, Hato Rey 00918.

Tampa, Fla.: Interstate Bldg., Room 601, 1211 N. Westshore Boulevard 33607.

Radio shore stations providing medical advice.–Messages to shore stations may be transmitted in code groups or plain language; messages should be signed by the master and be prefixed: "DH MEDICO". The following stations maintain a continuous guard on 500 kHz. (See Medical advice, chapter 1.)

NMA, Miami, Fla., U.S. Coast Guard.

WPD, Tampa, Fla., RCA Global Communications, Inc.

WLO, Mobile, Ala., Mobile Marine Radio, Inc.

NMG, New Orleans, La., U.S. Coast Guard.

WNU, Slidell, La., TRT Telecommunications Corp.

WPA, Port Arthur, Tex., RCA Global Communications, Inc.

KLC, Galveston, Tex., Radio KLC, Inc.

NMR, San Juan, Puerto Rico, U.S. Coast Guard.

Measured Courses.–The positions of measured courses are shown on the chart and their description is included in the Coast Pilots when information is reported to the National Ocean Service. Courses are located in the following places covered by this Coast Pilot:

South of Punta Vaca, Isla de Vieques, P.R. 25664.

Tampa Bay, Fla. 11414.

Lake Pontchartrain, La., W of entrance to the Inner Harbor Navigation Canal 11369.

CLIMATOLOGICAL TABLES

These tables were prepared by the Environmental Data Service. Station level pressure refers to the actual pressure taken at the elevation of the station. Where it has been reduced to sea level, the term sea level pressure is used. Time given is local standard time.

* means less than 0.5 percent.
* means less than 0.5 day.
* means trace (not measurable) of precipitation.

KEY WEST, FLORIDA (24°33'N., 81°45'W.) Elevation 4 ft. (1.2m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1019.6	1018.3	1017.8	1017.3	1016.2	1015.8	1017.5	1016.2	1014.3	1014.5	1017.3	1019.3	1017.0	15
TEMPERATURE (DEGREES F)														
MEAN	70.7	71.6	74.6	78.1	80.9	83.5	84.6	84.7	83.2	79.6	75.1	71.5	78.2	30
MEAN DAILY MAXIMUM	75.6	76.6	79.4	82.5	85.3	87.9	89.2	89.5	87.8	84.0	79.6	76.4	82.8	30
MEAN DAILY MINIMUM	65.8	66.5	69.8	73.6	76.4	79.1	80.0	79.9	78.6	75.2	70.6	66.6	73.5	30
EXTREME HIGHEST	85	85	87	89	91	94	95	95	94	93	88	85	95	23
EXTREME LOWEST	46	47	53	55	66	68	69	68	70	60	49	46	46	23
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0700L)	83	80	79	77	76	78	77	77	80	82	82	83	80	27
AVERAGE PERCENTAGE (1300L)	70	67	66	64	65	68	66	67	69	69	69	69	67	27
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	5.0	4.7	4.6	4.4	5.1	6.3	6.3	6.2	6.6	5.7	4.8	4.9	5.4	23
MEAN NUMBER OF DAYS WITH CLEAR SKIES	11	11	13	13	10	4	3	3	2	8	11	11	100	23
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	8	6	6	5	7	11	10	10	11	10	7	8	99	23
PRECIPITATION														
MEAN AMOUNT (INCHES)	1.67	1.85	1.56	2.17	2.51	4.55	4.11	4.47	7.34	5.57	2.67	1.52	39.99	30
GREATEST AMOUNT (INCHES)	9.27	4.46	4.41	12.83	12.90	14.43	11.69	11.34	18.45	21.57	9.01	4.84	62.92	27
LEAST AMOUNT (INCHES)	0.03	0.02	*	0.00	0.12	0.90	0.54	2.25	1.70	0.74	0.13	0.18	19.99	27
MAXIMUM IN 24 HRS. (INCHES)	4.43	2.54	3.10	3.15	8.89	4.00	3.05	3.23	6.65	8.47	7.33	4.60	8.89	27
MEAN AMOUNT OF SNOW (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	7	6	5	4	8	12	13	15	16	12	7	7	112	27
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	9.4	10.1	10.1	9.9	8.2	7.5	7.3	6.8	7.8	8.9	9.1	9.7		15
MEAN WIND SPEED (KNOTS) (1300L)	10.9	11.4	11.5	11.8	10.0	9.0	8.7	8.4	9.4	10.5	10.7	11.1		15
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	7.7	7.5	7.1	5.6	4.2	1.2	0.9	1.1	2.2	7.7	7.9	8.3		15
NORTH NORTHEAST	15.9	10.3	7.7	4.4	2.5	0.8	0.5	1.7	2.1	13.3	15.2	15.9		15
NORTHEAST	21.9	13.0	10.0	11.1	7.3	5.5	3.7	7.1	12.8	23.8	30.7	25.4		15
EAST NORTHEAST	10.0	8.2	9.1	11.0	7.4	5.9	4.4	8.9	11.6	12.5	11.1	12.5		15
EAST	8.0	9.6	10.3	16.1	17.8	12.9	18.7	15.6	15.2	8.3	6.4	9.0		15
EAST SOUTHEAST	4.4	8.0	10.2	13.2	14.8	13.1	18.6	13.7	7.7	6.5	5.5	5.5		15
SOUTHEAST	6.3	10.8	13.9	14.6	15.4	15.1	23.3	16.8	11.4	5.5	4.4	5.6		15
SOUTH SOUTHEAST	3.1	6.2	5.2	5.9	6.0	9.3	7.2	7.3	5.6	3.1	1.6	2.4		15
SOUTH	5.0	8.0	8.2	3.6	6.1	13.9	6.8	7.3	9.6	3.0	2.9	2.8		15
SOUTH SOUTHWEST	1.6	2.8	3.0	1.7	2.5	4.9	3.8	2.4	4.3	1.2	0.4	0.7		15
SOUTHWEST	1.9	1.3	2.7	2.0	2.2	3.5	3.0	3.6	4.1	1.6	1.5	0.9		15
WEST SOUTHWEST	0.6	0.9	0.9	0.8	1.5	2.7	2.1	1.3	1.3	1.3	1.3	1.2		15
WEST	1.4	1.2	0.6	1.0	1.6	2.4	1.7	2.6	2.0	2.5	1.5	1.4		15
WEST NORTHWEST	1.8	2.0	0.9	1.3	0.7	0.5	0.6	1.1	0.8	1.0	1.2	0.3		15
NORTHWEST	3.9	3.4	3.2	1.7	1.4	1.3	0.5	1.3	1.5	2.2	2.3	2.7		15
NORTH NORTHWEST	3.4	5.8	4.5	2.7	2.2	0.3	0.2	0.9	0.7	2.6	2.8	3.1		15
CALM	3.1	1.2	2.4	3.3	6.4	6.7	4.4	7.3	7.0	3.8	3.1	2.4		
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	12.2	11.0	8.7	7.6	7.6	5.1	2.6	4.4	4.5	13.8	13.9	12.3		15
NORTH NORTHEAST	15.3	8.7	7.5	5.5	4.0	1.9	1.5	3.8	4.5	13.8	16.6	14.9		15
NORTHEAST	12.8	7.6	5.8	3.8	2.9	2.2	1.4	2.7	5.2	15.9	16.2	18.2		15
EAST NORTHEAST	6.1	3.9	3.1	4.1	2.3	2.4	0.7	2.3	3.0	7.1	8.1	6.6		15
EAST	11.5	12.4	11.8	18.7	14.3	11.4	14.7	14.7	15.5	12.9	13.1	14.1		15
EAST SOUTHEAST	7.0	10.3	11.2	15.8	18.1	14.6	19.6	16.3	13.1	6.5	6.3	7.6		15
SOUTHEAST	8.0	10.4	15.3	15.6	18.1	16.4	22.9	17.4	15.3	6.3	5.6	6.5		15
SOUTH SOUTHEAST	2.4	5.5	8.2	8.5	6.8	10.4	8.1	8.7	7.4	4.0	2.4	2.9		15
SOUTH	7.3	10.4	8.7	6.4	7.7	14.3	12.6	9.4	11.3	4.7	3.3	4.4		15
SOUTH SOUTHWEST	3.2	4.0	4.7	1.5	4.3	6.4	4.5	5.4	4.9	1.7	1.9	2.2		15
SOUTHWEST	2.2	2.5	3.2	1.9	2.2	3.6	3.3	4.3	4.9	2.0	1.5	1.7		15
WEST SOUTHWEST	1.0	1.0	1.3	1.2	2.2	2.3	1.4	1.2	1.9	1.3	1.1	0.9		15
WEST	2.5	1.5	1.0	1.3	2.4	1.9	1.6	2.8	2.2	1.7	1.6	1.3		15
WEST NORTHWEST	1.4	2.1	1.1	1.5	0.9	1.2	1.3	1.5	1.3	1.6	1.3	0.4		15
NORTHWEST	3.0	3.6	2.2	2.7	2.4	1.7	1.7	2.2	1.9	2.7	2.7	2.0		15
NORTH NORTHWEST	3.7	4.7	5.8	3.9	2.9	3.0	0.9	2.0	1.7	3.3	3.9	3.9		15
CALM	0.4	0.2	0.5	0.1	0.9	1.3	1.1	0.9	1.3	0.8	0.3	0.3		
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	*	*	0	0	0	0	0	0	*	*	*	*	1	27

FORT MYERS, FLORIDA (26°35'N., 81°52'W.) Elevation 15 ft. (4.6m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1020.2	1018.9	1017.3	1017.9	1015.4	1015.9	1016.9	1017.2	1014.9	1016.5	1018.8	1019.9	1017.5	3
TEMPERATURE (DEGREES F)														
MEAN	63.5	64.7	68.5	73.3	77.7	81.1	82.5	82.8	81.6	76.4	69.4	64.8	73.9	30
MEAN DAILY MAXIMUM	74.7	76.0	79.7	84.8	89.0	90.5	91.1	91.5	89.8	85.3	79.9	75.9	84.0	30
MEAN DAILY MINIMUM	52.3	53.3	57.3	61.8	66.4	71.7	73.8	74.1	73.4	67.5	58.8	53.6	63.7	30
EXTREME HIGHEST	88	92	91	93	98	98	97	96	95	93	90	88	98	16
EXTREME LOWEST	28	32	36	44	52	63	69	70	68	52	34	26	26	16
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0700L)	89	88	89	88	87	88	88	89	90	88	89	89	88	15
AVERAGE PERCENTAGE (1300L)	58	55	52	48	49	60	60	61	62	57	55	55	56	15
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	5.0	4.9	4.9	4.6	5.0	6.2	6.5	6.3	6.2	5.1	4.4	4.7	5.3	27
MEAN NUMBER OF DAYS WITH CLEAR SKIES	11	11	12	12	10	5	2	3	4	11	13	12	106	34
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	9	7	8	6	7	10	11	11	11	8	6	8	102	34
PRECIPITATION														
MEAN AMOUNT (INCHES)	1.64	2.03	3.06	2.03	3.99	8.89	8.90	7.72	8.71	4.37	1.31	1.30	53.95	30
GREATEST AMOUNT (INCHES)	6.04	4.65	18.58	7.66	10.32	20.10	15.28	16.22	16.60	12.04	3.85	5.42	80.17	36
LEAST AMOUNT (INCHES)	0.00	*	0.03	*	0.34	3.73	2.28	3.98	2.33	0.05	*	0.10	32.83	36
MAXIMUM IN 24 HRS. (INCHES)	2.25	2.60	7.92	3.82	4.57	6.67	4.06	6.73	9.34	10.85	3.34	3.00	10.85	36
MEAN AMOUNT OF SNOW (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	0	0	0	0	0	0	0	0	0	0	0	0	0	35
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	5	6	5	5	8	15	18	18	16	9	4	5	113	35
WIND														
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	7.5	5.9	5.9	7.8	5.4	3.9	2.7	0.5	1.7	2.7	5.0	3.2	4.3	6
NORTH NORTHEAST	11.3	10.0	8.6	7.8	7.0	6.1	2.7	4.8	6.7	21.0	12.2	8.6	8.9	6
NORTHEAST	12.9	13.5	8.6	10.0	9.7	6.1	7.0	12.9	19.9	27.4	26.7	22.6	14.3	6
EAST NORTHEAST	15.1	12.9	10.8	9.4	5.9	10.6	10.3	12.4	22.2	16.1	16.1	14.5	13.0	6
EAST	20.4	14.7	14.6	14.4	14.5	16.1	28.1	22.0	22.8	9.7	11.1	15.1	17.0	6
EAST SOUTHEAST	5.9	4.7	9.2	13.3	10.8	14.4	21.1	8.6	9.4	7.5	5.6	5.9	9.7	6
SOUTHEAST	2.2	5.3	8.1	11.1	13.4	11.7	15.7	15.6	5.6	2.2	3.3	3.8	8.2	6
SOUTH SOUTHEAST	1.6	4.7	5.9	4.4	7.0	6.1	5.4	8.1	3.3	2.7	4.4	3.8	4.8	6
SOUTH	2.7	3.5	6.5	3.3	5.9	4.4	3.8	4.3	1.7	0.5	1.1	2.7	3.4	6
SOUTH SOUTHWEST	1.1	1.8	2.7	1.1	2.7	1.7	0.0	1.6	1.7	0.5	1.7	1.1	1.5	6
SOUTHWEST	1.1	0.6	1.6	2.8	1.1	2.8	1.6	0.0	2.8	1.1	1.1	0.5	1.4	6
WEST SOUTHWEST	1.1	0.6	2.2	1.1	1.6	3.3	0.0	0.0	0.6	0.0	0.0	0.5	0.9	6
WEST	1.6	0.6	1.1	3.3	3.8	2.2	0.0	0.5	0.6	0.5	0.0	1.6	1.3	6
WEST NORTHWEST	0.5	1.2	0.5	1.7	0.5	1.1	0.0	0.5	0.6	0.0	0.6	0.0	0.6	6
NORTHWEST	1.1	0.6	0.5	1.7	1.1	2.8	0.5	0.5	1.7	0.5	0.0	1.6	1.1	6
NORTH NORTHWEST	2.7	2.9	1.1	2.8	2.7	1.1	0.0	0.5	0.0	1.6	2.2	1.1	1.6	6
CALM	11.3	16.5	11.9	3.9	7.0	5.6	1.1	7.0	5.0	5.9	8.9	13.4	8.1	6
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	3.2	2.9	3.2	2.2	0.5	2.8	1.1	7.6	2.8	4.3	11.7	5.4	4.0	6
NORTH NORTHEAST	6.5	6.5	5.4	5.0	5.9	3.9	2.7	4.3	1.7	9.1	5.0	7.0	5.3	6
NORTHEAST	4.3	7.1	3.8	5.6	8.6	1.1	5.4	5.4	7.2	16.7	12.8	8.6	7.2	6
EAST NORTHEAST	3.8	6.5	4.3	6.7	5.9	5.6	5.9	6.5	11.1	23.7	15.6	8.6	8.7	6
EAST	15.6	11.2	7.5	12.2	8.1	8.3	11.3	12.0	20.6	13.4	11.1	14.1	12.1	6
EAST SOUTHEAST	15.6	7.6	5.9	7.8	3.8	6.1	10.2	4.9	10.6	4.8	7.8	7.0	7.7	6
SOUTHEAST	9.7	4.7	3.8	3.3	6.5	5.0	11.3	2.7	6.1	3.2	3.3	6.5	5.5	6
SOUTH SOUTHEAST	5.4	5.9	4.3	2.2	1.6	4.4	2.7	3.3	3.3	0.5	2.2	5.4	3.4	6
SOUTH	4.3	6.5	8.1	5.0	1.6	2.2	4.3	2.7	2.2	1.1	2.8	2.7	3.6	6
SOUTH SOUTHWEST	5.4	8.2	12.4	10.0	3.2	6.1	5.4	9.8	6.7	1.1	6.1	7.6	6.8	6
SOUTHWEST	4.3	10.0	14.0	11.7	11.3	7.8	7.5	8.2	6.1	5.4	8.3	7.6	8.5	6
WEST SOUTHWEST	6.5	5.3	9.7	7.2	16.1	12.8	10.2	10.3	8.9	4.8	2.2	7.6	8.5	6
WEST	4.8	4.7	4.8	6.7	14.0	16.7	10.2	10.9	5.6	4.3	2.8	2.7	7.4	6
WEST NORTHWEST	3.8	3.5	4.8	8.3	7.0	8.9	4.8	2.7	3.3	3.8	1.1	3.8	4.7	6
NORTHWEST	3.8	5.3	4.3	3.3	4.8	3.3	2.2	4.3	2.2	2.2	3.9	2.7	3.5	6
NORTH NORTHWEST	2.7	4.1	2.2	2.8	1.1	3.9	3.2	4.3	0.6	1.1	2.2	2.2	2.5	6
CALM	0.5	0.0	1.6	0.0	0.0	1.1	1.6	0.0	1.1	0.5	1.1	0.5	0.7	6
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	5	3	3	2	1	*	*	*	*	1	2	4	23	32

TAMPA, FLORIDA (27°58'N., 82°32'W.) Elevation 19 ft. (5.8m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1020.4	1018.9	1017.8	1017.4	1016.0	1015.8	1017.4	1016.0	1014.7	1015.5	1018.2	1019.9	1017.3	28
TEMPERATURE (DEGREES F)														
MEAN	60.4	61.8	66.0	72.0	77.2	81.0	81.9	82.2	80.8	74.7	66.8	61.6	72.2	30
MEAN DAILY MAXIMUM	70.6	71.9	76.1	82.4	87.5	89.9	90.1	90.4	89.0	83.9	77.1	72.0	81.7	30
MEAN DAILY MINIMUM	50.1	51.7	55.9	61.6	66.9	72.0	73.7	74.0	72.6	65.5	56.4	51.2	62.6	30
EXTREME HIGHEST	84	88	88	93	98	97	97	98	96	93	90	86	98	12
EXTREME LOWEST	23	27	35	40	49	61	63	67	64	40	23	27	23	12
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0700L)	87	84	85	86	84	85	87	90	89	88	87	86	86	12
AVERAGE PERCENTAGE (1300L)	60	55	54	49	50	59	62	64	60	56	54	56	57	12
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	5.5	5.4	5.5	5.0	5.2	6.3	6.8	6.7	6.5	5.2	4.8	5.3	5.7	29
MEAN NUMBER OF DAYS WITH CLEAR SKIES	10	9	10	11	10	5	2	3	4	11	12	11	98	29
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	11	10	11	8	9	11	13	12	12	9	8	11	125	29
PRECIPITATION														
MEAN AMOUNT (INCHES)	2.33	2.86	3.89	2.10	2.41	6.49	8.43	8.00	6.35	2.54	1.79	2.19	49.38	30
GREATEST AMOUNT (INCHES)	8.02	7.95	12.64	6.59	7.55	13.73	20.59	18.59	13.04	7.36	6.12	6.66	76.57	29
LEAST AMOUNT (INCHES)	*	0.21	0.06	*	0.17	1.86	2.31	2.35	1.28	0.23	*	0.21	28.89	29
MAXIMUM IN 24 HRS. (INCHES)	3.29	3.25	5.20	3.70	3.97	5.53	12.11	5.37	4.67	2.54	4.22	3.28	12.11	29
MEAN AMOUNT OF SNOW (INCHES)	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	29
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	29
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	6	7	7	5	6	12	16	17	13	7	5	6	107	29
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	6.4	6.8	7.2	6.9	5.8	5.1	4.6	4.5	6.0	6.8	6.4	6.2		31
MEAN WIND SPEED (KNOTS) (1300L)	8.9	9.6	10.2	9.3	8.5	7.9	6.9	6.7	7.4	8.3	8.2	8.3		31
DIRECTION (PERCENTAGE OF OBS.) AT 0700L														
NORTH	9.6	8.6	7.8	6.2	4.3	2.0	0.9	1.8	3.4	9.1	11.0	10.1		31
NORTH NORTHEAST	10.5	10.1	8.7	5.5	4.6	2.8	1.3	3.2	8.0	17.8	15.1	11.6		31
NORTHEAST	12.0	10.2	8.0	9.7	7.6	5.1	3.5	5.1	14.8	22.1	20.3	15.3		31
EAST NORTHEAST	10.4	9.1	7.5	8.9	10.1	8.2	5.2	9.1	14.6	12.3	10.5	12.6		31
EAST	8.2	7.8	8.1	11.7	12.0	11.7	10.4	12.6	13.7	8.7	6.5	8.1		31
EAST SOUTHEAST	4.4	5.8	6.8	8.7	8.5	8.1	10.0	8.7	7.9	2.7	3.3	4.9		31
SOUTHEAST	5.7	6.1	8.7	9.2	8.2	9.6	13.8	11.7	9.0	3.2	3.7	5.4		31
SOUTH SOUTHEAST	6.2	6.8	9.1	7.9	8.2	8.7	13.8	8.9	5.3	2.6	4.1	5.0		31
SOUTH	5.4	6.8	7.2	6.3	6.1	7.1	9.3	5.7	3.3	1.5	3.9	4.8		31
SOUTH SOUTHWEST	2.1	2.2	3.0	1.8	1.6	2.0	2.0	2.2	0.5	0.8	0.9	1.0		31
SOUTHWEST	1.2	1.1	1.6	2.0	2.1	2.9	2.4	2.4	1.0	0.6	0.7	0.5		31
WEST SOUTHWEST	0.6	1.6	1.2	1.3	1.9	3.0	2.9	1.7	0.8	0.6	0.6	0.5		31
WEST	0.9	1.8	2.3	3.2	3.0	6.1	4.1	2.6	1.6	1.6	0.9	0.8		31
WEST NORTHWEST	1.0	1.9	2.0	2.9	2.1	3.3	1.5	1.2	1.0	1.0	0.8	1.0		31
NORTHWEST	3.0	3.3	3.8	3.2	3.6	2.6	1.0	1.6	0.8	1.1	1.4	2.0		31
NORTH NORTHWEST	5.1	4.4	3.8	2.7	2.6	0.9	1.0	1.1	1.0	2.1	3.6	4.0		31
CALM	13.6	12.4	10.5	8.8	13.7	15.9	16.8	20.3	13.1	12.2	12.5	12.4		31
DIRECTION (PERCENTAGE OF OBS.) AT 1300L														
NORTH	4.2	3.4	2.3	2.0	1.5	2.9	1.8	2.3	2.4	4.1	5.0	4.6		31
NORTH NORTHEAST	5.4	5.6	3.4	2.7	3.5	3.0	2.0	2.3	5.2	8.4	7.0	5.9		31
NORTHEAST	7.4	6.4	6.0	5.7	6.7	6.5	4.6	5.3	13.7	17.8	14.8	10.2		31
EAST NORTHEAST	7.8	7.4	5.6	7.5	8.5	6.2	3.3	6.4	10.7	15.1	11.0	9.1		31
EAST	6.8	5.0	5.5	7.4	7.7	5.7	4.4	5.7	13.6	10.0	8.2	7.8		31
EAST SOUTHEAST	4.4	3.1	3.1	5.6	4.1	2.1	3.2	3.7	4.5	4.2	3.2	4.4		31
SOUTHEAST	3.8	3.9	5.2	5.1	3.6	2.3	3.1	4.4	5.0	2.4	3.5	4.6		31
SOUTH SOUTHEAST	6.2	5.7	4.6	3.1	2.2	2.7	4.2	3.4	4.5	1.8	3.4	5.2		31
SOUTH	7.3	7.4	6.8	5.1	3.3	5.3	8.4	7.3	5.6	2.8	4.6	6.7		31
SOUTH SOUTHWEST	9.1	9.4	12.1	9.1	8.7	8.6	11.7	8.5	6.2	3.9	6.2	7.5		31
SOUTHWEST	7.7	9.0	12.8	13.0	11.7	12.3	12.3	11.0	5.8	4.2	6.1	7.2		31
WEST SOUTHWEST	2.7	4.6	5.4	6.8	6.9	9.0	9.5	7.2	4.5	2.2	3.1	3.0		31
WEST	2.9	5.1	5.3	6.0	7.6	9.5	9.6	9.3	4.4	3.9	2.7	3.0		31
WEST NORTHWEST	3.4	4.9	5.6	4.9	6.3	6.1	7.0	5.8	3.2	4.8	3.8	1.9		31
NORTHWEST	9.6	10.3	8.5	8.8	10.8	9.5	6.7	7.6	4.0	6.3	8.4	8.8		31
NORTH NORTHWEST	8.8	6.7	6.3	4.8	4.7	4.9	3.0	3.8	2.6	4.7	6.0	6.6		31
CALM	2.5	2.2	1.4	2.3	2.1	3.5	5.3	5.9	4.2	3.6	2.9	3.6		31
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	6	3	3	2	1	*	*	*	*	1	3	5	24	29

APALACHICOLA, FLORIDA (29°44'N., 85°02'W.) Elevation 19 ft. (5.8m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1020.8	1019.4	1017.8	1017.4	1016.2	1015.7	1017.0	1015.9	1015.4	1016.8	1019.3	1020.5	1017.7	30
TEMPERATURE (DEGREES F)														
MEAN	53.7	55.8	60.7	68.3	74.9	80.0	81.4	81.5	78.6	70.8	61.1	55.2	68.5	30
MEAN DAILY MAXIMUM	61.1	63.1	67.6	75.0	81.8	86.4	87.5	87.7	84.7	78.3	69.0	62.7	75.4	30
MEAN DAILY MINIMUM	46.3	48.5	53.8	61.5	68.0	73.6	75.2	75.2	72.4	63.3	53.2	47.6	61.6	30
EXTREME HIGHEST	79	80	82	90	96	101	102	99	96	93	87	82	102	46
EXTREME LOWEST	14	21	26	37	50	58	65	66	50	39	24	13	13	46
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0700L)	87	86	85	85	83	84	85	87	88	86	85	87	86	25
AVERAGE PERCENTAGE (1300L)	69	67	66	66	65	68	72	80	71	64	64	70	69	21
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	5.7	5.5	5.5	4.8	4.5	5.2	6.0	5.8	5.5	3.9	4.4	5.6	5.2	42
MEAN NUMBER OF DAYS WITH CLEAR SKIES	10	10	11	12	13	10	7	8	10	17	14	10	132	45
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	2	12	12	8	7	8	11	11	10	7	8	13	109	45
PRECIPITATION														
MEAN AMOUNT (INCHES)	3.07	3.78	4.70	3.61	2.78	5.30	8.02	8.07	9.00	2.88	2.68	3.32	57.21	30
GREATEST AMOUNT (INCHES)	8.25	9.19	14.33	10.98	8.70	18.32	17.95	21.08	22.35	12.09	9.00	7.87	99.30	46
LEAST AMOUNT (INCHES)	0.04	0.38	0.71	0.09	0.28	0.56	1.56	1.85	0.60	0.01	0.04	0.30	34.07	46
MAXIMUM IN 24 HRS. (INCHES)	3.77	3.74	8.17	7.76	7.07	5.34	6.75	5.67	11.71	6.32	5.84	4.15	11.71	46
MEAN AMOUNT OF SNOW (INCHES)	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	46
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	0.2	1.2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	1.2	46
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	0	*	0	0	0	0	0	0	0	0	0	0	*	46
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	9	9	8	6	5	10	15	14	11	5	6	8	106	46
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	7.0	7.6	8.3	7.7	6.4	5.7	4.9	4.8	6.5	6.8	6.8	7.0		30
MEAN WIND SPEED (KNOTS) (1300L)	9.0	10.0	11.0	10.7	9.9	9.0	8.3	7.8	8.5	8.2	8.3	8.6		30
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	11.5	10.8	8.9	7.2	8.2	4.6	5.2	6.6	6.3	10.8	12.5	10.6		30
NORTH NORTHEAST	9.8	10.9	9.5	6.7	5.9	5.4	4.3	6.2	9.4	13.5	13.1	10.6		30
NORTHEAST	7.7	7.7	7.3	6.3	6.6	8.0	6.8	10.1	13.2	14.8	10.9	9.1		30
EAST NORTHEAST	8.6	6.6	7.8	7.0	7.6	9.4	7.8	11.9	19.5	16.6	11.1	10.1		30
EAST	10.4	9.4	10.2	11.3	12.0	12.5	12.2	14.7	21.0	15.7	13.8	12.7		30
EAST SOUTHEAST	6.3	7.8	7.5	9.7	7.3	5.3	5.5	4.1	5.1	4.4	5.2	7.6		30
SOUTHEAST	5.6	4.7	6.9	8.2	5.2	2.6	3.7	2.5	2.8	1.6	2.3	4.6		30
SOUTH SOUTHEAST	5.0	6.7	8.0	7.1	5.1	2.5	2.0	1.7	1.1	0.4	2.7	3.9		30
SOUTH	2.9	3.2	5.1	6.1	5.7	3.5	3.3	1.9	1.6	0.8	2.2	2.3		30
SOUTH SOUTHWEST	1.6	1.7	2.5	3.0	3.5	4.0	3.8	2.4	1.6	0.7	2.3	0.8		30
SOUTHWEST	1.1	1.1	1.9	2.3	3.3	5.0	5.4	3.3	1.0	0.8	1.0	0.7		30
WEST SOUTHWEST	1.2	1.9	2.0	2.7	4.6	7.7	6.4	3.2	1.1	0.5	0.8	0.8		30
WEST	2.1	2.5	2.4	3.5	4.6	8.0	8.2	4.3	0.7	1.2	1.2	1.9		30
WEST NORTHWEST	2.9	2.5	2.2	2.8	3.0	3.2	3.9	3.4	0.9	1.1	1.7	2.3		30
NORTHWEST	4.2	3.9	3.6	3.2	3.3	3.6	3.2	2.8	1.5	1.8	3.0	3.5		30
NORTH NORTHWEST	6.5	6.4	5.6	3.7	3.8	3.9	3.1	3.0	1.8	4.8	5.5	6.2		30
CALM	12.7	12.2	8.5	9.4	10.3	10.8	15.2	17.9	11.5	10.4	10.6	12.4		30
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	8.4	6.4	5.3	3.3	2.6	2.2	1.4	1.9	4.0	7.8	9.3	8.8		30
NORTH NORTHEAST	7.2	7.8	5.2	2.5	2.0	1.9	1.9	3.1	5.7	9.5	8.9	8.2		30
NORTHEAST	4.9	4.1	3.6	1.5	1.7	1.8	2.1	3.4	7.7	8.6	7.2	5.8		30
EAST NORTHEAST	4.0	3.4	1.6	1.4	1.4	2.8	2.3	3.7	8.6	9.4	4.9	4.4		30
EAST	3.8	4.6	2.6	1.7	2.2	3.3	2.9	4.9	9.3	6.9	4.2	4.7		30
EAST SOUTHEAST	2.6	3.1	2.9	1.8	1.8	2.3	2.3	3.5	5.2	3.7	2.4	3.8		30
SOUTHEAST	5.8	4.2	4.5	4.4	2.2	2.6	2.5	3.2	3.9	2.2	2.6	5.5		30
SOUTH SOUTHEAST	13.1	10.8	14.4	11.1	6.8	4.0	4.9	3.3	5.2	3.5	8.4	10.0		30
SOUTH	10.7	12.2	13.7	18.0	14.7	8.7	9.9	9.0	8.6	6.5	9.8	10.3		30
SOUTH SOUTHWEST	5.6	7.4	9.7	15.9	16.0	14.2	13.7	13.5	9.4	6.5	6.9	5.1		30
SOUTHWEST	3.9	5.5	7.3	11.7	14.3	19.8	19.4	17.3	9.8	7.4	5.1	4.7		30
WEST SOUTHWEST	5.7	7.4	8.3	11.3	18.7	22.8	20.0	17.2	10.1	9.7	6.0	4.5		30
WEST	6.3	9.0	9.0	8.8	10.3	10.5	11.4	9.9	6.4	7.0	7.9	6.6		30
WEST NORTHWEST	4.4	3.6	3.7	1.8	2.1	1.2	1.7	1.6	1.5	2.5	4.1	3.7		30
NORTHWEST	4.3	3.9	2.5	1.7	1.3	0.4	0.9	1.0	1.4	2.6	4.3	4.5		30
NORTH NORTHWEST	6.6	5.0	4.9	2.3	1.2	0.7	0.9	1.6	1.6	4.5	6.2	5.9		30
CALM	2.7	1.4	0.9	0.9	0.8	0.7	1.9	1.9	1.6	1.9	2.0	3.4		30
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	7	5	5	2	1	*	*	*	*	1	2	5	28	46

PENSACOLA, FLORIDA (30°28'N., 87°12'W.) Elevation 112 ft. (34.2m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1020.9	1019.0	1017.5	1016.7	1016.0	1015.2	1016.6	1015.5	1015.1	1016.9	1019.5	1020.4	1017.4	24
TEMPERATURE (DEGREES F)														
MEAN	52.1	54.8	59.9	68.1	75.2	80.6	81.8	81.8	78.3	70.0	59.5	53.8	68.0	30
MEAN DAILY MAXIMUM	61.2	64.1	68.9	76.8	84.2	89.0	89.7	90.0	86.3	79.9	69.7	63.2	76.9	30
MEAN DAILY MINIMUM	43.0	45.5	50.8	59.4	66.1	72.1	73.9	73.6	70.2	60.0	49.3	44.3	59.0	30
EXTREME HIGHEST	80	82	85	87	96	98	99	100	97	92	85	81	100	12
EXTREME LOWEST	11	19	27	37	51	57	61	63	43	38	26	24	11	12
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	83	80	82	84	86	85	87	88	86	83	82	84	84	10
AVERAGE PERCENTAGE (1200L)	66	58	60	58	58	60	63	66	63	54	57	66	61	10
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	7.1	5.8	6.1	6.0	5.9	5.6	6.6	6.6	5.8	4.5	4.8	6.2	5.9	9
MEAN NUMBER OF DAYS WITH CLEAR SKIES	6	9	8	8	9	7	3	4	8	14	13	9	98	9
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	19	12	14	13	12	8	12	13	11	9	9	16	148	9
PRECIPITATION														
MEAN AMOUNT (INCHES)	4.37	4.69	6.31	4.99	4.25	6.30	7.33	6.67	8.15	3.13	3.37	4.66	64.22	30
GREATEST AMOUNT (INCHES)	11.83	11.66	11.81	15.52	8.35	10.00	16.03	13.09	11.53	12.01	6.54	7.68	82.96	12
LEAST AMOUNT (INCHES)	1.22	2.78	0.87	0.67	0.30	2.00	1.69	3.10	1.66	0.00	0.55	2.47	41.20	12
MAXIMUM IN 24 HRS. (INCHES)	3.69	4.19	4.33	7.51	4.74	6.77	5.14	3.05	10.02	4.98	3.59	4.52	10.02	12
MEAN AMOUNT OF SNOW (INCHES)	*	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	12
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	*	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	1.9	12
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	0	*	0	0	0	0	0	0	0	0	0	0	*	12
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	11	10	10	7	8	10	14	13	9	5	8	11	116	12
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	7.0	7.0	7.4	6.9	6.0	5.1	4.5	4.7	6.6	6.7	6.8	7.2		24
MEAN WIND SPEED (KNOTS) (1300L)	9.5	10.2	10.3	9.9	9.0	7.8	7.4	7.0	7.9	8.2	8.9	9.0		24
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	11.7	11.3	8.2	7.5	9.0	8.1	7.1	11.3	8.7	13.8	14.6	11.5		24
NORTH NORTHEAST	9.3	10.2	8.5	8.4	9.2	8.8	9.7	12.5	15.5	18.6	14.6	11.9		24
NORTHEAST	13.4	11.8	11.3	7.7	9.1	9.2	10.4	16.0	23.4	19.2	15.7	11.5		24
EAST NORTHEAST	7.3	7.8	9.0	7.1	8.0	9.4	8.3	9.7	15.3	12.5	9.9	9.4		24
EAST	8.4	7.3	8.0	8.1	8.0	8.0	6.1	6.5	10.3	8.4	7.1	9.7		24
EAST SOUTHEAST	4.5	5.2	4.7	7.0	4.7	2.7	2.5	1.4	1.9	1.8	1.9	3.7		24
SOUTHEAST	3.5	3.1	5.6	7.9	5.2	2.4	1.7	1.6	1.9	1.0	1.7	2.3		24
SOUTH SOUTHEAST	5.7	4.1	5.0	6.1	5.9	2.6	2.0	1.2	1.4	0.8	2.5	3.2		24
SOUTH	3.2	3.3	4.3	6.7	4.9	3.1	2.4	1.4	1.6	1.1	1.8	4.0		24
SOUTH SOUTHWEST	2.5	2.1	3.3	4.4	3.4	3.3	2.7	1.7	0.3	0.2	2.1	2.3		24
SOUTHWEST	1.6	1.6	3.7	3.9	3.7	4.2	3.3	1.8	1.0	0.9	1.7	1.8		24
WEST SOUTHWEST	2.3	2.7	2.9	3.4	3.0	3.6	4.1	2.4	1.1	0.8	1.4	1.9		24
WEST	2.4	4.8	4.0	3.1	4.8	7.0	8.4	4.6	1.4	1.4	2.6	3.2		24
WEST NORTHWEST	4.2	4.3	3.8	2.9	4.1	6.4	5.9	5.7	1.5	2.5	4.1	3.4		24
NORTHWEST	5.2	5.7	4.9	3.0	4.1	4.6	4.5	4.6	3.3	4.2	4.9	4.9		24
NORTH NORTHWEST	7.9	6.6	6.4	4.9	4.2	5.1	4.8	5.0	4.5	6.3	6.3	7.3		
CALM	7.0	8.1	6.5	7.9	8.8	11.5	16.2	12.4	6.9	6.7	7.0	7.9		24
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	10.8	9.0	6.8	5.2	5.2	2.8	3.3	3.8	6.1	11.3	10.2	10.0		24
NORTH NORTHEAST	6.2	6.5	5.4	2.7	3.7	3.1	2.8	4.9	7.7	8.5	7.9	6.8		24
NORTHEAST	4.5	4.3	3.6	2.1	2.4	2.4	2.3	4.1	6.7	7.6	5.8	5.1		24
EAST NORTHEAST	3.2	3.1	3.1	1.7	2.0	2.5	1.9	3.6	5.8	6.5	3.6	3.8		24
EAST	6.9	4.5	4.3	2.2	2.2	2.5	3.3	4.9	8.0	6.1	6.0	8.2		24
EAST SOUTHEAST	7.2	6.5	7.2	6.0	5.0	4.4	4.7	6.1	8.0	9.1	7.7	7.3		24
SOUTHEAST	8.7	9.5	9.5	13.5	11.4	9.5	9.5	10.7	11.5	8.9	8.5	8.6		24
SOUTH SOUTHEAST	8.2	7.7	10.3	15.5	15.3	11.5	10.9	9.7	10.6	6.1	5.8	5.6		24
SOUTH	7.5	5.4	9.8	11.2	13.0	15.6	12.9	11.2	8.5	5.2	4.6	6.8		24
SOUTH SOUTHWEST	4.6	7.3	7.1	11.8	13.5	13.1	13.6	9.3	4.7	4.1	5.9	5.1		24
SOUTHWEST	5.0	7.7	6.4	7.7	10.0	12.7	11.9	8.8	4.3	3.5	4.5	3.6		24
WEST SOUTHWEST	2.5	5.3	4.4	4.9	3.9	5.8	6.2	5.3	2.3	2.0	3.4	3.5		24
WEST	4.1	3.8	4.0	3.0	3.2	4.1	5.1	4.5	2.5	2.7	3.6	4.6		24
WEST NORTHWEST	3.5	4.5	4.3	2.1	2.5	2.8	3.0	3.3	2.3	3.0	5.1	4.0		24
NORTHWEST	5.9	6.1	5.1	3.2	2.3	2.8	3.1	3.4	3.6	5.0	5.5	5.9		24
NORTH NORTHWEST	8.2	7.3	7.5	5.9	3.3	2.6	2.0	2.8	4.9	8.1	10.0	7.8		24
CALM	3.2	1.6	1.2	1.1	1.1	2.1	3.4	3.5	2.5	2.3	2.1	3.5		24
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	9	4	7	3	2	1	1	*	*	2	3	6	37	6

MOBILE, ALABAMA (30°41'N., 88°15'W.) Elevation 211 ft. (64.3m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1021.0	1019.3	1017.5	1016.9	1015.7	1015.4	1016.5	1015.7	1015.3	1017.3	1019.3	1020.8	1017.6	19
TEMPERATURE (DEGREES F)														
MEAN	51.2	54.0	59.4	67.9	74.8	80.3	81.6	81.5	77.5	68.9	58.5	52.9	67.4	30
MEAN DAILY MAXIMUM	61.1	64.1	69.5	78.0	85.0	89.8	90.5	9.06	86.5	79.7	69.5	63.0	77.3	30
MEAN DAILY MINIMUM	41.3	43.9	49.2	57.7	64.5	70.7	72.6	72.3	68.4	58.0	47.5	42.8	57.4	30
EXTREME HIGHEST	79	81	89	91	99	101	100	102	98	93	87	81	102	14
EXTREME LOWEST	8	11	11	36	46	56	62	60	42	38	24	10	8	14
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	82	81	84	87	86	86	89	90	88	85	85	84	86	12
AVERAGE PERCENTAGE (1200L)	64	56	56	55	53	54	61	62	60	52	56	63	58	13
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	6.7	6.2	6.1	5.9	5.7	5.8	6.7	6.1	5.9	4.3	5.2	6.2	5.9	27
MEAN NUMBER OF DAYS WITH CLEAR SKIES	7	8	9	8	9	7	3	6	8	15	11	9	100	27
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	17	14	14	12	11	9	13	10	11	8	11	16	146	27
PRECIPITATION														
MEAN AMOUNT (INCHES)	4.71	4.76	7.07	5.59	4.52	6.09	8.86	6.93	6.59	2.55	3.39	5.92	66.98	30
GREATEST AMOUNT (INCHES)	9.35	9.01	15.58	17.69	11.17	13.07	19.29	12.05	13.61	6.72	13.65	11.38	90.53	34
LEAST AMOUNT (INCHES)	0.98	1.31	0.59	0.48	0.45	1.19	2.16	2.35	0.58	0.03	0.25	1.45	42.35	34
MAXIMUM IN 24 HRS. (INCHES)	8.34	5.00	6.52	13.36	4.47	7.38	5.34	6.62	6.82	4.30	7.02	5.50	13.36	34
MEAN AMOUNT OF SNOW (INCHES)	0.1	0.2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.1	0.4	34
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	3.5	3.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	3.0	3.6	34
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	*	*	*	0	0	0	0	0	0	0	0	*	*	34
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	11	10	11	8	8	12	17	14	10	6	8	11	124	34
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	7.4	7.4	7.9	7.7	7.0	5.9	5.2	5.2	6.7	6.3	6.8	7.0		25
MEAN WIND SPEED (KNOTS) (1300L)	9.7	10.3	11.0	11.4	10.7	9.2	8.2	7.9	8.3	7.9	8.8	8.9		25
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	13.0	12.4	10.3	9.3	8.8	9.6	8.1	12.0	15.2	19.2	15.9	16.2		25
NORTH NORTHEAST	7.2	8.7	7.5	5.6	6.1	5.1	4.3	6.6	9.8	12.4	10.2	9.5		25
NORTHEAST	7.0	7.1	7.2	6.7	5.4	5.6	5.5	8.1	12.3	10.9	7.9	7.4		25
EAST NORTHEAST	4.6	4.2	4.6	5.3	5.4	5.2	4.6	5.7	11.0	7.9	5.5	4.8		25
EAST	5.1	6.1	5.8	8.5	8.8	9.4	6.6	7.9	11.6	7.8	6.6	6.7		25
EAST SOUTHEAST	2.7	5.0	5.5	6.6	6.3	4.6	4.0	3.3	4.0	2.9	3.2	3.6		25
SOUTHEAST	4.6	4.8	6.5	9.0	6.1	4.0	3.7	2.0	2.7	1.6	2.6	3.6		25
SOUTH SOUTHEAST	5.2	4.7	6.1	7.4	6.0	2.0	1.5	0.9	1.3	0.6	2.7	3.4		25
SOUTH	4.1	4.2	6.1	5.8	3.7	3.0	2.4	1.2	1.6	1.0	2.4	2.9		25
SOUTH SOUTHWEST	2.4	2.1	2.1	4.2	3.3	1.9	1.5	1.1	0.6	0.5	1.5	1.6		25
SOUTHWEST	2.1	2.9	3.2	2.5	3.2	3.8	4.1	2.2	1.1	0.7	2.3	2.2		25
WEST SOUTHWEST	2.8	3.2	3.4	3.1	3.2	4.2	4.0	2.5	0.8	0.8	2.0	2.1		25
WEST	4.7	5.2	3.3	4.6	6.3	9.4	10.0	6.3	2.8	2.5	3.5	4.2		25
WEST NORTHWEST	4.8	5.8	4.5	3.1	5.3	7.5	8.4	7.3	2.3	3.7	3.6	3.8		25
NORTHWEST	8.4	6.0	6.4	5.0	7.0	6.8	9.6	10.5	6.0	7.5	8.5	8.4		25
NORTH NORTHWEST	11.4	9.1	8.9	6.8	7.2	8.1	7.9	11.0	9.0	12.9	14.0	10.1		25
CALM	10.0	8.6	8.8	6.4	7.7	9.7	13.9	11.4	8.1	7.0	7.3	9.6		25
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	9.5	8.9	6.8	4.8	3.3	2.6	2.2	2.6	6.2	10.0	9.9	10.5		25
NORTH NORTHEAST	6.5	6.4	4.4	3.7	3.5	2.0	1.8	2.2	5.6	8.2	6.9	7.3		25
NORTHEAST	4.7	4.6	4.1	3.0	3.8	3.1	2.9	4.1	8.2	8.4	6.2	5.5		25
EAST NORTHEAST	3.2	3.1	3.1	2.7	2.9	3.5	2.8	3.8	6.6	6.9	4.0	4.2		25
EAST	5.1	5.0	5.1	3.6	5.0	6.1	6.7	10.2	14.1	11.7	7.5	6.8		25
EAST SOUTHEAST	5.7	7.2	6.1	4.6	6.2	7.9	7.9	9.6	10.3	9.4	7.8	6.8		25
SOUTHEAST	10.9	11.1	12.0	12.8	13.9	15.6	13.7	16.1	12.9	9.5	9.6	10.4		25
SOUTH SOUTHEAST	13.3	13.3	17.3	23.2	21.1	18.2	14.9	12.8	10.7	9.6	13.7	11.3		25
SOUTH	7.4	8.4	10.9	15.8	17.9	14.9	16.3	11.5	8.8	6.0	5.6	6.5		25
SOUTH SOUTHWEST	2.3	2.0	2.4	4.8	4.4	4.2	4.8	3.3	1.8	1.2	1.8	1.9		25
SOUTHWEST	2.8	4.4	3.5	3.6	3.1	5.4	5.3	3.6	1.6	1.0	2.4	1.7		25
WEST SOUTHWEST	2.6	3.3	3.1	2.8	2.9	3.2	4.7	3.5	1.1	0.9	1.1	1.7		25
WEST	3.1	3.0	3.2	2.0	1.4	4.5	5.2	3.8	1.0	2.1	2.3	3.3		25
WEST NORTHWEST	3.6	5.1	3.5	3.3	2.9	3.2	4.1	3.7	2.2	2.7	4.7	3.9		25
NORTHWEST	7.1	5.5	5.8	4.2	3.4	2.5	3.0	3.2	2.9	3.9	5.1	6.5		25
NORTH NORTHWEST	10.0	7.3	7.5	4.8	3.3	1.8	2.4	3.6	3.7	6.8	9.2	9.1		25
CALM	2.3	1.6	1.2	0.4	0.9	1.3	1.4	2.4	2.3	1.7	2.2	2.3		25
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	6	4	5	5	2	1	1	1	2	2	4	5	39	34

NEW ORLEANS, LOUISIANA (29°59'N., 90°15'W.) Elevation 4 ft. (1.2m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1021.4	1019.2	1018.0	1016.9	1016.4	1015.5	1017.1	1016.2	1015.5	1017.3	1019.9	1020.8	1017.8	15
TEMPERATURE (DEGREES F)														
MEAN	52.9	55.6	60.7	68.6	75.1	80.4	81.9	81.9	78.2	69.8	60.1	54.8	68.3	30
MEAN DAILY MAXIMUM	62.3	65.1	70.4	78.4	84.9	89.6	90.4	90.6	86.6	79.9	70.3	64.2	77.7	30
MEAN DAILY MINIMUM	43.5	46.0	50.9	58.8	65.3	71.2	73.3	73.1	69.7	59.6	49.8	45.3	58.9	30
EXTREME HIGHEST	83	85	87	91	96	100	99	100	97	92	86	84	100	30
EXTREME LOWEST	14	19	26	32	41	55	60	60	42	35	24	17	14	29
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	86	85	85	88	89	89	91	91	89	88	86	86	88	27
AVERAGE PERCENTAGE (1200L)	67	63	61	61	60	62	66	66	66	59	60	67	63	27
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	6.7	6.2	6.2	5.7	5.2	5.1	6.2	5.5	5.3	4.1	5.0	6.2	5.6	27
MEAN NUMBER OF DAYS WITH CLEAR SKIES	7	8	8	8	10	10	5	8	10	16	11	8	109	27
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	17	14	14	11	9	7	11	9	9	8	10	15	134	27
PRECIPITATION														
MEAN AMOUNT (INCHES)	4.53	4.82	5.49	4.15	4.20	4.74	6.72	5.27	5.58	2.26	3.8	5.13	56.77	30
GREATEST AMOUNT (INCHES)	12.62	10.56	19.09	10.47	14.33	12.28	11.46	11.77	16.74	6.45	14.58	10.77	83.54	29
LEAST AMOUNT (INCHES)	0.54	1.02	0.24	0.33	0.99	1.12	3.45	2.00	0.24	0.00	0.21	1.46	43.15	29
MAXIMUM IN 24 HRS. (INCHES)	4.77	5.60	7.87	4.35	9.86	4.19	4.30	4.82	6.50	3.44	8.72	4.85	9.86	29
MEAN AMOUNT OF SNOW (INCHES)	*	0.1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.1	0.2	29
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	0.1	2.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	2.7	2.7	29
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	0	*	0	0	0	0	0	0	0	0	0	*	*	27
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	10	10	9	7	7	10	15	13	10	6	7	10	114	27
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	4.9	5.0	4.9	4.0	3.8	2.7	2.0	2.0	3.1	3.2	3.7	4.4		13
MEAN WIND SPEED (KNOTS) (1300L)	8.3	8.9	8.7	8.2	7.2	6.0	5.4	5.2	6.5	6.8	7.6	7.7		13
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	11.9	11.0	8.8	5.8	4.8	5.1	3.6	5.5	8.4	9.5	9.1	8.6		13
NORTH NORTHEAST	12.5	11.7	7.7	5.2	5.8	5.4	3.4	5.8	11.8	15.2	11.9	12.2		13
NORTHEAST	10.1	7.6	6.8	5.3	7.6	6.5	4.1	7.7	11.9	10.1	9.5	8.2		13
EAST NORTHEAST	7.4	4.8	6.0	3.7	5.6	4.4	2.9	2.7	5.3	6.3	7.1	6.3		13
EAST	6.7	6.5	6.8	6.5	7.6	5.4	3.9	5.6	7.5	5.9	5.7	7.4		13
EAST SOUTHEAST	3.3	3.5	5.3	7.2	6.7	3.7	2.1	2.4	4.5	2.5	4.3	4.1		13
SOUTHEAST	1.7	2.5	5.2	7.1	6.8	4.2	2.3	2.1	3.5	2.0	1.8	2.9		13
SOUTH SOUTHEAST	2.0	3.2	5.5	8.8	6.4	3.6	2.3	1.4	1.1	2.1	2.2	4.3		13
SOUTH	4.8	4.6	4.9	8.9	6.8	4.0	3.8	2.0	2.0	1.4	2.2	3.6		13
SOUTH SOUTHWEST	2.5	3.0	2.7	3.7	2.1	3.2	1.7	2.1	0.7	0.8	2.0	2.6		13
SOUTHWEST	1.4	2.4	2.7	3.6	1.8	2.9	2.7	1.3	0.7	0.5	1.1	1.1		13
WEST SOUTHWEST	1.7	2.0	2.3	1.1	1.4	4.0	3.0	2.0	0.3	0.8	1.6	1.1		13
WEST	3.2	2.9	3.2	2.3	2.9	5.8	8.4	4.1	2.3	1.3	2.9	2.9		13
WEST NORTHWEST	2.0	3.0	2.9	1.6	2.6	3.9	5.6	3.3	1.6	1.3	1.9	2.0		13
NORTHWEST	3.7	2.9	4.5	1.9	3.0	3.3	4.3	3.2	1.4	1.7	2.9	3.1		13
NORTH NORTHWEST	4.4	5.7	4.2	2.9	3.4	2.0	2.6	2.4	1.6	3.3	3.2	5.0		13
CALM	21.0	22.5	20.8	24.3	24.8	32.6	43.5	46.6	35.3	35.4	30.8	24.8		
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	11.7	8.2	7.8	3.9	4.8	4.3	5.2	6.6	7.1	9.0	10.0	8.7		13
NORTH NORTHEAST	7.2	6.1	4.1	3.2	4.3	4.1	3.3	5.1	7.5	10.2	7.4	6.4		13
NORTHEAST	7.1	5.8	4.6	2.5	4.4	5.6	5.2	6.7	9.8	9.7	7.7	7.3		13
EAST NORTHEAST	7.1	6.3	6.4	3.8	7.1	5.0	4.7	6.3	12.2	14.1	7.9	8.0		13
EAST	11.8	8.6	9.8	8.3	9.8	10.5	7.9	11.5	13.8	13.7	11.4	11.3		13
EAST SOUTHEAST	7.0	6.9	7.6	8.8	9.5	9.4	5.0	6.1	10.1	7.4	8.4	6.6		13
SOUTHEAST	4.5	3.4	5.8	7.8	6.7	5.4	4.4	5.2	4.9	4.7	4.7	4.6		13
SOUTH SOUTHEAST	3.9	4.2	5.8	10.8	9.8	5.9	5.3	4.8	4.5	3.5	5.5	6.5		13
SOUTH	6.3	8.8	11.0	17.1	13.7	8.0	8.8	7.4	6.7	4.2	6.3	8.7		13
SOUTH SOUTHWEST	4.6	5.3	5.3	9.0	7.4	6.3	8.1	6.3	2.6	1.7	3.6	4.8		13
SOUTHWEST	2.8	4.1	3.7	5.5	3.8	6.9	6.9	4.7	1.8	1.9	2.2	2.8		13
WEST SOUTHWEST	4.2	4.8	4.5	3.9	3.2	6.7	7.8	4.6	2.0	2.3	2.8	2.4		13
WEST	4.7	6.8	4.7	3.9	3.5	7.8	10.7	6.2	3.0	2.6	4.1	3.8		13
WEST NORTHWEST	3.2	5.2	4.9	2.0	2.0	4.3	5.1	5.4	2.8	2.4	4.3	3.8		13
NORTHWEST	5.1	4.8	5.6	2.8	2.4	2.5	3.3	2.9	3.0	4.1	3.4	5.1		13
NORTH NORTHWEST	7.0	8.9	7.1	5.4	5.6	3.6	3.0	3.9	4.5	7.2	7.8	7.7		13
CALM	1.9	1.8	1.4	1.5	2.3	3.9	5.5	6.5	3.8	1.6	2.2	1.7		
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	7	4	4	2	1	*	*	*	*	2	4	6	31	27

PORT ARTHUR, TEXAS (29°57'N., 94°01'W.) Elevation 16 ft. (4.9m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1018.7	1018.7	1013.5	1015.2	1012.2	1014.0	1015.4	1015.8	1014.3	1018.3	1018.6	1019.1	1016.2	3
TEMPERATURE (DEGREES F)														
MEAN	52.0	55.1	60.1	68.9	75.0	80.8	83.0	83.1	78.9	69.9	60.2	54.2	68.5	30
MEAN DAILY MAXIMUM	61.5	65.0	70.5	78.3	84.3	89.9	92.0	92.6	88.6	81.3	70.9	64.2	78.3	30
MEAN DAILY MINIMUM	42.4	45.1	49.7	59.4	65.7	71.7	74.0	73.6	69.2	58.5	49.4	44.1	58.6	30
EXTREME HIGHEST	80	84	87	90	93	99	103	107	99	95	87	82	107	15
EXTREME LOWEST	14	22	27	36	47	57	61	62	45	37	27	17	14	15
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	90	89	89	91	92	93	94	94	93	91	89	90	91	15
AVERAGE PERCENTAGE (1200L)	71	62	62	65	64	63	64	65	65	58	61	69	64	15
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	7.1	6.3	6.5	6.7	6.1	5.4	6.0	5.8	5.6	4.7	5.5	6.4	6.0	22
MEAN NUMBER OF DAYS WITH CLEAR SKIES	6	8	7	6	6	8	5	6	9	12	10	9	92	22
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	18	14	16	16	12	7	9	9	10	8	12	16	147	22
PRECIPITATION														
MEAN AMOUNT (INCHES)	4.06	4.24	3.05	4.19	4.94	4.81	5.89	5.69	5.34	3.71	4.26	4.89	55.07	30
GREATEST AMOUNT (INCHES)	9.57	11.76	8.83	15.30	9.63	14.05	18.71	17.26	18.15	15.09	10.42	12.47	78.91	22
LEAST AMOUNT (INCHES)	0.60	0.36	0.06	0.35	0.55	0.96	0.63	0.98	0.50	0.00	0.15	1.32	33.07	22
MAXIMUM IN 24 HRS. (INCHES)	4.92	5.05	5.28	10.09	7.18	10.20	4.87	8.45	13.17	8.06	7.26	6.24	13.17	22
MEAN AMOUNT OF SNOW (INCHES)	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.6	22
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	3.0	4.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	4.4	22
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	*	*	*	0	0	0	0	0	0	0	0	0	*	22
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	10	9	8	7	8	8	11	12	10	6	7	9	105	22
WIND														
MEAN WIND SPEED (KNOTS)	9.6	10.5	10.5	10.6	9.6	7.7	6.8	6.5	7.7	7.5	8.9	9.1	8.8	5
DIRECTION (PERCENTAGE OF OBS.)														
NORTH	11.7	8.2	7.8	6.1	4.9	3.7	4.2	3.8	9.0	10.5	13.4	10.1	7.8	5
NORTH NORTHEAST	7.3	8.4	6.2	4.7	4.4	5.9	4.6	5.6	11.0	9.4	11.0	9.8	7.6	5
NORTHEAST	6.8	6.2	5.0	3.4	4.3	5.6	4.1	7.7	12.9	9.0	7.4	8.8	6.8	5
EAST NORTHEAST	8.4	6.3	5.8	4.1	4.2	5.7	3.8	9.4	9.8	7.4	9.1	9.0	6.9	5
EAST	9.2	7.7	4.3	3.8	3.8	4.8	3.3	6.7	6.8	7.3	9.1	10.3	6.4	5
EAST SOUTHEAST	8.8	7.3	7.6	9.8	6.5	5.3	4.0	7.0	7.3	8.8	8.9	9.9	7.6	5
SOUTHEAST	4.9	4.8	9.3	9.9	13.0	8.2	3.1	5.2	4.9	9.1	5.3	4.2	6.9	5
SOUTH SOUTHEAST	4.1	5.7	11.5	13.8	16.1	9.6	4.3	5.2	6.0	6.5	5.4	4.1	7.7	5
SOUTH	5.8	10.4	10.8	18.8	20.5	19.3	15.5	9.4	9.8	8.0	5.9	4.6	11.5	5
SOUTH SOUTHWEST	3.3	7.8	7.1	8.3	9.5	11.9	17.1	10.9	4.8	4.5	2.9	3.0	7.6	5
SOUTHWEST	3.6	5.0	3.4	3.6	3.2	5.0	11.1	8.3	2.3	1.9	2.7	3.2	4.4	5
WEST SOUTHWEST	2.6	2.9	1.8	1.2	1.0	3.4	8.1	5.6	1.9	2.0	1.9	2.5	2.9	5
WEST	2.7	3.8	2.5	1.5	1.3	1.9	5.8	3.7	1.8	1.7	1.6	2.7	2.6	5
WEST NORTHWEST	5.4	5.7	4.8	3.3	2.4	2.5	4.9	3.5	2.5	3.4	3.6	4.3	3.9	5
NORTHWEST	6.5	4.3	5.0	3.0	1.3	2.0	2.3	2.6	2.9	4.0	4.0	5.3	3.6	5
NORTH NORTHWEST	8.0	4.3	5.3	3.8	1.9	2.0	1.9	2.9	3.7	5.0	6.3	6.5	4.3	5
CALM	1.0	1.1	1.9	1.0	1.5	3.3	1.9	2.6	2.6	1.5	1.1	1.5	1.5	5
DIRECTION (MEAN SPEED, KNOTS)														
NORTH	10.8	10.9	10.0	9.7	8.2	7.0	5.8	5.2	7.6	8.2	9.6	8.8	8.9	5
NORTH NORTHEAST	9.7	12.7	10.1	10.3	8.9	7.3	6.1	6.0	7.6	8.3	8.9	9.8	8.9	5
NORTHEAST	8.8	10.6	10.0	8.9	7.6	7.1	6.3	6.3	7.6	7.0	8.0	8.9	8.0	5
EAST NORTHEAST	9.0	9.8	9.9	9.3	7.7	6.7	6.5	7.0	8.3	6.8	8.2	9.0	8.2	5
EAST	8.9	10.3	9.3	9.9	8.3	6.8	6.4	7.5	8.4	7.6	8.2	9.2	8.5	5
EAST SOUTHEAST	9.2	10.7	10.6	11.9	10.0	8.2	7.1	8.2	9.6	7.9	8.1	9.8	9.4	5
SOUTHEAST	10.0	9.7	11.5	11.5	11.8	9.3	6.9	7.0	7.9	8.5	9.6	9.0	9.9	5
SOUTH SOUTHEAST	11.1	10.5	12.4	11.5	11.6	9.1	7.3	7.4	9.3	7.5	10.3	9.3	10.3	5
SOUTH	10.6	10.3	11.9	11.0	9.5	8.4	7.6	6.9	8.2	6.9	10.2	9.0	9.2	5
SOUTH SOUTHWEST	8.3	11.3	11.0	11.0	9.1	9.3	7.8	7.3	8.9	8.2	8.3	9.0	9.0	5
SOUTHWEST	8.1	9.8	8.7	10.1	8.7	7.5	6.9	6.3	6.4	6.1	8.6	8.2	7.7	5
WEST SOUTHWEST	7.4	8.4	7.5	7.0	6.5	6.7	6.1	6.2	5.3	6.0	7.4	8.0	6.7	5
WEST	8.0	8.8	9.0	8.0	6.6	6.2	6.3	6.2	5.1	5.7	6.9	8.9	7.2	5
WEST NORTHWEST	10.2	11.4	11.2	10.3	8.5	6.5	6.2	6.6	5.9	7.1	8.4	9.1	8.8	5
NORTHWEST	11.5	10.5	10.9	9.6	7.7	6.8	5.6	5.3	5.8	7.8	8.3	9.6	8.9	5
NORTH NORTHWEST	11.0	10.5	10.7	11.2	8.3	7.1	5.3	4.9	7.2	7.8	11.5	10.7	9.6	5
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	8	6	6	3	1	*	*	*	1	3	5	7	41	22

GALVESTON, TEXAS (29°18'N., 94°48'W.) Elevation 7 ft. (2.1m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
TEMPERATURE (DEGREES F)														
MEAN	53.9	56.2	61.0	69.2	75.9	81.3	83.2	83.3	80.0	73.1	63.5	57.1	69.8	30
MEAN DAILY MAXIMUM	59.4	61.5	66.0	73.3	80.0	85.2	87.4	87.6	84.6	78.0	68.8	62.7	74.5	30
MEAN DAILY MINIMUM	48.3	50.9	55.9	65.0	71.8	77.4	79.0	78.9	75.3	68.1	58.2	51.5	65.0	30
EXTREME HIGHEST	77	83	85	92	93	99	101	100	96	94	85	80	101	30
EXTREME LOWEST	11	8	27	38	52	57	66	67	52	41	26	18	8	30
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	85	84	85	86	84	81	81	81	81	80	84	86	83	88
AVERAGE PERCENTAGE (1200L)	77	74	74	75	73	70	70	69	68	65	72	77	72	58
PRECIPITATION														
MEAN AMOUNT (INCHES)	3.02	2.67	2.60	2.63	3.16	4.05	4.41	4.40	5.60	2.83	3.16	3.67	42.20	30
GREATEST AMOUNT (INCHES)	10.39	8.29	9.49	11.04	10.79	15.49	18.74	19.08	26.01	17.78	16.18	10.28	78.39	105
LEAST AMOUNT (INCHES)	0.02	0.09	0.06	0.01	*	*	*	0.00	0.04	*	0.03	0.23	21.40	105
MAXIMUM IN 24 HRS. (INCHES)	5.38	6.55	8.10	9.23	7.71	12.56	14.35	9.05	11.65	14.10	9.01	5.43	14.35	105
MEAN AMOUNT OF SNOW (INCHES)	0.1	0.2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.3	105
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	2.5	15.4	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	15.4	105
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	*	*	0	0	0	0	0	0	0	0	0	0	*	104
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	10	9	8	6	6	6	9	9	9	6	8	10	96	104
WIND														
MEAN WIND SPEED (KNOTS)	11.5	12.3	11.5	11.8	11.2	10.9	10.1	9.5	9.4	10.0	11.4	11.0	10.9	10
DIRECTION (PERCENTAGE OF OBS.)														
NORTH	9.0	9.2	8.3	5.7	4.8	1.4	1.9	2.1	6.4	9.0	11.2	11.6	6.7	10
NORTH NORTHEAST	7.0	7.6	5.8	4.4	3.4	1.9	1.2	2.4	6.7	9.5	9.8	7.9	5.6	10
NORTHEAST	5.6	7.3	5.7	4.1	3.8	2.8	1.5	4.0	10.5	10.1	9.3	6.6	5.9	10
EAST NORTHEAST	5.7	4.7	4.7	2.8	2.0	2.1	1.0	2.5	7.3	5.5	5.7	4.6	4.0	10
EAST	7.0	8.2	6.5	5.5	3.7	3.3	1.9	4.7	8.2	5.4	8.3	7.9	5.9	10
EAST SOUTHEAST	9.7	9.1	10.5	14.4	7.9	5.3	3.6	6.8	13.4	9.6	8.5	7.9	8.9	10
SOUTHEAST	11.4	10.5	13.6	18.1	16.5	12.8	8.1	11.1	12.3	13.5	9.9	10.3	12.2	10
SOUTH SOUTHEAST	11.7	9.5	13.5	16.7	21.2	20.7	15.0	11.2	10.8	10.5	8.3	9.1	12.2	10
SOUTH	7.4	8.4	11.7	11.1	18.6	27.6	26.3	21.4	11.0	9.9	7.7	6.5	14.0	10
SOUTH SOUTHWEST	3.7	4.4	4.7	4.1	5.9	10.4	16.7	14.4	3.4	3.1	2.6	3.4	6.4	10
SOUTHWEST	2.9	3.8	3.4	2.2	3.0	4.3	10.1	7.2	2.1	3.0	2.6	3.8	4.1	10
WEST SOUTHWEST	1.8	1.7	1.0	1.0	1.5	1.4	4.0	3.0	1.1	1.2	1.5	2.3	1.8	10
WEST	1.9	2.4	1.3	1.1	1.6	1.1	2.8	2.2	1.1	1.3	1.9	2.8	1.8	10
WEST NORTHWEST	3.3	3.1	2.1	1.4	1.3	1.1	2.1	2.3	1.7	1.6	1.8	3.8	2.1	10
NORTHWEST	4.7	5.2	2.8	3.5	2.2	1.8	2.2	2.3	1.4	2.3	4.3	5.3	3.1	10
NORTH NORTHWEST	6.3	4.2	3.4	2.9	1.7	0.8	1.0	1.6	1.5	3.3	4.8	4.9	3.0	10
CALM	0.9	0.7	1.0	0.8	1.0	0.9	0.7	0.9	1.2	1.3	1.7	1.6	1.1	10
DIRECTION (MEAN SPEED, KNOTS)														
NORTH	13.3	15.2	14.8	13.8	12.1	10.4	7.9	8.2	10.4	11.5	14.2	13.5	13.0	10
NORTH NORTHEAST	13.1	14.7	14.0	13.1	12.6	10.0	8.5	8.5	10.5	12.6	13.9	12.4	12.7	10
NORTHEAST	12.2	12.6	11.7	11.3	10.9	9.6	9.1	8.2	10.4	10.8	12.7	11.3	11.2	10
EAST NORTHEAST	12.6	12.9	11.7	11.1	11.3	11.4	9.7	8.8	10.6	10.2	11.9	10.8	11.2	10
EAST	11.6	12.0	10.7	11.5	11.6	9.8	8.0	9.4	10.4	9.5	10.4	10.8	10.7	10
EAST SOUTHEAST	10.7	11.2	10.8	11.6	12.2	10.9	9.8	9.6	9.6	10.2	9.9	10.3	10.6	10
SOUTHEAST	9.1	10.6	9.9	12.4	11.7	11.4	9.2	9.1	8.5	9.7	8.9	9.5	10.2	10
SOUTH SOUTHEAST	9.9	10.8	10.4	10.9	11.6	11.4	10.2	9.3	9.1	9.1	10.2	9.6	10.4	10
SOUTH	9.9	10.4	10.2	11.0	11.1	11.6	10.7	9.9	9.0	9.4	11.2	9.8	10.5	10
SOUTH SOUTHWEST	10.6	12.0	10.7	12.1	11.0	11.6	11.6	11.4	9.0	8.6	10.9	10.8	11.2	10
SOUTHWEST	11.5	12.1	10.2	9.7	8.9	8.9	10.7	10.2	7.8	8.5	10.4	11.4	10.2	10
WEST SOUTHWEST	8.8	10.2	9.7	9.0	6.9	7.6	8.2	7.7	6.9	8.0	8.8	9.9	8.4	10
WEST	9.5	9.5	12.2	10.6	8.9	7.8	7.6	7.3	6.6	7.1	7.8	10.1	8.8	10
WEST NORTHWEST	13.7	13.0	14.7	13.2	9.1	8.5	8.6	8.1	6.7	8.0	11.1	10.2	10.8	10
NORTHWEST	13.5	15.8	15.3	13.5	10.6	9.2	8.1	8.1	7.0	9.6	11.4	12.3	12.1	10
NORTH NORTHWEST	17.4	16.0	16.8	16.8	11.0	9.7	7.6	7.7	8.4	11.2	15.6	14.7	14.4	10

HOUSTON, TEXAS (29°58'N., 95°21'W.) Elevation 96 ft. (29.3m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1020.4	1018.6	1016.7	1015.0	1014.6	1014.2	1015.9	1014.9	1014.6	1017.1	1019.3	1019.8	1016.7	24
TEMPERATURE (DEGREES F)														
MEAN	52.1	55.3	60.8	69.4	75.8	81.1	83.3	83.4	79.2	70.9	61.1	54.6	68.9	30
MEAN DAILY MAXIMUM	62.6	66.0	71.8	79.4	85.9	91.3	93.8	94.3	90.1	83.5	73.0	65.8	79.8	30
MEAN DAILY MINIMUM	41.5	44.6	49.8	59.3	65.6	70.9	72.8	72.4	68.2	58.3	49.1	43.4	58.0	30
EXTREME HIGHEST	84	82	90	89	93	99	101	101	97	93	88	83	101	6
EXTREME LOWEST	19	22	25	31	46	52	62	62	48	39	24	21	19	6
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	89	87	89	90	93	92	93	95	95	95	90	88	91	6
AVERAGE PERCENTAGE (1200L)	67	57	61	60	61	59	58	62	66	60	59	62	61	6
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	7.0	6.2	6.6	6.7	6.2	6.0	6.0	6.1	6.3	5.2	5.2	6.5	6.2	6
MEAN NUMBER OF DAYS WITH CLEAR SKIES	7	8	8	7	7	7	6	6	6	11	11	9	93	6
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	18	14	17	17	14	11	10	11	14	11	11	18	166	6
PRECIPITATION														
MEAN AMOUNT (INCHES)	3.57	3.54	2.68	3.54	5.10	4.52	4.12	4.35	4.65	4.05	4.03	4.04	48.19	30
GREATEST AMOUNT (INCHES)	7.68	3.40	8.52	7.15	14.39	13.46	6.7	6.95	9.38	9.31	7.90	7.33	70.16	6
LEAST AMOUNT (INCHES)	0.36	0.55	1.21	1.68	3.41	0.26	1.42	2.03	0.80	3.30	1.54	0.64	37.83	6
MAXIMUM IN 24 HRS. (INCHES)	2.00	1.55	7.47	2.54	4.69	6.61	3.99	3.21	2.87	4.06	3.55	3.43	7.47	6
MEAN AMOUNT OF SNOW (INCHES)	0.2	0.2	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.4	41
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	2.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	6	*	*	0	0	0	0	0	0	0	0	0	1	6
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	11	7	10	7	10	8	10	11	10	8	8	9	108	6
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	6.3	6.3	7.1	6.9	6.2	4.9	3.6	3.7	5.0	4.9	6.0	5.9		
MEAN WIND SPEED (KNOTS) (1300L)	10.1	10.7	11.3	11.3	10.1	9.2	7.5	7.7	8.8	9.0	10.1	9.7		29
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	10.5	8.6	8.9	5.3	5.2	3.7	3.4	5.5	10.3	12.9	12.6	10.7		29
NORTH NORTHEAST	9.5	7.0	6.9	5.6	5.5	5.2	4.1	6.7	13.6	12.6	8.6	7.6		29
NORTHEAST	8.0	7.2	7.5	6.9	6.3	5.7	4.9	9.0	17.6	14.1	10.2	8.0		29
EAST NORTHEAST	5.6	6.4	6.1	4.0	4.2	4.0	3.2	4.0	7.6	6.4	6.3	6.5		29
EAST	6.6	7.4	6.6	4.8	3.6	2.5	2.3	2.7	3.3	5.3	5.1	6.9		29
EAST SOUTHEAST	3.9	4.6	5.3	6.2	5.7	3.9	1.4	1.0	2.7	2.7	3.8	3.8		29
SOUTHEAST	3.5	4.5	7.1	10.9	10.8	6.3	2.5	2.2	3.1	4.3	5.3	3.9		29
SOUTH SOUTHEAST	5.3	6.5	9.8	15.0	14.7	10.6	4.3	3.2	3.3	3.3	5.0	4.8		29
SOUTH	7.1	6.1	7.8	11.6	11.2	13.1	8.4	5.3	4.2	2.3	5.7	5.0		29
SOUTH SOUTHWEST	3.4	3.1	2.9	3.5	3.1	6.0	6.5	4.5	1.2	0.8	1.6	2.5		29
SOUTHWEST	2.1	2.1	2.5	1.7	0.8	2.9	5.5	5.3	0.9	1.2	1.4	1.6		29
WEST SOUTHWEST	2.1	2.9	2.0	1.2	1.4	2.0	4.7	4.0	0.8	0.7	1.8	2.6		29
WEST	4.2	3.1	2.3	1.9	2.2	2.0	5.0	5.5	1.5	1.0	2.7	3.6		29
WEST NORTHWEST	2.8	2.9	2.4	2.0	2.1	1.8	3.2	2.3	1.0	0.7	2.5	3.1		29
NORTHWEST	4.1	3.8	2.5	1.6	1.7	2.2	2.3	2.6	2.7	3.5	4.0	5.1		29
NORTH NORTHWEST	6.3	6.0	5.0	3.0	3.1	1.5	1.5	1.9	3.3	4.8	6.6	8.1		29
CALM	15.2	17.7	14.5	14.7	18.3	26.6	36.5	34.4	23.1	23.5	16.8	16.2		29
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	9.9	7.3	6.5	5.1	4.1	1.5	1.9	2.3	7.5	8.5	8.8	8.6		29
NORTH NORTHEAST	6.9	5.3	4.1	3.0	3.8	2.3	2.7	2.8	5.7	8.0	7.4	5.4		29
NORTHEAST	4.5	4.9	4.1	3.5	4.0	3.2	3.1	4.6	9.4	7.3	4.9	4.9		29
EAST NORTHEAST	5.2	5.1	4.4	3.6	3.5	3.4	3.7	6.4	9.9	6.9	5.5	5.8		29
EAST	8.6	9.0	8.9	8.5	10.3	9.4	5.5	11.3	15.9	13.8	9.6	9.1		29
EAST SOUTHEAST	5.5	8.0	10.3	11.2	10.1	10.8	7.9	9.9	10.3	10.8	7.7	6.9		29
SOUTHEAST	4.1	4.6	5.0	9.8	10.6	10.7	8.1	8.6	8.3	9.0	6.1	4.5		29
SOUTH SOUTHEAST	5.0	6.9	10.2	17.4	18.1	15.6	12.0	8.3	7.9	6.8	8.8	5.0		29
SOUTH	11.5	11.1	13.2	16.6	18.5	19.6	16.2	12.5	7.5	7.7	9.2	10.2		29
SOUTH SOUTHWEST	7.2	6.0	7.2	5.2	4.2	8.4	8.5	6.8	3.2	3.5	5.3	4.8		29
SOUTHWEST	4.7	3.8	3.0	1.8	1.9	4.4	9.0	6.5	1.4	2.2	3.3	4.0		29
WEST SOUTHWEST	3.8	3.5	2.7	1.3	1.5	1.8	7.6	5.0	1.8	1.8	3.1	4.2		29
WEST	4.3	3.9	3.1	1.8	1.9	2.2	4.3	6.2	2.4	1.9	3.2	4.2		29
WEST NORTHWEST	3.6	4.4	3.5	2.7	1.6	1.4	2.0	1.7	1.1	1.9	2.3	4.1		29
NORTHWEST	5.5	6.8	6.3	3.1	1.6	1.4	1.7	2.2	2.1	3.6	5.5	7.1		29
NORTH NORTHWEST	7.7	7.3	5.9	4.0	2.4	1.3	1.7	1.1	3.0	4.5	7.2	8.9		29
CALM	2.1	2.0	1.4	1.5	1.9	2.5	4.3	3.6	2.7	1.7	1.9	2.5		29
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	7	5	5	3	2	2	0	1	2	5	4	6	41	6

CORPUS CHRISTI, TEXAS (27°46'N., 97°30'W.) Elevation 41 ft. (12.5m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1019.4	1017.6	1015.2	1013.5	1012.8	1012.8	1014.7	1014.0	1013.3	1015.8	1017.9	1018.9	1015.5	28
TEMPERATURE (DEGREES F)														
MEAN	56.3	59.6	64.9	72.8	77.9	82.4	84.8	85.1	81.0	73.9	64.9	59.1	71.9	30
MEAN DAILY MAXIMUM	66.5	69.8	75.5	82.1	86.6	91.2	94.4	94.8	90.0	84.1	75.2	69.3	81.6	30
MEAN DAILY MINIMUM	46.1	49.3	54.2	63.4	69.1	73.6	75.2	75.4	72.0	63.7	54.6	48.9	62.1	30
EXTREME HIGHEST	91	88	97	97	99	97	101	100	100	93	92	90	101	11
EXTREME LOWEST	18	27	29	39	47	58	64	64	54	40	29	18	18	11
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	90	88	88	90	92	93	93	93	91	90	88	87	90	11
AVERAGE PERCENTAGE (1200L)	71	65	63	65	66	65	58	61	65	61	61	65	64	11
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	6.7	6.4	6.6	6.7	6.3	5.3	4.8	4.9	5.2	4.6	5.7	6.4	5.8	33
MEAN NUMBER OF DAYS WITH CLEAR SKIES	7	7	7	5	6	9	11	11	10	13	9	8	103	33
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	17	15	16	15	13	7	6	7	9	8	12	16	141	33
PRECIPITATION														
MEAN AMOUNT (INCHES)	1.58	1.95	1.10	2.15	3.17	2.67	1.88	3.20	4.90	2.77	1.63	1.53	28.53	30
GREATEST AMOUNT (INCHES)	10.78	5.24	4.80	8.04	9.38	13.35	10.99	12.64	20.93	10.66	8.53	7.80	44.35	37
LEAST AMOUNT (INCHES)	0.03	*	*	*	*	0.13	0.00	0.10	0.78	0.00	*	0.01	14.66	37
MAXIMUM IN 24 HRS. (INCHES)	6.38	2.99	2.67	7.19	4.65	4.72	3.73	6.38	8.76	7.25	3.44	3.86	8.76	33
MEAN AMOUNT OF SNOW (INCHES)	0.1	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.1	36
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	1.1	1.1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	1.1	37
MEAN NUMBER OF DAYS WITH SNOW (ONE INCH OR MORE)	*	*	0	0	0	0	0	0	0	0	0	0	*	36
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	8	7	6	5	6	6	5	6	9	7	6	7	77	36
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	10.2	10.3	11.0	11.3	10.8	9.7	9.8	6.7	8.1	8.3	9.9	9.5		25
MEAN WIND SPEED (KNOTS) (1300L)	11.7	12.6	14.0	14.8	14.1	13.8	13.1	12.0	11.1	11.0	12.1	11.0		25
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	18.9	13.7	10.9	6.2	4.8	2.3	1.8	3.5	13.1	15.5	18.3	19.7		25
NORTH NORTHEAST	13.0	11.9	8.8	6.2	4.5	1.9	0.8	2.8	11.1	14.2	14.4	13.1		25
NORTHEAST	6.0	8.1	6.6	5.1	3.8	1.8	0.6	1.4	3.6	5.8	6.0	6.1		25
EAST NORTHEAST	2.4	5.0	5.9	3.7	2.4	1.4	0.9	1.5	2.4	1.4	1.7	2.5		25
EAST	2.5	4.1	6.0	8.1	5.4	3.6	1.9	3.5	5.9	4.9	2.0	2.7		25
EAST SOUTHEAST	1.8	5.5	6.5	11.0	8.8	4.3	3.1	2.5	4.6	5.0	2.7	3.3		25
SOUTHEAST	7.9	9.3	14.9	21.5	21.9	17.4	8.1	7.4	9.2	10.0	7.0	6.8		25
SOUTH SOUTHEAST	8.5	9.2	15.2	20.5	24.8	31.7	25.6	15.3	9.5	10.2	9.3	8.5		25
SOUTH	9.9	8.8	8.1	6.2	9.5	19.5	30.4	24.5	8.7	6.3	9.6	7.9		25
SOUTH SOUTHWEST	2.6	1.8	1.9	1.6	2.4	3.7	8.8	7.3	4.0	2.8	3.9	2.7		25
SOUTHWEST	2.2	2.2	1.6	0.7	1.7	2.8	5.3	5.8	3.8	3.6	2.8	2.2		25
WEST SOUTHWEST	1.7	1.9	1.2	1.3	1.1	1.9	2.6	4.0	2.9	1.9	1.7	2.2		25
WEST	3.4	3.5	1.3	1.6	2.2	1.7	2.5	5.2	4.5	3.2	4.1	3.7		25
WEST NORTHWEST	2.1	2.5	1.3	0.9	0.6	1.2	0.8	1.8	1.7	1.3	2.0	2.5		25
NORTHWEST	3.9	3.2	2.8	1.1	1.1	1.1	0.7	2.2	2.4	3.6	3.7	4.3		25
NORTH NORTHWEST	8.6	6.6	4.0	2.7	1.9	0.8	0.7	2.2	4.9	4.6	6.2	7.5		25
CALM	4.7	2.7	3.0	1.7	2.9	2.9	5.5	9.0	7.8	5.7	4.6	4.2		25
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	15.5	13.2	8.4	4.6	4.1	1.3	0.4	1.0	5.6	9.2	14.4	15.7		25
NORTH NORTHEAST	10.5	9.6	6.4	4.3	2.8	1.2	1.1	1.3	7.7	9.9	10.3	11.2		25
NORTHEAST	10.2	10.9	6.3	5.4	4.9	3.3	2.4	5.5	13.8	13.1	11.5	8.7		25
EAST NORTHEAST	3.8	5.8	9.4	7.0	5.7	4.7	3.3	8.0	11.6	7.9	5.4	2.8		25
EAST	2.6	3.6	7.4	8.6	8.4	7.0	6.0	11.1	11.9	7.2	3.7	2.5		25
EAST SOUTHEAST	3.0	5.9	8.4	14.9	15.7	15.3	13.8	15.3	13.4	9.8	4.2	4.4		25
SOUTHEAST	7.8	11.7	19.6	25.3	31.4	36.0	36.4	28.1	17.4	16.4	9.6	8.4		25
SOUTH SOUTHEAST	14.3	15.8	16.8	20.5	20.7	24.1	29.8	20.9	10.1	13.6	15.4	13.6		25
SOUTH	9.5	6.0	5.1	3.4	3.2	4.8	5.6	4.7	2.7	4.1	9.2	9.1		25
SOUTH SOUTHWEST	1.3	0.6	0.6	0.3	0.2	0.4	0.2	0.3	0.4	0.4	1.2	1.3		25
SOUTHWEST	0.7	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	1.3		25
WEST SOUTHWEST	0.5	0.7	0.2	0.1	0.1	0.1	*	0.1	0.2	0.2	0.6	0.7		25
WEST	1.2	1.1	0.6	0.4	0.1	0.1	0.0	0.4	0.7	0.6	1.1	1.3		25
WEST NORTHWEST	1.2	1.4	0.8	0.0	0.2	0.0	*	0.2	0.3	0.6	1.0	1.4		25
NORTHWEST	6.2	5.2	3.8	1.4	0.6	0.3	0.1	0.4	1.0	1.5	3.5	5.7		25
NORTH NORTHWEST	10.9	7.2	5.4	3.6	1.6	1.1	0.2	0.2	2.9	4.7	8.0	11.1		25
CALM	0.8	0.4	0.3	*	0.1	0.1	0.4	0.3	0.3	0.6	0.7	0.9		25
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	6	5	4	3	1	*	*	*	*	1	3	5	29	33

BROWNSVILLE, TEXAS (25°54'N., 97°26'W.) Elevation 19 ft. (5.8m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
STATION LEVEL PRESSURE														
MEAN (MILLIBARS)	1017.6	1015.2	1011.5	1011.5	1009.1	1011.9	1013.5	1014.6	1014.6	1015.9	1016.9	1019.6	1014.3	3
TEMPERATURE (DEGREES F)														
MEAN	60.3	63.4	67.7	74.9	79.3	82.8	84.4	84.4	81.6	75.7	68.1	62.8	73.8	30
MEAN DAILY MAXIMUM	69.5	72.7	76.6	83.1	87.1	90.6	92.8	93.0	89.9	84.7	77.5	72.3	82.5	30
MEAN DAILY MINIMUM	51.0	54.1	58.8	66.7	71.4	75.0	75.9	75.7	73.2	66.6	58.7	53.3	65.0	30
EXTREME HIGHEST	93	90	95	99	102	97	99	100	99	92	94	87	102	9
EXTREME LOWEST	24	26	35	44	52	60	69	63	56	49	35	27	24	9
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0600L)	87	86	87	86	89	89	90	90	89	88	85	85	88	9
AVERAGE PERCENTAGE (1200L)	68	60	60	60	60	61	56	58	62	61	60	63	61	9
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	6.8	6.5	6.7	6.6	5.9	5.3	4.7	5.0	5.4	4.8	5.7	6.5	5.8	33
MEAN NUMBER OF DAYS WITH CLEAR SKIES	6	7	6	5	6	8	11	10	9	11	9	7	95	33
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	17	15	16	14	10	6	5	6	8	7	11	16	131	33
PRECIPITATION														
MEAN AMOUNT (INCHES)	1.35	1.48	0.69	1.28	2.51	2.80	1.19	2.66	5.23	3.32	1.34	1.24	25.09	30
GREATEST AMOUNT (INCHES)	5.11	10.25	4.27	5.85	6.69	13.06	5.59	9.56	19.26	17.11	6.26	9.45	47.51	36
LEAST AMOUNT (INCHES)	*	*	*	*	0.01	0.01	*	0.02	0.07	0.34	0.01	*	11.59	36
MAXIMUM IN 24 HRS. (INCHES)	2.95	4.98	1.85	3.69	4.56	8.18	3.62	4.99	12.19	6.67	3.64	5.69	12.19	36
MEAN AMOUNT OF SNOW (INCHES)	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	36
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	36
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	7	6	4	4	5	5	5	7	10	6	6	6	72	33
WIND														
MEAN WIND SPEED (KNOTS)	10.4	11.2	12.1	12.8	12.2	11.2	10.2	9.6	8.5	8.8	9.6	9.5	10.7	10
DIRECTION (PERCENTAGE OF OBS.)														
NORTH	7	7	6	4	2	1	*	1	5	5	7	7	4	10
NORTH NORTHEAST	4	4	4	3	2	1	*	1	5	4	4	3	3	10
NORTHEAST	4	5	5	4	3	2	1	3	9	7	4	4	4	10
EAST NORTHEAST	2	3	4	4	3	3	1	3	7	5	2	3	3	10
EAST	3	4	7	7	7	7	4	7	8	8	4	3	6	10
EAST SOUTHEAST	6	7	9	14	17	16	13	14	12	12	6	6	11	10
SOUTHEAST	16	18	22	27	35	38	35	30	16	18	13	11	23	10
SOUTH SOUTHEAST	19	18	20	19	17	20	30	25	10	12	16	15	18	10
SOUTH	8	7	6	5	3	5	9	9	4	4	7	8	6	10
SOUTH SOUTHWEST	2	2	1	1	1	1	2	2	1	1	2	3	2	10
SOUTHWEST	1	1	1	1	1	1	1	1	1	1	2	2	1	10
WEST SOUTHWEST	1	1	1	1	1	*	*	*	1	1	1	2	1	10
WEST	1	1	1	1	1	1	*	*	1	1	2	2	1	10
WEST NORTHWEST	2	3	2	1	1	1	*	*	2	2	4	3	2	10
NORTHWEST	10	8	5	3	3	1	1	1	8	9	12	12	6	10
NORTH NORTHWEST	12	10	6	4	4	1	*	1	6	8	14	15	7	10
CALM	1	1	1	1	1	1	2	2	3	2	2	2	2	10
DIRECTION (MEAN SPEED, KNOTS)														
NORTH	10.2	11.1	11.6	10.9	9.3	6.0	3.7	5.0	7.2	9.0	9.2	9.6	9.6	10
NORTH NORTHEAST	11.0	11.4	12.4	12.2	11.3	9.0	5.4	8.2	10.6	9.5	9.3	9.1	10.3	10
NORTHEAST	8.9	10.2	10.5	10.7	9.7	9.1	7.6	9.5	10.5	9.6	8.7	8.4	9.7	10
EAST NORTHEAST	7.3	9.5	9.3	11.2	10.0	10.3	9.1	9.8	9.4	8.9	8.8	6.9	9.3	10
EAST	8.2	8.9	10.4	10.9	10.1	10.4	10.1	10.1	8.8	8.3	6.5	6.8	9.4	10
EAST SOUTHEAST	8.9	10.9	11.2	12.3	12.1	12.1	11.2	10.3	8.9	8.7	8.1	8.2	10.6	10
SOUTHEAST	11.0	12.6	13.4	14.7	14.2	12.7	11.5	11.2	9.6	9.0	9.7	9.7	12.0	10
SOUTH SOUTHEAST	13.4	13.5	15.2	15.2	14.4	11.9	10.9	10.2	9.7	10.2	12.4	12.4	12.5	10
SOUTH	12.6	12.1	12.9	12.7	9.7	10.1	8.7	8.5	8.0	8.7	11.2	11.5	10.6	10
SOUTH SOUTHWEST	9.7	10.3	8.7	8.1	6.5	7.4	6.3	6.9	5.7	5.9	8.1	8.7	7.9	10
SOUTHWEST	5.7	7.1	5.8	7.1	6.1	5.8	5.6	5.3	5.7	6.0	5.5	6.0	6.0	10
WEST SOUTHWEST	6.4	6.3	6.3	6.0	5.1	6.5	4.0	4.4	6.0	6.2	6.3	5.5	5.9	10
WEST	6.5	6.9	6.3	6.6	5.7	6.3	4.5	4.4	7.9	5.3	6.3	7.4	6.5	10
WEST NORTHWEST	8.5	9.0	8.1	8.4	6.5	6.4	3.4	5.1	7.1	7.5	9.0	8.6	8.1	10
NORTHWEST	11.5	12.1	10.8	9.2	9.0	6.4	4.9	5.1	7.2	9.9	10.9	10.6	10.2	10
NORTH NORTHWEST	11.7	12.7	12.9	11.2	9.8	6.4	4.6	5.1	7.8	10.0	12.1	11.4	11.1	10
VISIBILITY														
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	6	5	4	2	1	*	*	*	*	1	3	5	27	33

SAN JUAN, PUERTO RICO (18°26'N., 66°00'W.) Elevation 47 ft. (14.3m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)	1016.8	1016.9	1016.5	1015.8	1015.6	1016.7	1017.0	1015.6	1014.2	1013.5	1013.7	1015.3	1015.6	19
TEMPERATURE (DEGREES F)														
MEAN	75.4	75.3	76.3	77.5	79.2	80.5	80.9	81.3	81.1	80.6	78.7	76.8	78.6	30
MEAN DAILY MAXIMUM	81.9	82.1	83.6	84.4	85.6	87.0	87.0	87.5	87.6	87.4	85.0	83.1	85.2	30
MEAN DAILY MINIMUM	68.8	68.4	68.9	70.6	72.8	74.0	74.8	75.1	74.6	73.7	72.3	70.5	72.0	30
EXTREME HIGHEST	90	92	93	93	94	96	93	96	94	95	92	90	96	21
EXTREME LOWEST	61	62	60	64	66	69	69	70	69	67	66	63	60	21
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0800L)	81	80	78	75	77	78	79	79	80	81	81	80	79	20
AVERAGE PERCENTAGE (1400L)	64	62	60	62	65	66	66	66	67	66	66	65	64	20
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	5.2	5.0	5.0	5.4	6.5	6.5	6.1	6.2	6.4	6.3	5.8	5.8	5.9	20
MEAN NUMBER OF DAYS WITH CLEAR SKIES	8	7	8	7	3	3	4	4	2	3	4	5	58	20
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	5	4	4	6	11	11	9	9	10	11	8	7	95	20
PRECIPITATION														
MEAN AMOUNT (INCHES)	3.73	2.50	2.04	3.40	6.54	5.64	6.41	6.98	6.07	5.64	5.49	4.71	59.15	30
GREATEST AMOUNT (INCHES)	7.49	6.44	5.41	8.48	14.99	10.96	9.35	11.76	10.85	15.06	11.11	10.00	74.05	21
LEAST AMOUNT (INCHES)	0.94	0.71	0.72	0.50	0.44	1.24	1.12	3.06	1.93	1.63	2.31	0.68	35.58	21
MAXIMUM IN 24 HRS. (INCHES)	5.08	2.73	3.91	6.37	3.08	3.55	2.28	5.08	3.44	5.00	3.72	3.54	6.37	21
MEAN AMOUNT OF SNOW (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21
MAXIMUM SNOWFALL IN 24 HRS. (INCHES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	18	13	12	13	17	17	20	19	18	17	18	19	200	20
WIND														
MEAN WIND SPEED (KNOTS) (0700L)	7.4	6.9	7.2	6.9	6.6	6.9	7.6	6.9	4.9	4.1	4.6	6.1		18
MEAN WIND SPEED (KNOTS) (1300L)	10.2	10.3	10.8	10.5	10.1	9.9	10.3	10.0	8.7	8.0	8.2	9.1		18
DIRECTION (PERCENTAGE OF OBS.): AT 0700L														
NORTH	4.3	3.1	3.3	3.2	2.8	0.2	0.9	1.5	1.9	2.0	3.3	4.9		18
NORTH NORTHEAST	5.6	5.0	5.6	3.4	1.9	0.6	1.7	1.8	1.2	1.2	4.2	7.8		18
NORTHEAST	14.3	13.4	9.2	10.7	4.7	3.5	9.9	9.8	6.1	3.6	8.9	13.5		18
EAST NORTHEAST	22.5	19.0	18.4	17.8	10.8	15.8	25.2	21.3	16.8	10.4	15.3	18.7		18
EAST	20.6	23.5	24.6	19.9	29.8	33.6	37.3	39.3	20.7	16.1	16.3	17.4		18
EAST SOUTHEAST	4.9	6.8	7.8	9.5	15.6	20.4	12.4	10.4	7.5	6.5	3.3	4.1		18
SOUTHEAST	3.2	3.1	5.6	5.6	9.5	12.5	5.5	5.3	6.7	6.5	2.2	2.4		18
SOUTH SOUTHEAST	0.7	1.3	2.3	3.0	3.6	3.1	1.7	1.5	2.2	2.5	1.2	1.1		18
SOUTH	0.9	0.7	0.6	1.7	3.1	1.4	0.6	0.9	1.5	4.3	0.9	1.1		18
SOUTH SOUTHWEST	0.2	1.0	0.9	1.2	1.2	0.5	0.1	0.5	1.4	2.0	0.7	0.5		18
SOUTHWEST	1.0	1.2	2.3	2.0	1.8	0.8	0.4	0.8	2.5	4.9	2.0	1.3		18
WEST SOUTHWEST	1.4	1.5	1.6	1.4	0.8	0.3	0.2	0.3	1.8	2.4	2.2	1.1		18
WEST	1.0	1.3	1.8	0.7	1.2	0.5	0.2	0.2	1.5	1.6	2.7	0.8		18
WEST NORTHWEST	0.6	0.7	0.3	0.7	0.4	0.2	0.1	0.2	0.8	1.1	1.1	0.6		18
NORTHWEST	1.7	2.6	2.3	1.6	1.6	0.2	0.3	1.1	1.3	3.3	3.5	2.0		18
NORTH NORTHWEST	2.6	2.8	2.3	3.9	1.3	0.3	0.4	0.4	1.5	2.6	4.9	3.5		18
CALM	14.4	12.8	11.1	13.8	9.8	5.9	3.1	8.7	24.4	29.1	27.4	19.2		18
DIRECTION (PERCENTAGE OF OBS.): AT 1300L														
NORTH	4.1	3.2	1.7	1.8	1.1	0.5	0.6	0.7	0.5	0.7	3.3	4.3		18
NORTH NORTHEAST	7.8	8.6	7.8	8.0	5.3	2.1	3.2	4.7	4.9	5.5	8.5	10.9		18
NORTHEAST	20.3	18.3	18.4	22.6	9.2	8.4	15.2	17.4	14.9	11.4	20.1	21.2		18
EAST NORTHEAST	22.6	18.3	15.6	13.9	9.6	11.8	20.6	17.8	15.2	11.7	18.2	20.1		18
EAST	21.9	24.8	23.4	19.6	28.4	33.7	35.7	30.0	26.4	20.8	20.3	17.9		18
EAST SOUTHEAST	9.4	11.1	12.0	11.5	21.3	24.3	16.1	16.8	13.0	12.8	8.8	10.5		18
SOUTHEAST	3.4	4.3	4.0	4.8	8.0	7.6	4.2	4.8	5.3	6.8	4.0	3.5		18
SOUTH SOUTHEAST	3.3	2.0	4.0	5.2	5.7	4.6	1.4	2.2	5.5	6.0	3.6	3.5		18
SOUTH	4.2	6.2	9.3	7.3	7.2	4.2	1.5	3.5	7.7	15.4	6.9	4.7		18
SOUTH SOUTHWEST	0.8	1.2	1.8	3.4	2.3	1.3	0.2	0.4	2.6	3.9	1.1	0.9		18
SOUTHWEST	0.4	0.2	1.4	0.5	0.6	0.1	0.2	0.5	1.5	1.6	1.7	0.4		18
WEST SOUTHWEST	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.9	0.4	0.1		18
WEST	0.0	0.1	0.0	0.3	0.1	0.2	0.2	0.3	0.2	0.2	0.6	0.1		18
WEST NORTHWEST	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2		18
NORTHWEST	0.4	0.9	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.7	0.4	0.5		18
NORTH NORTHWEST	0.8	0.6	0.4	0.4	0.5	0.3	0.1	0.2	0.3	0.5	1.0	0.9		18
CALM	0.5	0.3	0.1	0.2	0.5	0.6	0.7	0.4	1.5	1.1	0.8	0.4		18
DAYS WITH VISIBILITY EQUAL TO OR LESS THAN 1/4 MILE	0	0	0	0	0	0	0	0	0	0	0	0	0	20

ST. CROIX, VIRGIN ISLANDS (17°45'N., 64°42'W.) Elevation 80 ft. (24.4m)

WEATHER ELEMENTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE														
MEAN (MILLIBARS)														
TEMPERATURE (DEGREES F)														
MEAN	77	77	78	79	81	82	83	83	83	82	80	78	80	38
MEAN DAILY MAXIMUM	81	82	83	84	86	87	87	87	87	86	85	83	85	36
MEAN DAILY MINIMUM	73	72	73	74	76	77	78	78	77	76	75	74	75	36
EXTREME HIGHEST	87	87	89	91	95	92	94	99	92	92	90	89	99	25
EXTREME LOWEST	55	55	58	63	62	67	67	67	66	62	63	59	55	25
RELATIVE HUMIDITY														
AVERAGE PERCENTAGE (0530L)	79	80	78	80	83	80	82	82	83	85	85	83	82	6
AVERAGE PERCENTAGE (1730L)	73	72	71	74	77	76	77	77	80	80	80	76	76	6
CLOUD COVER														
AVERAGE AMOUNT (TENTHS)	3.7	3.5	3.5	3.7	4.0	4.4	4.3	3.9	4.0	3.9	3.7	3.7	3.9	19
MEAN NUMBER OF DAYS WITH CLEAR SKIES	5.0	5.2	4.2	3.8	2.0	2.0	1.5	1.2	2.8	3.2	5.0	3.7	39.6	4
MEAN NUMBER OF DAYS WITH CLOUDY SKIES	0.8	0.0	1.0	2.2	2.2	2.2	0.0	0.8	0.5	1.5	2.0	0.0	13.2	4
PRECIPITATION														
MEAN AMOUNT (INCHES)	2.24	2.20	1.18	2.99	4.33	4.72	3.38	4.17	5.67	5.79	5.98	3.78	46.43	42
GREATEST AMOUNT (INCHES)	5.79	7.12	4.25	17.24	15.13	10.47	6.12	18.72	18.69	16.06	13.68	7.20	73.94	24
LEAST AMOUNT (INCHES)	0.43	0.59	0.26	0.52	0.43	0.34	1.02	0.72	1.34	1.59	0.93	0.53	25.10	24
MAXIMUM IN 24 HRS. (INCHES)	1.50	1.53	1.05	7.84	5.74	4.94	2.13	5.34	7.80	6.44	2.64	2.36	7.84	17
0.01 INCH OR MORE, MEAN NUMBER OF DAYS	13.0	10.8	7.4	8.4	11.2	11.7	12.1	12.1	12.4	12.8	14.5	13.1	139.5	37
WIND														
MEAN WIND SPEED (KNOTS) (0900L)	12.1	13.1	14.6	15.0	14.3	14.8	15.5	14.2	12.6	11.4	10.6	11.7	13.3	9
MEAN WIND SPEED (KNOTS) (1500L)	13.6	14.5	15.4	15.2	14.5	15.9	16.1	14.7	12.8	11.3	11.5	12.8	14.0	9
DIRECTION (PERCENTAGE OF OBS.): AT 0900L														
NORTH	1.3	0.7	1.0	0.7	1.0	0.0	0.3	1.1	1.2	1.0	2.9	0.0	0.9	9
NORTH NORTHEAST	3.2	2.8	1.6	2.0	1.9	0.7	0.0	0.7	0.3	1.6	1.0	1.3	1.4	9
NORTHEAST	10.3	7.4	4.8	1.7	2.9	1.0	1.3	3.6	3.7	4.5	8.9	9.7	5.0	9
EAST NORTHEAST	34.5	34.6	29.4	19.3	6.1	8.0	17.7	17.2	15.4	13.9	29.3	43.0	22.4	9
EAST	22.9	25.1	24.8	26.3	23.2	33.7	36.1	26.2	25.2	23.9	21.7	24.9	26.2	9
EAST SOUTHEAST	18.1	19.1	30.3	39.3	41.6	43.0	36.1	38.4	36.3	33.5	21.7	13.3	30.9	9
SOUTHEAST	2.9	4.9	4.8	5.0	13.2	9.7	5.5	6.1	9.2	13.9	7.0	3.9	7.2	9
SOUTH SOUTHEAST	0.6	1.8	1.0	4.7	4.8	2.0	1.0	3.2	3.7	3.9	1.6	0.3	2.4	9
SOUTH	0.0	0.7	1.3	0.3	2.9	1.0	1.0	1.1	0.9	0.6	0.3	0.6	0.9	9
SOUTH SOUTHWEST	1.0	0.4	0.6	0.7	0.6	0.3	0.6	0.7	1.2	0.6	1.9	0.0	0.7	9
SOUTHWEST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.6	0.3	0.1	9
WEST SOUTHWEST	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	9
WEST	0.0	0.4	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.1	9
WEST NORTHWEST	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9
NORTHWEST	0.0	0.7	0.3	0.0	0.0	0.3	0.0	0.4	0.0	0.3	1.0	0.3	0.3	9
NORTH NORTHWEST	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.0	0.6	0.6	0.3	9
CALM	2.9	1.1	0.0	0.0	1.3	0.3	0.3	0.4	1.8	2.3	1.0	1.6	1.1	9
DIRECTION (PERCENTAGE OF OBS.). AT 1500L														
NORTH	1.0	0.7	1.0	0.3	0.3	0.0	0.3	0.4	1.2	1.0	1.9	0.3	0.7	9
NORTH NORTHEAST	5.5	1.8	2.3	1.0	1.6	0.0	0.3	1.4	1.2	0.3	4.1	2.6	1.8	9
NORTHEAST	8.1	7.4	6.8	2.0	2.3	0.3	1.3	4.3	2.5	4.5	11.1	8.4	4.9	9
EAST NORTHEAST	27.5	21.6	21.6	14.0	4.5	6.0	14.5	15.5	12.3	13.2	18.7	34.5	17.0	9
EAST	15.5	17.0	16.5	19.3	15.8	27.0	29.7	17.3	21.2	16.8	17.1	19.0	19.4	9
EAST SOUTHEAST	26.2	30.0	34.8	42.7	41.3	50.3	46.5	38.8	33.5	34.8	28.6	23.2	35.9	9
SOUTHEAST	7.1	11.3	9.4	10.7	22.3	11.7	4.5	12.9	15.4	15.8	7.0	8.1	11.4	9
SOUTH SOUTHEAST	1.9	5.7	3.9	6.3	6.5	4.0	1.3	3.6	5.2	8.4	3.2	1.6	4.3	9
SOUTH	1.3	0.7	1.3	2.7	1.9	0.3	0.6	1.8	3.4	1.6	2.2	0.3	1.5	9
SOUTH SOUTHWEST	1.6	1.8	1.3	1.0	1.0	0.3	0.3	1.8	1.8	1.0	0.6	0.3	1.1	9
SOUTHWEST	1.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.6	1.6	0.0	0.4	9
WEST SOUTHWEST	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.7	0.3	0.3	1.6	0.0	0.3	9
WEST	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.6	1.0	0.0	0.2	9
WEST NORTHWEST	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.1	9
NORTHWEST	1.3	0.4	0.3	0.0	1.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	9
NORTH NORTHWEST	1.0	1.1	0.6	0.0	0.6	0.0	0.0	1.1	0.9	0.0	0.6	0.6	0.5	9
CALM	0.0	0.4	0.0	0.0	0.6	0.0	0.0	0.0	0.3	0.6	0.3	0.6	0.2	9
VISIBILITY														
DAYS WITH VISIBILITY LESS THAN 1/4 MILE	0	0	0	0	0	0	0	0	0	0	0	0	0	9

METEOROLOGICAL TABLE FOR COASTAL AREA OFF KEY WEST
Boundaries: 23°N. to 25°N., between 79°W. and 83°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	.6	*	*	*	0	*	*	*	*	.7	*	*	*
Wave height ≧ 10 feet (1)	2.0	1.9	1.3	2.7	.8	*	*	*	.9	2.3	1.5	1.6	1.2
Visibility < 2 naut. mi. (1)	*	*	*	*	*	.6	*	*	*	.6	*	*	*
Precipitation (1)	2.5	2.2	1.6	1.2	2.1	3.5	2.0	2.0	3.6	4.4	2.7	2.0	2.4
Temperature ≧ 85°F (1)	*	.6	1.2	1.1	7.8	19.9	35.8	41.3	28.3	10.4	2.5	.8	12.6
Mean Temperature (°F)	72.3	72.5	74.2	76.9	79.7	82.2	83.9	84.3	83.3	80.5	76.7	73.3	78.5
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	78	77	78	77	77	79	77	77	78	78	76	77	77
Sky overcast or obscured (1)	12.5	11.0	10.2	7.0	8.9	13.4	6.4	5.5	11.1	13.3	9.8	11.8	10.1
Mean cloud cover (eighths)	3.7	3.6	3.4	3.2	3.4	4.2	3.9	3.9	4.3	4.2	3.7	3.8	3.8
Mean sea-level pressure (2)	1019	1018	1018	1017	1016	1016	1018	1016	1014	1014	1017	1019	1017
Extreme max. sea-level pressure (2)	1032	1033	1030	1029	1027	1033	1031	1027	1030	1027	1029	1030	1033
Extreme min. sea-level pressure (2)	1001	1002	1002	1001	1008	997	1002	1003	995	991	1001	1001	991
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Thunder and lightning (1)	*	.6	*	*	1.6	2.7	4.2	4.6	5.6	2.8	.8	*	2.0

METEOROLOGICAL TABLE FOR COASTAL AREA OFF FORT MYERS
Boundaries: 25°N. to 27°N., between 85°W. and coast

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	.8	.6	*	*	*	*	0	*	*	*	*	*	*
Wave height ≧ 10 feet (1)	5.0	3.9	3.1	1.7	.7	.8	*	*	1.6	3.1	2.8	2.5	2.3
Visibility < 2 naut. mi. (1)	.9	1.2	1.0	.8	.7	.7	*	*	.6	*	*	.7	.6
Precipitation (1)	2.7	2.5	2.0	1.1	1.8	2.4	1.9	2.7	3.6	2.7	1.7	1.7	2.2
Temperature ≧ 85°F (1)	*	*	.8	2.2	6.4	19.0	34.7	36.2	22.1	6.7	1.6	*	10.9
Mean Temperature (°F)	70.1	70.7	72.4	75.2	78.9	82.2	84.0	84.2	83.1	79.6	75.1	71.6	77.5
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	78	78	79	79	79	79	76	76	79	77	76	77	78
Sky overcast or obscured (1)	17.1	16.6	13.7	10.0	9.1	10.0	6.7	6.7	12.2	11.7	10.7	13.2	11.5
Mean cloud cover (eighths)	4.1	4.0	3.8	3.3	3.3	3.7	3.8	3.9	4.4	4.0	3.8	4.0	3.8
Mean sea-level pressure (2)	1019	1018	1017	1017	1016	1016	1018	1016	1015	1015	1017	1018	1017
Extreme max. sea-level pressure (2)	1034	1035	1030	1031	1027	1030	1030	1030	1029	1027	1028	1031	1035
Extreme min. sea-level pressure (2)	1000	1000	973	1001	1001	999	1005	1005	998	999	1001	999	973
Prevailing wind direction	E	E	SE	E	E	E	E	E	E	NE	NE	E	E
Thunder and lightning (1)	.6	.9	.9	.7	1.2	2.5	3.7	4.0	4.1	1.9	.9	.7	1.8

METEOROLOGICAL TABLE FOR COASTAL AREA OFF APALACHICOLA
Boundaries: 27°N. to coast, between 86°W. and coast

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	1.0	1.9	1.0	0	0	0	0	*	1.7	*	1.4	1.0	.8
Wave height ≧ 10 feet (1)	8.1	4.2	4.6	2.0	1.0	.9	*	.9	4.8	2.6	2.6	3.0	2.9
Visibility < 2 naut. mi. (1)	2.3	2.5	4.2	1.1	1.1	*	.9	*	1.0	*	*	2.2	1.3
Precipitation (1)	3.3	3.8	2.2	1.8	2.0	2.6	3.4	3.1	6.5	1.9	1.0	2.4	2.8
Temperature ≧ 85°F (1)	0	0	*	.9	3.2	13.5	28.4	30.6	17.1	3.1	.6	*	8.2
Mean Temperature (°F)	63.9	65.6	67.9	72.5	77.5	81.4	83.5	83.5	82.0	77.6	71.8	67.1	75.0
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	77	76	78	78	80	79	77	78	78	76	75	76	78
Sky overcast or obscured (1)	21.8	24.6	18.9	13.6	8.8	11.5	7.4	11.7	18.6	13.2	13.0	18.7	15.2
Mean cloud cover (eighths)	4.3	4.4	4.0	3.2	3.2	3.6	4.0	4.2	4.7	3.9	3.7	4.3	4.0
Mean sea-level pressure (2)	1020	1019	1018	1018	1017	1016	1018	1016	1015	1016	1018	1020	1017
Extreme max. sea-level pressure (2)	1032	1031	1032	1027	1026	1026	1026	1027	1027	1028	1028	1031	1032
Extreme min. sea-level pressure (2)	1005	1001	1002	1004	1006	1007	1009	1005	1002	1002	1006	1006	1001
Prevailing wind direction	N	E	SE	SE	E	E	SE	E	E	E	NE	E	E
Thunder and lightning (1)	.7	1.9	1.5	*	1.0	2.6	5.7	4.7	4.3	1.0	*	*	2.0

(1) Percentage frequency.
(2) Millibars.
* 0.0-0.5%

These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

METEOROLOGICAL TABLE FOR COASTAL AREA OFF PENSACOLA
Boundaries: 27°N. to coast, between 89°W. and 86°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	1.2	1.5	*	*	*	*	*	*	.7	.7	.9	.9	.6
Wave height ≧ 10 feet (1)	5.6	5.3	4.2	1.8	.8	.9	*	*	3.6	4.1	3.5	4.3	3.0
Visibility < 2 naut. mi. (1)	2.0	1.3	2.2	1.1	*	*	*	*	.6	*	*	.9	1.0
Precipitation (1)	2.4	4.6	3.4	2.7	2.7	2.6	3.4	3.4	4.1	3.2	2.3	3.6	3.3
Temperature ≧ 85°F (1)	*	*	*	.7	4.0	15.1	29.3	30.5	14.4	3.4	.6	*	8.3
Mean Temperature (°F)	64.8	65.0	67.3	71.8	77.3	81.7	83.4	83.4	81.6	77.1	70.7	66.5	74.6
Temperature ≦ 32°F (1)	*	0	0	0	0	0	0	0	0	0	0	0	*
Mean relative humidity (%)	77	76	77	78	79	78	77	77	78	74	74	75	77
Sky overcast or obscured (1)	26.3	25.6	21.0	16.1	11.0	9.4	10.7	10.5	15.7	11.9	14.9	21.9	16.2
Mean cloud cover (eighths)	4.7	4.6	4.2	3.7	3.4	3.6	4.0	4.0	4.4	3.8	3.9	4.5	4.1
Mean sea-level pressure (2)	1020	1018	1018	1017	1016	1016	1017	1016	1015	1016	1019	1020	1017
Extreme max. sea-level pressure (2)	1037	1036	1033	1032	1028	1027	1030	1026	1026	1032	1031	1037	1037
Extreme min. sea-level pressure (2)	1000	997	1000	1000	1001	1001	1001	1002	993	998	1001	1002	993
Prevailing wind direction	N	SE	SE	SE	SE	SE	SE	E	E	E	E	E	E
Thunder and lightning (1)	.8	1.0	1.1	1.1	1.4	2.2	3.2	3.0	2.2	.8	.6	*	1.5

METEOROLOGICAL TABLE FOR COASTAL AREA OFF NEW ORLEANS
Boundaries: 27°N. to coast, between 92°W. and 89°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	1.3	.9	1.0	*	*	*	*	*	.9	.6	1.0	.8	.6
Wave height ≧ 10 feet (1)	3.9	4.8	4.3	2.1	1.0	.8	*	*	3.4	2.9	3.7	3.9	2.8
Visibility < 2 naut. mi. (1)	1.0	1.2	1.2	.7	*	*	*	*	*	*	*	.7	*
Precipitation (1)	2.9	4.1	2.7	1.7	1.5	1.7	2.6	3.2	3.8	2.7	3.0	3.3	2.6
Temperature ≧ 85°F (1)	*	*	*	.9	4.6	19.3	38.5	38.2	19.8	4.2	*	*	10.6
Mean Temperature (°F)	65.1	65.9	67.8	72.5	77.6	82.1	84.0	84.0	82.2	77.4	71.3	67.4	75.1
Temperature ≦ 32°F (1)	*	*	0	0	0	0	0	0	0	0	0	0	*
Mean relative humidity (%)	77	78	78	81	80	78	76	77	78	74	75	77	77
Sky overcast or obscured (1)	26.5	26.3	22.7	16.6	9.7	7.0	8.3	9.0	13.2	11.5	18.4	23.0	16.0
Mean cloud cover (eighths)	4.6	4.6	4.3	3.7	3.3	3.3	3.8	3.8	4.1	3.6	4.1	4.5	4.0
Mean sea-level pressure (2)	1020	1018	1017	1017	1016	1016	1017	1016	1015	1016	1019	1020	1017
Extreme max. sea-level pressure (2)	1038	1041	1034	1033	1029	1032	1030	1031	1029	1035	1037	1037	1041
Extreme min. sea-level pressure (2)	1000	995	998	998	1000	1000	999	1002	984	1000	1001	999	984
Prevailing wind direction	E	SE	SE	SE	SE	SE	SE	SE	E	NE	E	E	E
Thunder and lightning (1)	*	1.0	1.1	.9	1.0	1.7	3.0	2.4	1.8	1.0	.7	.6	1.3

METEOROLOGICAL TABLE FOR COASTAL AREA OFF GALVESTON
Boundaries: 27°N. to coast, between 95°W. and 92°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	1.3	1.2	.8	*	*	*	*	*	1.1	*	1.0	.9	.7
Wave height ≧ 10 feet (1)	4.0	5.1	3.4	2.2	1.2	.8	*	*	2.8	2.1	3.7	3.9	2.5
Visibility < 2 naut. mi. (1)	2.9	2.8	2.8	2.0	*	*	*	*	*	*	.8	2.0	1.2
Precipitation (1)	3.2	4.0	1.8	1.6	1.7	1.7	2.1	2.2	3.0	2.4	2.8	4.1	2.6
Temperature ≧ 85°F (1)	0	*	*	*	2.8	18.4	39.4	41.0	19.3	4.2	*	*	10.6
Mean Temperature (°F)	61.9	63.0	65.5	70.9	76.7	81.9	84.1	84.2	82.1	76.4	69.5	64.6	73.9
Temperature ≦ 32°F (1)	*	*	0	0	0	0	0	0	0	0	0	0	*
Mean relative humidity (%)	80	80	80	83	81	79	77	77	77	74	76	78	78
Sky overcast or obscured (1)	32.2	30.7	28.2	21.9	11.8	6.8	8.3	8.6	13.5	13.4	20.1	29.4	18.8
Mean cloud cover (eighths)	4.7	4.6	4.5	4.1	3.5	3.3	3.7	3.7	3.9	3.5	4.0	4.6	4.0
Mean sea-level pressure (2)	1020	1018	1017	1016	1015	1015	1017	1016	1015	1017	1019	1020	1017
Extreme max. sea-level pressure (2)	1040	1041	1035	1038	1031	1029	1028	1028	1030	1037	1036	1040	1041
Extreme min. sea-level pressure (2)	1001	994	998	993	1000	981	999	1000	987	1000	999	1000	981
Prevailing wind direction	N	SE	SE	SE	SE	SE	S	SE	E	E	SE	N	SE
Thunder and lightning (1)	*	1.0	.6	.9	.9	1.3	1.8	1.8	2.2	1.1	1.2	1.0	1.2

(1) Percentage frequency.
(2) Millibars.
* 0.0-0.5%

These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

METEOROLOGICAL TABLE FOR COASTAL AREA OFF CORPUS CHRISTI
Boundaries: 26°N. to coast, between 95°W. and coast

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≥ 34 knots (1)	1.5	1.4	.9	*	*	*	0	*	*	.7	1.6	1.9	.8
Wave height ≥ 10 feet (1)	7.3	5.3	3.8	2.9	2.1	1.8	.9	*	2.0	3.3	6.5	5.7	3.5
Visibility < 2 naut. mi. (1)	4.7	3.4	5.7	3.5	1.0	.6	*	*	*	*	.7	1.3	1.8
Precipitation (1)	5.2	3.1	2.4	2.0	1.5	2.2	.7	3.4	3.0	1.8	2.6	6.5	2.8
Temperature ≥ 85°F (1)	0	0	*	*	1.8	16.2	32.9	39.4	21.8	4.9	.6	0	9.8
Mean Temperature (°F)	63.5	64.8	66.9	71.9	77.2	82.0	83.8	83.9	82.5	77.6	71.6	66.6	74.5
Temperature ≤ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	80	79	81	83	83	81	79	78	76	73	77	78	79
Sky overcast or obscured (1)	41.7	29.7	32.3	27.8	14.5	6.1	5.4	8.7	11.2	10.6	23.2	35.2	20.5
Mean cloud cover (eighths)	5.4	4.5	4.7	4.7	4.1	3.5	3.4	3.7	3.8	3.6	4.4	5.2	4.3
Mean sea-level pressure (2)	1020	1018	1017	1015	1014	1014	1016	1015	1014	1017	1018	1019	1016
Extreme max. sea-level pressure (2)	1040	1041	1033	1031	1030	1023	1024	1023	1024	1033	1040	1038	1041
Extreme min. sea-level pressure (2)	999	999	998	995	1000	1001	1001	1001	992	997	1000	1000	992
Prevailing wind direction	SE	SE	SE	SE	SE	SE	SE	SE	E	SE	SE	SE	SE
Thunder and lightning (1)	.6	*	*	*	1.5	1.0	1.2	1.9	2.0	1.4	1.2	1.1	1.1

METEOROLOGICAL TABLE FOR MONA PASSAGE
Boundaries: 18°N. to 19°N., between 67°W. and 69°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≥ 34 knots (1)	*	0	*	*	0	*	0	*	*	*	0	*	*
Wave height ≥ 10 feet (1)	4.7	5.2	4.0	1.9	2.1	2.1	3.2	1.8	2.2	2.0	3.2	3.1	2.8
Visibility < 2 naut. mi. (1)	*	*	*	*	*	*	*	*	*	*	*	*	*
Precipitation (1)	2.3	2.7	1.4	2.4	4.7	2.9	2.7	2.5	2.4	2.6	3.7	3.6	2.8
Temperature ≥ 85°F (1)	1.3	1.3	1.8	3.0	7.3	10.1	12.7	17.1	17.9	15.9	9.1	2.8	8.3
Mean Temperature (°F)	77.8	77.4	77.8	78.9	80.5	81.7	82.2	82.7	82.9	82.5	81.2	79.2	80.4
Temperature ≤ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	78	78	77	78	81	81	80	80	79	79	78	78	79
Sky overcast or obscured (1)	4.3	4.7	4.0	5.5	10.7	9.8	8.7	7.6	6.0	6.7	4.9	6.2	6.6
Mean cloud cover (eighths)	3.0	3.2	2.9	3.3	4.1	4.0	3.8	3.6	3.6	3.6	3.3	3.4	3.5
Mean sea-level pressure (2)	1016	1017	1016	1016	1015	1016	1017	1015	1014	1013	1013	1015	1015
Extreme max. sea-level pressure (2)	1024	1025	1026	1025	1026	1024	1025	1023	1021	1021	1023	1023	1026
Extreme min. sea-level pressure (2)	1004	1005	1004	1003	1004	1001	1005	1003	1000	1004	1003	1005	1001
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Thunder and lightning (1)	*	*	*	1.0	3.4	4.7	3.6	3.9	6.8	6.3	4.0	1.2	3.0

METEOROLOGICAL TABLE FOR COASTAL AREA OFF SOUTHERN PUERTO RICO
Boundaries: 17°N. to coast, between 65°W. and 68°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≥ 34 knots (1)	*	*	*	*	*	0	0	0	0	*	*	*	*
Wave height ≥ 10 feet (1)	1.7	2.0	1.0	1.1	1.2	1.7	2.8	2.8	1.2	*	1.6	1.0	1.6
Visibility < 2 naut. mi. (1)	*	*	*	*	.6	*	*	*	*	*	.7	*	*
Precipitation (1)	2.6	1.9	3.2	1.1	4.1	1.6	3.5	2.3	3.0	4.2	3.0	3.4	2.8
Temperature ≥ 85°F (1)	1.5	1.4	.8	2.6	8.2	11.9	12.6	14.7	22.8	16.8	9.9	3.7	8.9
Mean Temperature (°F)	78.4	77.8	77.8	79.1	80.8	82.0	82.3	82.7	83.1	82.7	81.6	79.8	80.3
Temperature ≤ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	77	75	77	75	79	78	79	79	78	78	77	77	78
Sky overcast or obscured (1)	2.8	3.3	6.7	2.7	11.0	7.5	8.6	7.7	8.1	8.7	4.6	4.5	6.4
Mean cloud cover (eighths)	3.0	3.1	3.3	2.9	4.3	4.0	3.8	3.6	3.8	3.9	3.4	3.4	3.5
Mean sea-level pressure (2)	1016	1016	1016	1015	1015	1016	1016	1015	1014	1013	1013	1014	1015
Extreme max. sea-level pressure (2)	1024	1025	1026	1022	1021	1022	1025	1023	1020	1021	1023	1023	1026
Extreme min. sea-level pressure (2)	1005	1003	1005	1004	1005	1004	1005	1003	1003	1005	1000	1004	1000
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Thunder and lightning (1)	*	0	*	*	1.4	1.5	2.8	2.8	5.6	7.4	2.9	1.0	2.1

(1) Percentage frequency.
(2) Millibars.
* 0.0-0.5%

These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

METEOROLOGICAL TABLE FOR COASTAL AREA OFF NORTHERN PUERTO RICO
Boundaries: 20°N. to coast, between 65°W. and 68°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	*	*	*	*	0	0	0	0	*	*	0	*	*
Wave height ≧ 10 feet (1)	4.5	3.4	3.1	3.0	2.9	1.7	4.2	2.0	2.2	1.6	4.8	6.5	3.4
Visibility < 2 naut. mi. (1)	*	*	.9	.8	*	.6	*	*	*	*	*	*	*
Precipitation (1)	3.1	3.3	1.9	2.2	2.9	2.5	2.3	2.5	3.3	3.6	3.1	3.4	2.8
Temperature ≧ 85°F (1)	1.0	1.1	1.8	2.4	3.8	8.6	9.4	12.6	14.9	11.7	4.9	2.0	6.3
Mean Temperature (°F)	77.3	76.9	77.6	78.3	79.8	81.5	82.0	82.5	82.7	82.3	80.7	78.8	79.7
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	77	.7	78	77	79	81	80	79	79	78	77	76	78
Sky overcast or obscured (1)	4.8	5.2	4.3	4.4	10.0	8.1	7.4	6.6	7.0	5.9	6.0	5.9	6.3
Mean cloud cover (eighths)	3.3	3.3	3.2	3.2	4.1	3.9	3.9	3.6	3.6	3.6	3.6	3.6	3.6
Mean sea-level pressure (2)	1017	1017	1017	1016	1016	1017	1017	1016	1014	1014	1014	1016	1016
Extreme max. sea-level pressure (2)	1025	1026	1026	1026	1024	1024	1025	1023	1023	1021	1023	1023	1026
Extreme min. sea-level pressure (2)	1005	1005	1003	1004	1004	1005	1007	1001	1003	1002	998	1005	998
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Thunder and lightning (1)	*	*	*	.6	1.6	2.1	1.5	2.2	5.1	4.4	2.8	.9	1.8

METEOROLOGICAL TABLE FOR COASTAL AREA OFF VIEQUES
Boundaries: 18°N. to 19°N., between 65°W. and 66°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	*	*	0	*	0	0	0	*	0	0	0	*	*
Wave height ≧ 10 feet (1)	2.0	.6	*	*	*	*	*	*	*	*	.6	.7	*
Visibility < 2 naut. mi. (1)	*	*	*	*	*	*	*	*	*	*	*	*	*
Precipitation (1)	2.1	1.8	2.6	2.8	4.9	3.2	3.2	4.7	3.8	2.9	4.3	5.3	3.5
Temperature ≧ 85°F (1)	2.4	2.3	3.0	4.6	6.5	10.9	17.1	21.5	22.0	19.5	12.2	3.5	10.4
Mean Temperature (°F)	78.3	78.1	78.1	79.3	80.6	82.0	82.7	82.9	83.2	83.0	81.8	79.5	80.1
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	76	74	74	74	78	78	79	78	78	79	75	73	76
Sky overcast or obscured (1)	3.7	2.7	3.5	4.6	11.5	12.9	6.8	9.5	8.1	8.7	4.5	8.3	7.1
Mean cloud cover (eighths)	3.3	3.2	3.2	3.4	4.1	4.3	3.9	3.9	3.9	4.1	3.6	4.0	3.7
Mean sea-level pressure (2)	1017	1017	1017	1016	1015	1017	1017	1016	1014	1013	1013	1015	1016
Extreme max. sea-level pressure (2)	1023	1024	1026	1026	1023	1024	1024	1023	1021	1021	1021	1022	1026
Extreme min. sea-level pressure (2)	1009	1005	1003	1004	1004	1004	1007	1005	1006	1003	1005	1006	1003
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	NE	E
Thunder and lightning (1)	*	*	0	*	.7	1.0	1.6	1.6	3.8	4.5	2.0	*	1.3

METEOROLOGICAL TABLE FOR COASTAL AREA OFF VIRGIN ISLANDS
Boundaries: 17°N. to 19°N., between 63°W. and 65°W.

Weather elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Wind ≧ 34 knots (1)	*	*	*	0	0	*	0	*	*	0	*	*	*
Wave height ≧ 10 feet (1)	5.2	2.4	3.2	1.3	1.5	2.0	2.7	2.0	2.1	1.1	2.9	4.1	2.7
Visibility < 2 naut. mi. (1)	*	*	*	*	*	*	*	*	*	*	.7	0	*
Precipitation (1)	3.8	2.5	2.6	3.1	3.5	3.1	4.3	4.3	5.0	3.7	4.5	5.5	3.8
Temperature ≧ 85°F (1)	*	.7	1.3	1.0	5.2	10.9	9.8	12.9	14.6	10.0	9.2	2.1	6.5
Mean Temperature (°F)	77.6	77.2	77.5	78.5	80.1	81.7	82.0	82.4	82.6	82.2	81.2	79.2	80.0
Temperature ≦ 32°F (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean relative humidity (%)	77	76	76	77	79	79	80	80	79	79	77	77	78
Sky overcast or obscured (1)	3.6	4.0	3.5	4.6	8.9	5.8	6.9	5.6	9.5	5.9	4.3	4.9	5.6
Mean cloud cover (eighths)	3.3	3.2	3.1	3.4	4.0	3.8	3.8	3.5	3.9	3.8	3.3	3.3	3.5
Mean sea-level pressure (2)	1016	1016	1016	1016	1016	1016	1017	1015	1014	1013	1013	1015	1015
Extreme max. sea-level pressure (2)	1025	1025	1026	1023	1022	1025	1027	1023	1021	1022	1020	1023	1027
Extreme min. sea-level pressure (2)	1001	1006	1003	1007	1009	1003	1011	1008	1005	1005	1005	1006	1001
Prevailing wind direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Thunder and lightning (1)	*	0	*	*	1.3	1.2	1.0	2.5	4.6	5.7	3.1	.7	1.8

(1) Percentage frequency.
(2) Millibars.
* 0.0-0.5%

These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

MEAN SURFACE WATER TEMPERATURES (T) AND DENSITIES (D)

Stations	Years	Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec		Mean	
		(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}
Key West, Fla. 24°33.2'N., 81°48.9'W.	41	21.7	26.8	22.2	26.9	23.7	27.1	25.8	27.3	27.9	27.5	29.6	27.2	30.4	27.3	30.6	27.3	29.7	26.9	27.6	26.6	24.4	27.0	22.3	26.9	26.3	27.1
St. Petersburg, Fla. 27°46.0'N., 82°37.0'W.	25	16.7	19.7	17.6	19.6	19.7	19.4	23.1	19.5	26.4	20.5	28.8	21.2	29.7	20.6	29.7	18.6	28.7	17.1	25.4	17.5	21.0	18.8	17.6	19.5	23.7	19.2
Cedar Keys, Fla. 29°08.0'N., 83°01.9'W.	31	14.4	19.9	15.7	19.1	18.4	18.1	22.9	18.1	26.4	19.1	29.1	20.2	29.8	19.9	29.8	19.0	28.3	18.8	24.2	19.2	19.0	20.2	15.4	20.1	22.8	19.3
Pensacola, Fla. 30°24.2'N., 87°12.8'W.	48	13.1	13.0	14.3	11.9	17.1	9.5	21.6	8.2	25.4	10.9	28.6	12.8	29.6	12.9	29.7	12.3	27.8	14.6	23.5	15.9	18.1	17.2	14.2	15.5	21.9	12.9
Grand Isle, La. 29°10.0'N., 89°55.0'W.	21	16.1	22.6	16.2	21.0	17.6	20.3	20.9	17.3	25.2	16.7	28.3	17.3	29.3	20.1	29.4	20.8	28.3	21.2	25.0	22.7	21.2	24.1	18.1	23.9	23.0	20.7
Eugene Island, La. 29°22.4'N., 91°23.1'W.	28	10.8	1.9	11.9	1.1	15.3	1.1	19.9	0.8	24.6	0.6	28.3	0.6	29.4	1.0	29.6	2.4	27.9	5.7	23.3	5.5	17.3	4.7	12.6	3.3	20.9	2.4
Galveston, Tex. 29°18.6'N., 94°47.6'W.	50	13.1	17.1	14.2	16.7	16.8	16.6	21.4	16.2	25.6	15.1	28.8	16.0	30.2	19.1	30.3	22.1	28.5	19.9	24.4	18.6	18.8	18.8	14.8	18.2	22.3	17.9
Freeport Harbor, Tex. 28°56.8'N., 95°18.5'W.	16	11.9	18.1	13.5	17.6	16.2	18.9	21.4	18.5	25.1	17.0	27.7	19.1	28.7	22.5	29.3	24.5	27.9	20.9	23.8	18.4	18.9	19.0	14.9	18.4	21.6	19.4
Rockport, Tex. 28°01.4'N., 97°02.8'W.	7	16.7	20.6	16.8	20.0	19.8	19.6	23.5	20.6	27.1	20.9	30.1	22.4	30.8	25.6	30.8	27.6	29.1	23.2	25.6	20.4	20.1	20.5	16.9	19.2	23.9	21.7
Port Aransas, Tex. 27°49.6'N., 97°03.5'W.	11	13.6	22.5	14.3	23.1	16.7	23.4	22.2	22.9	25.8	21.8	28.8	24.3	29.8	26.2	30.0	27.2	29.2	24.8	25.3	22.6	20.7	22.8	16.3	23.3	22.7	23.7
Port Mansfield, Tex. 26°33.3'N., 97°25.8'W.	9	14.6	25.8	16.1	26.0	18.6	26.2	23.8	26.3	26.1	24.9	28.3	24.7	29.2	27.1	29.2	30.1	28.3	29.7	24.6	28.0	20.7	28.8	16.7	27.6	23.0	27.1
Brazos Santiago, Tex. 26°04.1'N., 97°09.1'W.	14	14.6	24.2	15.3	24.6	17.4	25.1	21.3	25.3	24.7	25.3	26.3	26.7	25.9	27.2	26.7	27.5	28.2	26.6	25.8	25.2	21.7	25.5	17.6	24.6	22.1	25.7
Port Isabel, Tex. 26°03.6'N., 97°12.9'W.	24	16.0	24.8	17.3	25.0	19.8	24.7	23.6	25.3	26.8	25.4	29.0	26.4	29.6	27.5	29.6	27.6	29.1	25.7	25.9	24.3	21.4	25.1	17.5	25.3	23.8	25.5
San Juan, P.R. 18°27.0'N., 66°05.4'W.	10	26.6	25.4	26.4	26.0	26.9	26.1	27.4	26.2	27.3	25.3	28.1	25.5	28.3	25.6	28.4	25.1	28.8	24.4	28.6	24.0	28.2	24.1	27.1	24.5	27.7	25.2
Isla Maguey, P.R. 17°58.3'N., 67°02.7'W.	15	26.6	26.3	26.4	26.7	27.1	26.8	28.0	27.0	28.6	27.0	28.8	26.9	28.9	26.9	29.3	26.6	29.6	26.2	29.2	25.9	28.6	25.9	27.2	26.1	28.2	26.5

F (Fahrenheit) = 1.8C (Celsius) + 32

Density as used in this table is the specific gravity of the sea water or the ratio between the weight of a sea-water sample and the weight of an equal volume of distilled water at 15°C (59°F). These figures representing density at 15°C (ρ_{15}) are expressed in terms of sigma-t (σ_t) where t = 15°C and σ_{15} = (ρ_{15} − 1) 1000. Thus, for ρ_{15} = 1.0238, σ_{15} = 23.8. Obtain the pamphlet, "Surface Water Temperature and Density, Atlantic Coast, North and South America, NOS Publication 31-1", for greater detail; for sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DETERMINATION OF WIND SPEED BY SEA CONDITION

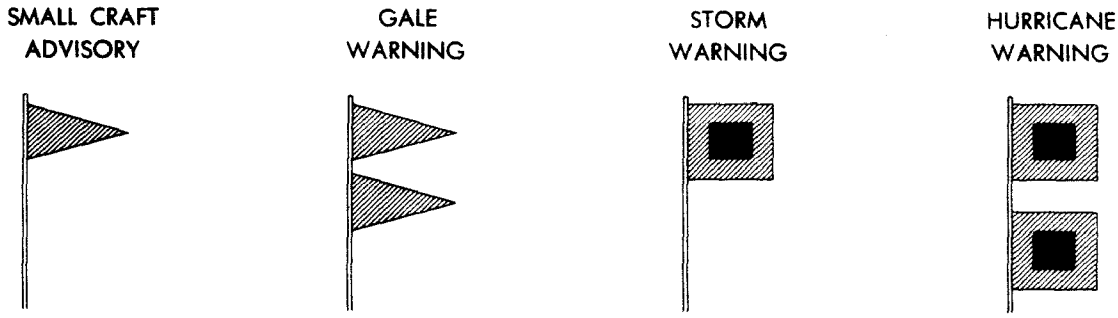
Miles per hour	Knots	Descriptive	Sea Conditions	Wind force (Beaufort)	Probable wave height (in ft.)
0-1	0-1	Calm	Sea smooth and mirror-like.	0	-
1-3	1-3	Light air	Scale-like ripples without foam crests.	1	1/4
4-7	4-6	Light breeze	Small, short wavelets; crests have a glassy appearance and do not break.	2	1/2
8-12	7-10	Gentle breeze	Large wavelets; some crests begin to break; foam of glassy appearance. Occasional white foam crests.	3	2
13-18	11-16	Moderate breeze	Small waves, become longer; fairly frequent white foam crests.	4	4
19-24	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray.	5	6
25-31	22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray.	6	10
32-38	28-33	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins.	7	14
39-46	34-40	Gale	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind.	8	18
47-54	41-47	Strong gale	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble, and roll over; spray may reduce visibility.	9	23
55-63	48-55	Storm	Very high waves with long overhanging crests. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea is white in appearance. The tumbling of the sea becomes heavy and shocklike. Visibility is reduced.	10	29
64-72	56-63	Violent storm	Exceptionally high waves that may obscure small and medium-sized ships. The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility is reduced.	11	37
73 or more	64 or more	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very much reduced.	12	45

ATMOSPHERIC PRESSURE CONVERSION TABLE

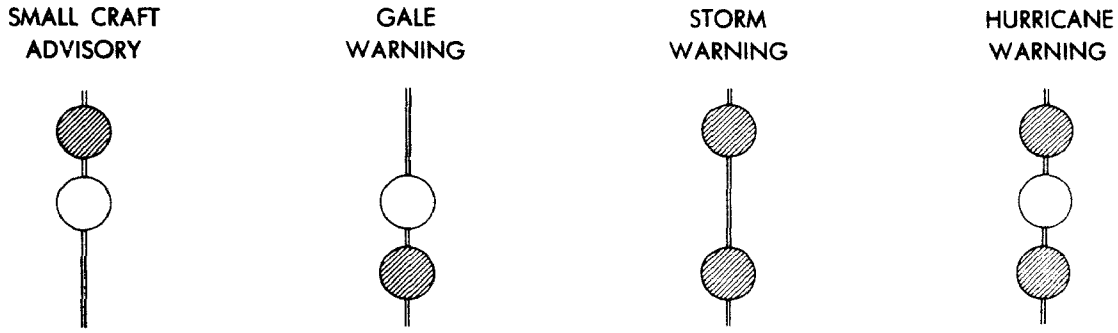
Inches	Millibars	Inches	Millibars	Inches	Millibars
28.44	963	29.32	993	30.21	1023
28.53	966	29.41	996	30.30	1026
28.62	969	29.50	999	30.39	1029
28.70	972	29.59	1002	30.48	1032
28.79	975	29.68	1005	30.56	1035
28.88	978	29.77	1008	30.65	1038
28.97	981	29.86	1011	30.74	1041
29.06	984	29.94	1014	30.83	1044
29.15	987	30.03	1017	30.92	1047
29.24	990	30.12	1020	31.01	1050

NATIONAL WEATHER SERVICE COASTAL WARNING DISPLAYS

DAYTIME SIGNALS



NIGHT (LIGHT) SIGNALS



Note: Shaded area represents the color RED on flags and lights.

EXPLANATION OF DISPLAYS

Small Craft Advisory: One RED pennant displayed by day and a RED light ABOVE a WHITE light at night, to alert mariners to sustained (more than two hours) weather or sea conditions, either present or forecast, that might be hazardous to small boats. Mariners learning of a Small Craft Advisory are urged to determine immediately the reason by tuning their radios to the latest marine broadcasts. Decision as to the degree of hazard will be left up to the boatman, based on his experience and size and type of boat. The threshold conditions for the Small Craft Advisory are usually 18 knots of wind (less than 18 knots in some dangerous waters) or hazardous wave conditions.

Gale Warning: Two RED pennants displayed by day and a WHITE light ABOVE a RED light at night to indicate that winds within the range 34 to 47 knots are forecast for the area.

Storm Warning: A single square RED flag with a BLACK center displayed during daytime and two RED lights at night to indicate that winds 48 knots and above, no matter how high the speed, are forecast for the area. However, if the winds are associated with a tropical cyclone (hurricane) the STORM WARNING display indicates that winds within the range 48 to 63 knots are forecast.

Hurricane Warning: Displayed only in connection with a tropical cyclone (hurricane). Two square RED flags with BLACK centers displayed by day and a WHITE light between two RED lights at night to indicate that winds 64 knots and above are forecast for the area.

Note: A "HURRICANE WATCH" is an announcement issued by the National Weather Service via press and radio and television broadcasts whenever a tropical storm or hurricane becomes a threat to a coastal area. The "Hurricane Watch" announcement is not a warning, rather it indicates that the hurricane is near enough that everyone in the area covered by the "Watch" should listen to their radios for subsequent advisories and be ready to take precautionary action in case hurricane warnings are issued.

Note: A SPECIAL MARINE WARNING BULLETIN is issued whenever a severe local storm or strong wind of brief duration is imminent and is not covered by existing warnings or advisories. No visual displays will be used in connection with the Special Marine Warning Bulletin; boaters will be able to receive these special warnings by keeping tuned to a NOAA VHF-FM radio station or to Coast Guard and commercial radio stations that transmit marine weather information.

ATLANTIC OCEAN DISTANCES FOR DEEP-DRAFT VESSELS MONTREAL, CANADA, TO PANAMA CANAL ZONE

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: New York, N. Y., is 1399 nautical miles from San Juan, P. R.

	MONTREAL, CANADA* 45°30.2'N., 73°33.0'W	Cabot Strait 47°07.0'N., 60°17.0'W.	Gut of Canso (Lock) 45°39.0'N., 61°25.0'W.	Portland, Maine 43°39.4'N., 70°14.7'W.	Boston, Mass. 42°22.0'N., 71°03.0'W.	NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	Philadelphia, Pa. 39°56.8'N., 75°08.3'W.	Baltimore, Md. 39°16.0'N., 76°34.5'W.	CHESAPEAKE BAY ENT. 36°56.3'N., 75°58.6'W.	Norfolk, Va. 36°50.8'N., 76°17.9'W.	DIAMOND SHOALS 35°08.0'N., 75°15.0'W.	Wilmington, N. C. 34°14.0'N., 77°57.0'W.	Charleston, S. C. 32°47.2'N., 79°55.2'W.	Savannah, Ga. 32°05.0'N., 81°05.7'W.	Jacksonville, Fla. 30°19.2'N., 81°39.0'W.	Key West, Fla. 24°33.7'N., 81°48.5'W.	STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	Tampa, Fla. 27°56.5'N., 82°26.7'W.	Pensacola, Fla. 30°24.0'N., 87°13.0'W.	Mobile, Ala. 30°42.5'N., 88°02.5'W.	NEW ORLEANS, La. (via SW Pass) 29°57.0'N., 90°03.7'W.	Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	Galveston, Tex. 29°19.0'N., 94°47.0'W.	Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	San Juan, P. R. 18°27.8'N., 66°06.7'W.	YUCATAN CHANNEL 21°50.0'N., 85°03.0'W.	Panama Canal (Atlantic Ent.) 9°23.5'N., 79°55.3'W.	PANAMA CANAL (Pacific Ent.) 8°53.0'N., 79°31.0'W.
MONTREAL, CANADA*																													
Cabot Strait	681																												
Gut of Canso (Lock)	717	120																											
Portland, Maine	1276	595	484																										
Boston, Mass.	1318	637	526	100																									
NANTUCKET SHOALS	1311	630	519	203	163																								
NEW YORK, N. Y.	1534	853	742	426	386	223																							
Philadelphia, Pa.	1682	1001	890	575	535	372	240																						
Baltimore, Md.	1838	1157	1046	734	694	531	417	392																					
CHESAPEAKE BAY ENT.	1689	1008	896	584	544	381	267	242	150																				
Norfolk, Va.	1716	1035	923	611	571	408	294	269	173	27																			
DIAMOND SHOALS	1729	1048	936	628	588	425	345	322	267	117	144																		
Wilmington, N. C.	1948	1267	1155	847	807	644	564	541	486	336	363	219																	
Charleston, S. C.	2014	1333	1221	913	873	710	630	607	552	402	429	285	151																
Savannah, Ga.	2088	1407	1295	987	947	784	704	681	626	476	503	359	227	102															
Jacksonville, Fla.	2172	1491	1379	1071	1031	868	788	765	710	560	587	443	315	197	145														
Key West, Fla.	2479	1798	1690	1387	1347	1184	1109	1086	1031	881	908	764	667	572	543	462													
STRAITS OF FLORIDA	2540	1859	1751	1448	1408	1245	1170	1147	1092	942	969	825	728	633	604	523	73												
Tampa, Fla.	2772	2091	1983	1680	1640	1477	1402	1379	1324	1174	1201	1057	960	865	836	755	305	232											
Pensacola, Fla.	2971	2290	2182	1879	1839	1676	1601	1578	1523	1373	1400	1256	1159	1064	1035	954	504	431	331										
Mobile, Ala.	3011	2330	2222	1919	1879	1716	1641	1618	1563	1413	1440	1296	1199	1104	1075	994	544	471	383	87									
NEW ORLEANS, La. (via SW Pass)	3080	2399	2291	1988	1948	1785	1710	1687	1632	1482	1509	1365	1268	1173	1144	1063	613	540	497	270	261								
Port Arthur, Tex.	3240	2559	2451	2148	2108	1945	1870	1847	1792	1642	1669	1525	1428	1333	1304	1223	773	700	691	465	456	430							
Galveston, Tex.	3242	2561	2453	2150	2110	1947	1872	1849	1794	1644	1671	1527	1430	1335	1306	1225	775	702	684	472	462	437	82						
Corpus Christi, Tex.	3347	2666	2558	2255	2215	2052	1977	1954	1899	1749	1776	1632	1535	1440	1411	1330	880	807	801	587	577	552	243	209					
San Juan, P. R.	2445	1764	1669	1531	1486	1334	1399	1395	1375	1225	1252	1114	1153	1138	1156	1121	966	1017	1249	1448	1488	1557	1717	1719	1824				
YUCATAN CHANNEL	2730	2049	1937	1629	1589	1426	1346	1323	1268	1118	1145	1001	904	809	780	699	251	192	404	531	558	587	691	696	769	1111			
Panama Canal (Atlantic Ent.)	3203	2522	2419	2189	2149	1986	1972	1955	1904	1754	1781	1637	1609	1563	1564	1513	1060	1001	1213	1340	1367	1396	1487	1493	1549	990	809		
PANAMA CANAL (Pacific Ent.)	3249	2568	2465	2235	2195	2032	2018	2001	1950	1800	1827	1683	1655	1609	1610	1559	1106	1047	1259	1386	1413	1442	1533	1539	1595	1036	855	46	

*Quebec, Canada - SUBTRACT 139 miles.

All tabular distances are by outside routes which can be used by the deepest-draft vessel that the listed ports can accommodate. Lighter-draft vessels can save considerable mileage by transiting Canso Lock (Canada), the Cape Cod Canal (Massachusetts), and the Chesapeake and Delaware Canal (Delaware-Maryland); see the detailed tables. Gulf of Mexico distances are through the Shipping Safety Fairways.

TRANS-GULF DISTANCES FOR DEEP-DRAFT VESSELS KEY WEST, FLA., TO PORT BROWNSVILLE, TEX.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Tampa, Fla., is 810 nautical miles from Corpus Christi, Tex.

	YUCATAN CHANNEL 21°50.0'N., 85°03.0'W.	STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	Key West, Fla. 24°33.7'N., 81°48.5'W.	Port Boca Grande, Fla. 26°43.2'N., 82°15.3'W.	St. Petersburg, Fla. 27°46.0'N., 82°37.0'W.	Port Tampa, Fla. 27°51.7'N., 82°33.3'W.	Tampa, Fla. 27°56.5'N., 82°26.7'W.	Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	Panama City, Fla. 30°08.2'N., 85°37.6'W.	Pensacola, Fla. 30°24.0'N., 87°13.0'W.	Mobile, Ala. 30°42.5'N., 88°02.5'W.	Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	Gulfport, Miss. 30°21.5'N., 89°05.5'W.	New Orleans, La. (Gulf Outlet)* 29°57.0'N., 90°03.7'W.	New Orleans, La. (South Pass)* 29°57.0'N., 90°03.7'W.	NEW ORLEANS, LA. (SW. Pass)* 29°57.0'N., 90°03.7'W.	Morgan City, La. 29°41.5'N., 91°12.9'W.	Lake Charles, La. 30°13.1'N., 93°15.5'W.	Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	Orange, Tex. 30°05.3'N., 93°44.0'W.	Beaumont, Tex. 30°04.7'N., 94°05.2'W.	Galveston, Tex. 29°19.0'N., 94°47.0'W.	Texas City, Tex. 29°22.7'N., 94°53.2'W.	Houston, Tex. 29°45.0'N., 95°17.3'W.	Freeport, Tex. 28°56.3'N., 95°20.4'W.	Point Comfort, Tex. (Lavaca Bay) 28°38.7'N., 96°33.3'W.	La Quinta, Tex. 27°52.6'N., 97°15.7'W.	Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	Port Isabel, Tex. 26°03.6'N., 97°12.8'W.	Port Brownsville, Tex. 25°57.1'N., 97°24.0'W.
YUCATAN CHANNEL 21°50.0'N., 85°03.0'W.																														
STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	192																													
Key West, Fla. 24°33.7'N., 81°48.5'W.	251	73																												
Port Boca Grande, Fla. 26°43.2'N., 82°15.3'W.	332	150	223																											
St. Petersburg, Fla. 27°46.0'N., 82°37.0'W.	389	219	292	100																										
Port Tampa, Fla. 27°51.7'N., 82°33.3'W.	399	228	301	109	8																									
Tampa, Fla. 27°56.5'N., 82°26.7'W.	404	232	305	113	18	18																								
Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	495	369	442	281	240	248	252																							
Panama City, Fla. 30°08.2'N., 85°37.6'W.	506	381	454	294	252	261	265	42																						
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	533	437	510	372	334	343	347	154	139																					
Mobile, Ala. 30°42.5'N., 88°02.5'W.	562	471	544	413	377	386	390	206	193	89																				
Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	554	469	542	414	379	387	392	213	200	94	75																			
Gulfport, Miss. 30°21.5'N., 89°05.5'W.	576	492	564	436	401	409	413	235	222	117	98	52																		
New Orleans, La. (Gulf Outlet)* 29°57.0'N., 90°03.7'W.	575	513	586	474	444	452	457	288	274	188	170	149	171																	
New Orleans, La. (South Pass)* 29°57.0'N., 90°03.7'W.	579	524	597	489	459	467	472	308	295	253	236	216	238	---																
NEW ORLEANS, LA. (SW. Pass)* 29°57.0'N., 90°03.7'W.	587	540	613	512	488	498	502	346	333	288	269	250	271	---	---															
Morgan City, La. 29°41.5'N., 91°12.9'W.	602	581	653	564	539	548	552	397	385	339	324	304	330	304	298	278														
Lake Charles, La. 30°13.1'N., 93°15.5'W.	705	715	789	717	697	706	710	568	558	517	504	484	506	479	472	454	182													
Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	691	700	773	704	684	693	697	555	545	504	491	471	493	466	460	441	190	83												
Orange, Tex. 30°05.3'N., 93°44.0'W.	713	722	795	726	707	715	719	577	567	526	513	493	515	488	482	463	212	105	22											
Beaumont, Tex. 30°04.7'N., 94°05.2'W.	717	726	799	730	710	719	723	581	571	530	517	497	519	492	486	467	216	109	26	27										
Galveston, Tex. 29°19.0'N., 94°47.0'W.	696	702	775	709	690	699	703	562	550	509	496	476	498	471	465	446	235	128	89	111	115									
Texas City, Tex. 29°22.7'N., 94°53.2'W.	702	707	780	714	695	704	708	567	555	514	501	481	503	476	470	451	240	133	94	116	120	9								
Houston, Tex. 29°45.0'N., 95°17.3'W.	740	746	819	752	733	742	746	605	594	553	539	519	542	514	508	490	278	172	132	154	158	47	52							
Freeport, Tex. 28°56.3'N., 95°20.4'W.	717	743	816	747	729	738	742	604	593	552	538	518	540	513	508	489	273	166	126	148	152	84	89	127						
Point Comfort, Tex. (Lavaca Bay) 28°38.7'N., 96°33.3'W.	761	797	870	806	786	795	799	661	649	609	595	575	597	570	564	545	354	248	208	230	234	165	170	209	119					
La Quinta, Tex. 27°52.6'N., 97°15.7'W.	763	802	875	811	792	800	804	666	654	614	600	580	602	575	569	550	390	283	244	266	270	201	206	244	154	112				
Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	769	807	880	816	797	805	810	671	659	618	605	585	607	580	574	555	395	289	249	271	275	207	212	250	160	117	15			
Port Isabel, Tex. 26°03.6'N., 97°12.8'W.	718	782	855	814	802	810	815	684	673	632	618	598	621	593	588	569	415	376	336	358	362	293	298	337	247	204	137	142		
Port Brownsville, Tex. 25°57.1'N., 97°24.0'W.	729	793	866	825	813	822	826	695	684	643	629	609	632	604	599	580	426	387	347	369	373	304	309	348	258	215	148	154	13	

*Baton Rouge, La. (30°27.0'N., 91°11.7'W.) ADD 115 miles.

Entrance buoy (24°27.7'N., 81°48.1'W.) to Key West, 6.3 miles.
Entrance buoy (27°35.8'N., 82°55.6'W.) to Tampa, 38 miles.
Entrance buoy (30°16.3'N., 87°17.5'W.) to Pensacola, 11.5 miles.
Entrance buoy (30°08.1'N., 88°04.0'W.) to Mobile, 35 miles.
Mississippi River-Gulf Outlet Approach Lighted Whistle Buoy NO (29°26.4'N., 88°56.9'W) to New Orleans, 73 miles.
South Pass entrance buoy (28°58.7'N., 89°06.6'W.) to New Orleans, 96 miles.
Southwest Pass entrance buoy (28°52.6'N., 89°25.9'W.) to New Orleans, 102 miles.
Calcasieu Channel buoy "CC" (29°27.3'N., 93°13.4'W.) to Lake Charles, 50 miles.
Sabine Pass buoy 17 (29°36.9'N., 93°48.3'W.) to Port Arthur, 16.6 miles.
Galveston Bay entrance buoy (29°18.6'N., 94°38.1'W.) to: Galveston, 9.3 miles; Texas City, 14.3 miles; Houston, 53 miles.
Aransas Pass entrance buoy (27°47.6'N., 96°57.4'W.) to Corpus Christi, 25 miles.
Brazos Santiago entrance buoy (26°04.0'N., 97°06.6'W.) to Port Brownsville, 17.5 miles

All tabular distances are via STRAITS OF FLORIDA, 24°25.0'N., 83°00.0'W., and through the Shipping Safety Fairways. For distances from Key West to west Florida ports via Rebecca Shoal Channel, 24°24.4'N., 82°42.0'W., SUBTRACT 24 miles from Port Boca Grande distance, 17 miles from Tampa Bay distances, 9 miles from Port St. Joe and Panama City distances, and 5 miles from Pensacola distance.

COASTWISE AND INSIDE-ROUTE DISTANCES KEY WEST, FLA., TO APALACHICOLA, FLA.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Flamingo is 225 nautical miles from Clearwater.

	Key West, Fla. 24°33.7'N., 81°48.5'W.	Marathon 24°42.2'N., 81°06.7'W.	Matecumbe Harbor 24°51.1'N., 80°44.5'W.	Flamingo 25°08.5'N., 80°55.4'W.	Cape Sable 25°09.0'N., 81°11.0'W.	Everglades 25°52.0'N., 81°23.1'W.	Naples 26°08.0'N., 81°47.6'W.	Fort Myers 26°38.9'N., 81°52.3'W.	Port Boca Grande 26°43.2'N., 82°15.3'W.	Venice 27°06.7'N., 82°27.8'W.	Sarasota 27°20.0'N., 82°32.9'W.	Bradenton 27°30.0'N., 82°34.4'W.	St. Petersburg 27°46.0'N., 82°37.0'W.	Tampa 27°56.5'N., 82°26.7'W.	Clearwater 27°58.5'N., 82°49.6'W.	Tarpon Springs 28°09.4'N., 82°45.8'W.	Cedar Key 29°08.0'N., 83°01.9'W.	St. Marks 30°09.2'N., 84°12.2'W.	Carrabelle 29°51.0'N., 84°40.0'W.	Apalachicola, Fla. 29°43.5'N., 84°58.8'W.
Marathon	42																			
Matecumbe Harbor	65	29																		
Flamingo	70	37	35																	
Cape Sable	57	31	32	17																
Everglades	88	80	81	66	49															
Naples	98	100	103	88	71	38														
Fort Myers	134	136	139	124	107	79	44													
Port Boca Grande	144	146	149	134	117	88	54	35												
Venice	172	174	177	162	145	116	82	63	28											
Sarasota	186	189	191	176	159	131	96	78	43	15										
Bradenton	210	213	215	200	183	155	120	102	67	39	25									
St. Petersburg	218	221	224	209	192	163	129	110	75	47	33	22								
Tampa	232	235	237	222	205	177	143	124	89	61	42	36	18							
Clearwater	234	237	240	225	208	179	145	126	91	63	49	38	31	47						
Tarpon Springs	250	253	255	240	223	195	160	142	107	79	65	54	47	63	18					
Cedar Key	310	313	316	301	284	255	221	202	167	139	125	114	107	123	79	68				
St. Marks	387	389	392	377	360	332	297	278	244	216	202	191	184	200	155	145	91			
Carrabelle	389	391	394	379	362	334	299	280	245	218	204	193	186	202	157	147	101	52		
Apalachicola, Fla.	406	408	411	396	379	350	316	297	262	234	221	209	202	218	174	164	118	69	25	

Routes used in table: Hawk Channel between Marathon and Key West; Northwest Channel (Key West) and outside to places between Cape Sable and San Carlos Bay; thence inside to Anclote Keys; and thence outside to St. George Sound. Distances from Everglades northward are inside via Big Marco River and Gordon Pass.

DISTANCES BY GULF INTRACOASTAL WATERWAY
APALACHICOLA, FLA., TO PORT BROWNSVILLE, TEX.

Figure at intersection of columns opposite ports in question is the nautical/statute mileage between the two. Example: Mobile, Ala., is 398 nautical miles (458 statute miles) from Beaumont, Tex.

Nautical Miles / Statute Miles	Apalachicola, Fla. 29°43.5'N., 84°58.8'W.	Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	Panama City, Fla. 30°08.2'N., 85°37.6'W.	Fort Walton Beach, Fla. 30°24.0'N., 86°36.7'W.	Pensacola, Fla. 30°24.0'N., 87°13.0'W.	Mobile, Ala. 30°41.5'N., 88°02.2'W.	Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	Biloxi, Miss. 30°23.5'N., 88°52.0'W.	Gulfport, Miss. 30°21.4'N., 89°05.6'W.	NEW ORLEANS, LA. 29°57.0'N., 90°03.7'W.	Houma, La. 29°35.9'N., 90°42.6'W.	Morgan City, La. 29°41.3'N., 91°12.7'W.	Lake Charles, La. 30°13.1'N., 93°15.5'W.	Orange, Tex. 30°04.0'N., 93°43.3'W.	Beaumont, Tex. 30°04.6'N., 94°05.2'W.	Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	Galveston, Tex. 29°18.5'N., 94°48.1'W.	Houston, Tex. 29°45.0'N., 95°17.4'W.	Texas City, Tex. 29°22.7'N., 94°53.2'W.	Freeport, Tex. 28°56.3'N., 95°20.4'W.	Port O'Connor, Tex. 28°26.5'N., 96°24.4'W.	Rockport, Tex. 28°01.1'N., 97°02.9'W.	Aransas Pass, Tex. 27°53.9'N., 97°08.0'W.	La Quinta, Tex. 27°52.6'N., 97°15.7'W.	Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	Port Mansfield, Tex. 26°33.4'N., 97°25.6'W.	Port Isabel, Tex. 26°03.6'N., 97°12.8'W.	Port Brownsville, Tex. 25°57.1'N., 97°24.6'W.
Apalachicola, Fla. 29°43.5'N., 84°58.8'W.		31	59	129	173	246	255	274	285	348	410	447	604	618	647	640	707	751	708	749	825	877	885	898	905	985	1021	1036
Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	27		41	113	155	230	239	258	268	331	392	430	587	602	629	624	689	734	690	732	809	861	868	881	887	968	1003	1018
Panama City, Fla. 30°08.2'N., 85°37.6'W.	51	36		71	114	189	197	216	227	290	351	389	545	560	588	582	648	693	649	690	766	819	826	840	846	926	962	977
Fort Walton Beach, Fla. 30°24.0'N., 86°36.7'W.	112	98	62		43	117	127	145	157	219	280	318	474	489	518	511	578	623	579	620	696	748	755	769	774	855	892	907
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	150	135	99	37		84	93	112	122	185	246	284	441	456	484	478	544	589	545	587	663	715	722	735	741	822	858	872
Mobile, Ala. 30°41.5'N., 88°02.2'W.	214	200	164	102	73		67	85	97	159	220	258	415	429	458	451	518	563	519	560	636	688	696	709	716	796	832	847
Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	222	208	171	110	81	58		37	47	110	171	209	366	381	409	403	468	513	470	511	587	640	647	661	666	747	783	797
Biloxi, Miss. 30°23.5'N., 88°52.0'W.	238	224	188	126	97	74	32		32	96	157	194	351	366	394	388	453	498	456	496	573	625	632	646	651	732	769	783
Gulfport, Miss. 30°21.4'N., 89°05.6'W.	248	233	197	136	106	84	41	28		76	138	175	333	348	375	368	435	480	436	478	554	605	613	626	633	713	749	764
NEW ORLEANS, LA. 29°57.0'N., 90°03.7'W.	302	288	252	190	161	138	96	83	66		61	99	255	270	299	292	359	404	360	402	478	529	536	550	556	636	673	688
Houma, La. 29°35.9'N., 90°42.6'W.	356	341	305	243	214	191	149	136	120	53		38	194	209	237	231	297	342	299	339	417	468	475	489	495	575	612	626
Morgan City, La. 29°41.3'N., 91°12.7'W.	388	374	338	276	247	224	182	169	152	86	33		157	171	200	193	260	305	261	303	379	430	437	451	457	537	574	589
Lake Charles, La. 30°13.1'N., 93°15.5'W.	525	510	474	412	383	361	318	305	289	222	169	136		37	66	59	125	170	127	168	244	296	304	316	322	404	440	455
Orange, Tex. 30°04.0'N., 93°43.3'W.	537	523	487	425	396	373	331	318	302	235	182	149	32		30	24	90	135	92	132	209	261	268	282	288	368	405	419
Beaumont, Tex. 30°04.6'N., 94°05.2'W.	562	547	511	450	421	398	355	342	326	260	206	174	57	26		30	97	142	98	139	215	267	274	288	293	375	411	426
Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	556	542	506	444	415	392	350	337	320	254	201	168	51	21	26		67	112	68	109	185	237	244	258	264	345	381	396
Galveston, Tex. 29°18.5'N., 94°48.1'W.	614	599	563	502	473	450	407	394	378	312	258	226	109	78	84	58		55	12	46	122	174	182	194	200	281	318	333
Houston, Tex. 29°45.0'N., 95°17.4'W.	653	638	602	541	512	489	446	433	417	351	297	265	148	117	123	97	48		55	97	173	224	232	245	252	333	368	383
Texas City, Tex. 29°22.7'N., 94°53.2'W.	615	600	564	503	474	451	408	396	379	313	260	227	110	80	85	59	10	48		51	128	180	186	200	206	287	323	338
Freeport, Tex. 28°56.3'N., 95°20.4'W.	651	636	600	539	510	487	444	431	415	349	295	263	146	115	121	95	40	84	44		81	132	140	153	160	241	276	291
Port O'Connor, Tex. 28°26.5'N., 96°24.4'W.	717	703	666	605	576	553	510	498	481	415	362	329	212	182	187	161	106	150	111	70		52	60	72	78	159	196	211
Rockport, Tex. 28°01.1'N., 97°02.9'W.	762	748	712	650	621	598	556	543	526	460	407	374	257	227	232	206	151	195	156	115	45		10	23	30	110	146	161
Aransas Pass, Tex. 27°53.9'N., 97°08.0'W.	769	754	718	656	627	605	562	549	533	466	413	380	264	233	238	212	158	202	162	122	52	9		14	20	100	136	151
La Quinta, Tex. 27°52.6'N., 97°15.7'W.	780	766	730	668	639	616	574	561	544	478	425	392	275	245	250	224	169	213	174	133	63	20	12		17	98	133	148
Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	786	771	735	673	644	622	579	566	550	483	430	397	280	250	255	229	174	219	179	139	68	26	17	15		102	138	153
Port Mansfield, Tex. 26°33.4'N., 97°25.6'W.	856	841	805	743	714	692	649	636	620	553	500	467	351	320	326	300	244	289	249	209	138	96	87	85	89		38	53
Port Isabel, Tex. 26°03.6'N., 97°12.8'W.	887	872	836	775	746	723	680	668	651	585	532	499	382	352	357	331	276	320	281	240	170	127	118	116	120	33		15
Port Brownsville, Tex. 25°57.1'N., 97°24.6'W.	900	885	849	788	758	736	693	680	664	598	544	512	395	364	370	344	289	333	294	253	183	140	131	129	133	46	13	

PUERTO RICO AND VIRGIN ISLANDS DISTANCES

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: San Juan, Puerto Rico, is 80 nautical miles from Charlotte Amalie, St. Thomas.

	San Juan, P. R. 18°27.6'N., 66°06.6'W.	Fajardo, P. R. 18°20.2'N., 65°37.8'W.	Ensenada Honda, P. R. 18°13.8'N., 65°37.4'W.	Humacao, P. R. 18°09.9'N., 65°44.6'W.	Bahia de Jobos, P. R. 17°57.0'N., 66°13.3'W.	Ponce, P. R. 17°58.2'N., 66°37.3'W.	Bahia de Tallaboa, P. R. 17°58.9'N., 66°44.6'W.	Bahia de Guayanilla, P. R. 17°59.5'N., 66°46.4'W.	Bahia de Guanica, P. R. 17°57.5'N., 66°54.5'W.	Mayaguez, P. R. 18°13.2'N., 67°09.7'W.	Bahia de Aguadilla, P. R. 18°26.0'N., 67°09.6'W.	Puerto Arecibo, P. R. 18°28.9'N., 66°42.1'W.	Ensenada Honda, Culebra 18°18.0'N., 65°17.0'W.	Isabel Segunda, Vieques 18°09.2'N., 65°26.7'W.	Charlotte Amalie, St. Thomas, V.I. 18°20.0'N., 64°55.5'W.	Cruz Bay, St. John, V.I. 18°20.0'N., 64°47.8'W.	Road Town, Tortola, B.V.I. 18°25.3'N., 64°37.1'W.	Christiansted, St. Croix, V.I. 17°45.0'N., 64°42.0'W.	Frederiksted, St. Croix, V.I. 17°42.9'N., 64°53.4'W.	Krause Lagoon, St. Croix, V.I. 17°42.5'N., 64°46.3'W.
40																				
52	14																			
59	21	11																		
103	65	56	48																	
152*	83	74	65	31																
145*	88	79	71	36	13															
145*	89	80	72	37	14	5														
138*	99	90	82	47	22	16	15													
92	121	133	131	96	74	67	67	60												
74	103	115	123	105	83	76	77	70	23											
43	72	84	92	140	118	112	112	105	58	40										
59	25	25	31	76	93	98	99	109	141	123	92									
55	18	12	17	62	79	85	86	96	136	118	87	15								
80	46	44	50	93	110	116	117	126	161	144	112	24	33							
82	53	51	57	99	116	121	122	132	164	146	115	31	40	11						
94	66	65	71	113	131	136	137	147	175	157	126	47	55	24	15					
103	68	69	68	101	119	124	125	135	184	166	135	48	54	38	37	42				
96	61	60	58	89	106	111	112	122	171	159	128	42	46	38	39	46	19			
112	77	72	70	101	117	122	123	133	182	176	144	59	62	54	55	62	35	18		

* Via Mona Passage
Limetree Bay, St. Croix, V.I., 1 mi. E of Krause Lagoon

Radio Bearing Conversion Table

Table of corrections, in minutes

[DIFFERENCE OF LONGITUDE IN DEGREES]

Mid. L.	½°	1°	1½°	2°	2½°	3°	3½°	4°	4½°	5°	5½°	6°	6½°	7°	7½°	8°	8½°	9°	9½°	10°
15°	4	8	12	16	19	23	27	31	35	40	43	47	50	54	58	62	66	70	74	78
16°	4	8	12	17	21	25	29	33	37	41	45	50	54	58	62	66	70	74	79	83
17°	4	9	13	18	22	26	31	35	39	44	48	53	57	61	66	70	75	79	83	88
18°	5	9	13	19	23	28	32	37	42	46	51	56	60	65	70	74	79	83	88	93
19°	5	10	15	20	24	29	34	39	44	49	54	59	63	68	73	78	83	88	93	98
20°	5	10	15	21	26	31	36	41	46	51	56	62	67	72	77	82	87	92	98	103
21°	5	11	16	21	27	32	38	43	48	54	59	64	70	75	81	86	91	97	102	108
22°	6	11	17	22	28	34	39	45	51	56	62	67	73	79	84	90	96	101	107	112
23°	6	12	18	23	29	35	41	47	53	59	64	70	76	82	88	94	100	105	111	117
24°	6	12	18	24	31	37	43	49	55	61	67	73	79	85	92	98	104	110	116	122
25°	6	13	19	25	32	38	44	51	57	63	70	76	82	89	95	101	108	114	120	127
26°	7	13	20	26	33	39	46	53	59	66	72	79	85	92	99	105	112	118	125	131
27°	7	14	20	27	34	41	48	54	61	68	75	82	89	95	102	109	116	123	129	136
28°	7	14	21	28	35	42	49	56	63	70	77	84	92	99	106	113	120	127	134	141
29°	7	15	21	29	36	44	51	58	65	73	80	87	95	102	109	116	124	131	138	145
30°	7	15	22	30	38	45	53	60	68	75	83	90	98	105	113	120	127	135	143	150
31°	8	15	23	31	39	46	54	62	70	77	85	93	100	108	116	124	131	139	146	155
32°	8	16	24	32	40	48	56	64	72	79	87	95	103	111	119	127	135	143	151	159
33°	8	16	25	33	41	49	57	65	74	82	90	98	106	114	123	131	139	147	155	163
34°	8	17	25	34	42	50	59	67	75	84	92	101	109	117	126	134	143	151	159	168
35°	9	17	26	34	43	52	60	69	77	86	95	103	112	120	129	138	146	155	163	172
36°	9	18	26	35	44	53	62	71	79	88	97	106	115	123	132	141	150	159	168	176
37°	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	163	172	181
38°	9	18	28	37	46	55	65	74	83	92	102	111	120	129	139	148	157	166	175	185
39°	9	19	28	38	47	57	66	75	85	94	104	113	123	132	142	151	160	170	179	189
40°	10	19	29	39	48	58	68	77	87	96	106	116	125	135	145	154	164	174	183	193
41°	10	20	30	39	49	59	69	79	89	98	108	118	128	138	148	157	167	177	187	197
42°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	151	161	171	181	191	201
43°	10	20	31	41	51	61	72	82	92	102	113	123	133	143	153	164	174	184	194	205
44°	10	21	31	42	52	63	73	83	94	104	115	125	135	146	156	167	177	188	198	208
45°	11	21	32	42	53	64	74	85	95	106	117	127	138	149	159	170	180	191	201	212
46°	11	22	32	43	54	65	76	86	97	108	119	129	140	151	162	173	183	194	205	216
47°	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	186	197	208	219
48°	11	22	33	45	56	67	78	89	100	111	123	134	145	156	167	178	190	201	212	223
49°	11	23	34	45	57	68	79	91	102	113	125	136	147	158	170	181	192	204	215	226
50°	11	23	34	46	57	69	80	92	103	115	126	138	149	161	172	184	195	207	218	230
51°	12	23	35	47	58	70	82	93	105	117	128	140	152	163	175	186	198	210	221	233
52°	12	24	35	47	59	71	83	95	106	118	130	142	154	165	177	189	201	213	225	236
53°	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
54°	12	24	36	49	61	73	85	97	109	121	133	146	158	170	182	194	206	218	231	243
55°	12	25	37	49	61	74	86	98	111	123	135	147	160	172	184	197	209	221	233	246
56°	12	25	37	50	62	75	87	100	112	124	137	149	162	174	187	199	211	224	236	249
57°	13	25	38	50	63	75	88	101	113	126	138	151	164	176	189	201	214	226	239	252
58°	13	25	38	51	64	76	89	102	115	127	140	153	165	178	191	204	216	229	242	254
59°	13	26	39	51	64	77	90	103	116	129	141	154	167	180	193	206	219	231	244	257
60°	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260

Example. A ship in latitude 39°51′. N., longitude 67°35′ W., by dead reckoning, obtains a radio bearing of 299° true on the radiobeacon located in latitude 40°37′. N., longitude 69°37′ W.

Radiobeacon station	Latitude	40°37′ N.
Dead-reckoning position of ship	Latitude	39°51′
Middle latitude		40°14′
Radiobeacon station	Longitude	69°37′ W.
Dead reckoning position of ship	Longitude	67°35′
Longitude difference		2°02′

Entering the table with difference of longitude equals 2°, which is the nearest tabulated value and opposite 40° middle latitude, the correction of 39′ is read.

As the ship is east of the radiobeacon, a minus correction is applied. The Mercator bearing then will be 299°−000°39′=298°21′. To facilitate plotting, subtract 180° and plot from the position of the radiobeacon the bearing 298°21′−180°, or 118°21′ (Mercator bearing reckoned clockwise from true north).

Distance of Visibility of Objects at Sea

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer whose eye is at sea level; in practice, therefore, it is necessary to add to these a distance of visibility corresponding to the height of the observer's eye above sea level.

Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles
6	2. 8	48	7. 9	220	17. 0	660	29. 4	2, 000	51. 2
8	3. 1	50	8. 1	240	17. 7	680	29. 9	2, 200	53. 8
10	3. 6	55	8. 5	260	18. 5	700	30. 3	2, 400	56. 2
12	4. 0	60	8. 9	280	19. 2	720	30. 7	2, 600	58. 5
14	4. 3	65	9. 2	300	19. 9	740	31. 1	2, 800	60. 6
15	4. 4	70	9. 6	320	20. 5	760	31. 6	3, 000	62. 8
16	4. 6	75	9. 9	340	21. 1	780	32. 0	3, 200	64. 9
18	4. 9	80	10. 3	360	21. 7	800	32. 4	3, 400	66. 9
20	5. 1	85	10. 6	380	22. 3	820	32. 8	3, 600	68. 6
22	5. 4	90	10. 9	400	22. 9	840	33. 2	3, 800	70. 7
24	5. 6	95	11. 2	420	23. 5	860	33. 6	4, 000	72. 5
26	5. 8	100	11. 5	440	24. 1	880	34. 0	4, 200	74. 3
28	6. 1	110	12. 0	460	24. 6	900	34. 4	4, 400	76. 1
30	6. 3	120	12. 6	480	25. 1	920	34. 7	4, 600	77. 7
32	6. 5	130	13. 1	500	25. 6	940	35. 2	4, 800	79. 4
34	6. 7	140	13. 6	520	26. 1	960	35. 5	5, 000	81. 0
36	6. 9	150	14. 1	540	26. 7	980	35. 9	6, 000	88. 8
38	7. 0	160	14. 5	560	27. 1	1, 000	36. 2	7, 000	96. 0
40	7. 2	170	14. 9	580	27. 6	1, 200	39. 6	8, 000	102. 6
42	7. 4	180	15. 4	600	28. 0	1, 400	42. 9	9, 000	108. 7
44	7. 6	190	15. 8	620	28. 6	1, 600	45. 8	10, 000	114. 6
46	7. 8	200	16. 2	640	29. 0	1, 800	48. 6		

Conversion Table, Degrees to Points and Vice Versa

° ′	Points	° ′	Points	° ′	Points	° ′	Points
0 00	N	90 00	E	180 00	S	270 00	W
2 49		92 49		182 49		272 49	
5 38	N ½ E	95 38	E ½ S	185 38	S ½ W	275 38	W ½ N
8 26		98 26		188 26		278 26	
11 15	N x E	101 15	E x S	191 15	S x W	281 15	W x N
14 04		104 04		194 04		284 04	
16 53	N x E ½ E	106 53	ESE ½ E	196 53	S x W ½ W	286 53	WNW ½ W
19 41		109 41		199 41		289 41	
22 30	NNE	112 30	ESE	202 30	SSW	292 30	WNW
25 19		115 19		205 19		295 19	
28 08	NNE ½ E	118 08	SE x E ½ E	208 08	SSW ½ W	298 08	NW x W ½ W
30 56		120 56		210 56		300 56	
33 45	NE x N	123 45	SE x E	213 45	SW x S	303 45	NW x W
36 34		126 34		216 34		306 34	
39 23	NE ½ N	129 23	SE ½ E	219 23	SW ½ S	309 23	NW ½ W
42 11		132 11		222 11		312 11	
45 00	NE	135 00	SE	225 00	SW	315 00	NW
47 49		137 49		227 49		317 49	
50 38	NE ½ E	140 38	SE ½ S	230 38	SW ½ W	320 38	NW ½ N
53 26		143 26		233 26		323 26	
56 15	NE x E	146 15	SE x S	236 15	SW x W	326 15	NW x N
59 04		149 04		239 04		329 04	
61 53	NE x E ½ E	151 53	SSE ½ E	241 53	SW x W ½ W	331 53	NNW ½ W
64 41		154 41		244 41		334 41	
67 30	ENE	157 30	SSE	247 30	WSW	337 30	NNW
70 19		160 19		250 19		340 19	
73 08	ENE ½ E	163 08	S x E ½ E	253 08	WSW ½ W	343 08	N x W ½ W
75 56		165 56		255 56		345 56	
78 45	E x N	168 45	S x E	258 45	W x S	348 45	N x W
81 34		171 34		261 34		351 34	
84 23	E ½ N	174 23	S ½ E	264 23	W ½ S	354 23	N ½ W
87 11		177 11		267 11		357 11	

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.12 feet or 1,852 meters 1 statute mile = 5,280 feet or 1,609.35 meters

Nautical miles	0	1	2	3	4	5	6	7	8	9
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.769	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.126	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.483	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.840	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.197	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.554	81.705	82.856	84.007	85.158	86.308	87.459	88.610	89.761	90.911
80	92.062	93.213	94.364	95.515	96.665	97.816	98.967	100.118	101.268	102.419
90	103.570	104.721	105.871	107.022	108.173	109.324	110.475	111.625	112.776	113.927

STATUTE MILES TO INTERNATIONAL NAUTICAL MILES

Statute miles	0	1	2	3	4	5	6	7	8	9
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.249	19.118	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.746	55.615	56.484	57.353	58.222	59.091	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029

FEET TO METERS

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

METERS TO FEET

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

TABLE FOR ESTIMATING TIME OF TRANSIT

Distance	Speed in knots																		
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	30
Nautical miles	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*	*Days-hours*
10	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
20	0-3	0-2	0-2	0-2	0-2	0-2	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
30	0-4	0-3	0-3	0-3	0-3	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-1
40	0-5	0-4	0-4	0-4	0-3	0-3	0-3	0-3	0-3	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2
50	0-6	0-6	0-5	0-5	0-4	0-4	0-4	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-2	0-2
60	0-8	0-7	0-6	0-5	0-5	0-5	0-4	0-4	0-4	0-4	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-2
70	0-9	0-8	0-7	0-6	0-6	0-5	0-5	0-5	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-3	0-3	0-3	0-3
80	0-10	0-9	0-8	0-7	0-7	0-6	0-6	0-5	0-5	0-5	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-4	0-3
90	0-11	0-10	0-9	0-8	0-8	0-7	0-6	0-6	0-6	0-5	0-5	0-5	0-5	0-4	0-4	0-4	0-4	0-4	0-3
100	0-13	0-11	0-10	0-9	0-8	0-8	0-7	0-7	0-6	0-6	0-6	0-5	0-5	0-5	0-5	0-4	0-4	0-4	0-3
200	1-1	0-22	0-20	0-18	0-17	0-15	0-14	0-13	0-13	0-12	0-11	0-11	0-10	0-10	0-9	0-9	0-8	0-8	0-7
300	1-14	1-9	1-6	1-3	1-1	0-23	0-21	0-20	0-19	0-18	0-17	0-16	0-15	0-14	0-14	0-13	0-13	0-12	0-10
400	2-2	1-20	1-16	1-12	1-9	1-7	1-5	1-3	1-1	1-0	0-22	0-21	0-20	0-19	0-18	0-17	0-17	0-16	0-13
500	2-15	2-8	2-2	1-21	1-18	1-14	1-12	1-9	1-7	1-5	1-4	1-2	1-1	1-0	0-23	0-22	0-21	0-20	0-17
600	3-3	2-19	2-12	2-7	2-2	1-22	1-19	1-16	1-14	1-11	1-9	1-8	1-6	1-5	1-3	1-2	1-1	1-0	0-20
700	3-16	3-6	2-22	2-16	2-10	2-6	2-2	1-23	1-20	1-17	1-15	1-13	1-11	1-9	1-8	1-6	1-5	1-4	0-23
800	4-4	3-17	3-8	3-1	2-19	2-14	2-9	2-5	2-2	1-23	1-20	1-18	1-16	1-14	1-12	1-11	1-9	1-8	1-3
900	4-17	4-4	3-18	3-10	3-3	2-21	2-16	2-12	2-8	2-5	2-2	1-23	1-21	1-19	1-17	1-15	1-14	1-12	1-6
1,000	5-5	4-15	4-4	3-19	3-11	3-5	2-23	2-19	2-15	2-11	2-8	2-5	2-2	2-0	1-21	1-19	1-18	1-16	1-9
2,000	10-10	9-6	8-8	7-14	6-23	6-10	5-23	5-13	5-5	4-22	4-15	4-9	4-4	3-23	3-19	3-15	3-11	3-8	2-19
3,000	15-15	13-21	12-12	11-9	10-10	9-15	8-22	8-8	7-20	7-8	6-23	6-14	6-6	5-23	5-16	5-10	5-5	5-0	4-4
4,000	20-20	18-12	16-16	15-4	13-21	12-20	11-22	11-3	10-10	9-19	9-6	8-19	8-8	7-22	7-14	7-6	6-23	6-16	5-13
5,000	26-1	22-4	20-20	18-23	17-9	16-1	14-21	13-21	13-1	12-6	11-14	10-23	10-10	9-22	9-11	9-1	8-16	8-8	6-23
6,000	31-6	27-19	25-0	22-17	20-20	19-6	17-21	16-16	15-15	14-17	13-21	13-4	12-12	11-22	11-9	10-21	10-10	10-0	8-8

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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

COAST PILOT REPORT

PLEASE MAIL TO:

Director, Charting and Geodetic Services
Attention: N/CG223
National Ocean Service, NOAA
Rockville, Maryland 20852

This record of your experience and observations when coasting, entering port, and/or following inside channels will be used to correct, amplify, or confirm the description now given in the Coast Pilot.

Your cooperation is voluntary.

Please use additional sheets if more space is needed.
Additional report forms will be provided upon receipt of each report.

GEOGRAPHIC LOCATION

LATITUDE	LONGITUDE	CHART NUMBER	COAST PILOT NUMBER

VESSEL	MASTER/COMMANDING OFFICER
DATE OF OBSERVATION	OBSERVER

I. LANDMARKS: Mention those visible from seaward and useful for navigation (day and/or night); include natural ranges and indicate the pair of marks forming a range. Photographs of landmarks difficult to describe are solicited; each view should be labeled with the distance off and the direction towards which the camera was pointed.

TYPE	CHARTED		LATITUDE (Approximate)	LONGITUDE (Approximate)	DESCRIPTIVE INFORMATION HELPFUL IN IDENTIFICATION
	YES	NO			

II. RADAR: List best radar targets and, if known, give maximum useful radar range at which the object can be positively identified and used. Mention under remarks places you have observed radar returns to be misleading.

NAME OR TYPE OF FEATURE (*Include approximate latitude and longitude if necessary to identify on chart*)	MAXIMUM USEFUL RANGE

III. ROUTES: Where entrance and inside routes are not marked by aids to navigation, show recommended directions for Coast Pilot (latitude and longitude of entrance point, and distances and true courses made good); include natural steering ranges if available.

IV. DANGERS: Mention those of concern to the navigator where special caution should be indicated in the Coast Pilot.

V. CURRENTS: Indicate places you have experienced conditions of current where special caution should be mentioned in the Coast Pilot.

VI. ANCHORAGES: Mention best anchorage in the area and other secure anchorages having good holding ground.

LOCATION *(Include anchorage bearings and natural ranges if available)*

TYPE OF BOTTOM OBSERVED:

	EXCEL	GOOD	FAIR	POOR	COMMENT
HOLDING QUALITY					
PROTECTION OFFERED					
ACCESSIBILITY					

RECOMMENDED FOR VESSELS:

LENGTH	DRAFT
____ TO ____ FT.	____ TO ____ FT.

VII. REMARKS:

VIII. OTHER COAST PILOT CHANGES

U.S. COAST PILOT

NUMBER	EDITION	PAGE	LINE(S)

NOTE: Any chart(s) submitted with your report to show conditions will be replaced free of charge.

READ: STRIKE OUT: INSERT AFTER: *(Circle one)*