U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, *Secretary*
COAST AND GEODETIC SURVEY
H. Arnold Karo, *Director*

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(1962)

UNITED STATES
COAST PILOT 5

ATLANTIC COAST

Gulf of Mexico, Puerto Rico, and Virgin Islands

Fifth (June 16, 1962) Edition

Corrected through NM–24/62

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Preface

United States Coast Pilot 5, Atlantic Coast—Gulf of Mexico, Puerto Rico, and Virgin Islands, Fifth (June 16, 1962) Edition, is based mainly upon the work of the Coast and Geodetic Survey but includes special material supplied by the Coast Guard, the Weather Bureau, and the Corps of Engineers.

Most new editions of Coast Pilots are written only after thorough field inspection by special Coast Pilot ship or shore parties. This 1962 edition of Coast Pilot 5 was put together from the observations of two field parties, one ship and one shore.

Gulf of Mexico inspection, Key West to the Rio Grande, was made in 1961 from the USC&GS Ship SCOTT, a 73-foot vessel commanded by Lieutenant Ronald M. Buffington, USC&GS. Inspection of Puerto Rico and the Virgin Islands was made by Navigation Specialist Lloyd L. Clay, USC&GS, early in 1962 with notable assists from units of the Greater Antilles Section of the Coast Guard.

This edition is corrected through Notice to Mariners 24 of 1962. Cumulative Supplements, containing revisions and new information reported since date of edition, usually are issued early each year and are distributed free. The Survey welcomes criticism of its Coast Pilots; write to Director, Coast and Geodetic Survey, U.S. Department of Commerce, Washington 25, D.C.

John A. McCormick
Chief, Coast Pilot Branch
Coast and Geodetic Survey

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1. GENERAL INFORMATION

EXPLANATORY.—Coast Pilot Supplements should be kept intact; the numbered-line continuity with the editions was designed to eliminate cutting and pasting.

Bearings.—These are true, and when given in degrees are clockwise from 000° (north) to 359°. Light-sector bearings are toward the light.

Bridges and cables.—Clearances of bridges and overhead cables are in feet above normal high water unless otherwise stated; clearances of drawbridges are for the closed position. These are the vertical clearances approved by the Nautical Chart Division, C&GS. They may be as-built, authorized, or reported; see latest prints of nautical charts for possible modifier. Also see charts for horizontal clearances of bridges; these are repeated in the Coast Pilots only when they are less than 50 feet and then only in terms of channel width or length of span.

Courses.—These are true and are given in degrees clockwise from 000° (north) to 359°. The courses given are the courses to be 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.

Depth units.—Depths are in feet or fathoms below the low-water tidal datum of the charts unless otherwise stated.

Distances.—These are in nautical miles unless otherwise stated. A nautical mile is 1 minute of latitude, or approximately 2,000 yards, and is about 1.15 statute miles.

Elevations.—These are in feet above the plane of reference used for that purpose on the charts.

Light and fog-signal characteristics.—These are not described and light sectors are not usually defined. See Coast Guard Light Lists for complete information.

Radio navigational aids and radio weather aids.—These are not fully described. See Coast Guard Light Lists and H.O. Publications 117 and 118.

Winds.—Directions are the true directions from which the winds blow. Velocities are in knots, which are nautical miles per hour.

The **COAST AND GEODETIC SURVEY** is required to provide charts and related information for the safe navigation of marine and air commerce, and to provide basic data for engineering and scientific purposes and for other commercial and industrial needs.

District Offices of the Coast and Geodetic Survey are located at some of the principal ports in the United States; see Appendix. Files of charts, Coast Pilots, and other publications are maintained at these offices for the use of mariners, who are invited to avail themselves of the facilities afforded.

Sales agents for Charts, Coast Pilots, Tide Tables, Tidal Current Tables, and Tidal Current Charts of the Coast and Geodetic Survey are located in many ports of the United States and in some foreign ports. See Appendix for list of sales agents. The charts and books also may be purchased from the Washington Office or from the District Offices. Orders mailed to Washington, D.C., should be accompanied by check or money order, made payable to C&GS, Department of Commerce. Indexes of charts and books will be furnished free, upon receipt of request designating areas of interest.

Special signals for surveying vessels.—Pilot Rules for Inland Waters, § 80.33, state that by day a surveying vessel of the Coast and Geodetic Survey, underway and employed in hydrographic surveying, may carry in a vertical line, one over the other not less than 6 feet apart where they can best be seen, three shapes not less than 2 feet in diameter of which the highest and lowest shall be globular in shape and green in color and the middle one diamond in shape and white.

(a) Vessels of the Coast and Geodetic Survey shall carry the above-prescribed marks while actually engaged in hydrographic surveying and underway, including drag work. Launches and other boats shall carry the prescribed marks when necessary.

(b) It must be distinctly understood that these special signals serve only to indicate the nature of the work upon which the vessel is engaged and in no way give the surveying vessel the right-of-way over other vessels or obviate the necessity for a strict observance of the rules for preventing collisions of vessels.

(c) By night a surveying vessel of the Coast and Geodetic Survey, underway and employed in hydrographic surveying, shall carry the regular lights prescribed by the rules of the road.

(d) A vessel of the Coast and Geodetic Survey, when at anchor in a fairway on surveying operations, shall display from the mast during the daytime two black balls in a vertical line and 6 feet apart. At night two red lights shall be displayed in the same manner. In the case of a small vessel the distance between the balls and between the lights may be reduced to 3 feet if necessary.

(e) Such vessels, when at anchor in a fairway on surveying operations, shall have at hand and show, if necessary, in order to attract attention, a flare-up light in addition to the lights which are, by this section, required to be carried.

International Rules of the Road, Part B, Rule 4(c), states that a vessel engaged in laying or in picking up a submarine cable or navigation mark, or a vessel engaged in surveying or underwater operations when from the nature of her work she is unable to get out of the way of approaching vessels, shall carry, in lieu of the lights specified in Rule 2(a) (i) and (ii), three lights in a vertical line one over the other not less than 6 feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 feet apart, where they can best be seen, three shapes each not less than 2 feet in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white.

The **wire drags** used by the Coast and Geodetic Survey 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.

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 Coast and Geodetic Survey basic field surveys, supplemented by data from other Government organizations.

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. Coast and Geodetic Survey 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, the principal lights, outer buoys, and landmarks visible at considerable distances are shown.

General charts, scales 1:100,000 to 1:600,000, are for coastwise navigation outside of outlying reefs and shoals.

Coast charts, scales 1:50,000 to 1:100,000, 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.

Intracoastal Waterway charts, scale 1:40,000, are a special series covering the New Jersey inside route, the Atlantic Coast inside route from Norfolk, Virginia, to Key West, Florida, and the Gulf Coast inside route from Carrabelle, Florida, to Port Brownsville, Texas.

Small-craft charts are another special series, started in 1959, covering areas of most interest to the amateur navigator. This unique series combines the graphics of the standard nautical charts with the verbal information of the Coast Pilots.

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. Up-to-date charts should be obtained at regular intervals.

A **new edition** of a chart is printed only when corrections are so extensive or of such importance to navigation as to necessitate a replacement of all previous issues; the number and date of the current edition are printed in the lower left corner. When the edition is revised, the date of the **latest revision** is printed to the right of the edition date. Before a chart is issued by the Coast and Geodetic Survey it is corrected by hand for all important information published in the weekly Notice to Mariners since the date of printing; the number and date of the last Notice to Mariners used are **stamped** in the lower right corner. Purchasers of charts should consult the Notice to Mariners for corrections subsequent to the stamped date.

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.—Most of the various types of echo sounder are calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated value 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, fresh water. Variation in line voltage can also cause errors of 10 percent or more in reading. Echoes can be obtained from schools of fish; in fact, trawlers are using the sounders for that purpose. The most serious error commonly occurs where the depth is greater than the scale range of the instrument; a 400-fathom scale indicates 15 fathoms visually and graphically when the depth is 415 fathoms. Where possible, wide variations from charted depths should be checked by wire soundings.

The **plane of reference** for depths on C&GS charts is

the mean of all low waters for the Atlantic coast of the United States, including the West Indies, and the mean of the lower low waters for the Pacific coast, including the Hawaiian Islands and Alaska. The plane most frequently used on foreign charts is mean low water springs. The effect of strong winds, in combination with the regular tidal action, may at times cause the water level to fall considerably below the reference plane.

Compass roses on charts.—The annual change in variation gradually introduces an error in the magnetic compass roses on charts. The compass roses are replotted for every new edition of the chart if the error is appreciable; and the amount and date of the variation and the amount of annual change are stated for each compass rose. On some of the sailing and general charts the magnetic variation is shown by isogonic lines.

Deviation of the compass.—The magnetic effect of the ship itself combines with any instrumental error of the compass to cause the deviation, which varies with the heading of the ship and with the magnetic latitude. It is customary to counteract the deviation as far as possible with soft iron and permanent magnets, suitable placed in or on the binnacle.

Local magnetic disturbance.—The charts show areas where the compass is disturbed by magnetic masses external to the ship. Such disturbances are fairly common in shallow waters but are never encountered over oceanic depths. Magnetic force diminishes so rapidly with distance that a magnetic center on land would have to be of unprecedented intensity to affect the compass of a vessel 0.5 miles from shore.

Overhead cables are shown on the charts and described in the Coast Pilots; the clearances given are for the lowest wires at high water. Vessels with masts, stacks, booms, or aerials should allow for an additional clearance under power cables equal to the distance between adjacent cables.

Submarine cable areas are shown on the charts but are not described in the Coast Pilots. Special effort should be made to avoid anchoring or trawling in cable areas. If a vessel does foul a cable, extreme care should be used when attempting to clear. Should normal methods fail, the anchor or other gear should be slipped and abandoned rather than risk breaking or cutting the cable. The high voltages in certain cables could cause severe burn or loss of life.

Tide Tables are issued annually by the Coast and Geodetic Survey 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 for obtaining heights of tide at any time, local civil time of sunrise and sunset for various latitudes, reduction of local civil 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, land-locked 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, reference should be made to the Tidal Current Tables.

Tidal Current Tables for the coasts of the United States are issued annually by the Coast and Geodetic Survey 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 the Coast and Geodetic Survey 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.

The **COAST GUARD** has among its duties (1) enforcement of the laws of the United States on the high seas, in harbors, bays, sounds, roadsteads, and other like bodies of water along the coasts of the United States, its territories and possessions; (2) enforcement of navigation laws, neutrality laws and regulations, rules and regulations in relation to anchorage grounds, and the Oil Pollution Act; (3) inspection of vessels of the Merchant Marine to insure safety to passengers and crews; (4) aid to distressed mariners and saving of life and property from shipwreck; (5) issuance of Merchant Marine licenses and documents; (6) investigation of marine casualties and accidents and suspension and revocation proceedings; (7) destruction of derelicts; (8) construction, operation, maintenance, and inspection of aids to navigation; (9) publication of Lists of Lights and Other Marine Aids and Local Notices to Mariners; and (10) maintenance and operation of ice breaking facilities.

Lists of Lights and Other Marine Aids.—Aids to navigation, consisting of lights, radiobeacons, fog signals, buoys, lightships, and daybeacons, are described in the Lists of Lights and Other Marine Aids (commonly referred to as Light Lists), which are for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D.C., and by various sales agents in the principal seaports. Mariners should refer to these publications for detailed information regarding the char-

acteristics, candlepower, and visibility of lights, as well as descriptions of light structures, lightships, daybeacons, buoys, radiobeacons, and fog signals.

Local Notices to Mariners.—Changes and deficiencies in aids to navigation maintained by or under the authority of the Coast Guard are published in Local Notices to Mariners issued by the District Commander of the area in which the aids are located. The local notices are intended for local navigation interests operating within the limits of a Coast Guard district. Changes in aids to navigation of the United States are also contained in the Weekly Notice to Mariners, prepared jointly by the U.S. Coast Guard and the U.S. Navy Hydrographic Office. The weekly notices are intended for mariners and others who have a definite need for them in connection with extended seagoing activities or those operating in several Coast Guard districts.

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 one of the U.S. Government shore radio stations listed in H.O. Publication No. 117, Radio Navigational Aids, 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 kc. 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 distances at which lights may be seen in clear weather, given in the Light Lists and on the charts, are the geographic ranges computed in nautical miles for a height of the observer's eye of 15 feet above sea level, unless the lights are not of sufficient candlepower to be seen to the limit of their geographic range, in which case the luminous range is given. These distances 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.

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 characteristic 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. 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.

Arcs drawn on charts around a light show the bearings between which the variation of visibility or obscuration occurs and do not indicate the distance at which it can be seen. On some bearings the distance may be reduced or increased by land or other obstructions, depending on the distance from the light.

Lights should not be passed close aboard because in many cases rip-rap mounds are maintained to protect the structures against ice damage and scouring action.

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 with or without the effects of wind and, 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.

Lightships.—Courses should invariably be set to pass lightships with sufficient clearance to avoid the possibility of collision from errors of observation, current and wind effects, other vessels in the vicinity, defect in steering apparatus, and from other causes. Experience shows that lightships cannot be safely used as leading marks to be passed close aboard, but should always be left broad off the course, whenever searoom permits.

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. A lightship known to be off station will

secure her light, fog signal, and radiobeacon and fly the International Code signal "PC" signifying "Lightship is not at anchor on her station."

Station (watch) buoys are sometimes moored near lightships to mark the approximate station should the lightship be carried away or temporarily removed. Since these buoys are always unlighted and, in some cases, moored as much as a mile from the lightship, the danger of a closely-passing vessel colliding with them is always present, particularly so during darkness or periods of reduced visibility.

Buoys.—The navigator should check the position by shore bearings, soundings, or other means, and not rely entirely on a buoy being on its charted position and showing its proper characteristic. Buoys are liable to be carried away, shifted, capsized, or sunk as a result of storms, ice conditions, collision, or other accident. Lighted buoys may become extinguished or show improper characteristics, or sound buoys may not function because of storm, ice, or collision.

Buoys may not always properly mark shoals or other obstructions due to shifting shoals and storms. 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 because of local conditions, and since sunken wrecks are not always static, extreme caution should be exercised when operating in the vicinity of such buoys.

Radiobeacons.—A list and descriptive details of all marine radiobeacons are given in the Light Lists and H.O. Publication No. 117, Radio Navigational Aids. 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 insure 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. 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.—The increasing use of radio directional bearings for locations of ships' positions at sea, especially during foggy weather, has made it particularly desirable to be able to apply these radio bearings directly to the nautical chart. These radio 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 is given in the Appendix for the conversion of a radio bearing into a Mercator bearing. It is sufficiently accurate for practical purpose 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 list of radiobeacons in the Light List or H.O. Publication No. 117, Radio Navigational Aids.

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 the north) will be as follows: In north latitude, the minus sign is used when the ship is east of the radiobeacon and the plus sign used when the ship is west of the radiobeacon. In south latitude, the plus sign is used when the ship is east of the radiobeacon, and the minus sign is used when the ship is west 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, a 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.

Loran.—A list of stations and descriptive details of the

Loran System are given in the Light Lists and H.O. Publication No. 117, Radio Navigational Aids. Instructions, tables, and charts of the Loran System are published by the Navy Hydrographic Office. Coast charts of the United States with Loran lines are published by the Coast and Geodetic Survey.

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 position used to establish the fix and by their angle of intersection.

Loran position determinations on or near the baseline extensions are subject to geometric errors exceeding two nautical miles per microsecond 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 insure that the ground wave signal of one station is not unknowingly matched with a skywave signal of the other station of the pair, or a one-hop skywave signal from station with a two-hop skywave signal from the other.

Numbering and recording of undocumented vessels.—Certain undocumented vessels are required to be numbered by the Federal Boating Act of 1958, effective April 1, 1960. They may be numbered either by the U.S. Coast Guard or by a state having an approved numbering system. Owners may obtain the necessary information from any Coast Guard District Commander.

Licensing of vessels.—Navigation laws pertaining to registry, enrollment, and licensing of vessels are administered by the **United States Bureau of Customs.** The bureau's functions also include issuing of commissions to yachts and the assignment of signal letters; the measurement of vessels, administration of tonnage duties, and the collection of tolls; the regulation of vessels in the coasting and fishing trade and limitation of the use of foreign vessels in waters under the jurisdiction of the United States; the recording of sales, conveyances, and mortgages of vessels; the protection of steerage passengers, and the remission of fines, penalties, and forfeitures incurred under the laws governing these matters. Collection districts and ports of entry located within the area covered by this Coast Pilot are tabulated in the Appendix.

Advance notice of arrival of vessels in ports.—The master or agents of certain vessels (foreign and domestic) are required to give advance notice to the Captain of the Port, U.S. Coast Guard, of the time of arrival in port; see **§ 124.10,** Chapter 2.

Danger signal.—It is stated in the **Pilot Rules for Inland Waters,** § 80.1, if, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle, the danger signal. Article 18, Rule III, of the **Inland Rules of the Road** also contains this provision. The **International Rules of the Road,** Part D. Rule 28(b), states, in part, that, whenever a power-driven vessel which, under these Rules, is to keep her course and speed, is in sight of another vessel and is in doubt whether sufficient action is being taken by the other vessel to avert collision, she may indicate such doubt by giving at least five short and rapid blasts on the whistle.

Minesweeper signals.—United States vessels engaged in minesweeping operations have their maneuvering powers considerably hampered. All other vessels, whether steamers or sailing craft, should keep out of the way of the sweepers, remembering especially that it is dangerous to pass between the vessels of a pair or group sweeping together.

All vessels towing sweeps are to show a black ball at the foremasthead and at each yardarm **by day** and green lights instead of the black balls **by night**; the lights may only be exhibited when necessary to warn approaching friendly vessels. Other vessels are not to approach the sweepers nearer than 500 yards on either beam or 1,000 yards astern; under no circumstances is a vessel to pass through a formation of mine sweepers. The sweepers should be prepared to warn other vessels who persist in approaching too close by means of any of the appropriate signals from the International Code of Signals.

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 under way (46 CFR 78.27-1(a)). The International Code Signal "ZO" 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 (46 CFR 78.23-1(a)).

Search and rescue operations.—The Coast Guard coordinates search and rescue operations in the cases of surface vessels or aircraft that are in distress or overdue. Search and rescue planes have special markings consisting of a wide band of fluorescent red orange around the after part of the fuselage or hull. The cooperation of vessel operators with search and rescue planes may mean the difference between life and death for some seaman or aviator.

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.

Search and rescue signals.—The information below is quoted from Annex 12 to The Convention on International Civil Aviation, Search and Rescue:

6.1—Signals, with surface craft.

6.1.1—When it is necessary for an aircraft to direct a surface craft to the place where an aircraft or a surface craft is in distress, the aircraft shall do so by transmitting precise instructions by any means at its disposal.

If such precise instructions cannot be transmitted or when necessary for any other reason, the instructions shall be given by using the procedure prescribed in 6.1.2.

Note.—Current maritime signalling procedures include:

For acknowledging receipt of signals, (i) the hoisting of the Code pennant (vertical red and white stripes) close up (means understood); (ii) the flashing of a succession of T's by signal lamp in the Morse Code; (iii) the changing of heading.

For indicating inability to comply, (i) the hoisting of the International flag N (a blue and white checkered square); (ii) the flashing of a succession of N's in the Morse Code.

6.1.2—The following procedures performed in sequence by an aircraft shall mean that the aircraft is directing a surface craft toward an aircraft or a surface craft in distress:

(a) Circling the surface craft at least once.

(b) Crossing the projected course of the vessel close ahead at a low altitude, opening and closing the throttle, or changing the propeller pitch.

(c) Heading in the direction in which the surface craft is to be directed. Repetitions of such procedures shall have the same meaning.

6.1.3—The following procedure performed by an aircraft shall mean that the assistance of the surface craft to which the signal is directed is no longer required: Crossing the wake of the surface craft close astern at a low altitude, opening and closing the throttle, or changing the propeller pitch.

Mariners are advised that United States Government vessels or planes in distress may exhibit, in addition to the distress signals set forth under International Rules of the Road, an orange smoke visible by day.

Ships in distress.—Radio-equipped vessels requiring assistance may obtain the services of the Coast Guard by transmitting a request on the international distress and calling frequency 500 kc. to "Any Coast Guard Unit" (radio call NCU), or to any shore radio station addressed to "COGARD." Shore radio stations will forward to the Coast Guard all information regarding vessels requiring assistance unless such information is contained in a message specifically addressed elsewhere.

If the following information is included in the original request for assistance it will place the responsible Coast Guard officer in a position to determine immediately the types and numbers of vessels and aircraft required to render adequate aid, thus greatly facilitating the work of the Coast Guard and avoiding any unnecessary delay in the dispatching of assistance:

1. Name, type, and nationality of vessel; color, size and shape.
2. Position, course, and speed (including drift).
3. Nature of trouble and condition of vessel, sea, and wind. Action taken, if any.
4. Number of persons on board.
5. State whether or not Coast Guard assistance is required.

Small craft in distress.—Under the provision of the international regulations, which permits the use of any means available to a vessel or aircraft in distress to draw attention and obtain help, small commercial and private craft equipped with radiotelegraph or radiotelephone apparatus that cannot be operated on the international distress frequency of 500 kc. (600 m.) may usually obtain Coast Guard assistance by transmitting the distress signal or call and the message on the 2182 kc. frequency.

Submarine emergency identification signals.—The following smoke-bomb or flare signals are made by submarines of the United States in cases of necessity:

Green indicates torpedo has been fired; will be used to simulate torpedo firing on special exercises such as convoy exercises.

Yellow indicates that submarine is about to come to periscope depth from below periscope depth. Surface craft terminate antisubmarine counterattacks and clear vicinity of submarine. Do not stop propellers!

Red indicates an emergency condition within the submarine and she will surface immediately if possible. Surface vessels clear the area and stand by to give assistance after the submarine has surfaced. In case of repeated red signals, or if the submarine fails to surface within a reasonable time, she may be assumed to be disabled. Buoy the location, look for submarine marker buoy, and attempt to establish sonar communications. Advise naval authorities.

The foregoing, all of which mark the submarine's position, are fired from a submerged signal ejector into the air to a height of about 300 feet, then float downward slowly, suspended from a small parachute, and give colored illumination for about 30 seconds.

Submarines are also equipped with messenger buoys which are about 3 feet in diameter and are painted international orange. A submarine on the bottom in distress and unable to surface, will, if possible, release this buoy. An object of this description which is sighted on the surface of the water should be investigated and naval authorities advised.

The **CORPS OF ENGINEERS**, U.S. Army, 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 the 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 approval of plans of bridges, the alteration of obstructive bridges, the establishment of anchorage grounds and harbor lines, the removal of sunken vessels obstructing or endangering navigation, and the granting of permits for structures or operations in navigable 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.

Anchorage areas and restricted areas in most places are defined and regulations governing them are established by the Corps of Engineers. The regulations are enforced by the U.S. Coast Guard, and the areas are shown on the

large-scale charts of the Coast and Geodetic Survey. Copies of the regulations may be obtained at the offices of the Corps of Engineers. The regulations also are copied into the appropriate Coast Pilots.

The **Port Series,** prepared by the Corps of Engineers and the Maritime Administration and sold by the Superintendent of Documents, Washington, D.C., are complete reports on the principal seaports of the United States and are primarily of interest to commercial and industrial concerns. They cover the subjects of particular interest to the shipping world, such as the physical features of each port, its organization and practices, regulations regarding the movement of ships and goods, port dues and charges, fuel and water, rail connections, and commerce.

Protection of navigable waters.—Given below are extracts from the laws of the United States for the protection and preservation of the navigable waters of the United States.

That it shall not be lawful to throw, discharge, or deposit, or cause, suffer, or procure to be thrown, discharged, or deposited either from or out of any ship, barge, or other floating craft of any kind, or from the shore, wharf, manufacturing establishment, or mill of any kind, any refuse matter of any kind or description whatever, other than that flowing from streets and sewers and passing therefrom in a liquid state, into any navigable water of the United States, or into any tributary of any navigable water from which the same shall float or be washed into such navigable waters; and it shall not be lawful to deposit, or cause, suffer or procure to be deposited material of any kind in any place on the bank of any navigable water, or on the bank of any tributary of any navigable water, where the same shall be liable to be washed into such navigable water, either by ordinary or high tides, or by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed.

That it shall not be lawful to tie up or anchor vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft; or to voluntarily or carelessly sink, or permit or cause to be sunk, vessels or other craft in navigable channels; or to float loose timber and logs, or to float what is known as sack rafts of timber and logs in streams or channels actually navigated by steamboats in such a manner as to obstruct, impede, or endanger navigation. And whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidently or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night, and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of said owner so to do shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same and prosecute such removal diligently, and failure to do so shall be considered as an abandonment of such craft, and subject the same to removal by the United States as hereinafter provided for.

That, except in case of emergency imperiling life or property, or unavoidable accident, collision, or stranding, and except as otherwise permitted by regulations prescribed by the Secretary as hereinafter authorized,[1] it shall be unlawful for any person to discharge, or suffer, or permit the discharge of oil by any method, means, or manner into or upon the coastal navigable waters of the United States from any vessel using oil as fuel for the generation of propulsion power, or any vessel carrying or having oil thereon in excess of that necessary for its lubricating requirements and such as may be required under the laws of the United States and the rules and regulations prescribed thereunder. The Secretary is authorized and empowered to prescribe regulations permitting the discharge of oil from vessels in such quantities, under such conditions, and at such times and places as in his opinion will not be deleterious to health or sea food, or a menace to navigation, or dangerous to persons or property engaged in commerce on such waters, and for the loading, handling, and unloading of oil.

WEATHER BUREAU.—Forecasts and warnings of the approach of storms over land and ocean areas are among the services of the Weather Bureau to navigation, commerce, agriculture, and the general public. Other warnings cover cold waves, frost, forest-fire hazard, and floods.

Meteorological information is collected and transmitted at hourly, 3-hourly, and 6-hourly intervals from land stations, ships at sea, and aircraft. These reports form a basis for the forecasting service, for summarization and publication of climatological data having general value and applicability, and for research basic to improvement of the national weather service.

Weather Bureau offices are located in many ports and other places throughout the continental United States and possessions. Stations in the area of concern to this Coast Pilot, at which the public may compare barometers against Weather Bureau barometers and discuss matters of weather service with Weather Bureau officials, are listed in the Appendix. By international agreement, the Weather Bureau also bears a share in the maintenance and operation of certain weather ships on the free oceans.

Marine meteorological service.—The collection of observations from ships at sea is conducted on a purely voluntary and cooperative basis. The Weather Bureau supplies shipmasters with blank forms, printed instructions, and such other material as is essential to the making and recording of observations. In the course of an average peacetime year, more than 400,000 observations are received from vessels representing every maritime nation and reaching every quarter of the globe.

The **hurricane and storm warning service** was established primarily to aid marine interests. Storm warnings are prepared at regular district forecast centers and at special hurricane forecast centers. The warnings are distributed to the public through all neighboring Weather Bureau offices by radio, the press, and every other available means. During the West Indian hurricane season, June to November, inclusive, teletype circuits expedite the exchange of reports from the Atlantic and Gulf

coasts; special reports are obtained from weather reconnaissance planes which fly near the storms and sometimes into the storm centers.

Coastal Warning Display System.—The Weather Bureau employs the following system for displaying warning signals at stations along United States coasts, except Alaska, but including the Great Lakes and Puerto Rico, when winds dangerous to navigation are forecast.

Small-craft warning: One red pennant displayed by day and a red light above a white light at night to indicate that winds up to 33 knots and/or sea conditions dangerous to small craft operations are forecast for the area.

Gale warning: Two red pennants displayed by day and a white light above a red light at night to indicate that winds ranging from 34 to 47 knots are forecast for the area.

Whole gale warning: A single square red flag with black center displayed by day and two red lights at night to indicate that winds ranging from 48 to 63 knots are forecast for the area.

Hurricane warning: Two square red flags with black centers displayed by day and a white light between two red lights at night to indicate that winds of 64 knots and above are forecast for the area.

The **NAVY HYDROGRAPHIC OFFICE** exists for the improvement of the means of navigating safely the vessels of the U.S. Navy and the Merchant Marine by providing accurate nautical charts and related publications for foreign waters. Publications include Sailing Directions (pilots), Light Lists, Table of Distances, Radio Navigational Aids, Radio Weather Aids, International Code of Signals, the American Practical Navigator (Bowditch), and the Notice to Mariners.

The weekly **Notice to Mariners** contains corrections to Charts, Coast Pilots, Sailing Directions, Light Lists, and other publications; see Appendix for coverage.

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 and unexpired resident aliens' border-crossing identification cards or valid non-resident aliens' border-crossing identification cards. Class C is only for aliens who are arriving in the United States as seamen as that term is defined in the last sentence of section 1 of the Immigration Act of 1917 (39 Stat. 874; 8 U.S.C. 173). [That the term seaman as used in this Act shall include every person signed on the ship's articles and employed in any capacity on board any vessel arriving in the United States from any foreign port or place.] No alien may enter the United States until he has been inspected by an immigration officer. A list of the ports of entry for aliens is given in the Appendix.

The **PUBLIC HEALTH SERVICE** administers hospitalization and outpatient treatment to legal beneficiaries of the Government; it also administers foreign and domestic quarantine laws, supervising the medical examination of immigrants and enforcing interstate laws.

Quarantine.—A vessel arriving at a port under the control of the United States shall undergo quarantine inspection prior to entry unless: (1) In the current voyage the vessel has not touched at any port other than those under the control of the United States, or in Canada, the Islands of St. Pierre and Miquelon, Iceland, Greenland, the West Coast of Lower California, Cuba, the Bahama Islands, the Canal Zone, the Bermuda Islands, and the Islands of Aruba and Curacao; or (2) in the current voyage the vessel has received pratique at a port under the control of the United States and since receiving same has not touched at a port other than those listed in (1); or (3) the vessel possesses a duplicate of a pratique issued at a port in Canada or the Canal Zone and since receiving same has not touched at ports other than those listed in (1).

A vessel otherwise exempt from quarantine inspection shall undergo such inspection prior to entering a port under the control of the United States if the vessel has aboard a person infected or suspected of being infected with certain communicable diseases, or if the vessel arrives from a port where at the time of departure there was present or suspected of being present cholera, plague, or yellow fever, or there was a significant increase in the prevalence of smallpox or typhus.

Vessels subject to quarantine inspection shall upon arrival at ports under the control of the United States fly a yellow flag, anchor in the quarantine anchorage, and await inspection. Only the quarantine officer, quarantine employees, or pilots shall be permitted to board any vessel subject to quarantine inspection until after it has been inspected by the quarantine officer and granted pratique, except with the permission of the quarantine officer. A person boarding such vessel shall be subject to the same restrictions as those imposed on the persons on the vessel.

Sanitary inspection.—Vessels arriving at a port under the control of the United States from a foreign port shall be subject to sanitary inspection to ascertain whether there exists rodent, vermin, or insect infestation or other unsanitary conditions requiring measures for the prevention of the introduction, transmission, or spread of communicable disease.

In general, where State quarantine is in force, the minimum requirements of quarantine are in accordance with the regulations of the Public Health Service. National quarantine regulations will be found at the stations of the service and at United States consulates, and will be furnished to vessels upon application to officers of the service or to the Bureau in Washington, D.C.

Medical service.—United States merchant seamen are

entitled to medical relief obtainable through the Public Health Service. A United States seaman is one engaged on board in care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service, on board, of those so engaged. **Hospitals, outpatient clinics,** and **outpatient offices** of the Public Health Service are located at the addresses given in the Appendix. Free medical advice is furnished to seamen by radio; see H.O. Publication 117, Radio Navigational Aids.

RADIO.—The Federal Communications Commission controls radio communications in the United States and in all possessions except the Panama Canal Zone. 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 United States ports. Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington 25, D.C., or from any of the field offices.

Marine weather broadcasts.—Information on weather over North Atlantic and North Pacific waters is issued by the Weather Bureau for broadcast by commercial and Government radio stations. Marine bulletins for the western North Atlantic are broadcast by Navy station NSS, Washington, D.C.; those for the eastern North Pacific are transmitted by KPH, Bolinas, Calif., and KTK, San Francisco, Calif. A separate bulletin for Central Pacific waters is broadcast by KHK, Kahuku, Hawaii. The marine bulletins include storm advisories and forecasts. Station frequencies, broadcast times, and areas affected are stated in H.O. Publication 118, Radio Weather Aids.

Advisories and forecasts also are broadcast by Navy stations NBA, Balboa, C.Z.; NPG, San Francisco, Calif.; NHB, Kodiak, Alaska; and NPM, Honolulu, Hawaii.

Local weather bulletins, containing coastal-area forecasts, storm advisories, and weather summaries for specific areas, are broadcast on regular schedules by many Government and commercial radio stations.

Emergency broadcasts by Navy radio stations.—Storm advisories and notices concerning the safety of navigation at sea are broadcast by Navy radio stations in accordance with the degree of urgency, as follows:

A. Notices of tidal waves, hurricanes, typhoons, and cyclones so imminent as to warrant immediate broadcasting: (1) One transmission immediately on receipt; (2) one transmission at the end of the first ensuing silent period; and (3) one transmission during the first ensuing on-watch period for ships with one operator, in case both previous transmissions were made during the off-watch period.

B. Storm warnings and notices of less urgency than those specified in (A) and other than those normally included in scheduled hydrographic broadcasts: (1) One transmission at the end of the first ensuing silent period; and (2) one transmission during the on-watch period for ships with one operator in case the previous transmission was made during an off-watch period.

These broadcasts are preceded by transmission of the Urgent Signal (XXX) or the Safety Signal (TTT) and a preliminary announcement on 500 kc. of the message to follow on the station working frequency.

Emergency broadcasts by Coast Guard radio stations.—Storm and hurricane warnings, advisories and other urgent marine information are broadcast by Coast Guard radio stations:

A. By radiotelegraph on the station's medium frequency immediately following the first silent period after receipt of the message at the radio station (HH+18 or HH+48) preceded by an initial call on 500 kc. Whenever this transmission occurs outside the watch hours for single radio operator ships, the message will be repeated at the end of the next silent period falling within the radio watch hours for such vessels. If a station makes daily broadcasts of marine information, the message will also be included in its next scheduled transmission.

B. By radiotelephone on 2182 kc. immediately following receipt of the message at the radio station and repeated at the station's next scheduled broadcast.

Radiotelephone broadcasts of weather information (United States).—Transmission by voice of weather information from the Weather Bureau is made through certain radio stations of the Coast Guard and of the commercial coastal radiotelephone service. These broadcasts are followed immediately by reports of dangerous obstructions and changes in aids to navigation.

This service gives to yachts, fishing craft, tugboats, and other vessels equipped with a radio receiving set having a band covering the frequency range of 2 to 3 megacycles, official weather information from the Weather Bureau in plain language and on regular schedules.

These radiotelephone broadcasts are made twice and, in some cases, four times daily at definite times and include marine forecasts, and storm warnings whenever they are issued, for coastal waters in or adjacent to the areas served by the radio stations.

Certain local radio stations in the standard broadcast band have microphones installed in nearby Weather Bureau offices. From these stations forecasts, weather summaries, and warnings are broadcast on regular schedule. For stations and schedules in the area covered by this volume, see the Appendix.

West Indies.—Coast Guard station NMR, San Juan, P.R., broadcasts twice daily by radiotelephone and radiotelegraph a weather bulletin consisting of marine forecasts and weather summary for the Caribbean Sea area and small-craft, storm, and hurricane warnings when applicable.

Mexico and Canada.—Scheduled broadcasts of weather information affecting the coasts of Mexico and Canada are made by designated stations of those countries on marine frequencies by both radiotelegraph and radiotelephone.

Reports from ships.—The master of every ship of the United States equipped with radio transmitting apparatus, on meeting with a tropical storm, dangerous ice, 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 west of Central America and Mexico are urged to cooperate with the Weather Bureau in furnishing these special reports in order that warnings to shipping and coastal areas may be issued.

TIME SIGNALS.—The **United States system** of broadcasting time signals begins at 55 minutes 0 second of some hour and continues for 5 minutes. Signals are transmitted on every second of this period except the 29th of each minute, the 51st of the first minute, the 52d of the second minute, the 53d of the third minute, the 54th of the fourth minute, the last 4 seconds of the first 4 minutes, and the last 9 seconds of the last minute. The hour signal is a 1.3-second dash, which is much longer than the others.

In all cases the beginnings of the dashes indicate the beginnings of the seconds, and the ends of the dashes are without significance. The number of dashes sounded in the group at the end of any minute indicates the number of minutes of the signal yet to be sent. In case of signal failure or error, the signal is repeated 1 hour later.

The **National Bureau of Standards** broadcasts time sugnals from its radio station **WWV** near Washington, D.C., on radio frequencies of 2.5, 5, 10, 15, 20, and 25 megacycles, which are on the air at all times, day and night. This insures reliable coverage of the United States and extensive coverage of other parts of the world. The services include time announcements, standard time intervals, standard audio frequencies, and radio-propagation disturbance-warning notices.

Time announcements.—The audio frequencies are interrupted at precisely 1 minute before each hour and each 5 minutes thereafter. They are resumed precisely on the hour and each 5 minutes thereafter. The beginnings of the periods, when the audio frequencies are resumed, are in agreement with the basic service of the U.S. Naval Observatory, and accordingly they accurately mark the hour and successive 5-minute periods.

Greenwich Mean Time is announced in telegraphic code each 5 minutes. The zero- to 24-hour system is used. This announcement refers to the end of the announcement interval. A voice announcement of eastern standard time is given following each telegraphic code announcement.

Standard time intervals.—On each carrier frequency is a pulse which occurs at intervals of precisely 1 second. The pulse is omitted at the beginning of the last second of every minute. The 1-minute, 4-minute, and 5-minute intervals, synchronized with the second pulses, are marked by the beginning or ending of the periods when the audio frequencies are off.

A **radio-propagation disturbance warning** forecast is transmitted in Morse code twice each hour at 19½ and 49½ minutes past the hour. These warnings tell users of radio transmission paths over the North Atlantic, the condition of the ionosphere at the time of the announcement, and how good or bad communication conditions are expected to be for the next 12 hours. During a period of radio-propagation disturbance, direction-finder observations may be unreliable; the letters "N", "U", and "W" signify that radio propagation conditions are, respectively, normal, unsettled, or disturbed.

Radio station **WWVH**, on the island of Maui, Hawaii, broadcasts on 5, 10, and 15 megacycles. The schedule of broadcasts is the same as that of station WWV for standard time intervals, time announcements in code, standard audio frequencies, and accuracy. Simultaneous reception of WWV and WWVH does not interfere with ordinary use of the standard frequency and time signals.

The WWVH broadcast is interrupted for 4 minutes following each hour and half hour and for periods of 34 minutes each day beginning at 1900 GMT.

DESTRUCTIVE WAVES.—Unusual sudden changes in water level can be caused by seismic sea waves 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.

Seismic sea waves are set up 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, that originated in the Aleutian Trench demolished nearby Scotch Cap Lighthouse and also caused $25,000,000 damage in the Hawaiian Islands 2,200 miles away.

The speed of seismic sea waves 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

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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 and are being 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 problem of detecting and reporting the existence of seismic sea waves when they do occur is being studied. A reporting system has been organized in the Pacific with its center in the Hawaiian Islands.

When an advance warning is available, 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 waves.—A considerable rise or fall in the level of the sea along a particular coast may result from strong winds and a 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 seismic sea waves 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.

2. NAVIGATION REGULATIONS

THIS chapter contains the sections of **Code of Federal Regulations, Title 33, Navigation and Navigable Waters,** that are of most importance in the areas covered by Coast Pilot 5. The sections are from Part 82, Boundary Lines of Inland Waters; Part 124, Control Over Movement of Vessels; Part 202, Anchorage Regulations; Part 203, Bridge Regulations; Part 204, Danger Zone Regulations; and Part 207, Navigation Regulations.

PART 82—BOUNDARY LINES OF INLAND WATERS.

§ 82.1 General basis and purpose of boundary lines. By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of Reorganization Plan No. 3 of 1946 (3 CFR, 1946 Supp., Ch. IV), and section 2 of the act of February 19, 1895, as amended (28 Stat. 672, 33 U.S.C. 151), the regulations in this part are prescribed to establish the lines dividing the high seas from rivers, harbors, and inland waters in accordance with the intent of the statute and to obtain its correct and uniform administration. The waters inshore of the lines described in this part are "inland waters," and upon them the inland rules and pilot rules made in pursuance thereof apply. The waters outside of the lines described in this part are the high seas and upon them the international rules apply. The regulations in this part do not apply to the Great Lakes or their connecting and tributary waters.

§ 82.2 General rules for inland waters. At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries for which specific lines are not described in this part, the waters inshore of a line approximately parallel with the general trend of the shore, drawn through the outermost buoy or other aid to navigation of any system of aids, are inland waters, and upon them the inland rules and pilot rules made in pursuance thereof apply, except that Pilot Rules for Western Rivers apply to the Red River of the North, the Mississippi River and its tributaries above Huey P. Long Bridge, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway.

§ 82.55 Florida Reefs and Keys from Miami to Marquesas Keys. A line drawn from the east end of the north jetty at the entrance to Miami, to Miami Lighted Whistle Buoy 2; thence to Fowey Rocks Lighthouse; thence to Pacific Reef Lighthouse; thence to Carysfort Reef Lighthouse; thence to Molasses Reef Lighthouse; thence to Alligator Reef Lighthouse; thence to Tennessee Reef Lighthouse; thence to Sombrero Key Lighthouse; thence to American Shoal Lighthouse; then to Key West Entrance Lighted Whistle Buoy; thence to Sand Key Lighthouse; thence to Cosgrove Shoal Lighthouse; thence to westermost extremity of Marquesas Keys.

§ 82.60 Florida Keys from Marquesas to Cape Sable. A line drawn from the northwesternmost extremity of Marquesas Keys to Northwest Channel Entrance Lighted Bell Buoy 1; thence to the southernmost extremity of East Cape, Cape Sable.

§ 82.65 San Carlos Bay and tributaries. A line drawn from the northwesternmost point of Estero Island to Caloosa Lighted Bell Buoy 2; thence to Sanibel Island Lighthouse.

§ 82.70 Charlotte Harbor, Fla., and tributaries. Eastward of Charlotte Harbor Entrance Lighted Bell Buoy off Boca Grande.

§ 82.80 Tampa Bay and tributaries. A line drawn from the southernmost extremity of Long Key, Fla., to Tampa Bay Lighted Whistle Buoy; thence to Southwest Channel Entrance Lighted Bell Buoy 1; thence to a spire on the northeast side of Anna Maria Key bearing approximately 109°.

§ 82.89 Apalachee Bay, Fla. Those waters lying north of a line drawn from Lighthouse Point on St. James Island to Gamble Point on the east side of the entrance to the Aucilla River, Fla.

§ 82.95 Mobile Bay, Ala., to Mississippi Passes, La. Starting from a point which is located 1 mile, 90° true, from Mobile Point Lighthouse, a line drawn to a point 5.5 miles, 202° true, from Mobile Point Lighthouse; thence to Ship Island Lighthouse; thence to Chandeleur Lighthouse; thence in a curved line following the general trend of the seaward, highwater shore lines of the Chandeleur Islands to the southwesternmost extremity of Errol Shoal (lat. 29°35.8′ N., long. 89°00.8′ W.); thence to a point 5.1 miles, 107° true, from Pass a Loutre Abandoned Lighthouse.

§ 82.100 Mississippi River. The Pilot Rules for Western Rivers are to be followed in the Mississippi River and its tributaries above the Huey P. Long Bridge.

§ 82.103 Mississippi Passes, La., to Sabine Pass, Tex. A line drawn from a point 5.1 miles, 106° true, from Pass a Loutre Abandoned Lighthouse to a point 1.7 miles, 113° true, from South Pass West Jetty Light; thence to a point 1.8 miles, 189° true, from South West Pass Entrance

Light; thence to Ship Shoal Lighthouse; thence to a point 10.2 miles, 172° true, from Calcasieu Pass Entrance Range Front Light; thence to a point 2.5 miles, 163° true, from Sabine Pass East Jetty Light.

§ 82.106 Sabine Pass, Tex., to Galveston, Tex. A line drawn from Sabine Pass Lighted Whistle Buoy 1 to Galveston Bar Lighted Whistle Buoy 1.

§ 82.111 Galveston, Tex., to Brazos River, Tex. A line drawn from Galveston Bar Lighted Whistle Buoy 1 to Freeport Entrance Lighted Bell Buoy 1.

§ 82.116 Brazos River, Tex., to the Rio Grande, Tex. A line drawn from Freeport Entrance Lighted Bell Buoy 1 to a point 4,350 yards, 118° true, from Matagorda Lighthouse; thence to Aransas Pass Lighted Whistle Buoy 1A; thence to a position 10½ miles, 90° true, from the north end of Lopeno Island (Lat. 27°00.1′ N., Long. 97°15.5′ W.); thence to Brazos Santiago Entrance Lighted Whistle Buoy 1.

§ 82.200 Bahia de San Juan. A line drawn from the northwesternmost extremity of Punta del Morro to Puerto San Juan Lighted Buoy 1; thence to Puerto San Juan Lighted Buoy 2; thence to the northernmost extremity of Isla de Cabras.

§ 82.205 Puerto Arecibo. A line drawn from the westernmost extremity of the breakwater through Puerto Arecibo Buoy 1; thence through Puerto Arecibo Buoy 2; thence to shore in line with the Church tower in Arecibo.

§ 82.210 Bahia de Mayaguez. A line drawn from the southernmost extremity of Punta Algarrobo through Manchas Interior Lighted Buoy 3; thence to Manchas Grandes Lighted Buoy 2; thence to the northwesternmost extremity of Punta Guanajibo.

§ 82.215 Bahia de Guanica. A line drawn from the easternmost extremity of Punta Brea through Bajio La Laja Lighted Buoy 2; thence to the westernmost extremity of Punta Jacinto.

§ 82.220 Bahia de Guayanilla. A line drawn from the southernmost extremity of Punta Ventana through Bahia de Guayanilla entrance Lighted Buoy 2; thence to the southeasternmost extremity of Punta Guayanilla.

§ 82.225 Bahia de Ponce. A line drawn from the southeasternmost extremity of Punta Cuchara through Bahia de Ponce Lighted Buoy 1; thence to Bahia de Ponce Lighted Buoy 2; thence to the southwesternmost extremity of Punta Cabullon.

§ 82.230 Bahia de Jobos. A line drawn from Punta Arenas through Bahia de Jobos Light; thence to Bahia de Jobos entrance Lighted Buoy 2; thence to the southernmost extremity of Isla Morrillo; thence to the southernmost extremity of Isla Pajaros.

§ 82.235 St. Thomas Harbor, St. Thomas. A line drawn from the southernmost extremity of Red Point through Lindbergh Bay Buoy 1; thence to Porpoise Rocks Lighted Buoy 2; thence to the southernmost extremity of Flamingo Point; thence to The Triangles Bell Buoy 2; thence to the Green Cay.

§ 82.240 Christiansted Harbor, Island of St. Croix, Virgin Islands. A line drawn from Shoy Point to Scotch Bank Lighted Buoy No. 1; thence to Long Reef Range Rear Daybeacon; thence to shore in range with stack at Little Princess northwestward of leper settlement.

§ 82.245 Sonda de Vieques. A line drawn from the easternmost extremity of Punta Yeguas, Puerto Rico, to a point 1 mile due south of the lighthouse at the entrance to Puerto Ferro; thence eastward in a straight line to a point 1 mile southeast of Punta Este Light, Vieques; thence in a straight line to the easternmost extremity of Punta del Este, Isla Culebrita. A line from the northernmost extremity of Cayo Nordeste to Piedra Stevens Lighted Buoy 1; thence to Las Cucarachas Light; thence to Cabo San Juan Light.

PART 124—CONTROL OVER MOVEMENT OF VESSELS:

§ 124.10 Advance notice of vessel's time of arrival to Captain of the Port. (a) The master or agents of every registered vessel of the United States, and every foreign vessel arriving at a United States port or place from a port or place outside the United States, or any such vessel destined from one port or place in the United States to another port or place in the United States, shall give at least 24 hours advance notice of arrival to the Captain of the Port at every port or place where the vessel is to arrive, except as follows:

(1) Registered United States pleasure vessels and registered United States fishing vessels are not required to submit advance notice of arrival report.

(2) When the port of arrival is not located within the geographical area assigned to a particular Captain of the Port, this advance notice of time of arrival shall be made to the Commander of the Coast Guard District in which such port or place is located.

(3) When the arrival is a direct result of the operation of "force majeure," and it is not possible to give at least 24 hours' advance notice of time of arrival, then advance notice as early as practicable shall be furnished.

(4) When the vessel, while in United States waters, does not navigate any portion of the high seas, i.e., does not navigate beyond the low water mark along the coasts or beyond the waters contained within the headlands of the United States.

(5) When a vessel is engaged upon a scheduled route if a copy of the schedule is filed with the Captain of the Port for each port of call named in the schedule and the times of arrival at each such port are adhered to.

(6) When the master of a merchant vessel (except on a coastwise voyage of 24 hours or less) reports in accord-

ance with the U.S. Coast Guard's voluntary Atlantic Merchant Vessel Report (AMVER) System, he shall be considered to be in constructive compliance with the requirements of paragraph (a) of this section and no additional advance notice of vessel's arrival reports to the Captain of the Port is required. The master or agent of a vessel on coastwise voyages of 24 hours or less shall report the advance notice of vessel's arrival to the Captain of the Port at next port of call prior to or upon departure from port.

(7) When a vessel which is engaged in operations in and out of the same port, either on voyages to sea and return without having entered any other port, or on coastwise voyages within the same Coast Guard District, or from ports within the First, Ninth, Thirteenth, or Seventeenth Coast Guard Districts to adjacent Canadian ports, and where no reason exists which renders such action prejudicial to the rights and interests of the United States; the Coast Guard District Commander having jurisdiction may prescribe conditions under which Coast Guard Captains of the Ports may consider such a vessel as being in constructive compliance with the requirements of this section without the necessity for reporting each individual arrival.

(8)(a) A westbound vessel which is to proceed to or through United States waters of the St. Lawrence River and/or the Great Lakes under conditions other than provided for in subparagraphs (3), (5), and (7) of this paragraph, shall be subject to compliance with paragraph (b) of this section.

(b) The master or agent of every vessel other than vessels of United States or Canadian nationality engaged in the coastal trade of their respective countries or in trade between their two countries without calling at any other country en route, when proceeding westbound to United States waters of the St. Lawrence River and/or the Great Lakes shall:

(1) At least 24 hours in advance of the vessel's arrival at the Snell Lock, Massena, New York, advise the Commander, Ninth Coast Guard District, Cleveland, Ohio, of estimated time of arrival of such vessel at the Snell Lock.

(2) In addition, prior to or immediately on entering Lake Ontario inbound, advise the Commander, Ninth Coast Guard District, of the vessel's first intended United States port of call, if any, and estimated time of arrival at that port.

(3) Upon the vessel's arrival in the first United States port, cause to be delivered to the Captain of the Port (or the Commander, Ninth Coast Guard District where no Captains of the Port are assigned) an itinerary giving the intended ports of call on the Great Lakes and the estimated dates of arrival.

(4) A master of a vessel who reports in accordance with the U.S. Coast Guard's voluntary Atlantic Merchant Vessel Report (AMVER) System and who includes in this report an estimated time of arrival at the Snell Lock, Massena, New York, shall be considered to be in constructive compliance with the requirements of subparagraph (1) of this paragraph and no additional advance notice of vessel's arrival at the Snell Lock is required. Likewise a master of such vessel who indicates in this report the name of the first intended United States port of call and estimated time of arrival at that port shall be considered in constructive compliance with subparagraph (2) of this paragraph and no additional advance notice of arrival is required.

§ 124.20 Penalties for violations. Failure to give advance notice will subject the master or agents of a vessel to the penalties of fine and imprisonment, as well as subject the vessel to seizure and forfeiture, as provided in section 2, Title II of the Act of June 15, 1917, as amended, 50 U.S.C. 192. In addition, such failure may result in delay in the movement of the vessel from the harbor entrance to her facility destination within the particular port.

PART 202—ANCHORAGE REGULATIONS:

§ 202.1 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). Section 1 of the act amended Article 11 of the Navigation Rules for Harbors, Rivers, and Inland Waters Generally (33 U.S.C. 180), section 2 amended Rule 9 of the Navigation Rules for Great Lakes and Their Connecting and Tributary Waters (33 U.S.C. 258), and section 3 amended Rule 10 of the Navigation Rules for Red River of the North and Rivers Emptying into Gulf of Mexico and Tributaries (33 U.S.C 319). 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 River and Harbor Act approved March 4, 1915 (38 Stat. 1053; 33 U.S.C. 471).

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

Subpart A—Special Anchorage Areas:

§ 202.75 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.

§ 202.190 Tortugas Harbor, in 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.

§ 202.193 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.

(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 anchroage 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.

§ 202.193a 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.

§ 202.194 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.

§ 202.194a 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.

§ 202.195 Mississippi River below Baton Rouge, La., including South and Southwest Passes. (a) The anchorage grounds—(1) Pilottown anchorage. An area approximately 4.7 miles in length along the right descending bank or west side of the river, 800 feet wide, extending from a point directly opposite Pilottown Wingdam Light, about 1.7 miles upstream from Head of Passes, upstream to a point 1.0 mile downstream from Wilder Flats light. The area is marked by large signs, "Pilottown

Anchorage," located on the right bank at the lower and upper limits. This anchorage is for ships which cannot proceed to sea because of fog at the Gulf ends of South and Southwest Passes or for any other reason.

(2) Explosives anchorage. An area along the right descending bank or west side of the river, 1,000 feet wide, extending upstream and downstream from a point located 1.4 miles upstream from Oak Point Light. The Commander, Eighth Coast Guard District, will designate anchorages upstream and downstream from this point. This anchorage is reserved for vessels carrying explosives. It may be used for a general anchorage when not required for vessels carrying explosives or dangerous or inflammable cargo. No vessel shall occupy this anchorage without obtaining a permit from the Commander, Eighth Coast Guard District.

(3) New Orleans general anchorage. An area approximately 2.1 miles in length along the right descending bank or southwest side of the river, 800 feet wide, extending from Cutoff Light upstream to the lower limits of the quarantine anchorage, approximately 0.7 mile downstream from the United States Quarantine Station Wharf. The area is marked by large signs, "General Anchorage," located on the right bank at the lower and upper limits. Vessels anchoring alongside of each other or in fleets are permitted, but during slack or low-water periods bow and stern anchors shall be provided.

(4) Quarantine anchorage. An area approximately 4,000 feet in length along the right descending bank or southwest side of the river, 800 feet wide, extending from the upper limits of the New Orleans general anchorage, approximately 0.7 mile downstream from the United States Quarantine Station Wharf, upstream to a point marked by a sign located at the lower end of the Todd-Johnson Wharf, approximately 160 feet upstream from the Quarantine Station Wharf. This anchorage must be used by vessels awaiting inspection by United States Public Health officials or under actual quarantine, and is under the supervision of the Officer in Charge of the United States Quarantine Station (section 364, Public Health Service Act, July 1, 1944, 58 Stat. 682; 42 U.S.C. 267).

(5) Cargo transfer anchorage. An area approximately 1.7 miles in length along the left descending bank of the river, about 600 feet wide, extending from Mile 127.3 to Mile 129.0 above Head of Passes. This area is located adjacent to the river end of Bonnet Carre Spillway. During the time when the Bonnet Carre Spillway is operating, vessels will not be permitted to use this area but will moor at areas as directed by the District Engineer, U.S. Army Engineer District, New Orleans. Upon completion of the transfer of cargo, vessels shall move from this area.

(6) Temporary anchorages, Baton Rouge, New Orleans. Vessels awaiting berthing at riverside wharves between Mile 233 above Head of Passes and the upper limits of the Port of New Orleans, Mile 107 above Head of Passes, will anchor in a manner and area as prescribed by the District Engineer, U.S. Army Engineer District, New Orleans.

(7) Baton Rouge general anchorage. An area, 1,400 feet wide, between Mile 225 and Mile 226.5 above Head of Passes with its west limit along the low water line.

(b) The regulations. (1) Except in cases of poor visibility or other emergency anchoring is prohibited in the Mississippi River below Baton Rouge outside of the established anchorages or in South and Southwest Passes. If it becomes necessary in an emergency to anchor a vessel outside of the prescribed anchorages the vessel shall be so anchored that it will not interfere with or endanger other vessels, and it shall be moved as soon as the emergency is over. If it becomes necessary in an emergency to anchor a vessel in South Pass or Southwest Pass, the vessel shall take a position as close to the east bank as possible.

(2) 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, or the suction of passing vessels.

(3) Except in case of great emergency, no vessel or craft shall anchor over revetted banks of the river. Every precaution shall be exercised at all times to avoid damage to the revetment works. The location of mattress work in New Orleans Harbor is indicated by warning signs erected at the ends and center of each reach of mattress work. 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 Engineer, Corps of Engineers, New Orleans, Louisiana.

(4) The masters and pilots of all seagoing steamers, tugboats, and other vessels passing the explosives anchorage shall regulate the speed of their vessels over the bed of the river so as not to exceed seven miles per hour going downstream or five miles per hour going upstream whenever any vessel is anchored or moored within the explosives anchorage and engaged in handling explosives.

§ 202.196 Sabine Pass Channel, Sabine Pass, Tex. (a) The anchorage area. The navigable waters of the old reach of Sabine Pass Channel lying along the southwesterly side of the realigned Sabine Pass Channel at Sabine Pass and extending northwesterly and southeasterly, respectively, to lines parallel to, and 500 feet from, the westerly bottom edge of the realigned channel.

(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 favorable tides to navigate the realigned reach of Sabine Pass Channel.

(2) Vessels shall not anchor in the anchorage area for periods exceeding 48 hours unless expressly authorized to do so by the Captain of the Port.

(3) Vessels shall not anchor so as to obstruct the free use of the anchorage area and shall at all times leave a clear passage for vessels navigating through the anchorage area.

(4) Vessels shall not unreasonably obstruct the approaches to landings, slips, wharves or other facilities in the harbor area.

(5) Anchors shall not be placed outside the limits of the anchorage area and no portion of the hull or rigging of

any anchored vessel shall be allowed to extend outside of the limits of the anchorage area.

(6) Vessels using spuds for anchors shall anchor as close to shore as practicable having due regard for the provisions in subparagraph (4) of this paragraph.

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

(8) 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 or other aids to navigation.

§ 202.197 Galveston Harbor, Tex. (a) The anchorage grounds—(1) Anchorage No. 1. A rectangular area in Bolivar Roads whose northerly boundary begins at a point located 180°, 250 yards from Galveston Bay Entrance Channel Lighted Bell Buoy 13 and extends 90°, 1,300 yards to its easterly terminus. The easterly and westerly boundaries are lines bearing 180° from each end of the northerly boundary and extending to the sand flats on the northerly side of South Jetty.

(2) Anchorage No. 2. An area in Bolivar Roads southward and westward from lines bearing 180° and 241½°, respectively, from Galveston Bay Entrance Channel Lighted Bell Buoy 13; eastward from longitude 94°45′; and northward from a line bearing 90° from Galveston Channel Lighted Bell Buoy 1.

(3) Anchorage No. 3. A triangular area in Bolivar Roads northward and southward of lines bearing 90° and 61½°, respectively, from Galveston Channel Lighted Bell Buoy 1; and westward from longitude 94°45′.

(4) Anchorage No. 4. An irregular shaped area in Bolivar Roads southwestward from the North Jetty; northwestward from a line bearing 61½° from Galveston Bay Entrance Channel Lighted Bell Buoy 14; northward from a line drawn from Galveston Bay Entrance Channel Lighted Bell Buoy 14 to Bolivar Roads Lighted Buoy 16 and thence to Bolivar Roads Lighted Bell Buoy 18; eastward from a line bearing 359° from Bolivar Roads Lighted Bell Buoy 18; and southeastward from a line bearing 223° from the old tower (abandoned lighthouse) on Bolivar Peninsula.

(b) The regulations. (1) Anchorage No. 1 is an explosives anchorage and is reserved primarily for vessels engaged in the transportation and handling of explosives and other dangerous articles. The anchoring of vessels in this area shall be subject to the supervision and approval of the Captain of the Port. Vessels not carrying or handling dangerous cargo shall not anchor in this area without the prior approval of the Captain of the Port.

(2) Anchorage No. 2 is a light draft anchorage and is reserved primarily for ships drawing 24 feet or less.

(3) Anchorage No. 3 is a deep draft anchorage and is reserved primarily for ships drawing more than 24 feet.

(4) Anchorage No. 4 is a general anchorage for all types of vessels. Small craft, drilling rigs, barges and other vessels which may safely do so shall anchor shoreward from a 2½-fathom depth. The deeper portions of this area are reserved primarily for ships which can safely anchor in the available depths. Vessels moored by spuds or otherwise so that they are not free to swing on their anchors but which require greater depth than 2½ fathoms, shall anchor as far shoreward as safety will permit and they shall anchor clear of the ships using the deeper portions of the anchorage.

(5) 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 any anchorage area including any vessel which is moored or anchored so as to obstruct navigation or interfere with range lights or other aids to navigation.

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

(2) Temporary anchorage (general). Beginning at the intersection of the east line of the San Juan Harbor turning basin with the south line of San Antonio Channel, which point bears 337°17′ true, 32 yards, from Isla Grande Light; thence along the east line of the turning basin 204°23′ true, 457 yards, to the north limit line of the west non-instrument approach zone to the San Juan Air Terminal; thence along the north limit line 268°21′ true, 508 yards; thence 24°23′ true, 457 yards; thence 88°21′ true, 508 yards, to the point of beginning.

(3) Restricted anchorage. Beginning at the southwest corner of the San Juan Harbor Turning Basin, which point bears 180° true, 1,058 yards, from Puntilla Point Daybeacon, and 227° true, 1,700 yards, from Isla Grande Light; thence along the west line of the turning basin 330°13′ true, 339 yards, to the south limit line of the west non-instrument approach zone to the San Juan Air Terminal; thence along the south limit line 77°32′ true, 419 yards; thence 150°13′ true, 456 yards, to the south line of the turning basin; thence along the south line 271°23′ true, 467 yards, 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) The anchorage described in paragraph (a)(2) of this section shall be a general anchorage. Vessels awaiting customs or quarantine shall use this anchorage. No vessel shall remain in this anchorage more than 12 hours without a permit from the U.S. Coast Guard Captain of the Port.

(3) No vessel shall anchor in the restricted anchorage without a permit from the U.S. Coast Guard Captain of the Port.

§ 202.245 Vieques Passage and Vieques Sound, north of Vieques Island. (a) The anchorage grounds.—(1) Vieques Passage explosives anchorage and ammunition

handling berth. A circular area having a radius of 2,000 yards with its center at latitude 18°11′12″, longitude 65° 33′12″.

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

(b) The regulations. No vessel or craft shall enter or remain in these anchorages while occupied by vessels having on board explosives or other dangerous cargo.

§ 202.250 St. Thomas Harbor, Charlotte Amalie, Virgin Islands. (a) The anchorage grounds.—(1) Inner harbor anchorage. Beginning at a point bearing 85°, 450 yards, from the center of Ballast Island; 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; thence 180°, 860 yards; thence 253°, 1,530 yards; thence due north 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 (explosives). 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 Light, Water Island, 55° to Hassel Island.

(4) Small-craft anchorage. All the waters north of a line passing through the center of Ballast Island and ranging 85°.

(5) Deep-draft anchorage. A circular area having a radius of 250 yards with its center at latitude 18°19′13″, longitude 64°58′32″.

Note. The center of the area is 193° true, 2,050 yards from the aerobeacon located on the upland in St. Thomas Airfield.

(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 shore line 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 Captain of the Port.

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

(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 Captain of the Port 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 Captain of the Port.

(4) The harbor regulations for the Port of St. Thomas, Virgin Islands 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 areas 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) 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.

§ 202.255 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 203—BRIDGE REGULATIONS:

§ 203.1 General. Drawbridges across navigable waters of the United States will not be opened to naviga-

tion for certain periods determined to be in the interest of public safety by the proper civil defense authorities 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) notwithstanding any general or special regulations heretofore or hereafter prescribed for the operation of any such drawbridge or drawbridges.

§ 203.240 Navigable waters discharging into the Atlantic Ocean south of and including Chesapeake Bay and into the Gulf of Mexico (including 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) If the weather conditions are good and sound signals can be heard when a vessel approaches a drawbridge and desires to pass through the draw, three distinct blasts of a whistle or horn shall be sounded or three calls through a megaphone shall be made from the vessel when within reasonable hearing distance of the bridge.

(1) When the draw of the bridge can be opened immediately, the drawtender shall reply by three distinct blasts of a whistle or horn, by three calls through a megaphone, or by three loud and distinct strokes of a bell.

(2) When the draw of the bridge cannot be opened immediately or when the bridge is open and is to be closed immediately, the drawtender shall reply by four or more short, distinct blasts of a whistle or horn, by four or more calls through a megaphone, or by four or more loud and distinct strokes of a bell (danger signal).

(c) When weather conditions prevent hearing the sound signals when a vessel approaches a drawbridge and desires to pass through the draw, signals shall be made from the vessel by swinging in circles at arm's length a lighted lantern at night and a flag by day.

(1) When the draw of the bridge can be opened immediately, the drawtender shall reply by raising and lowering in vertical plane a number of times a lighted lantern at night and a flag by day.

(2) When the draw of the bridge cannot be opened immediately or when the bridge is open and is to be closed immediately, the drawtender shall reply by swinging to and fro horizontally a number of times a lighted lantern at night and a flag by day.

(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) When a bridgetender is about to close a draw, he shall sound four or more short, distinct blasts of a whistle or horn, four or more calls through a megaphone, or four or more loud and distinct strokes of a bell (danger signal).

(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 operation of a drawspan, but all passage over, through, or under drawbridge shall be prompt, to prevent delay to either land or water traffic.

NOTE: The special regulations contained in §§ 203.245 to 203.491, prescribed where local conditions require to govern the operation of certain bridges, supplement the general regulations contained in § 203.240.

§ 203.241 The Intracoastal Waterway from the Virginia-North Carolina boundary to Key West, Florida, and the Gulf Intracoastal Waterway from Rigolets, Louisiana, to Apalachee Bay, Florida, and tributaries thereto; bridges. (a) Bridges over the above-captioned navigable waters will be operated in accordance with § 203.240. The regulations contained in this section shall be considered as additional to those contained in § 203.240.

(b) Drawbridges shall not be required to open for craft carrying appurtenances unessential to navigation and any vessel operator who causes a bridge to be opened in order to clear appurtenances unessential for navigation shall be considered in violation of the regulations of this section.

(c) Appurtenances unessential for navigation shall include but not be limited to fishing outriggers, radio or television antennae, false stacks, and masts purely for ornamental purposes. Appurtenances unessential to navigation will not include flying bridges, sailboat masts, pile driver leads, spud frames on hydraulic dredges, or other items of equipment clearly necessary to the intended use of the vessel.

(d) Owners of drawbridges shall report to the proper District Engineer the names of any vessels requiring bridge openings considered to be in violation of this sec-

tion. The District Engineer may at any time cause an inspection to be made of any craft utilizing the above-captioned navigable waters and is empowered to decide in each case whether or not the appurtenances are unessential to navigation. If the District Engineer decides a vessel has appurtenances unessential to navigation, he shall notify the vessel owner of his decision, specifying a reasonable time for making the alterations. If the vessel owner is aggrieved by the decision of the District Engineer, he may within 30 days after receipt of the request to perform necessary alterations, appeal the decision to the District Engineer in writing. After receipt by the District Engineer, the appeal will be forwarded through channels to the Secretary of the Army. If the Secretary of the Army rules that an appurtenance is unessential to navigation, the District Engineer 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 on the above-captioned navigable waters in such a manner as to require drawbridge openings shall be deemed in violation of the regulations of this section, unless the necessary alterations shall have been made.

§ 203.245 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 § 203.240 shall govern the operation 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), (g), and (h) apply to waterways discharging into the Atlantic Ocean south of and including Chesapeake Bay.

(i) Waterways discharging into Gulf of Mexico east of Mississippi River. (1) Caloosahatchee Canal, Fla.: Atlantic Coast Line Railroad Company bridge at Moore Haven. Between 10:00 p.m. and 6:00 a.m., the draw need not be opened for the passage of vessels.

(2) Orange River, Fla.; State Road Department of Florida bridge 0.9 mile above mouth and Seaboard Air Line Railway Company bridge 2.25 miles above mouth, near Fort Myers. At least 24 hours' advance notice required, except during a hurricane alert issued by the United States Weather Bureau affecting the area adjacent to Caloosahatchee and Orange Rivers when a draw tender shall be constantly on duty and the bridge opened at any time for the passage of vessels giving the usual signal.

(3) Myakka River, Fla.; railroad drawbridge near Charlotte Beach. At least 36 hours' advance notice required.

(3-a) Gasparilla Sound, Fla.; Seaboard Air Line Railroad Company bridge between the mainland and Gasparilla Island. Between the hours of 6:00 p.m. and 6:00 a.m. the following day, the southerly swingspan in the bridge need not be opened for the passage of vessels.

(4) Coffee Pot Bayou, St. Petersburg, Fla.; highway bridge at foot of Poplar Street. At least one hour's advance notice required.

(5) Pithlachascotee River, Fla.; State Road Department of Florida bridge 1.3 miles above mouth at New Port Richey. At least six hours' advance notice required, except during a hurricane alert issued by the United States Weather Bureau affecting the area when a draw tender shall be constantly on duty and the bridge opened promptly on signal.

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

(7) Flint River, Ga.; Seaboard Air Line Railway Company bridge and Atlantic Coast Line Railroad Company bridge at Bainbridge. At least 24 hours' advance notice required.

(8) Chattahoochee River, Ga. and Ala.; State of Alabama Highway Department bridge on U.S. Highway 84 and Atlantic Coast Line Railroad Company bridge at Alaga, Ala., Central of Georgia Railway Company bridge at Columbia, Ala., and Seaboard Air Line Railway Company bridge near Omaha, Ga. At least 6 hours' advance notice required.

(9) St. Andrew Bay (East Bay), Fla.; State Road Department of Florida bridge (DuPont Bridge) on U.S. Highway 98 between San Blas and Long Point. Between 6:30 a.m. and 7:45 a.m. and between 3:45 p.m. and 4:45 p.m., except Saturdays, Sundays, and national holidays, the draw need not be opened for the passage of vessels: Provided, That the draw shall be opened at any time for the passage of a tow or crash boat: And provided further, That the draw shall be opened at any time for the passage

of a vessel in an emergency involving danger to life or property which shall be indicated by four blasts of the signal device.

(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, Florida. Escambia County bridge in Pensacola. Between 7:30 a.m. and 8:30 a.m., 3:30 p.m. and 4:30 p.m., and 5:00 p.m. and 5:30 p.m., except Saturdays, Sundays and national holidays, the draw need not be opened for the passage of vessels: Provided, That the draw shall be opened at any time for the passage of a tow: And provided further, That the draw shall be opened at any time for the passage of a vessel in an emergency involving danger to life or property which shall be indicated by four blasts of the signalling device.

(12) Alabama River, Ala.; St. Louis-San Francisco Railway Company bridge at Yellow Bluff, near Coy. At least 48 hours' advance notice required.

(13) Coosa River, Ala.; Seaboard Air Line Railway Company bridge at Lock. At least 24 hours' advance notice required.

(14) Coosa River, Ala.; Louisville and Nashville Railroad Company 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.

(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, Alabama; Louisville and Nashville Railroad Company bridge near Mobile. Between 12:00 midnight and 8:00 a.m., the draw will not be required to open except in an emergency for the passage of fire boats and patrol boats operated by the Maritime Administration for security of vessels within the Mobile Reserve Fleet Anchorage extending above and below the bridge: Provided, That during periods of severe storms or hurricanes from the time the United States Weather Bureau sounds an "Alert" for the area until the "all clear" is sounded or for such period as the Fleet Superintendent, Mobile Reserve Fleet, may request, draw tenders will be constantly on duty and the draw 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.

(18) Bayou Sara, Ala.; Louisville and Nashville Railroad Company 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, Alabama, Southern Railway Company bridge at Mobile. On Sundays, legal holidays, and between 4:00 and 8:00 a.m. on all other days, the draw need not be opened for the passage of vessels, except in the event of emergency. At all other times, and in all other respects the regulations contained in § 203.240 shall govern the operation of this bridge. Whenever in the event of an emergency, a vessel is required to pass through the drawspan on Sunday, legal holidays, or between 4:00 p.m. and 8:00 a.m., the draw shall be opened promptly upon receipt of notice by the drawtender, who is domiciled in the immediate vicinity of the bridge. The notice posted in accordance with paragraph (d) of this section shall state how the drawtender may be reached.

(21) West Pearl River, La.; New Orleans and Northeastern Railroad Company bridge at Pearl River Station. At least six hours' advance notice required.

(22) (Revoked).

(23) Bayou Lacombe, La.; Louisiana Department of Highways bridge at Lacombe. At least 48 hours' advance notice required.

(24) Bayou Bienvenue, La.; Louisiana Department of Highways bridge near Chalmette. At least 24 hours' advance notice required.

(25) Amite River, La.; Louisiana Department of Highways bridge near French Settlement. 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) [Reserved].

(3) Bayou Lafourche, La.; Texas and New Orleans Railroad Company bridge at Lafourche and Louisiana Department of Highways bridges at Thibodaux and Labadieville. At least 48 hours' advance notice required.

(4) Bayou Lafourche, La.; Louisiana Department of Highways bridge and The Texas and Pacific Railway Company bridge near Napoleonville. At least 24 hours' advance notice required.

(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.; Department of Highways bridge near Gibson. 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.; The Texas and Pacific Railway Company bridge at Grosse Tete, and Louisiana Department of Highways bridge near Rosedale. At least 48 hours' advance notice required.

(10) Bayou Teche, La.; Louisiana Department of Highways bridge at Ruth. At least 48 hours' advance notice required.

(11) Bayou Teche, Louisiana: State of Louisiana, Department of Highways, and Southern Pacific Lines (Morgan's Louisiana and Texas Railroad and Steamship Company) bridges at Breaux Bridge, at least 48 hours' advance notice required.

(12) Stumpy Bayou, La.; Louisiana Department of Highways bridge near Weeks Island. At least 6 days' advance notice required.

(13) Bayou Courtableau, La.; Texas and New Orleans Railroad Company bridge at Washington. 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.

(14) Vermilion River, La.; Louisiana Department of Highways bridge near Lafayette. At least 48 hours' advance notice required.

(15) (Revoked).

(16) Bayou Plaquemine Brule, La.; Texas and New Orleans Railroad Company bridge near Midland. At least 24 hours' advance notice required.

(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) Bayou D'Inde, La.; Louisiana Department of Highways bridge. At least 48 hours' advance notice required.

(22) Bayou D'Inde, La.; railroad bridge of Defense Plant Corporation, Cities Service Refining Corporation, Agent. At least 72 hours' advance notice required.

(23) (Revoked).

(24) Houston River, La.; The Kansas City Southern Railway Company bridge near Lake Charles. At least 24 hours' advance notice required.

(25) English Bayou, La.; Louisiana Department of Highways bridge near Lake Charles. At least 48 hours' advance notice required.

(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.

(27) Cow Bayou, Tex.; Orange County highway bridge on Round Bunch Road and Texas Highway Department bridges at Bridge City and at Orangefield. At least 6 hours' advance notice required.

(28) Neches River, Tex.; Gulf, Colorado and Santa 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 Pacific 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), of this section shall not apply to these bridges.

(32) Brays Bayou, Tex.; city of Houston highway bridge at Broadway, Houston. At least 12 hours' advance notice required.

(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) Freeport Harbor, Tex.; Missouri Pacific Railroad Company bridge between Freeport and Velasco. At least 24 hours' advance notice required.

(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.; Missouri Pacific Railroad Company and Texas Highway Department bridges near Vanderbilt. At least 48 hours' advance notice required, except in emergencies, when the draws will be opened as soon as possible after the receipt of notice.

(39) Nueces Bay, Tex.; Texas Highway Department bridge between Corpus Christi and Portland. On Sundays, Texas State holidays, and national holidays, and between 9:00 p.m. and 6:00 a.m. on all other days, advance notice required: Provided, That during a hurricane alert or in the event of a major disaster affecting the Nueces Bay area, a draw tender shall be in constant attandance and the draw shall be opened promptly on signal. Advance notice when required shall be given between the hours of 6:00 a.m. and 8:00 p.m. on a day the draw tender is required to be in attendance.

(40) Laguna Madre, Tex.; Padre Island Causeway (Nueces County) swing barge bridge across Humble Oil and Refining Company channel. Between 4:00 p.m. and 7:00 a.m., at least 1 hour advance notice required: Provided, That the regulations of this section may be temporarily suspended by the District Engineer, U.S. Army Engineer District, Galveston, Tex., for such periods as he may determine to be necessary upon notice to Nueces County.

(41) Arroyo Colorado, Tex.; Texas Highway Department bridge at Rio Hondo. At least 12 hours' advance notice required.

§ 203.462 Caloosahatchee River, Fla.; Florida State Road Department bridge (Edison Bridge) at Fort Myers. (a) Except as otherwise provided in paragraphs (b) and (c) of this section, the owner of or agency controlling the bridge shall not be required to open the drawspan between the hours of 4:30 p.m., and 5:30 p.m., daily except on Sundays and the following legal holidays: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day.

(b) The regulations in this section shall not apply to vessels owned or operated by the United States. All such vessels shall be passed without delay through the draw of the bridge at any time on giving the usual signal.

(c) The draw of the bridge shall be opened at any time for the passage of a tow or of a vessel in an emergency involving danger of life or property. Such an emergency shall be indicated by four blasts of a whistle, horn, or megaphone.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a manner that they can easily be read at any time, signs setting forth the salient features of the regulations in this section.

§ 203.463 Manatee River, Fla.; State Road Department of Florida bridge near Bradenton. (a) Between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m., the draw need not be opened for the passage of vessels, except as provided in paragraph (b) of this section.

(b) The draw shall be opened promptly on signal for the passage of (1) Government owned or operated vessels, (2) any vessel during the existence of a hurricane alert issued by the United States Weather Bureau and affecting the area, and (3) any vessel in an emergency involving danger of life or property. An emergency shall be indicated by four blasts of a whistle, horn, or megaphone blown on the vessel.

(c) At times other than those specified in paragraph (a) of this section, and in all other respects the regulations contained in § 203.240 shall govern the operation of this bridge.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in such manner that it can easily be read at any time, a copy of the regulations of this section.

§ 203.465 Hillsborough River, Tampa, Florida. (a) City of Tampa highway bridges at Platt and Krause Streets and State Road Department of Florida highway bridge at Lafayette Street. (1) Except as otherwise provided in subparagraph (2) of this paragraph, the owners of or agencies controlling these bridges shall not be required to open the draws for the passage of vessels between 8:30 a.m. and 9:30 a.m. and between 5:00 p.m. and 6:15 p.m. on all days except Sundays.

(2) The draws shall be opened at any time to allow the passage of vessels owned or operated by the United States and vessels in distress. A vessel owned or operated by the United States or a vessel in distress desiring to pass either bridge shall so indicate by four blasts of a whistle or similar device.

(3) The owners of or agencies controlling the bridges shall keep a copy of the regulations in this paragraph conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time.

(b) City of Tampa highway bridge at West Columbus Drive (Michigan Avenue). (1) The owner of or agency controlling the bridge will not be required to keep a draw tender in constant attendance between 10:00 p.m. and 6:00 a.m.

(2) Persons requiring the opening of the draw of the bridge between 10:00 p.m. and 6:00 a.m. shall, except in an emergency, give one hour's advance notice of the time

at which such opening will be required. Such notice may be given in person, in writing, or by telephone to the authorized representative of the owner of or agency controlling the bridge. Upon receipt of such notice, the authorized representative shall cause a draw tender to be on duty at the bridge at the time specified in the notice, and the bridge shall at such time and for a reasonable period thereafter be prepared to open promptly for the passage of vessels.

(3) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time, a copy of the regulations in this paragraph, together with a notice stating exactly how the representative specified in subparagraph (2) of this paragraph may be reached.

(c) State Road Department of Florida highway bridge at West Hillsborough Avenue. (1) The owner of or agency controlling this bridge shall not be required to keep a draw tender in constant attendance between 10:00 p.m. and 6:00 a.m.

(2) Whenever, in the event of an emergency, a vessel, unable to pass under the closed bridge, is required to pass through the drawspan between 10:00 p.m. and 6:00 a.m., at least one hour's advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge. Upon receipt of such notice, the authorized representative, 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.

(3) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time, a copy of the regulations in this paragraph, together with a notice stating exactly how the representative specified in subparagraph (2) of this paragraph may be reached.

(d) City of Tampa highway bridge at West Sligh Avenue. (1) The owner of or agency controlling this bridge shall not be required to keep a draw tender in constant attendance between 6:00 p.m. and 7:00 a.m.

(2) Whenever, in the event of an emergency a vessel, unable to pass under the closed bridge, is required to pass through the drawspan between 6:00 p.m. and 7:00 a.m., at least one hour's advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge. Upon receipt of such notice, the authorized representative, 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.

(3) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time, a copy of the regulations in this paragraph, together with a notice stating exactly how the representative specified in subparagraph (2) of this paragraph may be reached.

§ 203.466 Clearwater Harbor, Fla.; the City of Clearwater bridge (Memorial Causeway), Clearwater Fla. (a) Except as otherwise provided in paragraphs (b) and (c) of this section, the owner or agency controlling the bridge shall not be required to open the drawspan for the passage of vessels on Saturdays, Sundays, Memorial Day, Independence Day and Labor Day between the hours of 4:30 p.m. and 7:00 p.m., except that the drawspan shall be opened at 5:15 p.m., 6:00 p.m., and 6:45 p.m. to allow all accumulated vessels to pass.

(b) The regulations in this section shall not apply to vessels owned or operated by the United States. All such vessels shall be passed without delay through the draw of the bridge at any time on giving the usual signal.

(c) The draw of the bridge shall be opened at any time for the passage of a tow or of a 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.

(d) The owner of or agency controlling the bridge shall keep a copy of the regulations in this section conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time.

§ 203.491 Mobile River and Chickasaw Creek, Ala.; Alabama State Highway bridge across Mobile River and 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.

§ 203.555 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 prescribed in paragraph (d) of this section 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 draw span or through the draw opening shall be in a manner to expedite both land and water traffic.

(d) Signals—(1) Call signals for opening of draw—(i) Sound signals. The general signal shall be one long blast of a whistle, horn, or siren, or one loud and distinct stroke of a bell, repeated at intervals until the acknowledging signal hereinafter prescribed is received from the bridge operator, except when a vessel or other water craft is about to leave a point between two drawbridges and within sight or hearing of them to pass through the draw downstream or in the direction of the ebb current, the signal shall be followed after a brief interval by an additional blast or distinct stroke of a bell.

(ii) Visual signal. A white flag by day, a white light by night, swung in full circles at arm's length in full sight of the bridge and facing the draw. This signal is to be used in conjunction with sound signals when conditions are such that sound signals may not be heard.

(2) Acknowledging signals by bridge operation—(i) Sound signals. Draw to be opened immediately: Same as call signal. Draw cannot be opened immediately, or if open must be closed immeditely: Four or more short and rapid blasts of a whistle, horn, or siren, or four sharp and rapid strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. The system of sight signals (hereinafter described) to be used in each individual case will be subject to the approval of the Division Engineer of the United States Engineer Department in charge of the locality. They will be used in conjunction with sound signals when conditions are such that sound signals alone are insufficient. Draw to be opened immediately: Green light (or a white flag during daylight hours) swung up and down vertically a number of times in full sight of the vessel, or three flashing green lights so located as to be visible to approaching vessels, or during daylight hours three cylinders or balls so located as to be visible to approaching vessels. Draw cannot be opened immediately, or if open must be closed immediately: A red light (or a red flag during daylight hours) swung to and fro horizontally in full sight of the vessel, or during daylight hours one cylinder or ball so located as to be visible to approaching vessels.

(3) Acknowledging signals by the vessel. Vessels or other watercraft having signaled for the opening of a draw and having received a signal that the draw cannot be opened immediately, or if open must be closed immediately, will acknowledge said signal by one long blast followed by a short blast or by swinging to and fro horizontally a red flag by day or a red light at night.

(e) A vessel approaching to pass two or more bridges less than 800 feet apart shall signal the first bridge as prescribed in paragraph (d) of this section 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 as prescribed in paragraph (d) of this section.

(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 as prescribed in paragraph (d) of this section. 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 as prescribed in paragraph (d) of this section.

(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 § 203.560, prescribed where local conditions require to govern the operation of certain bridges, supplement the general regulations contained in § 203.555.

§ 203.560 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 204—DANGER ZONE REGULATIONS:

§ 204.86 Florida Bay northeast of Pine Islands, Fla., live firing area for strafing. (a) The danger zone. (1) Bounded on the north by latitude 24°51′08″; on the east by longitude 81°13′52″; on the south by latitude 24°48′-52″; and on the west by longitude 81°16′21″.

(2) The hull of an ex-naval vessel (PE–19) is located in the center of the area and is used by the United States Fleet Aircraft for live strafing.

(b) The regulations. (1) The area is closed to all vessels at all times.

(2) This section shall be enforced by the Captain of the Port, Key West, Florida.

§ 204.90 Straits of Florida; Navy restricted area surrounding Woman Key and Ballast Key. (a) The danger zone. The waters within a rectangular area, approximately 3.0 nautical miles long from east to west and 2.4 nautical miles wide from north to south, with Woman Key at or near the center, bounded on the north by latitude 24°32′37″ (approximately one nautical mile north of the north shore of Woman Key); on the east by longitude 81°56′40″ (approximately one nautical mile east of the east shore of Ballast Key); on the south by latitude 24°30′12″ (approximately one nautical mile south of the south shore of Ballast Key); and on the west by longitude 81°59′53″ (approximately one nautical mile west of the west shore of Woman Key). The danger zone will be marked by buoys located at the four corners.

(b) The regulations. (1) The danger zone is open to navigation except when naval operations are in progress, when no vessel or other craft shall enter or remain within the area.

(2) Since naval operations will take place in the area at frequent and irregular intervals throughout the year regardless of season, advance notice will be given of the date on which the first such operations will begin. At intervals of not more than three months thereafter, notice will be sent out that operations are continuing. Such notices will appear in the local newspapers and in "Notice to Mariners."

(3) Prior to the conduct of operations the area will be patrolled by naval craft which will warn navigation to leave the area. Upon receiving such warning any watercraft within the danger zone shall leave it and no craft shall enter the area until operations have ceased.

(4) This section shall be enforced by the Commandant, Sixth Naval District, Charleston, South Carolina, and such agencies as he may designate.

§ 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) (Revoked).

(3) 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) Two circular areas located west of Marquesas Key each with a radius of two nautical miles, one having its center at latitude 24°34′30″ and longitude 82°14′00″, and the other having its center at latitude 24°34′30″ and longitude 82°24′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

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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 Port Tampa, Fla.; small-arms firing range, United States Air Force, MacDill Field. (a) The danger zone. Shoreward of a line beginning at Little Mangrove Point, latitude 27°51'06'', longitude 82°32'52''; thence southwesterly approximately 2,900 yards to latitude 27°50'00'', longitude 82°33'55''; thence southeasterly approximately 5,200 yards to latitude 27°47'27'', longitude 82°33'29''; thence northeasterly approximately 3,800 yards to latitude 27°47'46'', longitude 82°31'25''; and thence northeasterly approximately 5,100 yards to the shore line at latitude 27°49'20'', longitude 82°29'10''. 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) This section shall be enforced by the Commanding Officer, MacDill Field, Tampa, Florida, and such agencies as he may designate.

§ 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 possible 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.

§ 204.113 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) The waters of the Gulf of Mexico southeast of St. Andrew Bay East Entrance within a rectangular area one statute mile wide, the longitudinal center line of which extends from a point on shore at latitude 30°04′30″, longitude 85°36′48″, 206° true, a distance of one statute mile.

(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) Firing practice will ordinarily take place between 8:00 a.m. and 5:00 p.m. daily. No vessel or other craft shall enter or remain within the area during periods of firing. The area will be open to vessels at all other times.

(2) Prior to conducting firing practice a red flag will be displayed from the Fire Control Tower on the range and watercraft in the vicinity will be warned by patrol boats. Any watercraft within the area shall, upon being so warned, immediately leave the area and shall remain outside the area until the conclusion of firing practice.

(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 subparagraph (2) of this paragraph).

(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

§ 204.131 Gulf of Mexico in vicinity of St. Andrew Bay, Florida; U.S. Navy Mine Defense Laboratory Mine Testing Area. (a) The danger zone. A rectangular area about 2,000 yards wide and 2,700 yards long, approximately parallel to and about 500 yards offshore in the vicinity of St. Andrew Bay, Florida. The area is bounded as follows: Beginning at latitude 30°10′00″, longitude 85°48′03″; thence southeast to latitude 30°09′27″, longitude 85°47′09″; thence southwest to latitude 30°08′21″; longitude 85°48′02.5″; thence northwest to latitude 30°08′55″, longitude 85°48′54″; thence northeast to the point of beginning. The respective corners of the test area will be marked by buoys showing a flashing white light.

(b) The regulations. (1) No vessel shall enter or remain in the danger zone at any time, except as authorized by the enforcing agency.

(2) The regulations in this section shall be enforced by the Commanding Officer, U.S. Navy Mine Defense Laboratory, Panama City, Florida, 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″, three 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 manner 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 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 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 periods 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 subparagraph (1) of this paragraph, 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.

§ 204.140 Gulf of Mexico, south of Pensacola Bay; firing range, U.S. Naval Air Station, Pensacola, Fla. (a) The danger zone. The U.S. Navy Rifle Range is located on Santa Rosa Island between Fort Pickens and the U.S. Coast Guard Lighthouse. The danger area for the firing range extends 2.6 nautical miles seaward from Santa Rosa Island within the following coordinates: Beginning at a point, latitude 30°18′55″, longitude 87°15′59″; thence to latitude 30°17′33″, longitude 87°13′25″; thence to latitude 30°16′28″, longitude 87°16′57″; thence to latitude 30°19′04″, longitude 87°16′51″.

(b) The regulations. (1) Scheduled firing will take place on Tuesday of each week between the hours of 8:00 a.m. and 3:30 p.m. Unscheduled firing may take place other week days between these hours except Saturdays, Sundays and holidays, on which days the Rifle Range will be closed to all firing.

(2) On days when firing is to be conducted, a large red flag will be displayed from a mast adjacent to the firing range on Santa Rosa Island and all watercraft will be restricted from the area.

(3) The regulations in this section will be enforced by the Commanding Officer, Naval Air Station, Pensacola, Fla., and such other agencies as he may designate.

§ 204.162 Gulf of Mexico off Matagorda Peninsula and Matagorda Island, Tex.; Air Force practice gunnery, bombing, and rocket firing ranges. (a) The danger zones—(1) Area "A". An area off Matagorda Peninsula approximately 59 statute miles long and 29 statute miles wide, with its northwest boundary generally parellel to and about 15 miles offshore, described as follows: Beginning at latitude 28°41′, longitude 95°17′; thence to latitude 28°21′, longitude 94°59′; thence to latitude 27°55′, longitude 95°52′; thence to latitude 28°16′, longitude 96°08′; and thence to the point of beginning.

(2) Area "B". The waters of the Gulf of Mexico off Matagorda Island encompassed by an arc of a circle having a radius of five statute miles centered at latitude 28°17′, longitude 96°32′.

(3) Use of areas. These areas will be used daily from sunrise to sunset. Area "A" will be used for air-to-air gunnery and as an emergency live bomb salvo area. Prior to the salvo of live bombs, aircraft will clear the area, using both radar and visual means to insure that no vessels are in the area. Area "B" will be used for air-to-ground gunnery, dive bombing, rocket firing, horizontal bombing and firing at radio controlled targets.

(b) The regulations. (1) Except in an emergency involving danger to life or property, no vessel shall enter or remain in either danger zone between sunrise and sunset unless authorized to do so in writing by the enforcing agency.

(2) Vessels making scheduled trips over prescribed routes will be given prior written permission to transit the danger zones by the enforcing agency. Vessels so authorized to transit the danger zones shall pass directly through without unnecessary delay and shall display such identification as may be required by the enforcing agency.

(3) The regulations in this section shall be enforced by the Commanding Officer, Bergstrom Air Force Base, Austin, Texas, 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 meridan.

(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 latitude 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. The waters of the Atlantic Ocean and Vieques Sound within an area described as follows: Beginning at the northernmost extremity of Fungy Bowl; thence northeasterly approximately seven miles to latitude 18°26′30″, longitude 65°16′48″; thence approximately 107°30′ true to latitude 18°25′06″, longitude 65°12′06″; thence southwesterly approximately seven miles to Matojo Cay; thence southwesterly across Culebra Island to Scorpion Point; thence approximately 180° true to latitude 18°11′00″, longitude 65°18′42″; thence approximately 300° true to Hodgkins Shoal buoy; thence approximately 47° true to the point of beginning.

(b) The regulations. (1) The danger zone is subject to use as a target area for bombing and gunnery practice. Appropriate notices will be issued to the public in advance of this activity by the officer in charge of such activity.

(2) This section shall be enforced by the Commander, Training Group, Guantanamo Bay, Cuba, and such agencies as he may designate.

§ 204.232 Waters of Vieques Passage in the vicinity of Point Cascajo, Puerto Rico; antiaircraft artillery and waterborne target range, United States Army Forces Antilles and Military District of Puerto Rico. (a) The danger zone. (1) All waters of Vieques Passage off the east coast of Puerto Rico, within the sector of a circle, bounded by radii of 25,000 yards bearing 156°09′57″ and 226°48′46″, respectively, from latitude 18°12′24″, longitude 65°37′54″, and the included arc.

NOTE: All bearings are referred to true meridian.

(2) The outer boundaries of the danger zone will not be marked but signs will be posted at conspicuous places on the shore to warn against trespassing on the area. Aircraft and watercraft will be presumed to know the location of the danger zone by its principal landmark.

(b) The regulations. (1) The danger zone shall be open to navigation at all times except when antiaircraft artillery and water-borne target practice firing or both are being conducted. At such times, no vessel or other craft except those engaged in the patrol of the area or in antiaircraft artillery and water-borne target firing practice, shall enter or remain within the area.

(2) The fact that antiaircraft artillery and water-borne target firing practice or both are to take place over the designated area will be advertised to the public through the usual media for the dissemination of such information. Inasmuch as such practice is to carried on throughout the year, without regard to season, such advertising will be repeated at intervals not exceeding three months, and at more frequent intervals when, in the opinion of the Commanding General responsible for the use of the area, such frequent repetition is advisable in the interest of the public safety.

(3) Prior to conducting each antiaircraft artillery or water-borne target firing practice, or both, the entire danger zone will be patrolled to insure that no watercraft are within the danger zone. Any watercraft found in the vicinity will be warned that such practice 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.

(4) This section shall be enforced by the Commanding General, United States Army Forces Antilles and Military District of Puerto Rico, and such agencies as he 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 subparagraph (1) of this paragraph.

(3) United States property. All river and harbor lands owned by the United States in or along the waterways described in subparagraph (1) of this paragraph, 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—(1) General. As required by law, and general regulations to govern the operation of drawbridges crossing all navigable waterways of the United States discharging their waters into the Atlantic Ocean south of and including Chesapeake Bay and the Gulf of Mexico, excepting the Mississippi River and its tributaries, prescribed by the Secretary of War, all corporations or persons owning, operating and tending drawbridges 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 and other watercraft. The owner shall keep the operating machinery of the draw in serviceable condition, and shall have the draw opened and closed at intervals frequent enough to make certain that the machinery is kept in proper condition for satisfactory operation. Bridges and fender systems shall be constructed and maintained so as to afford at all times reasonably free, easy and unobstructed navigation of the draw opening or the drawspan. Any accident or damage to the bridge, the fenders or the operating mechanism, shall be promptly reported to the District Engineer, giving the cause and the probable period required for repairs. All bridges will be lighted in accordance with the rules and regulations of the United States Coast Guard. (See Part 68 of this title.)

(2) Signals for drawbridges. The signals for vessels desiring to pass bridges shall be those prescribed in the general regulations referred to in subparagraph (1) of this paragraph.

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

(e) Locks—(1) Authority of lockmasters. 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 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 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 assistants.

(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 vessels 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 subparagraph.

(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) 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 Engineer 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 Engineer.

(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 Federal Pilot Rules.

(v) No vessel, even if fastened to the bank as prescribed in subdivision (i) of this subparagraph, 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 at a regular established landing or wharf without written permission secured in advance from the District Engineer.

(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 not 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 Engineer 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 Federal Pilot Rules. 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.

(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 last 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 Superintendent of Lighthouses at Norfolk, Virginia, if north of New River Inlet, North Carolina; to the Superintendent of Lighthouses at Charleston, South Carolina, if between New River Inlet, North Carolina, and St. Lucie Inlet, Florida; to the Superintendent of Lighthouses at Key West, Florida, if between St. Lucie Inlet and Suwannee River, Florida; and to the Superintendent of Lighthouses, New Orleans, Louisiana, if between Suwannee River and St. Marks, Florida.

(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, Fla.; dummy minefield, U.S. Naval Station, Key West, Florida. (a) The area. The waters of Key West Harbor within a 500-yard square and marked by unlighted can buoys, the coordinates of which are as follows: Buoy No. 1, latitude 24°32′17″, longitude 81°48′07″; Buoy No. 2, latitude 24°32′32″, longitude 81°48′07″; Buoy No. 3, latitude 24°32′32″, longitude 81°47′50″; Buoy No. 4, latitude 24°32′17″, longitude 81°47′50″. The northerly limits of the area are about 450 yards south of Key West Island.

(b) The regulations. (1) All craft shall proceed with caution when underway in the area taking particular care to stand well clear of all navigational aids.

(2) All craft underway in this area shall stay well clear of naval craft (LCPR) displaying the Seven flag and be particularly alert to detect and obey all signals from such vessels. The display of the Seven flag is an indication that divers are operating.

(3) Anchoring, grapneling, and fishing, including the use of lobster pots, are prohibited in the area.

(c) The regulations shall be enforced by the Commanding Officer, U.S. Naval School Underwater Swimmers, U.S. Naval Station, Key West, Florida, and such agencies as he may designate.

§ 207.174 Gulf of Mexico, seaplane restricted area, Naval Air Station, Key West, Fla. (a) The area. An irregular area north of Key West Island, east of Fleming Key, and north and west of Dredgers Key, bounded as follows: Beginning at latitude 24°34′02″, longitude 81°47′36″; thence due north to latitude 24°35′30″; thence to latitude 24°35′55″, longitude 81°47′50″; thence to latitude 24°35′59″, longitude 81°47′41″; thence due east to longitude 81°47′24″; thence to latitude 24°35′55″, longitude 81°46′30″; thence to latitude 24°35′42″, longitude 81°46′18″; thence to latitude 24°35′26″, longitude 81°46′33″; thence due south to latitude 24°35′16″; thence due east to longitude 81°46′00″; thence due south to latitude 24°35′09″; thence due west to longitude 81°46′29″; thence to latitude 24°34′27″, longitude 81°47′14″; thence to latitude 24°34′02″, longitude 81°47′20″, and thence to the point of beginning.

(b) The regulations. (1) No vessel shall cross or enter the seaplane restricted area.

(2) Vessels using the perimeter channel along the east side of Fleming Key and along the north side of the Naval Air Station shall travel at a slow speed.

(3) Vessels using the perimeter channel shall lie to as close to the boundary markers as possible during landings or take-offs of aircraft in the restricted area.

(4) Vessels using the perimeter channel past the seaplane ramp shall give wide berth to seaplane equipment located adjacent to the ramp, and shall lie to if in the vicinity of the ramp when beaching or launching operations are in progress.

(5) No object that might endanger seaplane operations shall be cut adrift or thrown overboard.

(6) This section shall be enforced by the Commanding Officer, United States Naval Air Station, Key West, Florida, and such agencies as he may designate.

§ 207.175 St. Petersburg Harbor and Tampa Bay, Fla.; seaplane restricted and operating areas. (a) The areas—(1) The seaplane restricted area. The waters of St. Petersburg Harbor and Tampa Bay in the vicinity of the United States Coast Guard Air Station within an area described as follows: Beginning at the intersection of the easterly end of the concrete bulkhead along the northerly side of the Port of St. Petersburg with the northerly end of the steel bulkhead along the easterly side of the port; thence 242°30′, 450 feet; thence 152°30′, 600 feet; thence 180°00′, about 460 feet to the south edge of the entrance channel; thence 90°30′, 6,300 feet; thence 360°00′, 250 feet to the north edge of the entrance channel; thence 270°30′, 5,775 feet; thence 360°00′, 250 feet

to the steel bulkhead along the easterly side of the port; thence along the steel bulkhead to the point of beginning.

NOTE: All bearings are referred to true meridian.

(2) The seaplane operating area. A circular area with a radius of one nautical mile having its center at latitude 27°45′33″, longitude 82°35′24″. The center of the circle will be marked by a yellow and black buoy which will be lighted and showing an occulting white characteristic.

(b) The regulations. (1) The restricted area shall not be used for fishing or mooring and shall be kept clear except for watercraft making transit to and from the St. Petersburg Harbor Turning Basin, Bayboro Harbor, or Salt Creek.

(2) Watercraft in the restricted area, shall give seaplanes the right-of-way. All watercraft shall promptly clear the restricted area when seaplanes are observed approaching or when warned by the siren of a crash boat, and shall remain clear of the restricted area while seaplanes are passing through the area.

(3) The enforcing agency will send out a crash boat to warn watercraft in or near the area of impending seaplane operations within the area.

(4) The enforcing agency will post at the intersection of the southerly end of the steel bulkhead along the easterly side of the Port of St. Petersburg with the westerly end of the steel bulkhead along the southerly boundary of the United States Coast Guard Air Station a large sign reading "DANGER! COAST GUARD PLANES HAVE RIGHT OF WAY IN THIS CHANNEL. CLEAR CHANNEL PROMPTLY WHEN PLANES ARE OBSERVED APPROACHING OR WHEN WARNED BY SIREN OF CRASH BOAT."

(5) Watercraft may navigate, anchor, or moor within the operating area. Fishing will be permitted.

(6) Watercraft utilizing the operating area during hours from sunset to sunrise, or during periods of low visibility, shall comply strictly with existing regulations of the rules of the road applicable to inland waters and motorboat regulations pertaining to required lighting while underway or at anchor.

(7) Watercraft within the operating area must recognize the fact that the maneuverability of aircraft on the surface is relatively limited as compared to that of vessels or vehicles specifically designed for surface operations. Therefore, it is essential that occupants of all watercraft shall, when in the seaplane operating area, exercise due vigilance and be alert for the presence of aircraft either taxiing on the surface or approaching for landings and takeoffs in the area.

(8) Seaplane landings and takeoffs will be covered by the presence of a crash boat whenever possible. Under unusual and infrequent circumstances seaplanes may be limited to a particular heading or position of the operating area and watercraft in that vicinity may be requested by the Coast Guard to yield right-of-way to the aircraft for the particular maneuver involved. Under such unusual conditions watercraft shall comply with the request made by the Coast Guard crash boat for the mutual safety of boats and aircraft.

(9) The regulations of this section shall be enforced by the Commanding Officer, United States Coast Guard Air Station, St. Petersburg, Florida, and such agencies as he may designate.

§ 207.175a 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.

§ 207.176 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 Commander, Naval Air Training Bases, Pensacola, Florida, and such agencies as he may designate.

§ 207.180 All waterways tributary to the Gulf of Mexico (except the Mississippi River, its tributaries and outlets) 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 United States which are tributary to or connected by other waterways with the Gulf of Mexico, except the Mississippi River, its tributaries and outlets, between St. Marks, Fla., and the Rio Grande, Texas, both inclusive, and the Intracoastal Waterway from Apalachee Bay, Fla., to Brownsville, Texas.

(2) Locks and floodgates. All locks, floodgates, and appurtenant structures in the waterways described in subparagraph (1) of this paragraph.

(3) Bridges, wharves, and other structures. All bridges, wharves, and other structures in or over these waterways.

(4) Vessels and rafts. The term "vessels" as used in this section includes all floating craft other than rafts.

(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, United States Army, detailed in charge of the respective districts, and

their authorized assistants. The cities in which these District Engineers are located, and the limits of their jurisdiction, are as follows:

(1) U.S. District Engineer, Mobile, Alabama. From St. Marks River, Florida, to Pearl River, Mississippi and Louisiana, both inclusive, and the Intracoastal Waterway from Apalachee Bay, Florida, to Lighted Buoy No. 41, Lake Borgne, Louisiana, mile 36.4 east of Harvey Lock.

(2) U.S. District Engineer, New Orleans, Louisiana. From Pearl River, Mississippi and Louisiana, to Sabine River, Louisiana and Texas, both exclusive, and the Intracoastal Waterway from Lighted Buoy No. 41, Lake Borgne, Louisiana, mile 36.4 east of Harvey Lock, to Sabine River, mile 266 west of Harvey Lock.

(3) U.S. District Engineer, Galveston, Texas. From Sabine River, Louisiana and Texas, to the Rio Grande, both inclusive, and the Intracoastal Waterway from Sabine River, mile 266 west of Harvey Lock, to Brownsville, Texas.

(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, or clerks of vessels plying upon the waterways to which this section applies shall submit a report on such activities for statistical purposes which shall 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, cargo carrying capacity expressed in short tons.

(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 giving such statistical information on their activities as may be required by the District Engineer.

(3) Reports may be submitted on forms furnished free of charge by the District Engineer. They shall be presented to the lockmaster at any of the federally operated locks, the gatetender at any of the federally operated floodgates, or the bridgetender at any of the bridges operated by the War Department, for each trip made. Where no federally operated locks, floodgates, or bridges are 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.

(d) Locks and floodgates—(1) Authority of lockmasters. 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 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 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 or 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 assistants.

(2) Sound signals. Vessels desiring passage through a lock or floodgate in either direction shall give notice to the lockmaster or gatetender by three long and distinct blasts of a horn or whistle or calls through a megaphone when within a reasonable distance from the lock or floodgate. When the lock or floodgate is ready for entrance, the lockmaster or gatetender shall reply with three long blasts of a horn or whistle or calls through a megaphone. When the lock or floodgate is not ready for entrance, the lockmaster or gatetender shall reply by four or more short, distinct blasts of a horn or whistle or calls through a megaphone (danger signal). Permission to leave the lock or floodgate shall be indicated by the lockmaster or gatetender by one long blast.

(3) Visual signals. Signal lights will be displayed from sunset to sunrise as follows:

(i) One green light to indicate that the lock or floodgate is open to approaching navigation.

(ii) One red light to indicate that the lock or floodgate is not open to approaching navigation.

(iii) In addition, at certain locks where navigation over the dam is possible during high water, one purple light, visible both upstream and downstream, will also be displayed to indicate that navigation over the dam is possible. If no purple light is displayed, navigation over the dam is not possible.

(iv) During daylight hours large balls, similar in color and number to the light signals prescribed for use at night, will be displayed from a mast on the lock wall or other convenient location and at the site of the floodgates.

(4) Precedence at locks and floodgates. (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 subparagraph.

(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.

(5) Entrance to and exit from locks and passage through floodgates. No vessel or raft shall enter or leave locks or, while floodgates are in operation, attempt to pass through floodgates before being signalled to do so. While waiting their turn, vessel or rafts must not obstruct navigation and must remain at a safe distance from locks or floodgates. Before entering a lock they shall take position in the rear of any vessels or rafts that precede

them, and there arrange the two for locking in sections if necessary. Masters and pilots of vessels or persons in charge of rafts shall cause no undue delay in entering or leaving locks or passing through floodgates receiving the proper signal, and shall take such action as will insure 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 locks or floodgates promptly without damage to the structures. Vessels or tows that fail to enter locks or pass through floodgates with reasonable promptness after being signalled to do so will lose their turn.

(6) Lockage and passage of vessels. (i) Vessels shall enter and leave locks and pass through floodgates under such control as to prevent any damage to the locks, gates, gate walls, or fenders. Vessels shall be provided with suitable lines and fenders, shall always use fenders to protect the walls and gates, and when locking at night shall be provided with suitable lights and use them as directed. Vessels shall not meet or pass each other anywhere between the gate walls or fender system at the approaches to locks or floodgates.

(ii) Vessels which do not have a draft of at least three inches less than the depth over sills or breast walls, or which have projections liable to damage gates, walls, or fenders, shall not enter the approaches to or pass through locks or floodgates.

(iii) No vessel having chains, lines, or drags either hanging over the sides or ends or dragging on the bottom for steering or other purposes will be permitted to pass locks or dams or through floodgates.

(iv) Power vessels shall accompany tows through 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 locks, floodgates, or approaches.

(vii) The passing of coal from flats or barges to steamers while in locks is prohibited.

(viii) The lockmaster or gatetender may refuse to lock or pass vessels which, in his judgment, fail to comply with this section.

(7) 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 (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.

(8) Number of lockages. Tows or rafts locking in sections will generally be allowed only two consecutive lockages if individual 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 two or more tows or rafts are 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.

(9) Mooring. (i) Vessels and rafts when in a 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 the signal is given for the vessel or raft to leave. Tying 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, is prohibited.

(10) Operating 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 shall furnish ample help on the lock walls for handling lines under the direction of the lockmaster.

(e) 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 Engineer may specify the width of the fairway required in the various waterways under his charge.

(2) Anchoring or mooring in waterway. No vessels or rafts shall anchor or moor in any of the land cuts or other narrow parts of the waterway, except in 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 rafts. Stoppages shall be only for such periods as may be necessary.

(i) Except temporarily, as authorized above, no vessel or raft will be allowed to use any portion of the fairway as a mooring place without written permission from the District Engineer.

(ii) When tied up individually, all vessels shall 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 will be as close together as possible. In narrow sections, no vessel or raft shall be tied abreast of another.

(iii) Lights shall be displayed in accordance with provisions of the Federal Pilot Rules.

(iv) Whenever any vessel or tow is moored to the bank, as authorized above, 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) Vessels will not be permitted to load or unload in any of the land cuts, except at a regular established landing or wharf, without written permission secured in advance from the District Engineer.

(vi) No vessel, regardless or size, shall anchor in a dredged channel or narrow portion of a waterway for the purpose of fishing if navigation is obstructed thereby.

(3) Speed. Excessive speeding in narrow sections is prohibited. Official signs indicating limiting speeds through critical sections shall be strictly obeyed.

(i) When approaching and passing through a bridge, all vessels and rafts, regardless of size, shall control their

speed so as to insure that no damage will be done to the bridge or its fenders.

(ii) A vessel shall reduce its speed sufficiently to prevent any damage when approaching another vessel in motion or tied up, a wharf or other structure, works under construction, plant engaged in river and harbor improvement, levees withstanding flood waters, buildings submerged or partially submerged by high waters, or any other manner of structure or improvements likely to be damaged by collision, suction, or wave action.

(4) Size, assembly, and handling of tows. On waterways 150 feet wide or less, tows will not be allowed which are longer than 1,000 feet, exclusive of the towing vessel and hawser, or wider than one-half the bottom width of the channel or 55 feet, whichever width is less, except on waterways exempted by the District Engineer or on other waterways by special permission of the District Engineer.

(i) All vessels drawing tows not equipped with rudders in restricted channels and land cuts shall use two towlines, or a bridle on one towline, shortened to the greatest possible extent 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 accommodate the wave surge. In the case of lengthy or cumbersome tows, or tows in restricted channels, the District Engineer may require that tows be broken up, any 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 is permissible provided that adequate power is employed to keep the tow under full control at all times.

(ii) No tow shall be drawn by a vessel that has insufficient power or crew to permit ready maneuverability and safe handling.

(iii) No vessel or tow shall navigate through a drawbridge until the movable span is fully opened.

(5) Projections from vessels. No vessel 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 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 Federal Pilot Rules. 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 pass at a speed sufficiently slow to insure safe navigation. Vessels approaching an intersection or bend where the view is obstructed must exercise due caution. At certain intersections where strong currents may be encountered, sailing directions may be issued from time to time through navigation bulletins or signs posted on each side of the intersections which must be observed.

(f) Rafts. Rafts will be permitted to navigate a waterway only if properly and securely assembled. The passage of "bag" or "sack" rafts, "dog" rafts, or loose logs over any portion of a waterway is prohibited. Each section of a raft shall be so secured within itself 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 purpose.

(1) 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.

(2) Frequent inspections shall 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 shall take steps immediately to remove it from the waterway.

(3) The regulations prescribed in paragraph (e)(4) of this section governing the length and width of tows shall apply also to rafts.

(4) 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 shall, if necessary, stop and tie up along side the bank. Care must be exercised both in towing and mooring rafts to avoid the possibility of damage to aids to navigation maintained by or under authority of the United States.

(5) When rafts are left for any reason with no one in attendance, they shall 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. From sunset to sunrise, rafts moored to the bank shall have lights at 200-foot intervals along their entire length. Rafts shall not be moored at prominent projections of the bank or at critical sections.

(6) Logs may be stored in certain tributary streams provided a clear channel at least one-half the width of the channel be left for navigation along the tributary. Such storage spaces shall be protected by booms and, if necessary to maintain an open channel, piling shall also be used. Authority for placing such booms and piling shall be obtained by written permit from the District Engineer.

(7) 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.

(g) Damage. This section shall not affect the liability of the owners and operators of vessels for any damage caused by their operations to canal revetments, lock piers

and walls, floodgates and appurtenances, bridges, and bridge fenders, or for displacing or damaging buoys, stakes, spars, range lights, or other aids to navigation. Should any part of a revetment, lock, floodgate, or bridge be damaged, the master shall report that fact, and furnish a clear statement of how the damage occurred, to the nearest Government lockmaster, gatetender, or bridgetender, and by mail to the District Engineer in charge of the section of the waterway in which the damage occurred. Should any aid to navigation be damaged, the master shall report that fact immediately to the District Coast Guard Officer, New Orleans, Louisiana.

(h) Marine accidents. Masters, mates, pilots, owners, or other persons using the waterways to which the regulations in this section apply shall report to the District Engineer or his authorized representative by the most expeditious means available all marine accidents, such as fire, collision, sinking, or stranding, where there is possible obstruction of the channel or interference with navigation, 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 a sunken vessel shall take immediate steps to mark the wreck properly.

(i) Trespass on United States property. Trespass on waterway property or injury to the banks, locks, floodgates, 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, lock walls, floodgates, or bridges.

§ 207.184 Sabine River at Orange, Texas; restricted area in vicinity of the Texas Group, Atlantic Reserve Fleet. (a) The area. The berthing area of the Texas Group, Atlantic Reserve Fleet 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 pier heads of Piers 1 through 12; and from a line drawn parallel to, and 200 feet upstream from, Pier 1 to a line drawn parallel to, and 100 feet downstream from, Pier 12.

(b) The regulations. (1) No vessel or other craft, except vessels of the United States Government or vessels duly authorized by the Commander, Texas Group, Atlantic Reserve Fleet, shall navigate, anchor, or moor in the restricted area.

(2) The regulations of this section shall be enforced by the Commander, Texas Group, Atlantic Reserve Fleet, 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.

§ 207.188 Corpus Christi Bay and Laguna Madre; seaplane restricted area, Naval Air Station, Corpus Christi, Tex. (a) The area. The waters of Corpus Christi Bay and Laguna Madre within an area described as follows: Beginning at a point on the south shore of Corpus Christi Bay at the "North Gate" of the Naval Air Station (at approximate longitude 97°17′15″); thence to latitude 27°44′30″, longitude 97°20′00″; thence due north to latitude 27°46′30″; thence to Spoil Bank Light; thence to latitude 27°43′04″, longitude 97°13′12″; thence to latitude 27°40′44″, longitude 97°14′12″; thence to a point on the east shore of Encinal Peninsula at latitude 27°40′00″; thence generally northerly along the shore to Flour Bluff Point; and thence westerly along the south shore of Corpus Christi Bay to the point of beginning.

(b) The regulations. (1) No vessel or watercraft of any type shall enter or remain in the area at any time, day or night, except as provided in this paragraph.

(2) Clearance for watercraft operating in the area on set schedules and on prescribed routes may be granted upon written application to the enforcing agency.

(3) Changes in schedules and routes may be made upon written application to the enforcing agency.

(4) Off schedule operations of craft or operation over unprescribed routes may be authorized, in cases of necessity, upon special application in each case. These applications shall be made in writing to the enforcing agency, except as provided in subparagraph (5) of this paragraph.

(5) Commercial fishermen, geophysical exploration crews, and personnel of oil companies holding leases within the area will not be required to operate on set schedules or over prescribed routes but, in order to enter the area, either day or night, they shall have proper identification and the approval of the enforcing agency.

(6) The regulations in this section shall be enforced by the Chief of Naval Air Advanced Training, United States Naval Air Station, Corpus Christi, Texas, 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) 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 damage 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 Engineer may prescribe by navigation bulletins or other means the limiting speed in 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.

(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.

(c) Movement of vessels in vicinity of Algiers Point, New Orleans Harbor—(1) Control lights. When the Mississippi River reaches 10 feet on the Carrollton Gage on a rising stage, and until the gage reads 12 feet on a falling stage, the movement of all tugs with tows and all ships, whether under their own power or in tow, and 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 Esplanade 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 oscillate through 60 degrees, sweeping the entire width of the river every five seconds. 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 Morgans Wharf (on right descending bank) with the lower end of Desire Street Wharf (on left descending bank) when a red light is displayed. Vessels awaiting a change of signal shall keep clear of descending vessels.

(3) Descending vessels. (i) Descending vessels shall not proceed father down the river than a line connecting the lower end of Julia Street Wharf (on left descending bank) with Diana Street (on west 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 awaiting 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 departure. 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 Engineer 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 Engineer.

(d) 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 nine knots 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 subparagraph 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.

§ 207.240 Atchafalaya River, La.; special regulations to govern navigation through the reach of the Lower Atchafalaya River (Berwick Bay) in the vicinity of the Southern Pacific Railroad Bridge at Morgan City, La.

(a) Whenever the velocity of flow, either southward or northward, through the reach of the Lower Atchafalaya River (Berwick Bay) at Morgan City, La., reaches or exceeds a critical velocity as determined by the District Engineer, United States Army Engineer District, New Orleans, or whenever the District Engineer finds it necessary for the protection of life and property, the movement of vessels and the composition of tows passing through the Southern Pacific Railroad Bridge shall be governed by the regulations in this section. Day and night visual signals will be displayed at the center of the drawspan above the operator's house on top of the bridge structure when the regulations are in effect. During periods of foggy or inclement weather, or when for any other reason the visual signals cannot readily be seen, notice that the signals are being displayed will be given by blasts of a fog horn located on the bridge. To indicate that signals are being displayed to govern traffic moving through the bridge, one blast of 6 seconds' duration each minute will be sounded on air horn.

(b) By day the visual signals will consist of two red balls 2 feet in diameter displayed, one above the other not less than 4 feet nor more than 6 feet apart, from a pole, to indicate that vessels and tows moving through the bridge shall be governed by the regulations in this section.

(c) At night the visual signal will consist of two focused, flashing, white lights visible 360 degrees, of such character as to be visible on a dark night with a clear atmosphere for a distance of at least two (2) miles; displayed vertically one above the other, not less than four (4) feet nor more than six (6) feet apart, on the highest part of the swing span.

(d) When the signals described in paragraphs (b) and (c) of this section are displayed, unless otherwise directed by the District Engineer, tows made up of a barge with rakes on both ends or any other type vessel (except as described below), moving south through the bridge shall not exceed one barge with the towing vessel lashed securely in the rear or alongside of the barge.

(e) When the signals described in paragraphs (b) and (c) of this section are displayed, unless otherwise directed by the District Engineer, tows made up of barges with rakes on both ends, or other type vessel (except as described below), moving north through the bridge shall not exceed two (2) barges arranged in tandem with the towing vessel in the rear pushing the tow with its bow made up to the stern of the rear barge or lashed securely alongside and near the stern of the rear barge.

(f) Integrated tows consisting of bow section, middle box sections and stern section, with the push boats made up rigidly astern, may proceed in either direction through the bridge opening with a maximum of four sections. Regardless of the direction of the flow, the tow shall move through the navigation opening of the bridge at a minimum speed required to maintain steerageway.

(g) The regulations of paragraphs (d), (e), and (f) of this section shall not apply to tows with two (2) towing vessels of sufficient power, one ahead and one astern of the tow.

(h) Vessels and tows proceeding with the current shall have the right of way over vessels and tows proceeding against the current. When two vessels or tows are about to enter the navigation opening through the bridge from opposite directions at the same time, the vessel or tow proceeding against the current shall stop short of the

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opening until the vessel or tow having the right of way shall have passed through.

(i) Vessels and tows desiring to pass through the navigation opening of the bridge shall approach the opening along the axis of the channel and shall proceed with due regard for direction and velocity of the current and for any tendency to drift either to the right or to the left so as to pass through without danger of striking the bridge or the fenders. No vessel or tow shall attempt passage through the navigation opening until the bridge is fully open.

§ 207.810 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.

§ 207.812 San Juan Harbor, Puerto Rico; seaplane restricted area. (a) The area. (1) That part of San Juan Harbor, Puerto Rico, easterly and southeasterly of a line extending from Isla Grande Light 205°, 1,280 yards; thence 270°, 2,700 yards, to a point 218°, 685 yards, from San Juan Harbor Entrance Range Front Light; thence 157°, 675 yards, to a point 8°, 180 yards, from San Juan Harbor Entrance Range Rear Light; thence 90°, 2,185 yards, to the north side of Cataño Point. The following described portions of the area are exempted:

(i) All waters west of a line tangent to, and extending 180° from, Cataño Point.

(ii) The channel and turning basin to the Graving Dock and the channel from the Graving Dock turning basin to the Caño de Martin Peña.

(iii) The channel from the Graving Dock channel near lighted buoy 2 to the Army Terminal, Pueblo Viejo Bay.

(2) The area will be used by seaplanes for take-offs, landings, taxiing, and mooring.

(3) For protracted or regularly scheduled night seaplane operations the actual take-off and landing lane will be marked by special seadrome buoys which will show fixed lights either yellow or green. Buoys for marking the take-off and landing lane will be of the type seadrome buoy regularly used by the Navy, a small black and yellow striped rubber buoy equipped to show either yellow or green lights for night operations. No buoys will be used in the area which are not approved by the enforcing agencies, or which may be confused with the regular aids to navigation system of the harbor.

(b) The regulations. (1) No vessel shall lie to or anchor in or otherwise obstruct the area.

(2) All vessels passing through the area shall be alert for the approach of aircraft. Aircraft engaged in taking off or landing shall have the right of way over all vessels in the area. All vessels in the area shall proceed immediately to leave the area when warned by aircraft employing the "buzzing" method which consists of low flight by an airplane and repeated varying of the propeller speed, or when warned by a guard boat in the area.

(3) This section shall be enforced by the Commander, Naval Air Bases, Tenth Naval District, San Juan, Puerto Rico, and such agencies as he may designate.

§ 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 Daguao 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 naval reservation shoreline along 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.

§ 207.900 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 Commerce:

(1) Hudson River Reserve Fleet, Jones Point, New York.

(2) James River Reserve Fleet, Fort Eustis, Virginia.

(3) Wilmington Reserve Fleet, Brunswick River near Wilmington, North Carolina.

(4) Mobile Reserve Fleet, Tensaw River near Bay Minette, Alabama.

(5) Beaumont Reserve Fleet, Neches River near Beaumont, Texas.

(6) Suisun Bay Reserve Fleet near Benicia, California.

(7) Astoria Reserve Fleet, Cathlamet Bay near John Day Point, Oregon.

(8) Olympia Reserve Fleet, Budd Inlet at Olympia, Washington.

(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.

3. GULF OF MEXICO

The **Gulf of Mexico** coast of the United States is low and mostly sandy, presenting no marked natural features to the mariner approaching from seaward. The principal points and harbor entrances are marked by lighthouses, which are the chief guides for approaching or standing along the coast.

From the south shore of the Florida mainland, the **Florida Keys** and **Florida Reefs** extend for about 134 miles in a southwesterly curve to Sand Key Light, and about 58 miles in a westerly 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 northern boundary of the **Straits of Florida.** Toward the western end are several openings between the keys offering passage from the straits into the Gulf.

The southwestern 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. North 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 western 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.

Westward 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 west 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 just shoals.

The boundary between Florida and Alabama follows the Perdido River. The Alabama-Mississippi boundary follows a marked line cutting across the eastern end of Petit Bois Island, through Grande Batture Islands. Pearl River, from its most eastern 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 **chênières** because of the oak groves usually found growing on them, are former barrier beaches; good examples are Grand Chênière and Pecan Island. In addition to the chênière, 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.

Boundary lines of inland waters.—At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries for which specific lines are not described, **Inland Pilot Rules** apply shoreward of the outermost buoy or other aid to navigation of any system of aids; **International Pilot Rules** apply outside the aids. Specific lines are described in **Part 82,** Chapter 2.

Control over movement of vessels.—See **Part 124,** Chapter 2, for regulations requiring advance notice of vessel's time of arrival to Captain of the Port.

Channels.—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 southerly gales the sea breaks on some of the bars.

Dangers.—Numerous oil-well structures and appurtenances are located offshore between the Mississippi River Delta and Galveston Bay, extending as far out as the 30 fathom curve. Between the Mississippi River and Galveston Bay entrances, the structures are as much as 60 miles offshore.

In general, oil-well structures in the Gulf of Mexico can be identified at night by the display of a series of white lights extending from the platform to the top of the derrick when drilling operations are in progress, and at other times by the display of one or more fixed or quick flashing white lights, visible at least 3 miles in clear weather. Those structures located in inshore waters are lighted by one or more quick flashing red lights visible 1 mile in clear weather. Usually the structures in navigable waters are equipped with a fog signal.

Danger zones and **restricted areas** are located throughout the Gulf of Mexico from Key West to the Rio Grande, extending as much as 100 miles offshore; see **Parts 204** and **207**, Chapter 2, for limits and regulations.

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 less than 1.5 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 west coast of the peninsula of Florida from Cape Sable to Apalachee Bay, the mean range varies from 1 to 4 feet. Extreme tides from 3 feet below to 6 feet above the plane of reference have been observed on this coast.

Along the northern shore of the Gulf of Mexico from St. George Sound to the Rio Grande the tide is generally diurnal and the mean range is less than 2 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 ocassionally 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.

More detailed information on tides in the Gulf of Mexico is included in the Tide Tables.

Currents.—Under normal conditions, at all seasons of the year, the great volume of water passing northward through Yucatan Channel into the Gulf of Mexico spreads out in various directions. Surface flows set—westward across Campeche Bank, the Gulf of Campeche, and the Sigsbee Deep; northwestward toward Galveston and Port Arthur; north-northwestward toward the Mississippi Passes; and eastward 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. West of this line the drift is generally northward or westward, while east of it the drift is eastward or southeastward toward the Straits of Florida.

There are northward flows along the west side of the Gulf between Tampico and Corpus Christi in the vicinity of the 100-fathom and 1,000-fathom curves, north of the Sigsbee Deep between the 2,000-fathom and the 100-fathom curves, and along the west 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. More detailed information is included in the Tidal Current Tables.

The **Gulf Stream** 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 the Straits of Florida, its waters are characterized by a deep blue color, high salinity, great clearness, high temperature in the upper stratum, and absence of phosphorescence. The eye can penetrate it to considerable depths. At its junction with ordinary sea water the edges may frequently be recognized in moderate weather by the ripples which occur 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 to the eye. In addition, in the lower latitudes, the stream carries with it a quantity of gulf weed, which is olive brown, branched seaweed with berrylike air vessels. Surface debris such as logs and other material with small depth tend to drift toward the eastern edge of the stream but not toward the western edge.

The region where the Gulf of Mexico narrows to form the channel between Florida Keys and Cuba may be regarded as the head of the Gulf Stream. From this region the stream sets eastward and northward through the Straits of Florida, and after passing Little Bahama Bank it continues northward and then northeastward, following the general direction of the 100-fathom curve as far as Cape Hatteras. The flow in the Straits is frequently referred to as the **Florida Current.**

Shortly after emerging from the Straits of Florida, the stream is joined by the **Antilles Current,** which flows northwesterly along the open ocean side of the West

Indies before uniting with the water which has passed through the straits. The Antilles Current, like the Gulf Stream, carries warm, highly saline water of clear indigo blue. The union of the two currents give rise to a broad current possessing about the same characteristics as the Gulf Stream within the Straits except that the velocity is much reduced. Beyond Cape Hatteras the combined current turns more and more eastward under the combined effects of the deflecting force of the earth's rotation and the eastwardly trending coastline, until the region of the Grand Banks of Newfoundland is reached.

Eastward of the Grand Banks the whole surface is slowly driven eastward and northeastward by the prevailing westerly 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** or **Gulf Stream Drift.**

On its western or inner side, the Gulf Stream is separated from the coastal waters by a zone of rapidly falling temperature, to which the term cold wall has been applied. The abrupt change in the temperature of the waters separated by the cold wall is frequently very striking and is a definite indication of the edge of the stream. It is most clearly marked north of Cape Hatteras but extends, more or less defined, from the straits to the Grand Banks. In the vicinity of the Banks of Newfoundland the cold 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 parallels 42 and 43 and meridians 51 and 52, and flows easterly, parallel to the Gulf Stream.

Off Cape Hatteras the wide-spreading current separates into numerous bands which are indicated by the juxtaposition of warm and cold bands of water of varying widths. This feature, though not so marked, is also noticed below Cape Hatteras.

Throughout the whole stretch of 400 miles in the Straits of Florida, the stream flows with considerable velocity. Abreast of Habana, the average surface velocity in the axis of the stream is about 2.5 knots. As the cross-sectional area of the stream decreases, the velocity increases gradually, until abreast of Cape Florida, it becomes about 3.5 knots. From this point within the narrows of the straits, the velocity along the axis gradually decreases to about 2 knots off St. Augustine, and 1 knot off Cape Hatteras. These values are for the axis of the stream where the current is a maximum, the velocity of the stream decreasing gradually from the axis as the edges of the stream are approached. The velocity of the stream, furthermore, is subject to fluctuations brought about by variations in winds and barometric pressure.

Crossing the Gulf Stream at Jupiter or Fowey Rocks, an average allowance of 2.5 knots in a northerly 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 east-northeasterly 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 northeasterly direction for a distance of 40 miles from the 100-fathom curve.

From within the straits, the axis of the Gulf Stream runs approximately parallel to the 100-fathom curve as far as Cape Hatteras. Since this stretch of coastline sweeps northward, then eastward, in a sharper bend than does the 100-fathom curve, the stream lies at varying distances from the shore.

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 the 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 current, nor is it to be assumed that the northerly set will be lost when the thermometer shows a region of cold sea water.

The lateral boundaries of the current within the straits are fairly well fixed, but when the stream flows into the Atlantic Ocean the eastern boundary becomes somewhat vague. On the western 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 east, 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 Coast and Geodetic Survey indicate that, in general, the average position of the inner edge of the Gulf Stream as far as Cape Hatteras lies inside the 50-fathom curve. The Gulf Stream, however, shifts somewhat with the seasons, and is considerably influenced by the winds which cause fluctuations in its position, direction, and velocity; consequently, any limits which are assigned refer to mean or average positions. A further cause of fluctuation is found in the variations of the current which feed it or which, like the Labrador Current, come in conflict with it.

At the western 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 is deflected westward and lies very close to the shoreline.

Along the Florida Reefs between Alligator Reef and Dry Tortugas the distance of the northerly edge of the Gulf Stream from the edge of the reefs gradually increases toward the westward. Off Alligator Reef it is quite close inshore, while off Rebecca Shoal and Dry Tortugas it is possibly 15 to 20 miles south of the 100-fathom curve. Between the reefs and the northern 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 less distance than stated, and its width varies as the northern edge of the Gulf Stream approaches or recedes from the reefs.

The approximate position of the axis of the Gulf Stream for various regions is shown on the following Coast and Geodetic Survey charts: No. 1002, Straits of Florida; No.

1007, South Carolina to Cuba; No. 1112, Cape Canaveral to Key West; No. 1113, Alligator Reef to Habana. Chart No. 1001 shows the axis and the position of the inner edge of the Gulf Stream from Cape Hatteras to Straits of Florida.

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.

Local wind-current information is not available for the Gulf of Mexico. However, the information on "Wind-driven Currents" in the Tidal Current Tables, Atlantic Coast of North America, should be useful in estimating wind currents in the Gulf.

WEATHER.—The Appendix lists Weather Bureau offices and radio stations that transmit weather information; it also includes a table of fog-signal operation and climatological tables for several Gulf Coast ports. The following description of general weather conditions in the Gulf of Mexico was prepared by the Office of Climatology, U.S. Weather Bureau.

Climate.—The Gulf Coast of the United States arcs northwestward from Key West, near 24° N., to the Florida Panhandle and then roughly follows the 30th parallel to the vicinity of Houston where it begins a southwestern arc extending to the Mexican border a short distance south of Brownsville near 26° N. The climate of the Gulf Coast varies from humid and subtropical over southern Florida and southern Texas to a more variable but warm marine climate along the northern portions of the coast. Coastal terrain ranges from flat to gently rolling. In general, the weather patterns are essentially those which prevail in a transition zone between a tropical and a temperate area. Extended periods of stable humidity and temperature frequently occur.

The Gulf of Mexico is the source of the warm moist air which generally flows northward during the warmer months conditioning the coastal climate. Over the Florida Peninsula, the warm Gulf Stream brings a rather even climate throughout most of the year, with mild winters and without summer extremes. Strong air masses of continental origin periodically reach the area, particularly in winter.

Pressure.—The general circulation of air near the surface of the Gulf and along the Gulf Coast follows the sweep of the western extension of the Bermuda high pressure cell during the spring and summer months. The July mean pressure chart shows broad parallel isobars running generally from southeast to northwest over the entire Gulf. By autumn higher pressures over the North American continent modify the pattern and the isobars tend to lie more along an east-west axis over the Gulf.

Average pressures continue to be higher over North America through the winter, but by spring the western extension of the Bermuda High again emerges as the dominant control of the pressure pattern over the Gulf. This High has greater constancy than the continental high pressure so that in late spring and summer it maintains a rather steady flow of warm moist air which, to a large degree, controls the climate over the Gulf during these seasons of the year. Accordingly, spells of good weather tend to be longer during these seasons than during the late fall, winter, and early spring.

Another pressure variation is obvious at these latitudes. There is a twice-daily ebb and flow of barometic pressure, with an early morning and evening minima and late morning and night maxima. This regular diurnal pattern is masked at times by the larger pressure changes associated with storms of continental origin and tropical cyclones that reach the area. However, during the more settled weather of the summer and early fall, and during periods of steady weather conditions at other times of the year, the occurrence of a diurnal pressure change is so characteristic that an interruption of the pattern is generally considered to be an indication of a change in the weather and possibly the approach of a tropical cyclone.

Winds.—Near the Gulf Coast winds are more variable than over the open waters of the Gulf since the coastal winds fall more directly under the influence of the moving cyclonic storms that are characteristic of the continent. In coastal areas about 30 to 40 percent of midwinter winds are from the northern quadrant and 40 to 50 percent of the summer winds are from the southern directions. On the Florida coast, wind speeds average 9 knots in March, which is generally the month with highest velocities. At most locations the wind drops to below 7 knots in August. Along the Alabama and Louisiana coast wind speeds average 8 or 9 knots in August. On the Texas coast wind speeds average 12 knots in April, dropping to 9 knots in August.

Along the Gulf Coast, land and sea breezes prevail, although over the open waters offshore little difference between daytime and nighttime winds is noticed. Winds over the northwestern portion of the Gulf, on the whole, blow slightly more from a southerly direction throughout the year than over the eastern portions. In combination with the change in direction of the coastline, this leads to more persistent onshore winds throughout the year over the western portion of the Gulf. As a result both thunderstorms and fog are more evenly distributed throughout the year on the northwest coast than they are farther east.

Northers.—Some 30 to 40 polar air masses penetrate from the North American continent to the Gulf of Mexico each winter. During the year some 15 or 20 of these bring strong forcible northerly winds to the Gulf, and are called northers. Occasionally, local usage has corrupted the term norther to apply to any wind shift to northerly, if accompanied by a temperature drop. The wind itself is of prime importance to sailing vessels and to vessels of small tonnage, and sometimes to large vessels. Seamen usually have in mind a wind of at least 20 knots when

speaking of northers, and winds from 25 up to 50 knots or more may occur in severe northers of the Gulf. From 1 to 6 northers are likely to be severe over the Gulf during individual years. Northers ordinarily occur from November to March. Severe northers usually occur from December to February, but occasionally later. January or February, sometimes March, will be the month having the most northers for individual years. Northers generally last about a day and a half, but severe storms may endure for 3 or 4 days.

Precipitation.—Along the Gulf Coast precipitation tends to fall periodically during the late autumn, winter, and spring months, and is generally associated with extratropical cyclones. In summer and early autumn scattered shower and thunderstorm activity is high. The gentle coastal slopes do not, however, give rise to persistent areas of concentrated thunderstorm activity day after day. In general the greatest rainfall occurs in summer and early autumn with some of the heaviest falls associated with tropical cyclones during the months of August, September, and October.

New Orleans has some of the heaviest rainfall amounts along the coast. The wettest month is usually July with an average of 7.09 inches. The heaviest monthly rainfall of record at that location was 25.11 inches in October, 1937.

Temperature.—Average temperatures at coastal locations vary with latitude and exposure, and in winter depend, in addition, on the frequency and intensity of northers. The mean annual temperatures range from 67.3° F. at Mobile, which is the northernmost coastal point included in the area, to 77.6° F. at Key West, which is the southernmost point. Throughout the year the mean monthly temperatures at Key West closely follow the temperatures of the surrounding water areas, since this small key is away from the mainland and is, in fact, the only Gulf Coast land station in the area which has a full subtropical marine exposure and climate.

A further indication of differences between the ocean exposure of Key West and a relatively continental location such as Brownsville is seen in the extreme temperature ranges at the two stations. At Key West, the lowest temperature of record is 46° F. and the highest 95° F., while at Brownsville the lowest temperature of record is 22° F. and the highest 104° F.

At New Orleans the average temperature is 70.4° F. The coldest month, January, averages 55.9° F. and the warmest, August, 83.4° F., a difference of 27.5° F. The lowest mean monthly temperature since 1905 is 43.0° F. and the warmest 87.1° F. The extremes of temperatures at New Orleans are 102° F. in June and 17° F. in January.

Cloudiness.—Along the Gulf Coast cloudiness averages between 5- and 6-tenths sky cover with relatively small seasonal variation. October is generally the clearest month and December through March the cloudiest. The nature of the cloudiness varies with the season. In winter the Gulf Coast has occasional gray, overcast days but in summer these are rare. Much of the summer cloudiness consists of convective cumulus clouds or high, relatively transparent clouds.

Fog.—Warm, moist Gulf air blowing slowly over chilled land surfaces brings about the formation of fog at the ground. From November through April fog is encountered occasionally at points throughout the Gulf Coast region. It is most frequent in the vicinity of harbor entrances and over land areas extending into the Gulf, such as Cape San Blas. Fog forms with southerly winds and dissipates during northerly winds.

Fog is relatively infrequent at most Florida coastal points, with the exception of Tampa in the winter. There is a greater frequency along the Alabama and Louisiana coasts and the Texas coastal bend, with lesser amounts on the southwest Texas Coast. Fog is generally at a maximum in winter with little heavy fog in summer.

HURRICANES.—Severe tropical cyclones of the North Atlantic Ocean are usually called West Indian Hurricanes, but actually many of these storms form, move and die far out from the mainland and hundreds of miles from the West Indies. The storm field advances in a straight or curved track, sometimes with considerable speed, at other times at a much slower rate. The areas of the individual storms vary from less than 100 to more than 500 miles in width, with a comparatively calm center. Centers ranging from 4 to 22 miles across have been observed. This center is a region of lowest atmospheric pressure around which winds blow in a more or less circular course, spiraling inward in a counterclockwise direction. The wind at the outer edge of the storm area is light to moderate and gusty, and it often increases toward the center to speeds too high for instrument recording. Although the air movement inside the center or eye 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 shifting violent winds which surround it. Furthermore, after the center has passed a vessel, she may expect a sharp renewal of the gales, but blowing now from a different and more or less opposite direction. The fully developed tropical cyclone, encompassing many tens of thousands of square miles, is perhaps the most destructive of all storms.

Tropical cyclones occur over all the tropical oceans except the South Atlantic. They form in or near the region of doldrums, or light to calm wind movements near the Equator. In the North Atlantic, hurricanes form over a wide range of ocean between the Cape Verde Islands and the Windward Islands, over the western part of the Caribbean Sea, and over the Gulf of Mexico. While some may move northward in the beginning, especially those that form southeast of Bermuda, the majority take a westerly to northwesterly course. Of these, some curve gradually northward, either east of or above the larger islands of the West Indies, then turn northeastward or eastward near to or at some distance from the Atlantic Coast of the United States. Others pass over or to the south of the greater islands and enter the Gulf of Mexico, then curve northward or northeastward and strike some part of the east Gulf Coast, or else continue westward and strike the west Gulf Coast. The most common path is curved, the young storms moving generally in a westward direction at first, turning later to the northwestward and then to

the northeastward. A considerable number of hurricanes, however, remain in low latitudes and do not turn appreciably to the northward. Freak movements are not uncommon, and there have been storms describing loops, hairpin-curved paths, and other irregular patterns. Movement toward the southeast is rare in the West Indian region, and when it does occur it is of short duration. The entire Caribbean area, the Gulf of Mexico, the coastal regions bordering these bodies of water, and the Atlantic Coast are in danger of disturbances during the hurricane season.

The hurricane season generally begins in June and closes with November. The months of greatest frequency are August, September, and October. Hurricanes are most likely to be severe during August, September, and October. During all the months of the season, however, the chance of encountering an intense storm is great enough to warrant a careful watch of the weather elements in these waters. The June hurricanes which form in the West Indian region usually move in a direction between west and north while they are south of 25° North Latitude. In late September, October, and November, hurricanes of this region are more likely to move in a direction between north and east, passing through the Yucatan Channel, or over Cuba, Florida, or the Bahamas. Of the hurricanes that come from the Atlantic into the West Indies, the majority occur in August and September, and move on a west-northwesterly course in low latitudes, reaching the coast before curving toward the north and northeast. Late in the season, October or November, the movement of hurricanes that form east of the West Indies is often toward the north in the open Atlantic.

The average speed of movement of West Indian hurricanes is about 10 to 13 knots. This speed, however, varies considerably according to the location of the storm, its development and surrounding meteorological conditions. The highest rates of progression usually occur when the storm is moving northward or northeastward in the middle or higher latitudes.

Signs of approach.—One of the earliest signs of a hurricane is the appearance of high cirrus clouds which converge toward a point on the horizon that indicates the direction of the center of the storm. The snow-white fibrous mares' tails appear when the center is about 300 or 400 miles distant. Another usual early indication is a long, heavy swell propagated to a considerable distance, sometimes 2 or 3 days in advance, when there is no intervening land to interrupt it. This swell comes from the general direction in which the storm is approaching. There is usually a slight rise of the barometer at the outset, followed by a continuous fall. In front of the storm, if it is advancing in some westerly direction toward the observer, the winds blow from a northerly point (northeast, north, northwest); if in some northerly direction toward the observer, they will blow from an easterly point (southeast, east, or northeast). A further indication is a rough, increasing sea. If one or more of these signs be wanting, there is little cause for anticipating a hurricane.

As the storm center approaches, the barometer continues to fall. The wind increases in speed and blows in heavy squalls and the changes in its direction become more rapid. The wind, in general, will back to the left during this time if the center is moving toward the observer's left, or veer to the right if toward his right as he faces into the wind. Rain in showers accompanies the squalls, and when the center comes closer the rain is usually continuous and is attended by furious gusts of wind. The air is thick with rain and spume drift. Objects at a short distance are often hardly visible. If a vessel is on the line of the hurricane's advance, the wind will remain from the same direction, or nearly so, until the center is close to the vessel, or upon her.

Distance of hurricane center.—The distance from the center of a hurricane can be estimated from a consideration of the height of the barometer and the rapidity of its fall, and the velocity of the wind and the rapidity of its changes in direction. If the barometer falls slowly and the wind increases gradually, it may reasonably be supposed that the center is distant. With a rapidly falling barometer and increasing winds, it may reasonably be supposed that the center is approaching dangerously near, the more so if the winds blow closely from the direction of the increasing swell.

Bearings of center.—Facing the wind, the storm center will be 8 to 12 points to the right; when the storm is distant it will be from 10 to 12 points, and when the barometer has fallen 5 or 6 tenths of an inch it will be about 8 points.

A line drawn through the center of a hurricane in the direction in which it is moving is called the storm track, or axis of progression. The semicircle on either side of the axis is called, respectively, the right-hand or dangerous semicircle and the left-hand or navigable semicircle.

If the wind shifts to the right, the vessel will be in the right-hand or dangerous semicircle with regard to the direction in which the storm is traveling. In such case the vessel should be kept on the starboard tack and increase her distance from the center.

If the wind shifts to the left, the vessel will be in the left or navigable semicircle. The helm should be put up and the vessel run with the wind on the starboard quarter, preserving the compass course, if possible, until the barometer rises, when the vessel may be hove to on the port tack. If there is not sea room to run, the vessel can be put on the port tack at once.

Should the wind remain steady and the barometer continue to fall, the vessel is in the path of the storm and should run with the wind on the starboard quarter into the navigable semicircle.

In all cases act so as to increase as soon as possible the distance from the center, bearing in mind that the whole storm field is advancing. In receding from the center of a hurricane the barometer will rise and the wind and sea will subside.

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 following rules:

When there are indications of the near approach of a hurricane, sailing vessels may heave to on the starboard tack. The safety of the vessel often depends on heaving to in time. Steamers may remain stationary. Both should carefully observe and record changes in wind, barometer and swell so as to find the bearing of the center, and to ascertain by the shift of the wind in which semicircle the vessel is situated.

ROUTES.—On the eastern side of the Gulf of Mexico, for a distance of possibly 100 miles outside the 100-fathom curve, southeasterly 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 westward 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 westward of Rebecca Shoal from northward, a number of vessels have stranded on New Ground, indicating an easterly 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 south-southwestward of Dry Tortugas Light.

From Straits of Florida to Cape Hatteras vessels follow the Gulf Stream, pass about 14 miles southward 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 northward of the 295° course from Dry Tortugas to Heald Bank lighted whistle buoy, but go southward 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.

Along the course from Dry Tortugas to Galveston, for 200 miles after leaving Dry Tortugas, a southeastward current of about 0.5 knot may be expected. For the next 100 miles the current generally sets eastward with a velocity of 0.5 knot. For the next 200 miles the set is about north-northeast and the velocity is 0.2 knot. For nearly 200 miles before reaching Galveston the set is approximately west-northwest and the velocity 0.2 knot.

Winds and storms frequently modify normal conditions, and their effects must be taken into account.

Pilotage.—Pilotage is compulsory for certain vessels entering from sea; requirements are given in the chapter describing the port concerned.

Pilots cruise off the entrance to some of the major ports, but at other places they either maintain a lookout or meet ships by previous arrangements.

Towage.—Tugboats are stationed at most of the ports; arrangements for their use should be made in advance.

Supplies.—All kinds of supplies are available at Tampa, Pensacola, Mobile, New Orleans, Port Arthur, Galveston, Houston, and Corpus Christi. Limited quantities can be obtained at the other ports.

Repairs.—Hulls and machinery of medium to large vessels can be repaired at Tampa, Mobile, New Orleans, Beaumont, Galveston, and Houston. Smaller vessels can be hauled out at Pensacola, Orange, and Port Arthur. Extensive above-waterline hull and machinery repairs can be made at Pensacola, Pascagoula, Baton Rouge, and Lake Charles. Minor repairs can be made at Freeport, Corpus Christi, Port Isabel, and Brownsville. Marine railways are available and repairs to small 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. Emergency equipment is available at Pensacola, Orange, Port Isabel, and Brownsville.

Standard time.—Port St. Joe, Florida, and the areas eastward of it use eastern standard time, which is 5 hours slow of Greenwich mean time. The areas from Port St. Joe to the Rio Grande use central standard time, which is 6 hours slow of Greenwich mean time. Example: when it is 10 a.m. at Greenwich, it is 5 a.m. at Tampa, Fla., and 4 a.m. at Corpus Christi, Texas.

4. KEY WEST TO TAMPA BAY

Chart 1113.—The **Florida Keys** comprise a chain of low islands along the southeast coast of the Florida Peninsula extending westward 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, but 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.

Boundary lines of inland waters.—The lines established for the Key West area are described in **§ 82.55**, and **§ 82.60**, Chapter 2.

Charts 576, 584.—**Key West Harbor** is 145 miles southwestward of Miami Harbor. The harbor proper lies in front of the city of Key West, protected on the eastern 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 five principal channels with depths of 13 to 30 feet, and several minor channels.

Key West, on the island of the same name near the western end of the Florida Keys, is a winter resort and the site of a large naval base. Commercial fishing is one of the leading industries, but commerce is mostly in crude and refined oils.

Prominent features.—Easy to identify when standing along the keys at a distance of about 6 miles are the three 300-foot radio towers north of Fort Taylor, the hotel cupola, and the naval hospital cupola. Numerous tanks, lookout towers, and masts are prominent but difficult to identify.

Key West Light (24°33.0′ N., 81°48.1 W.), 91 feet above the water, is shown from an 86-foot buff conical tower near the western end of the island. The light structure is not conspicuous.

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, located on **Sand Key**, which is on the seaward side of the reefs about 7 miles southwestward of Key West Light.

Channels.—**Main Ship Channel** is the only deep-draft approach to Key West. Federal project depth is 30 feet from the Straits of Florida to and including a turning basin off the Naval Operating Base. The project is maintained and controlling depths are published in the Notice to Mariners. The channel is well marked by lighted ranges, a light, and buoys.

Northwest Channel is a medium-draft passage between Key West Harbor and the Gulf of Mexico. In April 1961 the controlling depth was 20 feet. Vessels drawing up to 20 feet 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 westward.

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 east jetty shows above low water. The channel is marked by lighted ranges, and lighted and unlighted buoys. The inner range is hard to identify until within about a mile of the front light. A good landmark for the Gulf entrance is the abandoned gray two-story lighthouse standing on piles 0.3 mile southwest of the west jetty.

Smith Shoal (chart 1252), 4.5 miles northward of the northward entrance to Northwest Channel, is covered 11 feet and is marked by a light, which also marks the northern approach to the channel. In 1961, a coral head covered 11 feet was located about 3.2 miles west-southwestward of the light.

Southeast Channel is marked by buoys and by the easterly edge of a red sector in Key West Light. Depths over the coral heads in the channel are 14 to 18 feet, and it is not recommended for drafts greater than 13 feet. The course through the channel is **321°** for Key West Light.

Southwest Channel, a convenient approach to Key West from southwestward, has been swept to a depth of 23 feet, and is marked by buoys. In April 1961, this depth was confirmed for midchannel. A general course along the southerly edge of a red sector in Key West Light, leads to the outer anchorage and Main Ship Channel. Strangers should not attempt passage by night.

West Channel, a passage leading westward from Key

West between the keys and outer reefs, is deep and fairly well marked. It is used by small boats bound toward the Dry Tortugas.

Calda Channel leads northward 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 northerly end. The controlling midchannel depth was 5 feet in April 1961. The channel should be used only with local knowledge and during good visibility.

Barque Channel, a buoyed channel with a depth of 8 feet, leads around the north end of Fleming Key. A channel with a depth of 9 feet then continues southward between the western edge of the seaplane landing area and Fleming Key to a junction with a channel from Man of War Harbor which leads along the north shore of Key West to Garrison Bight. A highway bridge crossing the channel between Key West and Fleming Key has a fixed span with a width of 33 feet and a clearance of 10 feet.

Measured course.—South of Sand Key is a measured course 6,510 feet long on bearing **089°38′.** The westerly front range marker is 140 yards north of Sand Key Light, and the easterly front marker is 50 yards north of Rock Key. The rear markers are about 600 yards north of the front markers. All are slatted white daymarks with vertical black trim.

Anchorages.—The best anchorage is north of the city in **Man of War Harbor** where depths are 19 to 26 feet. This, the usual quarantine anchorage, is protected against heavy seas by Frankfort and Pearl Banks, coral banks, on the west and **Fleming Key** on the east. Small craft usually anchor in **Key West Bight** or **Garrison Bight** on the north side of the city.

Vessels can anchor west 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 anchorage, southwest of **Fort Taylor,** is somewhat exposed, but has depths of 22 to 36 feet and is safe for vessels with good ground tackle. The anchorage area at Key West is one of the best for large vessels south of Chesapeake Bay.

Dangers.—A **naval restricted area** is about 0.6 mile south of Key West Light; limits and regulations are given in **§ 207.173,** Chapter 2.

A **naval seaplane restricted area,** into which entry is **prohibited,** is north of Key West, between Fleming Key and Sigsbee Park; for limits and regulations, see **§ 207.174,** Chapter 2.

A naval operating danger area is in the Straits of Florida, Rebecca Shoals Channel, and Gulf of Mexico westward of Key West; for limits and regulations, see **§ 204.95,** Chapter 2.

Tides.—The mean range of tide is 1.3 feet at Key West, and 2.5 feet at the Northwest Channel jetties. Daily predictions of times and heights of high and low water at Key West are given in the Tide Tables.

Currents.—In the southern approaches to Key West within the 10-fathom curve the currents are weak and variable. In the channel west of Key West the flood (northerly) and the ebb (southerly) currents average 1 and 1.5 knots, respectively. North of Key West in Man of War Harbor the tidal currents average 0.8 knot. 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. Daily predictions for the channel west of Key West are published in Tidal Current Tables; daily predictions for several locations in nearby channels can be obtained through the use of table 2 of the same publication. However, both the time and velocity of the current are influenced by winds.

See Appendix for **storm warning displays** in the Key West area.

Pilotage.—Pilotage is compulsory for vessels in foreign trade, and also for vessels in coastwise trade except those drawing less than 6 feet or having on board a pilot licensed by the United States Coast Guard. The usual procedure is to radio ahead for a pilot. Vessels are taken in day or night. Fast boats carry pilots out to waiting ships in 20 minutes. Fishermen at Key West are available as pilots for Hawk Channel.

Vessels frequently find it convenient to make use of a special service performed by the pilot boat at Key West. If requested by radio or telegraph, the pilot boat will meet vessels at the outer buoy at the entrance to the Main Ship Channel to deliver orders or provisions; there is a charge for this service.

Towage.—There is no commercial towboat service. Key West is the regular station for a large salvage tug. General equipment is available for heavy salvage work.

Quarantine.—Vessels subject to quarantine inspection are boarded off Fort Taylor, and no vessel is permitted to dock before obtaining pratique. The quarantine anchorage is in Man of War Harbor if size and draft of vessel permits. Larger vessels anchor in the outer harbor.

The United States Public Health Service maintains an outpatient office at Key West. In addition to the County and Navy hospitals, two private hospitals are available.

Customs.—Key West is a port of entry and marine documents are issued.

Immigration officials are stationed at Key West for the inspection of passengers and crews of vessels in the foreign trade.

Harbor regulations.—The harbormaster has direct supervision of the port, of anchoring and mooring all vessels, and collection of port dues. A speed limit of 6 miles per hour is enforced in the Main ship Channel between lighted buoy 10 and the inner harbor.

Wharves.—The only terminal wharves at Key West are government owned. The commercial wharves are described in connection with Safe Harbor. The only two suitable places for pleasure boats to dock are at the west end of **Key West Bight** and in **Garrison Bight.** In April 1961, the depth into the basin west of Key West Bight was 14 feet, with 7 feet at the fuel pumps. Garrison Bight had 5 feet in the entrance and 2 to 7 feet within the basin. The Key West Yacht Club is in Garrison Bight.

Supplies.—Diesel fuel, gasoline, fresh water, marine hardware, and good hotel accommodations can be obtained. Telephones and restrooms are available at the marine service facilities, and at the yacht club showers are also

available. Since Key West is less than an hour's run off the main route for ships passing the southern end of Florida, it is a convenient port of call for fuel and provisions. Local arrangements can be made for delivery of supplies and provisions to vessels in the Gulf Stream.

Repairs.—Three repair yards are located in Key West Bight. The largest can handle general repairs on craft up to 120 feet in length. General hull and engine repairs can be made.

Salvage and wrecking gear consist of a salvage tug and general equipment for heavy salvage work.

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 connects the city with Miami and points north, and there is air service to Miami. Bus service is available to mainland points.

Safe Harbor, 4 miles eastward of Key West, is a deep-water harbor on the south side of **Stock Island.** In April 1961, the approach channel had a midchannel depth of 18 feet and the harbor had depths of 20 to 30 feet. A lighted buoy marks the approach and a privately-maintained unlighted range marks the entrance channel. The range cannot be seen until close to shore. There are shrimp-packing facilities and terminal wharves here. Gasoline, fresh water, diesel fuel, ice, general supplies, and transfer and storage facilities are available. The same pilotage, customs, and other services available for Key West Harbor are available here.

Cow Key Channel, a bush-staked channel between Stock Island and Key West, had a least depth of 2 feet in April 1961. Shallow-draft craft can pass through the highway bridges between the keys. The bridges have fixed spans with a minimum width of 16 feet and a clearance of 8 feet. A small marina just south of the bridges has gasoline and water available. North of the bridges the channel is unmarked and difficult to follow.

Charts 1252, 1351.—From Key West to Dry Tortugas, the section consists of the continuation of the keys, with their intervening reefs and shoals, for some 63 miles westward of Key West. The keys are low, small in extent, and, except for the Dry Tortugas, generally covered with dense growths of mangrove.

About 5 miles south 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, southward and westward of Rebecca Shoal and the Dry Tortugas.

Currents are variable along the edges of the reefs, being influenced by winds, by differences of barometric pressure in the Gulf and the Straits of Florida, and by the tides. 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 **danger zone** in a **Navy restricted area** surrounds Woman Key and Ballast Key; for limits and regulations, see § **204.90,** Chapter 2.

Boca Grande Channel, between **Boca Grande Key** and the Marquesas Keys, is about 15 miles westward 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 buoys, 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 east coast. Good anchorage is available 1 mile northeastward 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 northward and the ebb southward. The velocity of the current is considerably influenced by the winds.

The **Marquesas Keys,** on the west 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. The anchorage is entered between **Gull Keys** and **Mooney Harbor Key** from a south-by-east direction, passing well to eastward of the coral heads a mile south of the opening. **Ellis Rock,** 4 miles northwest of the Marquesas Keys, is covered 7 feet and surrounded by depths of 21 to 39 feet; the rock is marked by a daybeacon.

Danger zones of bombing areas are in the vicinity of the Marquesas Keys; limits and regulations are given in § **204.95,** Chapter 2.

A large shoal, the western part of which is known as **The Quicksands,** extends 18 miles westerly from the Marquesas Keys. The shoal is about 4.5 miles wide between the 18-foot curves and has depths as little as 2 feet over its eastern part. At the western end of The Quicksands is **Halfmoon Shoal,** which has a least depth of 8 feet.

About 3.5 miles north of The Quicksands, is **New Ground,** a narrow ridge 6 miles long in an east-west direction. The least depth of 4 feet is near the lighted whistle buoy marking the western end of the ridge. The water shoals abruptly on the north side of New Ground, and vessels should stay in depths greater than 13 fathoms to insure 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 naval target ship, 300 feet long, has been sunk on the southerly edge of this channel about 11 miles east-northeastward of Rebecca Shoal Light. The wreck is visible 5 feet above water and is marked by a lighted buoy.

A channel sometimes used by vessels lies west of Halfmoon Shoal, but is not recommended. Southwest of Halfmoon Shoal several depths of 20 to 22 feet rise abruptly from depths of about 40 feet.

Isaac Shoal, 5 miles west of Halfmoon Shoal and 2 miles southeast of Rebecca Shoal, has a least known depth of 14 feet. Isaac Shoal rises from depths of 36 to 60 feet.

Rebecca Shoal, 43 miles west of Key West, is a small coral bank with a least depth of 11 feet. **Rebecca Shoal Light (24°34.7′ N., 82°35.2′ W.)** 66 feet above the water, is shown from a small white house and square skeleton tower on a pile foundation on the southerly edge of the shoal. A red sector from 254° to 302° in the light covers Isaac Shoal, Halfmoon Shoal, and The Quicksands.

Currents.—Between Halfmoon Shoal and Rebecca Shoal at Isaac Shoal the current floods northward with an average velocity of about one knot and ebbs southward with an average velocity of about 0.8 knot. The velocity of the current is considerably influenced by the wind.

The current south of New Ground Shoal has an average velocity of 0.7 knot with the flood setting northeastward and the ebb southwestward. The velocity and direction of the current are influenced considerably by the wind.

Chart 1351.—Rebecca Shoal Channel, immediately westward of Rebecca Shoal Light, frequently is used by vessels bound from the Straits of Florida to points on the west coast of Florida. Vessels bound for Mobile and points west pass to the westward of the 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 south of The Quicksands before turning northward. The passage is well lighted.

Chart 585.—The **Dry Tortugas** are a group of small keys and reefs 63 miles westward from Key West. The group is about 11 miles long, in a northeast-southwest direction, and 6 miles wide. **Pulaski Shoal,** at the northeastern end of the group, is 12 miles northwestward 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 hexagonal pyramidal tower on piles on the east 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,** a hexagonal-shaped structure with great walls 425 feet long rising from a surrounding moat. An abandoned lighthouse, 67 feet high, is behind the southeast bastion. The fortress, once a military prison, is now a National Monument administered by the National Park Service.

In April 1961, the southerly and northerly of the three wharves on the eastern side of the key were in ruins. The center wharf, off the southeast front of the fort, was in good condition, with 16 to 26 feet of water alongside. No fuel, provisions, or fresh water were available for visiting craft.

Small craft should not try to make Dry Tortugas from Key West, due to the rough nature of the sea around Rebecca Shoal.

Fort Jefferson National Monument.—Garden Key and the surrounding waters of the Dry Tortugas have been reserved as Fort Jefferson National Monument, and are subject to rules and regulations prescribed by the Secretary of the Interior.

Loggerhead Key, the other of the two principal keys in the Dry Tortugas, is 2.5 miles westward 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 at the light.

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.

Bush Key, just eastward 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 eastward or southeastward, 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 northwestward or southwestward, 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 buoyed 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 south of **East Key** and **Middle Key,** and passes between the marked 25-foot shoal southward of **Hospital Key** and **Iowa Rock** off **Bush Key Shoal.** The reefs south of Middle Key can be cleared by keeping south of a line through the abandoned lighthouse on Fort Jefferson and Dry Tortugas Light. The channel has depths of 30 feet or more, but it should be used with caution by vessels drawing more than 18 feet.

In Southeast Channel one mile east of Garden Key, the current floods northward and ebbs southward with an average velocity of 0.6 knot.

Southwest Channel leads between the reefs westward and southwestward of Garden Key and those off Loggerhead Key. The least depth found along the buoyed 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 northward, is northward and northwestward 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 with buoys.

In emergencies, the best shelter is southwest of Garden Key and the channel encircling it, where protection is afforded from northwesterly winds. However, the holding ground is poor, as boats drag anchor along the silty bottom.

Anchorage regulations for Tortugas Harbor are given in § **202.190,** Chapter 2.

In Southwest Channel one mile south of Loggerhead Key, the current floods northward and ebbs southwestward with an average velocity of about 0.5 knot.

Pilots are not available at the Dry Tortugas, but fishermen at Key West will pilot vessels between the two places.

Chart 1351.—For 10 miles westward 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 west of Loggerhead Key and has a least known depth of 38 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 1113.—From Cape Sable to San Carlos Bay the west 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 north-northwestward 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 either day or night. On account of frequency of northers during the winter months, this track is not recommended for small craft, and the route across Florida Bay is to be preferred.

Chart 1251.—Moser Channel, 36 miles eastward 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 highway bridge over Moser Channel has a swing span with a clearance of 23 feet.

The tidal current at the Moser Channel bridge floods northwestward with an average velocity of 1.4 knots and ebbs southeastward with an average velocity of 1.8 knots. Wind effects modify considerably the current velocities and directions.

A **prohibited area** used for strafing operations is 9 miles northwestward of Moser Channel bridge; see § **204.86,** Chapter 2, for limits and regulations.

Charts 1249, 1250.—Florida Bay, a triangular-shaped body of water between the Florida Keys and the south coast of the mainland, extends in a general east-west direction from Shell and Bogie Keys to Cape Sable. Depths are shallow and irregular; the bottom is mostly coral, with a thin covering of silt in the eastern part. From April to October the waters of the bay are clear and the shoals plainly discernible, but during the winter months the water frequently turns milky and renders the shoals indistinguishable.

In the eastern part of the bay are numerous ridges and reefs which bare, or nearly bare, at low water. The western part of the bay has depths ranging from 7 to 13 feet, and the bottom is covered with loggerhead sponges and small coral heads.

Chart 598.—Flamingo (P.O.), on the mainland about 9 miles east of East Cape, is a visitors' center in **Everglades National Park,** at the entrance of **Buttonwood Canal.** An entrance channel, dredged from the 7-foot contour in the bay to the creek entrance, in May 1961, had a controlling depth of 4½ feet. The channel is marked by lights and daybeacons. The highway bridge about 0.5 mile above the mouth of the creek has a fixed span with a width of 45 feet and a clearance of 10 feet. There are ramp and tie-up services, fuel and lodgings, at the Flamingo Marina; motorboats for sport fishing can be rented.

See Appendix for **storm warning displays.**

Charts 1253, 1254.—Cape Sable, the low and wooded southwestern 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.

Boundary lines of inland waters.—Lines from the Marquesas to Cape Sable are described in § **82.60,** Chapter 2.

Small vessels can find good anchorage 1.5 miles southeast of East Cape in 7 to 8 feet of water. The even marl bottom is good holding ground, and the anchorage is well protected from northerly winds. A drainage canal opening into Florida Bay 1 mile east 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 south. Only trappers and fishermen frequent this area.

From Northwest Cape the coast trends north for 20 miles, then northwestward 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.

Nothing stands out prominently along this section of the coast, but Shark River Island, Shark Point, and Highland Point can be identified by their slightly higher growths of timber. 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 north of Northwest Cape are frequented mostly by fishing parties, particularly during the winter season. Strangers are advised to hire guides at Flamingo Visitors Center, Marco, or Everglades. The rivers afford good anchorage for craft able to cross the bars off the entrances.

Charts 598, 599.—Craft drawing up to 3½ feet can traverse the system of tidal bays, creeks, and canals from Flamingo Visitors Center to the Gulf of Mexico 6 miles north 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 was 3½ feet in May 1961.

Ponce de Leon Bay is a nearly rectangular bight 7 miles north of Northwest Cape. **Shark Point**, on the north side of the bight, and **Shark River Island**, on the south 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 northern 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 east of north or south, and the shoal on the northwest 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 east and southeast 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 southeast corner of Ponce de Leon Bay. At the southern end of Oyster Bay is the entrance to **Joe River**, a tidal channel extending some 10 miles in a southeasterly direction to the southern end of Whitewater Bay. A depth of 5 feet can be carried through Oyster Bay and Joe River by avoiding occasional bars.

Numerous channels lead easterly from Oyster Bay through a belt of mangrove about 2 miles wide into **Whitewater Bay.** The latter has numerous low mangrove islands, and its salt water is from 2 to 6 feet deep. Northeasterly winds often cause drops in the water level of a half foot. At the southern end of Whitewater Bay, **Tarpon Creek** leads into **Coot Bay,** which is about 1 mile in diameter and 3 feet deep. 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 south side of Shark River Island, 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. The entrance to the river is marked by a light and the channel upstream is marked by daybeacons.

Shark River is the channel emptying into the middle of the east side of Ponce de Leon Bay. Some 8 miles northeastward, the channel enlarges into **Tarpon Bay.** A depth of about 5 feet can be carried through Shark River and Tarpon Bay. Shallow rivers lead north and east from Tarpon Bay into The Everglades.

Harney River, emptying into the Gulf about 2 miles north of Shark Point, is a good passage to Tarpon Bay. Numerous bars at the entrance limit the practicable depth to 2½ feet.

Broad River and **Rodgers River** enter the Gulf about 5 miles north of Shark Point. About 3½ feet can be taken over the bar 1.5 miles southwest 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 which extend northward along the coast for some 60 miles. Launches 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.

Lostmans River is entered through **First Bay,** which is about 10 miles northward of Ponce de Leon Bay. Local boatmen use the north 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. **Lostmans River Ranger Patrol Station** is located on the north side of the entrance to the river. The radio tower is prominent.

Chart 1253.—Seminole (Plover) Point, 24 miles northward from Northwest Cape, is fairly prominent when standing up the coast at a distance of 2 to 3 miles off. The point is the southwest end of **Plover Key,** and is the most westerly land seen until Pavilion Key is picked up to the northwestward.

Limited anchorage, protected in all weather, is available for boats drawing up to 4 feet between the keys of the group northwest of **Snake Key.** Approach the south end of the group on an easterly course and follow the shore at a distance of about 50 yards until in a landlocked harbor between the keys.

Chart 1254.—Pavilion Key, 30 miles northward 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 easterly point of the southern end of Pavilion Key. The approach to the anchorage passes close westward of the small key 0.3 mile southeast of Pavilion Key.

Chatham River and **Huston River** empty into the Gulf opposite Pavilion Key. These rivers offer a connection to the system of shallow bays which parallel the coast. A

draft of about 2 feet can be taken up these rivers, but local knowledge is necessary to avoid the numerous bars.

Jewel Key, 6 miles north-northwestward from Pavilion Key, marks the entrance to **Chokoloskee Pass,** the approach to the town of Chokoloskee. Jewel Key is a small flat island, easily identified by two prominent clumps of trees.

Chokoloskee (P.O.), about 3 miles east-northeastward from Jewel Key, is a small settlement where gasoline, oil, water, and ice can be obtained; general supplies are trucked in from Everglades over a highway causeway in which there is a bridge opening with a fixed span having a width of 23 feet and a clearance of 5 feet. A small repair yard on the east side of the island has a marine railway which can haul out craft 30 to 40 feet in length; facilities are available for hull and minor engine repairs.

There is no marked channel from Chokoloskee across **Chokoloskee Bay** to the entrance to **Barron River,** but with local knowledge 3 feet can be taken at high water by this route to the town of Everglades.

To enter Chokoloskee Pass, pass 200 yards southeast of Jewel Key on a northeasterly course. The channel also can be entered from the north side of Jewel Key. Leave the small island east of Jewel Key about 200 yards to southward, and continue in a northeasterly direction for 1.7 miles. The channel then turns southeasterly for 0.5 mile, then generally northeasterly to Chokoloskee. The upper part of the channel is very crooked, and is sometimes marked by stakes or piles with pointers. Vessels should proceed carefully to avoid the numerous oyster bars. A draft of about 4 feet can be carried to Chokoloskee, with local knowledge.

Rabbit Key Pass, 1.5 miles south of Chokoloskee Pass, is sometimes used by local fishermen to enter Chokoloskee Bay. A depth of about 4 feet can be carried at high water into this pass and about 3 feet to Chokoloskee. This pass is not marked, and local knowledge is necessary.

Indian Key Pass, 8 miles northwest of Pavilion Key, is the approach to the town of Everglades. The channel is marked by a light off the south end of Indian Key and by numerous daybeacons between Indian Key and the town. Local knowledge is required to avoid the bars along the channel. In April 1961, the controlling midchannel depth was 4 feet in Indian Key Pass and the dredged channel across Chokoloskee Bay to Everglades.

Indian Key, on the west side of the entance 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 northeast of Indian Key in depths of 8 to 13 feet, and about 1 mile northeast 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.

To enter Indian Key Pass, steer **030°** from the buoy 3.5 miles off Indian Key and pass 100 yards southeastward of the light at the entrance. The channel, marked by daybeacons, extends 2 miles in a northeastward direction from the light, then eastward for about a mile. From here the channel turns northeastward and is very crooked to the point where it emerges from the mangrove into the straight dredged cut across Chokoloskee Bay to the entrance to **Barron River.** A small rock shoal has been reported to be in the dredged cut northeastward of Daybeacon 33.

Everglades (P.O.), about 0.5 mile above the mouth of Barron River, is a small town which is the center of a commercial and sport-fishing industry, and for the truck farming of the nearby interior. It is 3 miles by connecting highway from the Tamiami Trail, the State highway between Tampa and Miami. The town has a telegraph office, several stores, a hospital, a theater, and two hotels. Gasoline, diesel fuel, fresh water, and ice are available at the waterfront, which is bulkheaded and affords excellent berthage to vessels able to enter the river. Marine hardware and supplies can be secured in town. The shipyard has a railway which can haul out boats up to 35 feet in length; some engine repairs can be made. Pilots and guides are available in Everglades. See Appendix for **storm warning displays.**

West Pass, 2.8 miles northwestward from Indian Key, extends generally northeastward for 3 miles from the north side of **Tiger Key** to **West Pass Bay.** A draft of 2 feet can be taken to West Pass Bay, thence eastward into Chokoloskee Bay and southeastward to Barron River and Everglades. West Pass is unmarked.

Fakahatchee Pass, 4 miles northwestward from Indian Key, extends northeastward for 3 miles from the west side of **Round Key** to **Fakahatchee Bay. Fakahatchee** is a small settlement on an island on the south side of the bay. No supplies are available at the settlement.

Cape Romano is the south end of a large island 78 miles northward from Key West. Here the coast changes its trend from northwest by west to north-northwest.

Northward of Cape Romano deep water approaches the coast much more closely than it does south 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. A radar tower on the north side of the entrance to Caxambas Pass is the most prominent landmark in the area. The buff-colored buildings near the tower are prominent at a distance of 5 to 6 miles offshore. Readily identifiable are the lights at Caxambas and Big Marco Passes, and the pier, buildings, and water tank at Naples.

Cape Romano Shoals, extending 10 miles southward from the cape, are a series of irregular patches that bare in places near the shore and have depths of 1 to 10 feet over them farther off. A lighted bell buoy marks the south end of the shoals. There is a strong current around the shoals, particularly on the seaward side and during spring tides. The flood current sets southward and the ebb northward.

Gullivan Bay is between Cape Romano and the islands to the eastward. At the head of the bay is **Coon Key** which marks the southern approach to Big Marco River and also the route westward to Caxambas Pass. On the approach from southeastward, **Coon Key Light (25°52.9′ N., 81°37.9′ W.),** 22 feet above the water and shown

from a white triangular pyramidal slatted structure on piles, can be seen from 5 miles off. 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 eastward as a narrow gap between the more distant keys.

Caxambas Pass, 4 miles northwestward from Cape Romano, is the entrance to a passage which leads eastward through **Caxambas Bay** to Gullivan Bay and Big Marco River. The distance from the pass to Coon Key is about 6 miles. The controlling midchannel depth over the shifting bar at the entrance to the pass and through the inside passage was 3 feet in April 1961. A light and a buoy mark the pass, and the inside passage is marked by daybeacons. Guides for Caxambas Pass and other passes in the vicinity can be obtained at Everglades, Marco, or Goodland.

Collier City is a small village on the north shore of Caxambas Bay. The wharves and piers are in ruins. A shell beach is prominent between the mangrove.

Goodland (P.O.) is a small fishing village on Big Marco River where groceries and some marine supplies, gasoline, ice, and bottled drinking water may be obtained. A small marina has storage facilities for boats up to 30 feet in length. The depth at the fuel pumps was 6 feet in 1961. The marina has a 2-ton lift and a marine railway that can haul out craft up to 30 feet in length for painting. Telephone and telegraph services are available; there are guides and boats for fishing parties.

Big Marco Pass, 8 miles northward from Cape Romano, is marked by a light, daybeacons, buoys, and a lighted buoy 2 miles off the pass. The channel over the bar is subject to change, and the buoys marking it are shifted from time to time. Shoals extend a mile seaward on either side of the channel; these usually are indicated by breakers or discolored water. A shoal which uncovers at low water extends about 250 yards northwest from the light. The controlling midchannel depth over the bar was 3½ feet in April 1961.

Big Marco River trends eastward and then southward for about 11 miles from Big Marco Pass to Gullivan Bay, and affords a through passage behind Cape Romano. The controlling midchannel depth was 4 feet in April 1961. 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 southeast to southwest, 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.

The highway bridge over Big Marco River, 3 miles north of Coon Key, has a swing span with a clearance of 8 feet. The overhead cable above the bridge has a clearance of 57 feet.

Marco (P.O.) is a small settlement on the south bank of Big Marco River 1 mile in from the light in Big Marco Pass. The town, a distributing point for the surrounding area, has hotels and a general store where gasoline, bottled drinking water, ice, groceries, and some marine hardware can be obtained. A 200-foot concrete L-pier had 10 feet at the fuel pumps in April 1961. Telephone and telegraph services are available. Marco is connected by road with the Tamiami Trail highway some 11 miles inland.

Guides may be engaged for fishing parties or passing yachts. **Smokehouse Bay** empties into Big Marco River on the south side at Marco. Depths of 5 feet can be carried through the marked entrance to a marine railway which has facilities for hull and minor engine repairs, and can haul out craft up to 45 feet in length.

Routes.—Approaching Big Marco River from Gullivan Bay, a course of **325°** from a position 0.3 mile northeast of Coon Key Light leads between the north end of Coon Key and Big Marco River Daybeacon 2. Then follow the daybeacons. After passing through the draw of the highway bridge, head north-northeast for 100 yards before heading north along the main channel. From the light in Big Marco Pass, follow the channels buoys to the lighted buoy off the pass, but be guided by breakers and discolored water.

An inside passage extends about 11 miles northerly from Marco to Naples through creeks and dredged channels. Federal project depth is 6 feet; in April 1961, the midchannel depth was 4 feet. The waterway is well marked.

Hurricane Pass, 1.5 miles northward from Big Marco Pass, was cut through the barrier beach by a hurricane. Depths in the pass were less than 1 foot in April 1961. The pass is seldom used.

Little Marco Pass, 3 miles northward from Big Marco Pass, had a depth of 2 feet over the bar in April 1961. The pass is unmarked and is little used.

Gordon Pass, 8 miles northward from Big Marco Pass and 2.5 miles south of Naples, is marked by buoys and daybeacons. A bar extends off the pass beyond a line of old piling which are broken off and submerged. In April 1961, the midchannel controlling depth was 4 feet across the bar and through the pass. An overhead power cable over the pass has a clearance of 65 feet.

Naples (P.O.), a town on the outer coast 11 miles north of Big Marco Pass, has a telegraph office, hotels, several general stores, and an ice plant. It is on the Tamiami Trail and the Atlantic Coast Line Railroad.

A tall water tank in Naples can be seen for a considerable distance offshore. The municipal fishing pier extends 1,000 feet out into the Gulf from the beach at Naples.

Three shipyards on **Naples Bay**, the head of the inland passage from Marco to Naples, can make hull and engine repairs. Boats up to 65 feet in length can be hauled on the largest marine railway. There are also travel lifts, the largest of which can haul 45 tons. The Municipal Dock at **Crayton Cove** provides wharfage for pleasure craft. Several marinas have gasoline, diesel fuel, fresh water, and ice; general supplies are available at Naples. No boats go beyond the highway bridge, at the north end of the bay, which has a fixed span with a width of 29 feet and a clearance of 6 feet. See Appendix for storm warning displays.

Chart 473.—San Carlos Bay, 41 miles north-northwestward 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 bay and adjacent waters are frequented mostly by small vessels and yachts, and are popular with tourists and fishermen during the winter months.

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 eastern end of **Sanibel Island.**

Boundary lines of inland waters.—The lines established for San Carlos Bay and tributaries are described in **§ 82.65,** Chapter 2.

Federal project depth in San Carlos Bay is 12 feet from the Gulf to Punta Rassa and the mouth of Caloosahatchee River; in May 1961, project depth obtained. A lighted range and several daybeacons mark the channel.

Estero Pass opens into the eastern end of San Carlos Bay 2.5 miles from Sanibel Island Light. Small vessels can find secure anchorage just inside the pass. A Federal project provides for a 12-foot channel through San Carlos Bay; thence 11 feet through Estero and Matanzas Passes to the upper shrimp terminals. In March 1961, the controlling depth was 11 feet. The channel is marked by lights, buoys, and daybeacons.

The highway bridge which connects Fort Myers Beach, on **Estero Island,** with the Tamiami Trail, on the mainland, has a swing span with a clearance of 8 feet. The nearby overhead power cable has a clearance of 69 feet. A marina at the northwest corner of the bridge has gasoline available. In April 1961, there was 17 feet of water at the pumps. There are also a launching ramp, a vertical lift that can lift out boats up to 24 feet in length, and covered and uncovered dockage for craft up to 40 feet in length, at the marina.

It is reported that a draft of 4½ feet can be taken back of Estero Island through **Matanzas Pass** and **Estero Bay** and out **Big Carlos Pass,** at the southeast end of the island, by way of a channel marked by privately maintained daybeacons. Caution should be observed in making through passage as Matanzas Pass and Estero Bay are unsurveyed and the daybeacons are uncharted. Drafts up to 5 feet can be carried through Big Carlos Pass with local knowledge. There are no daymarkers across the shoal water outside the pass.

Fort Myers Beach (P.O.), on Estero Island, has several general stores and several repair yards equipped to do hull and engine repairs. The largest marine railway can haul out craft up to 125 feet in length. Wet storage and wharfage are available at the yards and marinas. Gasoline, diesel fuel, fresh water, ice, and supplies are available. A highway leads to Fort Myers. See Appendix for **storm warning displays.**

Punta Rassa, 2 miles northward of Sanibel Island Light, is a small settlement on the point. Gasoline, oil, and limited supplies and provisions are available. See Appendix for **storm warning displays.** Highways lead to Fort Myers and Estero Island, and an automobile ferry operates daily to Sanibel Island, where the ferry landing is just west of the light.

In 1961, a highway causeway, with bridge sections over the channels, was under construction across San Carlos Bay from Punta Rassa to Sanibel Island.

The channel to Pine Island Sound along the northeast side of Sanibel Island has a least depth of about 8 feet and is marked by daybeacons and lights. The power cable between Woodrings Point and St. James City is submerged where it crosses the main channel and the channel to Tarpon Bay.

St. James City (P.O.) is a small fishing and residential community on the southern end of Pine Island, about 4 miles northwest of Sanibel Island Light. The entrance channel had 3 feet in April 1961, and within the canal, depths were about 8 feet. Gasoline can be obtained at a small pier which has depths of only 2 feet alongside and can be approached only by small craft. A road leads from St. James City to the northern end of Pine Island and connects with a road across Little Pine Island and Matlacha Pass to Fort Myers.

There are two fishing camps on **Monroe Canal** (chart 1255) where gasoline, drinking water, and some food supplies can be obtained. In April 1961, the controlling depth was 4 feet in the privately marked channel.

Anchorage.—Vessels with drafts too deep to enter San Carlos Bay can obtain good anchorage in depths of 15 to 25 feet, sticky bottom, 3 to 4 miles southeastward of Sanibel Island Light. With northerly winds there is good anchorage in depths of 16 to 24 feet under the lee of the southern end of Sanibel Island, with the light bearing anywhere between northeast and north-by-west. The anchorage off Punta Rassa is good, but the tidal currents have considerable velocity at times. There is good anchorage along the north shore of Sanibel Island west of the light; the currents have considerable velocity, but spots of good holding ground can be found. Excellent anchorage is available off St. James City in depths of 12 to 18 feet, good holding ground; the tidal currents have less velocity at this anchorage than at any of the others in San Carlos Bay. Fishing craft find storm anchorage in Tarpon Bay which, however, is unsurveyed and caution must be exercised in using it.

Currents.—The average velocity of the current is 1.0 knot in San Carlos Bay at Point Ybel.

Caloosahatchee River flows generally southwesterly from its source in Lake Okeechobee and empties into San Carlos Bay at Punta Rassa. The river has an average width of about a 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.

Federal project depth is 10 feet in Caloosahatchee River from Punta Rassa to Fort Myers. In April 1961, the least midchannel depth was 9 feet. The channel is well marked by lights, daybeacons, and ranges.

The mean range of tide in Caloosahatchee River is 1.7 feet at Punta Rassa and 0.9 foot at Fort Myers.

A dredged channel leading from the entrance to Caloosahatchee River southwestward to Pine Island Sound is

part of the Federal project for the extension of the Intracoastal Waterway to Anclote River. The midchannel controlling depth was 9 feet in 1961.

Port Comfort in Punta Rassa Cove has a marina with wet storage and wharfage for 100 boats. Gasoline, oil, water, ice, and some general supplies are available. A marine railway can haul out boats up to 50 feet in length for hull and minor engine repairs. The controlling depth was 4 feet in April 1961, in the privately marked channel.

Little Shell Island, on the north side of the river channel opposite **Shell Point,** has gasoline, water, and refreshments available.

Iona Cove, on the south side of the river and 1 mile above Shell Point, is the site of a small repair yard and boat basin with wet storage accommodations for 50 boats. The marine railway can haul out vessels up to 40 feet in length for hull and minor engine repairs. Gasoline, oil, fresh water, and ice are available at the yard. A draft of 3 feet can reach the yard. Privately maintained daybeacons and a lighted range mark the entrance channel; the rear range light is visible from the river channel.

Cape Coral (P.O.), the extensive canalized area close northwestward of **Redfish Point** on the north side of the river 7 miles above the mouth, is the site of a large housing development. A dredged channel, just west of Redfish Point, leads to a marina which has gasoline, water, ice, bait, and tackle. The depth into the basin was 7 feet in April 1961.

Deep Lagoon (Big Slough), across the river from Cape Coral, provides good anchorage and mooring for drafts up to 7 feet. A 7-foot channel leading into the lagoon is marked by privately maintained daymarkers.

Wyomi (Whiskey) Creek, on the south side of the river 10 miles above the mouth, has a privately-marked channel with a depth of 3 feet in April 1961. A housing development borders along the creek.

Hancock Creek, on the north bank of Caloosahatchee River across from Fort Myers, leads to a housing development a mile upstream. In April 1961, the channel had a controlling midchannel depth of 3 feet, and was well marked by privately-maintained daybeacons. A highway bridge 0.6 mile above the mouth has a fixed span with a width of 26 feet and a clearance of 5 feet.

Fort Myers (P.O.), on the south bank of Caloosahatchee River 14 miles above the mouth, is the commercial center for this part of the State. The city is served by the Atlantic Coast Line 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 numerous stores, a municipal airport, a hospital, and seasonal and year-round hotels. See Appendix for **storm warning displays.**

Gasoline, diesel fuel, water, ice, provisions, and marine hardware are available at Fort Myers. The largest marine railway has a capacity of 120 tons and can haul out vessels up to 100 feet in length. Machine shops are in operation.

The municipal yacht basin at Fort Myers is one block from the business center. The basin has excellent berthing facilities for 75 boats; controlling depth into the basin is 10 feet. A dockmaster is in attendance. Hot showers are available at the yacht basin. Charter boats and guides can be engaged through the dockmaster.

Edison Memorial Bridge, which crosses Caloosahatchee River at Fort Myers, has a bascule span with a clearance of 10 feet in the center and 6 feet at the fenders. Drawspan regulations are given in § **203.462,** Chapter 2. In May 1961, a fixed highway bridge was under construction about 0.4 mile below the Edison Memorial Bridge. Design clearances are for a channel span width of 90 feet and a clearance of 55 feet.

Above the Edison Memorial Bridge, two overhead power cables cross the river with clearness of 80 and 88 feet.

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 Part I of the weekly Notice to Mariners. See **United States Coast Pilot 4, Atlantic Coast, Cape Henry to Key West,** for detailed description of the waterway.

Charts 474, 1255, 1256.—The coast between Charlotte Harbor and Tampa Bay trends about northwest by north, and has a nearly straight sand beach which 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, but there is no continuous inside passage, even for the lightest draft, and boats use the open waters of the Gulf between Gasparilla Pass and Venice Inlet. The low shore is wooded nearly to the water's edge and has few prominent features except in the vicinity of Boca Grande and Sarasota.

A Federal project providing for the continuance of the Intracoastal Waterway in a channel 9 feet deep from Caloosahatchee River to Anclote River has not been completed. Controlling depths for the improved channels in Pine Island Sound from Punta Rassa to Charlotte Harbor, in Little Sarasota Bay and Sarasota Bay from Nokomis to Tampa Bay, and in Boca Ciega Bay from Tampa Bay to Clearwater Harbor, are given in this and the next chapter.

Chart 1255.—Matlacha Pass is a shallow body of water extending northward 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 is narrow and crooked and has numerous oyster bars. Privately maintained daybeacons mark the best water, but in May 1961, most were gone and it was impossible to follow the main channel without local knowledge. A highway bridge over Matlacha Pass from Pine Island and Little Pine Island to the mainland has a swing span with a width of 29 feet and a clearance of 8 feet; the overhead power cable at the bridge has a clearance of 64 feet. Gasoline, oil, and small charter boats can be obtained at the small docks near the bridge.

Pine Island Sound, between Pine Island and the outer islands, is the main thoroughfare between San Carlos Bay

and Charlotte Harbor, a distance of about 15 miles. The sound is full of shoals and low islands. A section of the 9-foot Federal project for the extension of the Intracoastal Waterway from Caloosahatchee River to Anclote River has been completed from Punta Rassa through Pine Island Sound to Charlotte Harbor. In April 1961, the controlling depth in the completed section was 8½ feet. It was reported that strong cross currents were encountered especially during ebb spring tides in the section of the waterway between Daybeacon 2A and 8. The channel is well marked.

Blind Pass separates Sanibel Island from **Captiva Island.** The pass is not marked and has a controlling depth of only 1 foot. A highway bridge over the pass has a fixed span with a width of 33 feet and a clearance of 8 feet.

Captiva (P.O.), a fishing village on Captiva Island about 3 miles north of Blind Pass, has a hotel and store. Gasoline, fresh water, and some general supplies are obtainable at Captiva. The approach channel, marked by a light, daybeacons, and an unlighted range, had a controlling depth of 4 feet in April 1961.

Redfish Pass is about 2 miles north of Captiva. This channel is winding and difficult, with frequent changes in depth and position. Fishing boats frequently use the pass.

Captiva Pass, leading from the Gulf into Pine Island Sound about 5 miles north of Captiva, is used to some extent by small fishing boats. The channel is unmarked, and local knowledge is required to carry the best water. There was 6 feet of water in the pass in May 1961. Fair anchorage is available for small boats in Safety Harbor, which is 0.5 mile south of Captiva Pass and on the inner side of the barrier island. The depth inside the harbor is about 5 feet, but only small craft drawing less than 4 feet can enter. The holding ground is good and the anchorage is well protected from all directions.

Useppa Island, a winter resort near the north end of Pine Island Sound, has a large hotel. On the northwest side of the island is a natural small-boat basin. Limited quantities of gasoline are available. Water and electricity are available at a small marina in the basin. There are several channels into the basin but none were marked in May 1961 and local knowledge was required to avoid the shoal areas. A depth of about 6 feet can be taken to the hotel wharf on the eastern side of the island.

Lacosta Island is on the south side of the entrance to Charlotte Harbor. **Pelican Bay,** on the northeast side of the island, affords well protected anchorage in depths of 5 to 7 feet. The entrance to Pelican Bay is about 1 mile from the north end of the island; the controlling depth was 5 feet in May 1961. A small circular basin at the northern end of Pelican Bay offers excellent protection to small craft, but in May 1961, the entrance was almost filled in and was difficult to navigate.

Chart 474.—Charlotte Harbor, about 60 miles south-southeastward from Tampa Bay, is the approach to Port Boca Grande, Boca Grande, Punta Gorda, and several smaller settlements. On the south side, Charlotte Harbor opens into Pine Island Sound and Matlacha Pass, already described, and on the north side into Gasparilla Sound.

When approaching the entrance to Charlotte Harbor from the southward or southwestward, the first object sighted in daytime will be **Boca Grande Range Rear Light,** 1.6 miles from the south end of **Gasparilla Island.** The light, 105 feet above the water, is shown from a white hexagonal pyramidal skeleton tower, inclosing a stair cylinder. The light is visible on the range line only. Upon closer approach, a yellow tower and a black tank, both about 0.4 mile north of the end of the island, will be seen. Two silver-colored water tanks and a radio tower at the town of Boca Grande also are prominent. **Gasparilla Island Light (26°43.0′ N., 82°15.7′ W.),** 41 feet above the water, is shown from a white frame dwelling on the south end of the island.

Boundary lines of inland waters.—The line established for Charlotte Harbor is described in § **82.70,** Chapter 2.

Charlotte Harbor is entered from the Gulf by way of the maintained Boca Grande Channel. The inner channel range is marked by a directional light and a rear range daybeacon. A break on the north side of the channel near the south end of Gasparilla Island forms a swash channel which had a controlling depth of 7½ feet in May 1961. The best water in this swash channel is about 500 feet off of the beach, on a course of **332°–152°.** Local craft also cross the shoal on the north side of the channel between Boca Grande front range light and the inner channel directional light.

Federal project depths are 32 feet from the Gulf to Port Boca Grande, and thence 10 feet to the commercial terminal at Punta Gorda. Controlling depths for the Boca Grande Channel are published in Notice to Mariners. In May 1961, the controlling depth from Boca Grande to the highway bridge at Punta Gorda was 7 feet.

Anchorage.—The best 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 while 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.

Tides and currents.—The mean range of tide in the harbor varies from 1 to 1.5 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 have considerable strength, especially the ebb current, which is said to attain occasionally an extreme velocity of 3 to 4 knots, dependent also upon the force and direction of the wind. In the harbor channel between Cape Haze and the north 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 southeast with an average velocity of about 0.5 knot; the ebb current is weak and variable. To the north

at the Myakka River bridges the current floods to the northwest and ebbs to the east with an average velocity of about 0.5 knot. In Peace River the current floods to the northeast and ebbs to the southwest with an average velocity of about 0.2 knot. Daily predictions of the current at several places in Charlotte Harbor may be obtained through the differences and ratios in Table 2 of the Tidal Current Tables.

Port Boca Grande, on the inner side of the south end of Gasparilla Island, is an important phosphate shipping port. Phosphate rock can be loaded aboard vessels at the rate of 960 tons per hour by means of power conveyors. The loading pier has depths of 31 feet or more along the face. Caution should be observed in coming alongside the dock because of possible currents. See Appendix for **storm warning displays.**

Pilotage.—Pilotage is compulsory except in the case of American vessels under enrollment whose masters or mates are licensed as pilots by the Federal Government. Pilots board vessels at the entrance buoy on signal or on notice by radio, and will take vessels in at night.

Towage.—The pilots have a small towboat available for light towing jobs. Rates are by agreement. There is also a tug available at the oil dock.

Quarantine.—There is no quarantine station at Port Boca Grande. Medical inspection is performed by a health officer who meets ships in port by special arrangement.

Customs.—Port Boca Grande is a port of entry. The Customs Service maintain an office and a deputy collector of customs at the port.

Immigration.—Immigration inspection is handled from Tampa by special arrangement.

Supplies.—Fresh water is piped to the pier, but 24 hours' notice is necessary if more than 40 tons are required. Any amount of ice can be had on short notice. Limited stocks of gasoline, provisions, and marine hardware are available locally; large orders require advance notice.

Repairs.—Small machine-shop repairs can be had locally; large jobs are taken care of with portable equipment from the mainland. About 4 hours' notice is required. Divers are available on a few hours' notice.

Communications.—The Seaboard Air Line Railroad operates freight service in and out of Port Boca Grande.

Boca Grande (P.O.) is a winter resort about 2 miles north of the south end of Gasparilla Island. The town has seasonal and year-round hotels, telegraph, and telephone communications, and rail freight service to the mainland.

Boca Grande Bayou, a landlocked lagoon at Boca Grande, provides shelter for small craft. There are boat landings and a marina has berthing facilities for vessels up to 118 feet in length. The dredged channel into the lagoon is marked by daybeacons, lights, and a lighted range. The channel had a controlling depth of 6½ feet in May 1961. Two bridges limit the height of vessels which can go northward in the lagoon, but entry from the northward is possible through an unmarked channel. The bridges have fixed spans with a minimum width of 26 feet and clearance of 11 feet.

There is a boatyard with marine ways capable of hauling out vessels up to 55 feet in length for complete repairs. A machine shop is on the premises. Gasoline, diesel fuel, fresh water, and electricity are available. The yard does salvage work and builds boats. Another railway can haul out vessels up to 50 feet in length; owners must arrange for their own repairs.

Diesel fuel, water, ice, and electricity are available at the marina, and provisions and supplies can be obtained in Boca Grande. The business district is about 0.5 mile from the wharves.

Bokeelia (P.O.) is a small settlement on **Bokeelia Island**, at the northerly end of Pine Island on the southern side of Charlotte Harbor. Drafts up to about 5 feet can be taken to the wharf at Bokeelia. Gasoline and some supplies, but no fresh water, are obtainable. At the marina on **Jug Creek** there are storage facilities for boats up to 28 feet in length; minor repairs can be made. Gasoline, oil, some marine hardware, bait and tackle, and limited quantities of rain water are available. There is a concrete launching ramp at the marina. There is a small marine railway at Bokeelia, in Back Bay, that can haul out boats up to 40 feet in length. However, no work is done by the yard other than hauling. The controlling depth was 2½ feet in Jug Creek, in May 1961. A road connects with the southern end of Pine Island and with the bridge over Matlacha Pass to the mainland. Boats on the fish runs out of Punta Gorda provide service to Bokeelia and the settlements on Pine Island Sound.

Gasparilla Pass, between Gasparilla Island and **Little Gasparilla Island**, affords passage from Gasparilla Sound to the Gulf. The channel is well marked but its depth and position are subject to frequent change. Local knowledge is needed to carry the deepest water. The controlling depth over the bar was 6 feet in May 1961.

The railroad trestle which crosses Gasparilla Sound from Placida to the north end of Gasparilla Island has three openings 0.6 mile apart; see **§ 203.245**, Chapter 2, for **drawspan regulations.** The northeasterly swing span has a width of 49 feet and a clearance of 4 feet; the middle swing span has a width of 49 feet and a clearance of 4 feet; and the southwesterly fixed span, close to the Gasparilla Island shore, has a width of 10 feet and a clearance of 5 feet. The new highway causeway, close northwestward of and parallel with the railroad trestleway, has three openings; a swing span with a clearance of 9 feet over the northeasterly opening; the opening over the main channel from Gasparilla Pass has a fixed span with a width of 48 feet and a clearance of 15 feet; and the southwesterly opening has a 48-foot fixed span with a clearance of 7 feet. On the northwest side of the causeway at the middle span is an overhead power cable with a clearance of 25 feet. About 0.1 mile northwestward of the causeway, an overhead power cable with a clearance of 40 feet extends across the sound, but this cable is submerged where it crosses the two main channels.

Chart 1255.—Gasparilla Sound extends northward from Charlotte Harbor for about 7 miles between Gasparilla and Little Gasparilla Islands and the mainland. The sound is navigable for vessels drawing up to 8 feet,

with local knowledge. The controlling depth to Lemon Bay was 1 foot in May 1961.

Gasparilla Sound and Pass are frequented only by local fishermen and residents. Good small-boat anchorage is available inside the north point of the pass between Little Gasparilla Island and **Bird Key.** The deep water is along the shore of the island.

Little Gasparilla Pass was completely filled in by sand in May 1961. A marine railway on Little Gasparilla Island can haul out boats up to 30 feet in length for minor repairs.

Myakka River empties into the head of Charlotte Harbor from northwestward. A depth of 9 feet can be taken into the mouth of the river, and 5 feet can be carried to **El Jobean** (P.O.), at the north end of the bridges crossing the river 3 miles above the mouth. No supplies are available there. The highway bridge has a fixed span with a clearance of 24 feet and the swing span of the railroad drawbridge has a width of 30 feet and clearances of 3 feet under the drawspan and 6 feet under the trestle. Drawspan regulations are given in § **203.245,** Chapter 2. The overhead telephone and telegraph cables crossing at the bridges have a clearance of 6 feet, but they can be removed whenever the drawspan of the railroad bridge is opened for the passage of boats.

Boats drawing 3 feet can navigate Myakka River as far as the Tamiami Trail Highway Bridge, 11 miles above the mouth. The bridge has a fixed span with a clearance of 14 feet. The nearby overhead power cable has a clearance of 35 feet. Gasoline, water, and some supplies are available. Local knowledge is needed to carry the best water.

Peace River empties into the head of Charlotte Harbor from northeastward. Above Punta Gorda the river is navigable for a draft of about 3 feet as far as Hull, 15 miles above the mouth, but caution is necessary to avoid the snags in the upper reaches. Local knowledge is needed to carry the best water. Heavy growth of hyacinth also is found in the upper reaches, which completely blocks many of the small inlets, bayous, and lakes.

Punta Gorda (P.O.), a town on the south bank of Peace River 2 miles above the mouth, has rail and highway connections with points to the north and south, as well as to the interior of the State. Punta Gorda is a commercial fishing port and boats on fish runs connect with various points on Charlotte Harbor and Pine Island Sound for delivery of supplies. Gasoline, diesel fuel, fresh water, ice, provisions, and marine supplies are available at Punta Gorda, and the town has a hospital. See Appendix for **storm warning displays.**

Vessels can anchor off Punta Gorda in depths of 6 to 10 feet. Federal project depth in the dredged channel to the commercial pier at the southwest end of the town is 10 feet. The channel is well marked by a light and several daybeacons. The controlling depth in this channel was 7 feet in May 1961. The approach channel to the municipal boat basin had a controlling midchannel depth of 4½ feet in May 1961. This channel is between the existing highway bridge and the ruins of the old bridge. The depth at the fuel pumps was 4½ feet. There is a concrete launching ramp at the basin. The controlling depth from the river entrance to the bridge is about 9 feet.

A repair yard at Punta Gorda has a marine railway capable of hauling out vessels up to 35 feet in length for hull and engine repairs; storage facilities are available. A fish company has a larger marine railway for repairing its own boats, but private boats up to 75 feet in length will be hauled out in emergencies.

The highway bridge over Peace River, about 3 miles above the mouth, is a conspicuous concrete structure. Its bascule span has a clearance of 13 feet. On the upstream side of the bridge is an overhead power cable with a clearance of 75 feet. The ruins of the old abandoned concrete bridge are close northeastward.

Charlotte Harbor (P.O.), a community at the north end of the bridge, has a marina, just east of the bridge, that has a 6-ton travel lift which can haul out boats up to 35 feet in length. Minor hull and engine repairs are made. Gasoline, water, and some supplies are available. The depth into the marina was 2 feet in May 1961.

Cleveland (P.O.) is a small village on the south bank 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 Cleveland. The controlling depth was 4 feet in May 1961. Overhead power cables crossing the river, about 5 mile above Punta Gorda, have a clearance of 60 feet.

Liverpool, a small settlement on the south bank of the river about 8 miles above the mouth, has gasoline, water, and limited supplies available. About 14 miles above the mouth, a highway bridge crossing the river has a fixed span with a clearance of 12 feet.

Lemon Bay is a shallow lagoon that extends 15 miles northwestward behind the barrier beach from the head of Gasparilla Sound. Access to the bay is difficult for any craft other than the shallowest draft boats. Two highway bridges cross the narrows between Gasparilla Sound and Lemon Bay. The southeasterly one has a fixed span with a width of 15 feet and a clearance of 6 feet, and the northwesterly one has a fixed span with a width of 18 feet and a clearance of 7 feet. The controlling depth through the passage, in May 1961, was 1 foot.

Stump Pass, near the south end of Lemon Bay, had a controlling depth of 2½ feet in May 1961. The pass is marked by privately-maintained daymarkers. A small marina, on the east side of Lemon Bay opposite Stump Pass, has gasoline, water, bait, and a launching ramp. Depths of 2 feet could be carried through the bush-staked entrance into the basin in May 1961. The highway bridge, 14 miles northwestward from Boca Grande, has a fixed channel span with a width of 26 feet and a clearance of 9 feet. On the northwest side of the bridge an overhead power cable has a clearance of 65 feet.

Punta Gorda Beach is on the west side of the bay just south of the bridge. Gasoline, water, bait, and general supplies are available.

Redfish Cove is on the east side of the bay at the north end of the bridge. There is a marina which has berthing, gasoline, water, and a launching ramp. Just west of the bridge at the north end, berthing, gasoline, water, and a launching ramp are available.

Englewood (P.O.) is on the east side of the bay about 0.5 mile north of the bridge. There is a boat basin with a marine railway that can haul out vessels up to 40 feet in length for general repairs. Berthing facilities, gasoline, water, provisions, a launching ramp, and some supplies are available. A fish house, a mile northwest of the marine railway, has gasoline, water, marine hardware, and a lunching ramp. There are no services along Lemon Bay north of Englewood.

Chart 1256.—A bridge across Lemon Bay at **Manasota,** about 6 miles northward from Punta Gorda Beach, has a fixed channel span width of 28 feet and a clearance of 7 feet. The nearby overhead power cable has a clearance of 65 feet.

Venice Inlet, about 26 miles northwestward from Port Boca Grande, has been dredged and jetties have been constructed. A light on the outer end of the north jetty and several daybeacons mark the inlet. Federal project depth is 9 feet through the inlet channel. The controlling depth was 6½ feet in April 1961.

The towns of **Venice** (P.O.), **Nokomis** (P.O.), and **Laurel** (P.O.) are on the shores of the three small bays (Roberts, Dona, and Lyons) inside and to the east and north of Venice Inlet. A high water tank is prominent. Drafts of 2½ to 3½ feet could be taken to the landings at these towns in May 1961. A 7-ton travel lift at Venice can haul out 35-foot boats for hull and engine repairs. A boatyard at Nokomis has a marine railway that can haul out craft up to 50 feet in length for hull and minor engine repairs. Diesel fuel, gasoline, water, ice, provisions, and limited supplies are available in all three towns. See Appendix for **storm warning displays.**

Blackburn Bay, Dryman Bay, Little Sarasota Bay, Sarasota Bay, Roberts Bay, and Sarasota Pass are connecting bodies of water which extend from Venice Inlet to the lower part of Tampa Bay, and are separated from the Gulf by a line of narrow keys. The projected route of the extension of the Intracoastal Waterway is through these waters which vary in width from a few hundred feet to 3 miles. The channel is marked by numerous daybeacons between Venice Inlet and Sarasota, and by daybeacons, lights, and lighted and unlighted ranges from Sarasota to Tampa Bay. In May 1961, a least depth of 3 feet in midchannel was available from Venice Inlet to Sarasota; thence 6 feet to Tampa Bay.

An overhead power cable north of Venice Inlet has a clearance of 40 feet. A highway bridge crosses the south end of **Blackburn Bay** 0.7 mile north of Venice Inlet; the swing span has a width of 48 feet, in the east draw, and a clearance of 9 feet.

Blackburn Point Bridge, a highway bridge crossing the south end of Little Sarasota Bay, 4.5 miles north of Venice Inlet, has a swing span with a clearance of 9 feet. The nearby overhead power cable has a clearance of 65 feet.

Midnight Pass, 6 miles northward from Venice Inlet, gives access to the Gulf from **Little Sarasota Bay.** The pass is narrow and has a controlling depth of about 3 feet; strangers should not attempt passage. **Osprey** (P.O.) is a small settlement on the east side of Little Sarasota Bay. Some supplies can be obtained here, but no services are available on the waterfront. A boatyard near the south end of Siesta Key, just north of Midnight Pass, has a travel lift that can haul out boats up to 55 feet in length for hull and minor engine repairs. Gasoline, water, and some supplies are available.

A highway bridge at **Stickney Point,** at the north end of Little Sarasota Bay, has a swing span with a clearance of 9 feet. The nearby overhead cable has a clearance of 77 feet.

A boatyard near the north end of Siesta Key opposite **Phillippi Creek,** has marine ways and a boat hoist capable of hauling out vessels up to 65 feet in length, for general repairs. Open and covered wet storage for 120 boats, and berthing facilities for craft up to 55 feet in length, are available. Diesel fuel, gasoline, water, ice, and marine hardware are available.

Big Sarasota Pass, 12 miles north-northwestward from Venice Inlet, is an inlet from the Gulf of Mexico to the southern end of Sarasota Bay. The pass lies between **Siesta Key** and the **Cerol Isles,** and is marked by a light and several daybeacons; the buoys at the entrance are shifted frequently to mark the changing channel. The pass had a controlling depth of 7½ feet over the bar in May 1961.

The highway bridge over the south end of Sarasota Bay from the mainland to the north end of Siesta Key has a bascule span with a clearance of 9 feet. The nearby overhead power cable has a clearance of 45 feet. A boatyard, on the east side of the bay, south of the bridge has a travel lift that can haul out 25-foot boats for general repairs.

The **Ringling Causeway** crossing Sarasota Bay from Sarasota to Cerol Isles, via **Coon Key** and **St. Armand Key,** has a bascule span over the north, or main, channel with a clearance of 22 feet. Over the south channel, there is a fixed span with a width of 46 feet and a clearance of 10 feet. Between Coon Key and St. Armand Key there is a fixed span with a clearance of 7 feet, and between St. Armand Key and Cerol Isles there is a fixed span with a width of 18 feet and a clearance of 6 feet.

Sarasota (P.O.), near the south end of the Sarasota Bay eastern shore, is one of the popular winter resorts of the Florida west coast. The cupola on the abandoned uncompleted hotel just northward of New Pass and several buildings, water tanks, and radio towers show prominently from offshore. The city has rail and highway communication to points north and south and to the interior of the State. The Sarasota-Bradenton Municipal Airport is north of the city. Oil storage plants, and a general warehouse are at Payne Terminal, 0.6 mile north of the bridge to Cerol Isles. The municipal pier is in the basin east of the bridge.

There are good hotels and stores in Sarasota. Gasoline, diesel fuel, and fresh water are available at Payne Terminal. Gasoline, diesel fuel, fresh water, ice, provisions, and marine hardware are available at the Municipal Pier. A boatyard at Payne Terminal can haul out craft up to 40 feet in length for general repairs. See Appendix for **storm warning displays.**

A draft of about 7 feet can be taken to the municipal pier, which has extensive berthing space for small yachts; anchorage is available near the pier. **Whitaker Bayou,** north of Payne Terminal, and **Hudson Bayou,** south of the municipal pier, provide excellent shelter for small craft. A highway bridge over Whitaker Bayou has a fixed span with a width of 32 feet and a clearance of 7 feet. A power cable over Hudson Bayou has a clearance of 65 feet. The bridge over Hudson Bayou has a bascule span with a width of 30 feet and a clearance of 7 feet; the overhead power cable at the bridge has a clearance of 65 feet. The dredged channels into these bayous have controlling depths of about 5 feet.

In Whitaker Bayou, three travel lifts can haul out boats up to 60 feet in length for complete repairs. Gasoline, oil, fresh water, and dockage for boats up to 48 feet in length are available. There is covered dry storage for boats up to 23 feet in length and a fresh water storage basin for boats up to 50 feet in length is also available.

New Pass is 2 miles northwestward from Big Sarasota Pass and at the north end of Cerol Isles. The entrance is marked by buoys, which are shifted frequently to conform with the changing channel, and the dredged channel from the pass to Payne Terminal is marked by daybeacons and a lighted range. The highway bridge over the pass has a bascule span with a clearance of 13 feet. A power cable over the pass near the bridge has a clearance of 80 feet. Controlling depths, in May 1961, were 2 feet over the bar; thence 9 feet to the entrance to Payne Terminal, whence the depths were 7 feet on into the basin.

Bolees Creek empties into Sarasota Bay 6 miles northwestward of Big Sarasota Pass. A privately-marked channel, with a controlling depth of 3 feet in May 1961, leads to the Holiday Yacht Club inside the creek. Gasoline, diesel fuel, water, lodging, and berthing for 30 boats are available.

Longboat Pass, 11 miles northwestward of Big Sarasota Pass, had depths of 6 feet over the bar in May 1961. The pass is constantly changing. In 1960, a new cut was washed through just south of the main entrance. The channel was marked only by a buoy at the southern end of a shoal extending west and south in an arc from Anna Maria Key.

Longbeach is a small fishing village and resort town on the south side of the inlet. Gasoline, water, bait, and tackle are available. About 1.5 miles southward of Longboat Pass, a privately-marked channel, with a depth of 4 feet in May 1961, leads to a boat basin, where gasoline, water, and lodging are available. A highway bridge over Longboat Pass has a bascule span with a width of 45 feet and a clearance of 17 feet.

Cortez (P.O.) is a small fishing and resort village on the eastern side of the narrows between Sarasota Bay and Sarasota Pass. Gasoline, diesel fuel, fresh water, ice, and general supplies are available. Drafts of 5 to 7 feet can be carried to the Cortez wharves, just south of the bridge over the narrows to Bradenton Beach on Anna Maria Key. See Appendix for **storm warning displays.** At **Bradenton Beach** there is a boatyard with a vertical lift capable of hauling out vessels up to 38 feet in length for general repairs. Gasoline, water, and some provisions are available on the waterfront. The highway bridge connecting Cortez and Bradenton Beach has a double-leaf span with a clearance of 17 feet.

Currents, Venice Inlet to Cortez.—In Venice Inlet the average velocity is about 1 knot. At the bridge at the south end of Blackburn Bay the current floods to the north and ebbs to the south with an average velocity of about 0.8 knot. At Blackburn Point Bridge at the south end of Little Sarasota Bay, the current floods southward with an average velocity of 1.4 knots and ebbs northward with an average velocity of 0.7 knot. In Midnight Pass the flood current sets northeastward with an average velocity of 1.8 knots and the ebb sets southwestward at an average velocity of 1.4 knots. One day's observation off the bridge at the north end of Little Sarasota Bay showed very weak currents. In Big Sarasota Pass the flood current averages 1.5 knots and the ebb 1 knot. In Sarasota Bay at the entrance to Roberts Bay, the current averages only 0.3 knot. At the bridge off Cedar Point the average velocity at strength is about 0.5 knot. In New Pass the average velocities of flood and ebb are about 1.6 knots and 1 knot, respectively.

In Longboat Pass the current averages about 1.7 knots. In Sarasota Pass off Cortez, the flood current sets to the north and averages about 0.6 knot; the ebb current is weak. Daily predictions of the current at many of these places may be obtained through the differences and ratios in table 2 of the Tidal Current Tables.

5. TAMPA BAY TO APALACHEE BAY

Chart 1114.—Depths of 18 feet extend nearly 5 miles from shore on either side of the dredged channel into Tampa Bay. On the approach the conspicuous landmarks include Egmont Key Light, a low aluminum water tank at Pass-a-Grille Beach, and a large hotel north of the beach. On each side of this hotel are water tanks which stand considerably higher than the hotel itself.

From Tampa Bay 35 miles northward 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 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 north of Tampa Bay are water tanks northwest of Johns Pass and south of Indian Rocks Beach; 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 northward, 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 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 shot up in aerial gunnery practice, leaving broken piling which constitute a hazard. Not all of the racks are charted.

Four artificial fishing reefs, marked by privately maintained buoys, have been established from 1 mile to 1.3 miles off the beach from Pass-a-Grille to Blind Pass.

The coast extends in a general northwesterly 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 unimportant 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 spongers and 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.

Chart 1257.—**Tampa Bay,** a large natural indentation about midway along the west coast of Florida, is one of the important harbors of the Gulf coast and is easily accessible day or night. The bay extends northeasterly for about 20 miles, and is 6 to 7 miles in width. It is the approach to Old Tampa and Hillsborough Bays, and to the cities of St. Petersburg, Port Tampa, and Tampa.

Boundary lines of inland waters.—The line established for Tampa Bay and tributaries is described in § **82.80**, Chapter 2.

Channels.—Tampa Bay has general depths of 18 to 30 feet between broad shoals that extend far from shore on all sides. Federal project depths for the main channels are 36 feet in the entrance from the Gulf, thence 34 feet to Tampa and Port Tampa. The channels are maintained at or near project depth. The channels are well marked with lights, lighted ranges, and lighted and unlighted buoys.

Anchorages.—Vessels with good ground tackle can anchor anywhere outside Egmont Bar in depths of 35 to 50 feet and ride out any gale short of a hurricane. The usual inside anchorages are southward of Mullet Key in depths of 30 to 35 feet; southwestward of Gadsen Point in natural depths of 29 to 36 feet.

Explosives and quarantine anchorages are east of Mullet Key and south of Interbay Peninsula; limits of the areas are given in § **202.193**, Chapter 2.

Bridges.—The Sunshine Skyway causeway connecting St. Petersburg with the southerly shore of the bay has four bridges crossing the bay proper. The northernmost span, a bascule drawbridge over the channel cut about 0.8 mile south of Maximo Point, has a clearance, at the center, of 21 feet. The low-level structure over Bunces Pass, 2.7 miles south of Maximo Point, has a fixed channel span with a clearance of 16 feet. The high-level fixed span over Mullet Key Channel has a clearance of 140 feet at the fenders and 151 feet at the center. Over the southern part of the bay crossing is a fixed span with a width of 45 feet and a clearance of 10 feet. Bridges in Old Tampa Bay and over the waterways in Tampa are described later in connection with the features of those places.

Tides.—The mean range of tide in Tampa Bay is about 1.5 feet. Daily tide predictions are given in the Tide Tables. 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 southwest wind raises the water by nearly the same amount and advances the time of high water by as much as 1 hour.

Currents.—Daily predictions of the current in Egmont Channel are given in the Tidal Current Tables, and similar predictions for several places in Tampa Bay and vicinity may be obtained through differences and ratios

given in table 2 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 6.8 miles west 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 northward and southward, respectively, with velocities usually less than 0.5 knot. Four days of current observations at this location during a period of moderate northerly winds showed a resultant nontidal current of nearly 0.5 knot setting southward.

Caution.—Construction of the Sunshine Skyway Causeway across the entrance to Tampa Bay has changed the currents in the area. Pending a new tidal current survey of Tampa Bay, the information for the Tampa Bay area included in the Tidal Current Tables and the Tidal Current Charts of Tampa Bay is considered questionable.

See Appendix for **storm warning displays** in the Tampa Bay area.

Chart 586.—Mullet Key, on the north side of the entrance to Tampa Bay, is low and wooded. The wharf on the southeast side of the key has a depth of about 10 feet at the face. A large pile of rocks covered by 2 feet, to the north and nearly in line with the face of the wharf, is a danger for vessels landing with a strong flood current, but is usually marked by tide rips except at slack water. A marked channel with a controlling depth of 3 feet leads from **Bunces Pass** to the pier at the south end of **Mullet Key Bayou.** Small craft can anchor in the bayou.

Egmont Channel, the main channel, which extends between Mullet Key and Egmont Key, is used by all deep-draft vessels entering Tampa Bay. A lighted range marks the dredged cut over the bar.

Egmont Key, about 1.5 miles southwest of Mullet Key, is about 1.6 miles long in a north-south direction, and is low and wooded. Shoal areas extend seaward from Egmont Key as far as **Palatine Shoal,** which is 5 miles westward of the key and on the south side of Egmont Channel entrance. Palatine Shoal consists of several small lumps with depths of 19 to 22 feet over them. **Egmont Key Light (27°36.0′ N., 82°45.4′ W.),** 85 feet above the water, is shown from an 87-foot white tower on the north end of the key. A fog signal and a radiobeacon are at the light. A pilot station and lookout tower are on Egmont Key. A draft of about 15 feet can be taken to the small pier just inside the north end of the key.

Southwest Channel, a buoyed natural passage on the south side of Egmont Key, has a controlling depth of about 16 feet, but is subject to shoaling. **Passage Key,** on the south 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.

Anna Maria Key, south of the Tampa Bay entrance, is separated from the mainland by Sarasota Pass. **Anna Maria** (P.O.) is a small village north of Bradenton Beach. A privately-marked channel with 3 feet in May 1961, leads to a yacht club, where gasoline, water, bait, tackle, lodging, and a launching ramp are available. A nearby marine railway can haul out boats up to 40 feet in length, for hull and engine repairs. Gasoline, diesel oil, and water are available at the yard.

Sarasota Pass, marked by daybeacons, lights, and lighted and unlighted ranges, joins Sarasota Bay with Tampa Bay in a dredged channel which had a controlling depth of 6 feet in May 1961.

A highway from Anna Maria Key to the mainland crosses Sarasota Pass, **Perico Island, Perico Bayou** and **Palma Sola Bay.** The highway bridge over Sarasota Pass has a double-leaf bascule span with a clearance of 18 feet and the bridges over Perico Bayou and Palma Sola Bay have fixed spans each with a width of 46 feet and a clearance of 10 feet.

The route of the extension of the Intracoastal Waterway from Caloosahatchee River to Anclote River is across lower Tampa Bay to the main ship channel, northward in the St. Petersburg Channel, then westward in the dredged channel, close southward of Pinellas Peninsula, that leads into Boca Ciega Bay. Small craft use the dredged channel which extends parallel with, and about 600 yards westward of the Sunshine Skyway between Maximo Point and Mullet Key Shoal. The channel is marked. In May 1961, the controlling depth was 9 feet.

Manatee River empties into the south side of Tampa Bay just east of Sarasota Pass. The river width varies from 0.5 mile to nearly a mile for about 10 miles above the mouth, thence from 80 to 600 feet for some 8 miles to Rye, and is marked as far as Rocky Bluff. The river is well protected from all directions and affords good storm anchorage for small boats.

The tidal current in the river entrance averages about 0.8 knot; off Bradenton, it averages about 0.5 knot.

Federal project depths for Manatee River are 13 feet from Tampa Bay to McNeil Point, thence 9 feet to Rocky Bluff, and thence 4 feet to Mitchellville Bridge, 21 miles above the mouth. In May 1961, midchannel controlling depths were 9 feet to McNeill Point; thence 8 feet to Bradenton, 7 feet to Rocky Bluff, and thence 2 feet to Rye Bridge. Above Rocky Bluff the river was obstructed by snags and debris.

Bradenton, a winter resort on the south 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 city pier with berthing space for larger vessels along the end and numerous berths for small craft inside the pierhead. The large building at the end of the pier is headquarters for the local Chamber of Commerce and Radio Station WTRL. The South Florida Museum and a city auditorium are at the head of the pier. The town has numerous stores, several hotels, a hospital, and a munic-

ipal airport about 6 miles south of the city. Gasoline, diesel fuel, ice, provisions, and small-boat supplies are available, and local guides can be obtained. See Appendix for **storm warning displays.**

A repair yard at **Shaw Point,** near the mouth of the river, has a marine railway capable of hauling out vessels up to 50 feet in length for engine and hull repairs. Gasoline, oil, and dry and wet storage are available. Another shipyard at **McKay Point,** 1 mile above Shaw Point and on the north side of the river, has two railways capable of hauling out vessels up to 80 feet in length for hull and engine repairs. This yard has facilities for covered storage for vessels up to 65 feet in length; gasoline, diesel fuel, fresh water, and marine supplies are available. A paved highway connects with Palmetto. Good anchorage can be had in depths of 15 feet, soft bottom, off the McKay Point Yard. A marina at **Rocky Bluff,** on the north side of the river 8.5 miles above Shaw Point, has a travel lift for boats up to 16 feet in length. Gasoline, oil, bait, tackle, and boat rentals are available.

Four bridges cross Manatee River at Bradenton. The first, a highway bridge close eastward of the city pier, has a bascule span with a clearance of 8 feet; see **§ 203.463,** Chapter 2, for **drawspan regulations.** The second, the Atlantic Coast Line Railroad Bridge 500 yards above the highway bridge, has a bascule span with a clearance of 5 feet. The third, a highway bridge about 500 yards above the railroad bridge, has a fixed span with a clearance of 40 feet. The fourth, the Seaboard Air Line Railroad Bridge about 500 yards farther upstream, has a swing span with a clearance of 6 feet. At Rocky Bluff, an overhead power cable crossing the river has a clearance of 34 feet, and another, about 0.5 mile farther upstream, has a clearance of 40 feet.

Palmetto is on the opposite side of Manatee River from Bradenton. **Ellenton** is on the north bank of the river 2 miles above the Seaboard Air Line 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. The Palmetto pier has slips for yachts and small boats drawing up to 7½ feet. A restaurant is in the large building on the end of the pier. Piling of a ruined pier extends outward to the channel west of the city pier. The landing at Ellenton is small.

Braden River, which empties into Manatee River about 2 miles above the upper highway bridge at Bradenton, has a controlling depth of 3 feet for about 2 miles above the highway bridge, but there are many shoals and the channel is unmarked. The highway bridge over Braden River has a fixed span with a width of 45 feet and a clearance of 10 feet. Overhead power cables at 0.1 mile and 0.6 mile above the bridge have a clearance of 35 feet.

Terra Ceia Bay, just north of Manatee River on the southeastern side of Tampa Bay, may be entered from Manatee River through a cut-off channel at the eastern end of **Snead Island** which has a Federal project depth of 6 feet. Daybeacons mark each end of the cut-off channel. The midchannel depth was 4 feet in May 1961. A highway bridge over the cut-off has a fixed span with a width of 33 feet and a clearance of 13 feet. An overhead power cable crossing close northeastward of the bridge has a clearance greater than that of the bridge.

The entrance to Terra Ceia Bay from Tampa Bay is the narrow and generally crooked channel between Snead Island and **McGill Island.** The channel is marked by daybeacons and has a controlling depth of about 5 feet.

Piney Point is a small projection on the southeast side of Tampa Bay about 11 miles above Egmont Key. An abandoned ferry slip is on the point.

Little Manatee River (chart 1257) empties into the southeast 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 was 3 feet in May 1961. The channel is difficult to follow without local knowledge. **Marsh Branch,** another privately maintained channel, had a depth of 3 feet from its junction with Little Manatee River to the highway bridge at **Ruskin,** an agricultural community. See Appendix for **storm warning displays.**

At **Shell Point,** on the north side of the entrance to Little Manatee River, is a fish camp with two small wharves and a protected yacht basin. At the railroad bridge, 2 miles above the mouth, are stores, garages, restaurants, two fish houses, and a small wharf used by excursion boats. Gasoline, oil, fresh water, and provisions are available in the town. The railroad bridge has a swing span with a width of 35 feet and a clearance of 4 feet. The highway bridge close above has a swing span with a clearance of 5 feet; overhead cables at the bridges have a minimum clearance of 58 feet.

Just north of the entrance to Little Manatee River, a privately marked channel, with 4 feet of water in May 1961, leads to a marina where gasoline, diesel fuel, water, marine hardware, and berthing for 80 boats are available. A 20-ton travel lift can haul out boats up to 55 feet in length for hull and engine repairs.

Chart 587.—Hillsborough Bay, the northeastern 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 east side of the channel for most of its length. Good anchorage is available for shallow-draft vessels in the central part of the bay westward of the main channel.

Two miles northward from the sharp turn in the main channel, a dredged channel leads eastward to **Alafia River.** Federal project depth for the channel is 30 feet deep from the ship channel in Hillsborough Bay to and including the turning basin at **East Tampa,** the site of a large phosphate plant, on the north side of Alafia River 0.5 mile above the mouth. The channel is well marked. The controlling depth to the turning basin was 29 feet in September 1961.

A draft of about 3 feet can be taken several miles up Alafia River at high water. A highway bridge 1 mile above the mouth of the river has a fixed span with a width of 44 feet and a clearance of 28 feet; the nearby overhead power cable has a clearance of 29 feet. The

railroad bridge just above the highway bridge has a swing span with a width of 40 feet and a clearance of 6 feet. Just above and below the bridges are boat piers, where gasoline, water, and bait are available. Boats can be rented. A nearby marine railway can haul out craft up to 65 feet in length for hull repairs. About 2.5 miles above these bridges there is an overhead power cable with a clearance of 35 feet.

The boat basin for MacDill Field is about 2 miles north of **Gadsden Point**, on the west side of Hillsborough Bay. The channel into the basin is well marked. The controlling depth in the channel was 10 feet and 7 feet in the basin in May 1961.

Port Sutton (Black Point) is on the east side of Hillsborough Bay opposite the south end of Davis Islands. A privately dredged channel leads northeastward from the main ship channel to a turning basin and slip at Port Sutton, the site of a large power plant. The stack atop the building is flood-lighted at night. A marginal wharf and facilities for unloading coal are at the north slip. Controlling midchannel depths in the channel and turning basin were 23 feet in 1961.

McKay Bay, about 1.3 miles north 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 a fixed span with a clearance of about 17 feet. An overhead power cable just above the causeway has a clearance of 37 feet. About 0.3 mile beyond the bridge is an overhead power cable with a clearance of 40 feet.

The main ship channel leads into Tampa Harbor along the east side of **Davis Islands.** The channel divides off the south end of **Seddon Island**; **Seddon Channel** continues northwestward to a turning basin at the mouth of Hillsborough River, and **Sparkman Channel** leads northward to another turning basin at the south end of **Ybor Channel.** A yacht basin on the west side of Seddon Channel has gasoline, water, a launching ramp, and berthing for boats up to 40 feet in length. The depth into the basin was 7 feet in May 1961. **Garrison Channel**, an east-west channel between Seddon Island and the Tampa waterfront, connects the two turning basins. The Seaboard Air Line Railroad bridge over Garrison Channel has a bascule span with a clearance of 5 feet.

Only small boats can pass around the north end of Davis Islands, which are connected with Tampa by a highway bridge having a fixed span with a width of 34 feet and a clearance of 10 feet. See Appendix for **storm warning displays.**

Hillsborough River flows southward through the city of Tampa into the turning basin at the north end of Seddon Channel. Daymarkers mark the channel for a short distance on the northwestern 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.

Federal project depths for Hillsborough River channel are 12 feet from the turning basin at the mouth to a point 100 feet south of Lafayette Street Bridge, thence 9 feet to a point 2,000 feet upstream from Columbus Drive bridge, 2.5 miles above the mouth. The controlling depth to the boatyard above Columbus Drive bridge was about 7 feet in May 1961. This yard can haul out boats up to 73 feet in length for complete hull and engine repairs.

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. New 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. The four highway bridges and one railroad bridge between Sligh Avenue and Sulphur Springs have fixed spans with a minimum 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. **Drawspan regulations** for the bridges over Hillsborough River are given in § **203.465,** Chapter 2.

Tampa is an important manufacturing and shipping center. The city has numerous wharves, the majority of which are on Garrison and Ybor Channels along the south and east sides of the business district. Tampa has considerable foreign and coastwise trade in phosphate rock, lumber, tobacco, bananas, and general merchandise.

Pilotage is compulsory for vessels in foreign trade, and for other vessels except when the masters or mates are licensed as pilots by the Federal Government. Pilotage is optional for vessels of the United States drawing 6 feet or less if such vessels have a coastwise license. Pilots can always be obtained by radio or by making signal outside the bar. The pilots have a lookout station on Egmont Key and use fast motorboats with a large **P** painted on the sides. Vessels entering by Egmont Channel are boarded near lighted bell buoy 2; those entering by Southwest Channel are boarded outside the bell buoy at that channel's entrance.

Towage.—Vessels usually proceed from the Gulf to Tampa under their own power. Towboats are available at Tampa and Port Tampa.

Quarantine.—The quarantine station is on Davis Islands. The quarantine anchorage is south of Gadsden Point, but vessels are boarded after docking. An outpatient clinic is maintained at the quarantine station. Tampa has several public and private hospitals with ample facilities. The nearest Public Health Service hospital is at Savannah.

Customs and immigration.—Tampa is the district headquarters of customs and port of entry; marine documents are issued. The offices of both the customs and immigration services are in the Federal Building.

Harbor regulations.—The port of Tampa includes Tampa proper, Port Tampa, and the mouth of the Alafia River. The governing body is the Hillsborough County Port Authority. Decisions of the harbormaster are final in all disputes involving shipmasters and dock owners.

Wharves.—Most of the wharves and terminal facilities at Tampa are privately owned and operated. The Seaboard Air Line Railroad phosphate elevator and terminals are on Seddon Island. North of the elevator is a terminal especially equipped for discharging, handling, and storing fertilizer and bulk materials, as well as general cargo. On the north side of Seddon Island, facing Garrison Channel, is a lumber terminal. On the mainland side of Garrison Channel are several terminals with long-established facilities for handling general cargo. On Ybor Channel is the Tampa Municipal Terminal which includes a slip about 900 feet long and 200 feet wide, and dock space of about 2,500 feet; many small vessels in the banana trade berth here. On the east shore of Sparkman Channel are two shipyards, a cement plant, and the terminals of the petroleum distributors. Most of Tampa's terminals have rail connections with the two trunk lines serving the port.

Supplies.—Fuel oil is available at Tampa, and fresh water, ice, provisions, and marine hardware can be obtained in quantity.

Repairs.—At the southern end of Sparkman Channel is a graving dock 526 feet long. Alongside the graving dock is a slip 1,200 feet long, 85 feet wide, and 20 feet deep for topside repairs. An outfitting wharf has a slip 200 feet long and 26 feet deep. Facilities at the yard include machine, foundry, pattern, carpenter, and electric shops.

Communications.—Tampa is served by the Seaboard Air Line Railroad and the Atlantic Coast Line Railroad. Regular scheduled steamship service is maintained between Tampa and Caribbean and West Indies ports, and also coastwise and intercoastal ports. Major airlines offer passenger and express service on regular schedules.

WPD, a privately owned radio station adjoining the Municipal Terminal on Ybor Channel, is used locally for communication with ships. Operating hours are from 8:00 a.m. to 5:00 p.m. Radio station WFLA transmits coastal storm warnings and emergency marine information.

Small-craft facilities.—The municipal boat landing is on the west side of the entrance to Hillsborough River. A yacht basin is on the Seddon Channel side of Davis Islands. There are several boatyards along Hillsborough River.

Old Tampa Bay, the northwestern 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. Federal project depth is 34 feet to and including the turning basin. The channel is well marked by buoys and lighted ranges. Spoil banks border the east side of the north-south reaches of the channel; several spoil islands 5 to 10 feet high are just south of Port Tampa.

A swash channel from Port Tampa parallels the southwest 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 for aircraft is southwesterly of Interbay Peninsula; see § 204.100, Chapter 2, for limits and regulations.

Gandy Highway Bridge, crossing Old Tampa Bay about 1.5 miles north of Port Tampa, has an opening with two parallel spans, about a mile west of the Interbay Peninsula shore. The northerly one is a fixed span with a clearance of 43 feet; the southerly one is a bascule span with a clearance of 13 feet.

There are two yacht basins, one on either side of the bridge at **Rattlesnake**, at the east end of Gandy Highway Bridge. Unmarked channels lead to the basins. The north basin has covered storage facilities for boats up to 35 feet in length. A vertical hoist can lift boats up to 20 tons in weight and 35 feet in length. Hull repairs are made and a mechanic can be called in for engine repairs. The south basin has facilities for vessels up to 6 feet in draft. A marine railway can haul out craft up to 40 feet in length for hull and engine repairs. Gasoline, water, ice, and provisions are available at both basins.

South Gandy Channel leads along the south side of the fill at the west end of Gandy Bridge to **Snug Harbor**, where small craft can find good anchorage from storms. Dock facilities are available at the head of the harbor. Gasoline, water, a launching ramp, and some supplies are available. At the west end of the highway fill are several fishing camps and a small repair yard with a railway that can haul out boats up to 32 feet in length for hull repairs. The controlling depth into Snug Harbor was 7 feet in May 1961.

The approach to South Gandy Channel is from southward, between shoals which can be avoided with a little care. When about 100 yards from the outer end of the highway fill, turn westward and steer parallel with the fill, following the channel markers.

Culbreath Bayou and another small-boat shelter, known as **Tampa Bay Marina**, are near the easterly end of the W. Howard Frankland Bridge on the eastern shore of the bay. In May 1961, marked channels 4 to 7 feet deep led to the basin and the marina. Fuel, water, marine hardware, and storage are available, and a vertical hoist can lift boats up to 20 tons and 42 feet in length. Hull and gasoline engine repairs can be made.

Along the east shore of Old Tampa Bay, north of Gandy Bridge, are several shallow basins suitable only for small craft. Most of these are privately marked.

The W. Howard Frankland Bridge, a highway causeway with three fixed channel spans, crosses Old Tampa Bay from a point just north of Beach Park to Big Island on the westerly shore, thence curving southerly to the mainland. The main channel span has a clearance of 45 feet. The other two spans, located at the south end of **Big Island Gap**, have minimum widths of 44 feet and minimum clearance of 6 feet.

Courtney Campbell Parkway crosses Old Tampa Bay about 6 miles above Gandy Bridge. This is a causeway, mostly fill, of a total length of 8 miles. Near the middle

is a bascule span with a clearance of 13 feet. Near the westerly end is a fixed span with a width of 18 feet and clearance of 9 feet.

Safety Harbor (P.O.) is a health resort on the northwest shore of Old Tampa Bay 2 miles north of the Parkway. Safety Harbor has rail and highway connections with Tampa and St. Petersburg. Gasoline, water, ice, and some supplies are available at the resort.

A draft of 8 feet can be taken within 0.5 mile of the landing at Safety Harbor. A small basin on the south side of the large waterfront fill can accommodate boats up to about 4 feet in draft, but the controlling depth into the basin was only about 1½ feet in May 1961. Gasoline is available in town but not at the basin.

From the Port Tampa dock, a course of **004°** for 1.6 miles leads to the draw in Gandy Bridge. Beyond the draw, a course of **322°** for 3 miles leads to the W. Howard Frankland Bridge, a fixed span; thence a course of **320°** for 3.3 miles leads to the draw in Courtney Campbell Parkway. Beyond this second draw, a course of **290°** for 3 miles leads to a position 0.5 mile off the Safety Harbor Landing.

At the head of Old Tampa Bay about 1 mile north 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 Phillipi Point has a clearance of 98 feet. The town of **Oldsmar** is on the northeast shore of the bight.

Charts 586, 587.—St. Petersburg, a large winter resort on the west side of Tampa Bay 6 miles south of Gandy Bridge, is the terminus of two railroads, 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 south.

St. Petersburg has numerous stores and hotels, a city hospital and several private hospitals, and two airports. Gasoline, diesel fuel, fresh water, ice, provisions, and yacht supplies are available in quantity. Boats can be chartered and guides engaged.

Federal project depths are 20 feet for a channel extending northerly about 5.5 miles from deep water in lower Tampa Bay, and thence 19 feet leading westward to the Port of St. Petersburg waterfront. The channel had 19 feet in May 1961.

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 westward reach leading to Port Tampa, then turning southwestward into the natural deep-water area extending toward St. Petersburg.

Pilotage.—Pilots for St. Petersburg go to Tampa Bay entrance only by previous arrangements. Shipmasters can communicate with the pilots by radio or telegram. Ships approaching the bar, and bound for St. Petersburg, should fly the international Code flags **SP**. The pilot boat flies a red-and-white pilot flag. Vessels entering by Egmont Channel are boarded between the sea buoy and lighted bell buoy 2; those coming in by Southwest Channel are boarded inside, near lighted bell buoy 7.

Customs, quarantine, immigration.—Vessels can arrange for customs, quarantine, and immigration inspection by telephoning the officials concerned in Tampa. St. Petersburg is a customs port of entry.

Port of St. Petersburg, the deepest and southernmost basin along the city water front, is about 500 yards long and 400 yards wide. Federal project depth is 24 feet in the port basin. A concrete wharf, with warehouse, along the north side of the basin provides berthing space for several vessels. The Coast Guard operates a buoy depot and air-sea rescue base at the outer end. A **restricted area** for seaplanes is off the base; limits and regulations are given in § **207.175,** Chapter 2.

Bayboro Harbor, which is entered from the inner end of the ship basin, is used by numerous fishing boats and other small commercial craft. Federal project depth is 12 feet in the harbor. The average depth of the harbor is about 13 feet. The largest of four boatyards in the harbor and in Salt Creek can haul out vessels 135 feet in length for complete repairs.

Oil stations and small commercial landings are along the banks of **Salt Creek,** which empties into the south side of Bayboro Harbor. Controlling depths in the creek are 10 feet to the first bend, thence 5 feet to about 100 yards east of the bridge at Third Street, south, which is the head of navigation.

Northward along the St. Petersburg waterfront from the ship basin are the Municipal Pier and three yacht basins. The pier is a long concrete structure with a two story pavilion on its outer end. 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 100 feet in length. In May 1961, controlling depth in both North and Central Yacht Basins was 10 feet. Gasoline and oil are available at the yacht club in Central Basin. South Yacht Basin, the second basin south of the pier, is used by small sailing vessels.

Lights mark the ends of the moles on either side of the entrance to Central Yacht Basin. Numerous slips are on the north and west sides of the basin, and a public landing is on the west side. The St. Petersburg Yacht Club is adjacent to Central Yacht Basin.

Coffeepot Bayou, 1 mile north of the Municipal Pier, affords good anchorage for small craft that can pass under the highway bridge which has a bascule span with a width of 34 feet and a clearance of 6 feet; see § **203.245,** Chapter 2, for **drawspan regulations.** The entrance channel is well marked with privately maintained daymarkers, and had a controlling depth of 3 feet in May 1961.

Smacks Bayou, about a mile northeast of Coffeepot Bayou, had a controlling depth of 4 feet in May 1961, in the well-marked approach from the southeast. Inside, there is deeper water resulting from recent dredging to provide land fill. Any vessel able to enter and pass the highway bridge which has a bascule span with a width of 23 feet and a clearance of 7 feet will find good shelter.

A marina just inside the entrance has gasoline, water, ice, and berthing for about 30 boats.

The basins on the south side of **Papys Bayou**, midway between Coffeepot Bayou and the Gandy Bridge, offer good protection for small boats during periods of very bad weather. The controlling depth into the bayou is about 2½ feet. Local knowledge is needed to find the best water.

Big Bayou is a mile south of the St. Petersburg ship basin. The privately marked channel into the bayou had a controlling depth of 4 feet in May 1961.

A small-boat channel behind Lewis Island connects Big and Little Bayous. It is crossed by two highway bridges and a pipeline. The bridges have fixed spans with a width of 40 feet and a clearance of 10 feet. The pipeline has a clearance of 10 feet.

Little Bayou is 2.5 miles south of the ship basin. A privately owned yacht basin is in the southern part of the bayou. A dredged channel extends southward from Little Bayou to deep water in the bay. In 1961, the controlling depth in the channel was 4 feet and 5 feet in the basin.

Charts 586, 858.—Boca Ciega Bay extends 13 miles northwestward from the lower part of Tampa Bay. In May 1961, Boca Ciega Bay was the scene of extensive construction, dredging, and revision. New channels were being dredged at several places in the bay. Several marinas were under construction or expansion. Several of the small keys had been filled in to form one large island and many new bridges were under construction linking many of the keys. Passage between Tampa Bay and Clearwater Harbor, via The Narrows, was afforded by a dredged channel, marked by daybeacons. This channel is a link in the inland waterway from Caloosahatchee River to Anclote River.

Tidal currents in the bay seldom exceed 0.5 knot. In Pass-a-Grille Channel, the flood current sets northward with an average velocity of 1.2 knots and ebbs southward at an average velocity of 1.4 knots. In Johns Pass, the flood sets northeastward at an average velocity of 2.0 knots and ebbs southwestward at an average velocity of 1.5 knots. Daily predictions for several places in these waters can be obtained from the Tidal Current Tables.

Bunces Pass is a passage into the southern part of Boca Ciega Bay from the Gulf, and on through to Tampa Bay. In May 1961, it was unmarked, and the controlling midchannel depth was 4 feet. A highway bridge, part of the Pinellas Bayway, is under construction over the pass between **Cunningham Key** and **Madelaine Key**. It will have a fixed channel span with a designed width of 50 feet and a clearance of about 18 feet.

The controlling depth through Boca Ciega Bay to Clearwater Harbor was 4 feet in May 1961, and thence 4 feet to Anclote River.

See Appendix for **storm warning displays** in Boca Ciega Bay.

Pass-a-Grille Channel, between **Pine Key** and Long Key, is a passage from the Gulf to the southerly section of Boca Ciega Bay. **North Channel** and **South Channel** are the two entrances. In May 1961, the controlling midchannel depth in North Channel was 7 feet, and in South Channel 5 feet. Caution should be used when entering via South Channel because at least one broken piling was observed awash. Both channels are marked.

In 1960, a submerged jet fuel storage tank facility was established about 100 yards off the beach in Pass-a-Grille Channel, about 0.3 mile north of the southerly tip of Pass-a-Grille Beach. Fixed white lights mark the facility.

Pass-a-Grille Beach (P.O.) is a resort on the south end of **Long Key**. Depths of 8 to 10 feet can be taken to the small wharves along the east side of the key. That portion of the channel between the key and Vina del Mar offers good protection for small craft. A highway bridge across the channel has a fixed span with a width of 30 feet and a clearance of 14 feet. The town has hotels, stores, gasoline, water, and ice; some yacht supplies are obtainable. Of the two boatyards equipped to do hull and engine repair, the larger has a traveling gantry crane capable of lifting a boat 50 feet in length and 22 tons in weight.

In 1961, construction was underway on the Pinellas Bayway, a complex system of causeways and highways crossing Boca Ciega Bay. The system connects the mainland at Cats Point with Long Key at Don Ce Sar Beach. Another section will trend southward from Cats Point Bank to Pine Key and continue southward, connecting **Cabbage Key** and **Cunningham Key**, crossing Bunces Pass to **Madelaine Key**; thence to **St. Jean Key** and Mullet Key, and from the eastern tip of Mullet Key across the southern end of Boca Ciega Bay to a junction with the Sunshine Skyway Causeway. There will be bridge openings in the various sections at the channels.

Don Ce Sar Beach, about 2 miles from the south end of Long Key, is the site of a large and ornate hotel building now used as a Veterans Administration headquarters. High water tanks are on the north and southeast sides of it. At **St. Petersburg Beach**, 2 miles north of the hotel, **Corey Causeway** crosses Boca Ciega Bay from Long Key to the mainland. The causeway has a bascule span with a clearance of 8 feet. See Appendix for **storm warning displays.**

Maximo Point, the southwestern extremity of Pinellas Peninsula, is at the north end of the Sunshine Skyway Causeway. There is a small-boat basin with covered storage for over 100 boats up to 23 feet in length. Gasoline, oil, water, bait, and tackle are available along with some marine hardware. A restaurant is on the premises. In May 1961, the controlling depth into the basin was 3 feet.

Frenchman Creek is on the east side of Boca Ciega Bay about 0.3 mile northward of Maximo Point. There is covered storage for over 200 craft up to 60 feet in length. A vertical hoist can lift out boats up to 12 tons in weight and 40 feet in length, for general repairs. Gaso-

line, water, and marine supplies can be obtained. The creek is crossed near the entrance by an overhead power cable and near the basin by a highway bridge with a fixed span with a width of 26 feet and a clearance of 16 feet. The controlling depth in Frenchman Creek was 5 feet to the basin, in May 1961.

Cats Point is on the east side of Boca Ciega Bay about 1.1 miles northward of Maximo Point. There is a marina with storage facilities for over 200 boats. In May 1961, construction was underway to accommodate up to 500 boats up to 75 feet in length and 7 feet in draft. Gasoline, diesel fuel, oil, water, ice, bait, and tackle are available. Boats can be rented or charted. A restaurant is on the premises and there is a concrete launching ramp. In May 1961, the entrance channel had a controlling depth of 5 feet and was marked by daybeacons.

Gulfport, on the north shore of Boca Ciega Bay opposite Long Key, is a suburb of St. Petersburg. A draft of about 6 feet can be taken to the pier. A water tank in Gulfport and a cupola 1 mile to the northwest can be seen from seaward.

Clam Bayou is a mile east of Gulfport. There is a boatyard and a yacht basin. The marine railway at the boatyard can haul out boats up to 50 feet in length. The yard does hull and engine repairs. Gasoline, water, and some marine supplies are available. The dredged channel into Clam Bayou, marked by privately maintained daybeacons, and a lighted range, had a controlling depth of 5 feet in May 1961.

Bear Creek is on the east side at the north end of Boca Ciega Bay. There are two marinas, the larger of which offers covered storage for boats up to 42 feet in length. A hoist can lift out boats up to 42 feet in length and 20 tons in weight, for complete repairs. A machine shop is on the premises. Gasoline, oil, fresh water, ice, and marine hardware are available.

Chart 858.—Treasure Island Causeway crosses Boca Ciega Bay from the island to the mainland. The causeway has a bascule span over the main channel with a clearance of 8 feet. The east and west openings have fixed spans with clearances of 4 and 5 feet, respectively.

Blind Pass, between Long Key and **Treasure Island,** is used by local fishing boats drawing up to 3 feet. The pass is marked by daymarkers and in May 1961, the controlling midchannel depth was about 3 feet. A highway bridge over the inner part of Blind Pass has a fixed span with a width of 22 feet and a clearance of 9 feet. Dock facilities, gasoline, water, and some provisions can be obtained near the bridge.

Johns Pass, between Treasure Island and **Sand Key,** affords passage for small craft between the Gulf and the northern part of Boca Ciega Bay. The channel is not well marked and is subject to very frequent shifting. The buoys marking the channel are moved periodically, but do not always indicate the best water. This pass should be used with caution. The highway bridge over the pass has a bascule span with a clearance of 6 feet; southwest of the bridge is an overhead power cable with a clearance of 66 feet. The controlling depth through the pass was 4 feet in May 1961.

Numerous fishing piers and bait houses are near Johns Pass bridge. Gasoline and water are available. **Madeira Beach** (P.O.) is a small community at the northwest end of the bridge. Two boatyards at Maderia Beach have marine railways, the largest of which can haul out craft up to 65 feet in length and 7 feet in draft for hull and engine repairs. The northerly of the two yards is in a cove known locally as Snug Harbor. See Appendix for **storm warning displays.**

Welch Causeway crosses Boca Ciega Bay from Sand Key to the mainland at a point 1.5 miles northwest of Johns Pass. The causeway has a bascule span with a width of 49 feet and a clearance of 8 feet. In 1961, a new bridge was under construction across the bay parallel to and just northwest of the causeway. A water tank at the Sand Key end of the bridge is prominent. An overhead cable at the bridge has a clearance of 62 feet. The shallow cove just east of the mainland end of the bridge has been dredged to form a small-boat basin adjacent to the Veterans Hospital. In May 1961, a depth of 4 feet could be taken into the basin, which is government owned. Private boats are prohibited from entering. Just north of the bridge, a channel, which in May 1961 had a controlling depth of 5½ feet, leads to a marina in a basin on Sand Key. Gasoline, water, marine hardware, and covered dockage for craft up to 40 feet in length are available. A 23-ton travel lift can haul out craft up to 40 feet in length for hull and engine repairs. Another basin on the mainland, with a depth of 4 feet, has a marina, where gasoline, water, covered dockage, and a launching ramp are available.

The Narrows, which connect the northwest end of Boca Ciega Bay with the south end of Clearwater Harbor, are about 4 miles long and are marked by daybeacons. On the west side of The Narrows near the south end are rocks which are covered at high water; to avoid them, mariners should favor the east bank. A marina inside the bight on Sand Key, just south of The Narrows, has gasoline, water, and limited supplies. Gasoline, water, and bait are also available on Sand Key, near the north and south ends of The Narrows. The highway bridge over The Narrows, from the mainland to **Haven Beach** on Sand Key, has a bascule span with a clearance of 25 feet. About 0.6 mile southward of the bridge, at the site of the former bridge which has been removed, is an overhead power cable with a clearance of 63 feet.

Clearwater Harbor extends about 7 miles northward from The Narrows to Dunedin Pass and has an average width of about 1 mile. The harbor is mostly shoal, but there are narrow natural channels varying in depth from 5 to 14 feet. **Belleair Beach Causeway** crosses the harbor from Sand Key to the mainland at a point 2.1 miles north of the bridge over The Narrows; the causeway has a bascule span with a clearance of 20 feet. **Belleair,** about 1 mile north of the mainland end of the causeway, has a large hotel with a private yacht basin into which a draft of

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about 4 feet can be taken. Gasoline and water can be obtained at **Belleair Beach,** on the west side of Clearwater Harbor.

The several channels in Clearwater Harbor are marked by numerous aids which should be followed closely as some sections are quite crooked. **Clearwater (Little) Pass,** 11 miles northward from Johns Pass, extends eastward from the Gulf between the north end of Sand Key and the south end of **Clearwater Beach Island.** Federal project depths for the dredged channels are 10 feet through Clearwater Pass; thence 8 feet eastward to the Intracoastal Waterway, and 8 feet northward from the pass along the east side of Clearwater Beach Island to a turning basin at the municipal pier. In May 1961, the controlling midchannel depth was 8 feet from the Gulf to the turning basin at Clearwater Beach, and 4 feet in the channel from the pass to the Intracoastal Waterway. The channels are well marked by lights, buoys, and daybeacons.

Dunedin (Big) Pass is 3 miles north of Clearwater Pass and at the opposite end of Clearwater Beach Island. A channel inside the pass leads along the inner side of the island southeasterly to the Clearwater Harbor channel. **Mandalay Channel** continues along the inner side of the island to the causeway, passing the Clearwater Yacht Club near the middle of the island. Gasoline, diesel fuel, water, and covered dockage are available. The depth over the bar at Dunedin Pass was 4 feet in May 1961. Marinas north and south of the causeway at **Clearwater Beach** have docking facilities for over 100 boats up to 50 feet in length.

Currents.—In Dunedin Pass, the current averages 1 knot and in Clearwater Pass 1.2 knots. In the harbor off Clearwater, the current averages 0.5 knot.

Because the bars are subject to change, the chart cannot be relied upon to show the latest condition, but inside the passes the channels are fairly stable, and the chart is a good guide. When the sea is smooth, which is the only time that a stranger should enter, the channels usually can be discerned by the difference in color of the water.

Clearwater Harbor is a link in the Intracoastal Waterway from Caloosahatchee River to Anclote River. The channel through the harbor passes close alongshore off Clearwater. Clearwater Causeway crosses Clearwater Harbor from Clearwater to Clearwater Beach. The bascule span in the causeway, over the main channel, has a width of 48 feet and a clearance of 6 feet; see § **203.466,** Chapter 2, for **drawspan regulations.** In 1961, an additional bridge, with bascule span, was under construction along the north side of this span. The fixed spans in the two highway bridges at the west end of the causeway have a minimum clearance of 7 feet. A channel leads along the south side of the causeway from Clearwater to the waterfront at Clearwater Beach. In May 1961, the controlling depth was 8 feet. The channel is marked.

Clearwater, the seat of Pinellas County, is a city on the east shore of Clearwater Harbor opposite Clearwater Pass. Two railroads connect with St. Petersburg, Tampa, and all points north, and paved highways connect with all parts of the State. The city operates two marinas and a city pier with protected basins, and there are several coves offering safe anchorage. A draft of 4 to 5 feet can be carried to the marinas and the city pier. A marine railway can haul out craft up to 70 feet in length for general hull and engine repairs. Gasoline, diesel fuel, water, ice, provisions, and some yacht supplies are obtainable. Boats can be chartered and local guides can be engaged. The large hotel in Clearwater is the most prominent object in the area.

See Appendix for **storm warning displays** in the Clearwater area.

St. Joseph Sound extends northward from Clearwater Harbor nearly to Anclote Keys, and is separated from the Gulf for a part of the distance by a narrow strip of beach known as **Caladesi Island** and **Honeymoon Island. Hurricane Pass** extends between them and, though subject to change, is good for from 3 to 5 feet with local knowledge. On a favorable tide a draft of a little more than 3 feet can be carried to the sound, but 3 feet is all that a stranger should attempt, and that only on a rising tide. Daybeacons mark the pass.

Five miles off St. Joseph Sound the current floods northward and ebbs southward with a velocity of 0.5 knot.

Dunedin is 3 miles north of Clearwater and directly opposite Dunedin Pass. A railroad and State highway provide communication with the interior. A small-boat basin is behind a bulkhead just south of the city wharf. Gasoline, provisions, and some yacht supplies are available. **Dunedin Channel** branches eastward from Dunedin Pass and leads to the wharves at Dunedin. In May 1961, 4 feet could be taken to the wharves by following this channel, which is marked.

Minnow Creek is 3 miles northward of Dunedin. There are three boatyards with marine railways and travel lifts, which can haul out craft up to 43 feet in length for general repairs. Gasoline, diesel fuel, water, provisions, and covered dockage are available. A dredged channel with a depth of 3 feet leads to the yard from just north of a small island in the center of **Smith Bayou.** The channel is privately marked.

In 1961, just south of Smith Bayou, a new causeway with bridges was under construction across St. Joseph Sound to connect Honeymoon Island with the mainland.

Ozona is 0.5 mile northward of Smith Bayou. In May 1961, a bush-staked channel leading to the fish company pier had a depth of 1 to 2 feet. Gasoline, water, bait, tackle, and a launching ramp are available.

A boiling spring is close to shore about 5 miles north of Dunedin and just south of **Crystal Beach.** The boiling water is visible above the surrounding waters in calm weather. Depths of 15 to 20 feet were found in the spring in 1924.

Anclote Keys, several in number, are about 13 miles northward from Clearwater. **Anclote Keys Light (28°10.0′ N., 82°50.7′ W.)** 101 feet above the water is shown from a 102-foot brown square pyramidal skeleton tower enclosing a stair cylinder, on the south end of Anclote Key, the largest of the group. The trees on the

south 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 westerly gales for vessels up to 7 feet in draft. The anchorage can be reached by passing either northward or southward of the keys, both passages being well marked. Vessels drawing more than 7 feet can anchor westward of the keys where, though more exposed to westerly winds, the water shoals so gradually that the seas are never very heavy, and vessels with good ground tackle can ride out anything but a hurricane. In Anclote Anchorage, the tidal current has an average velocity of 0.7 knot on the flood and ebb.

Anclote River empties into Anclote Anchorage over a broad shoal area. A radar installation on the north side of the entrance is conspicuous from the northwest at a distance of 10 miles. Federal project depth is 9 feet from the Gulf to a turning basin at Tarpon Springs. The controlling depth was 7 feet in June 1961. 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 or 3 feet.

Anclote is a small settlement on the north bank of Anclote River about 1 mile above the mouth. A fish camp here has gasoline and water available. A large elevator and a nearby water tank can be seen for 10 miles; the tank has a light on top.

Tarpon Springs (P.O.) is a winter resort and commercial fishing center on the south 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 west coast of Florida, has a municipal hospital, several hotels, 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 bridge. Gasoline, diesel fuel, water, ice, provisions, and marine supplies are obtainable. Several yards along the river have facilities for hauling, repairing and storing boats; the largest railway can haul out boats up to 65 feet in length. See Appendix for **storm warning displays.**

The highway bridge over Anclote River at Tarpon Springs has a fixed span with a width of 40 feet and a clearance of 10 feet.

Kreamer Bayou and Whitcomb Bay empty into Anclote River along the west side of Tarpon Springs. The junction is at the north end of a small island; the river passes to the east of the island and the common channel to the bayous passes to the west. The entrance channel branches at **Chesapeake Point** into Kreamer Bayou on the west and via **Tarpon Bayou** into Whitcomb Bay on the east. The channel to Kreamer Bayou has shoaled and only small skiffs can enter. The highway bridge over Tarpon Bayou has a bascule span with a width of 25 feet and clearance of 8 feet; the clearance of the nearby overhead power cable is 38 feet. A public wharf is south of the entrance to **Spring Bayou,** the second arm to the east in Whitcomb Bay, 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 Bay, which is centrally located in the town of Tarpon Springs.

Chart 1258.—The shoals that extend over 10 miles offshore along the coast for 40 miles northward from Anclote Keys are known under the general name of **St. Martins Reef.** The outer limit of shallow water and detached shoals is marked by a light 16 miles north by west from Anclote Keys Light.

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. About 4 miles northward of Anclote River a privately marked channel leads toward Big Bayou Point. No services are available here. In 1961, a depth of 4 feet was reported in the channel.

Pithlachascotee River, widely known as the **Cotee River,** empties into the Gulf 7 miles northward from Anclote River. The river has an extensive shoal area off the mouth and numerous oyster reefs just inside. Local fishing boats up to 4 feet in draft navigate the river to the upper highway bridge. In May 1961, the controlling depth was 2 feet across the shoals off the mouth of the river. A privately maintained light marks the entrance, and daymarkers mark the river channel. Depths of 2 feet and greater can be carried to New Port Richey.

Port Richey (P.O.) is a small town at the entrance to the river. A local boatyard has marine ways that can haul out small craft up to 40 feet in length for hull, engine, and electronic repairs. Gasoline, oil, water, and provisions are available. See Appendix for **storm warning displays.**

New Port Richey (P.O.) is a small town about 2.5 miles above the mouth of Pithlachascotee River. The municipal water tank at the town is 110 feet high and prominent from offshore. There is a small public wharf in the town. Gasoline, oil, water, ice, and provisions are available in the town, but not on the waterfront.

Three highway bridges cross the Pithlachascotee. The first 1.2 miles above the mouth has a bascule span with a width of 49 feet and a clearance of 9 feet. Drawspan regulations are given in **§ 203.245,** Chapter 2. About 2.0 miles above the mouth is an overhead power cable with an estimated clearance of 40 feet. About 2.7 miles above the mouth a highway bridge has a fixed span with a width of 40 feet and a clearance of 10 feet, and 0.6 mile above that is another highway bridge with a fixed span with a width of 27 feet and a clearance of 6 feet.

Hudson (P.O.) is a small settlement on **Hudson Creek** which empties into the Gulf 12 miles northward from Anclote River. In June 1961, a depth of only 2 feet could be carried into the creek. The entrance channel through

the flats is marked by privately-maintained daymarkers. Gasoline, water, ice, and a launching ramp are available at a small marina.

Aripeka (P.O.) is a village on **Hammock Creek,** 17 miles northward from Anclote River. There are numerous deep springs and shoals in the creek, which has a controlling depth of about 1½ feet. The approach to Aripeka is unmarked; local knowledge is needed to carry the best water. The highway bridges over the channels around the north and south sides of the island in mid-creek have fixed spans with a clearance of 2 to 3 feet. Gasoline, water, and provisions are available at the northerly of the two highway bridges. The town has a launching ramp. Aripeka is on a State highway.

Gulf Coast Retreat is the site of a large housing development, 20 miles northward of Anclote River. Gasoline, water, provisions, and a launching ramp are available. The approach channel can be followed by keeping the rock and fill spit to the northward, about 15 yards. In June 1961, this channel had depths of 1½ feet.

Bayport (P.O.), on **Weekiwachee River** 23 miles northward from Anclote River, consists of a few houses. On a favorable tide a draft of about 2 feet can be taken to the village. The channel begins close southward of **Beacon Rock,** which is 2 miles offshore and covers at high water, and continues in a generally east-by-south direction through the oyster reefs and into the river.

Chassahowitzka River empties into **Chassahowitzka Bay** 31 miles north of Anclote River. On a favorable tide, a draft of about 3 feet can be taken into the river; the channel is difficult for strangers. From Johns Island to the settlement of Chassahowitzka, the river is shallow and partly blocked by hyacinths and grass; the controlling 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.

Bird Island is prominent in the entrance to Chassahowitzka Bay. **Black Rock,** 1.3 miles seaward from the key, bares at half tide. **Chassahowitzka Point,** on the north side of the bay, is a high and conspicuous mangrove key.

Homosassa River empties into **Homosassa Bay** 37 miles northward from Anclote Keys Light. **St. Martins Keys** are prominent mangrove islets on the north side of the bay entrance. **Homosassa** (P.O.), a small fishing community 4 miles above the mouth of the river, has a hotel, stores, and commercial fish houses, and telephone and telegraph connections with the town of Crystal River. Gasoline, oil, ice, provisions, and a launching ramp are available. A Federal project provides for a channel 5 feet deep through the four bars at the entrance to the river. In June 1961, a depth of 3 feet could be taken to Homosassa. The river entrance is clearly marked by lighted buoys and daybeacons. Shoals on either side of the channel are discernible by their lighter color. The river channel is marked by daybeacons.

Crystal River empties into the north side of **Crystal Bay** 46 miles northward from Anclote Keys Light and 23 miles southeastward from the town of Cedar Keys. **Mangrove Point,** on the south side of the entrance to the bay, is prominent in the approach from the southwest. The white shell of **Shell Island,** on the south side of the river's entrance, is prominent when approached from the dredged channel across Crystal Reefs.

Federal project depths for Crystal River channel are 6 feet from the Gulf to the town of Crystal River. The entrance is across a large shoal area, thence across **Crystal Reefs** through the dredged channel. The channel, well marked by a light and daybeacons, had a controlling midchannel depth of 6 feet to **Salt River** and thence 3 feet to the town of Crystal River in June 1961. Above Salt River, the river is covered with grass, and local knowledge is necessary to carry the best water. Gasoline, water, bait, and tackle are available at a pier on the north side of Crystal River, 5 miles above the mouth.

The town of **Crystal River** (P.O.), at the head of the river 6 miles above the mouth, has railfreight, highway, telegraph, and telephone connections. Several commercial fish and oyster houses are here. Gasoline, oil, water, and provisions are obtainable and some repairs can be made to small boats. There is fresh water in the upper section of the river, which has its source in numerous springs. The mean tidal range at the mouth of the river is about 2.5 feet.

The approach to Crystal River is marked by a lighted buoy 11.7 miles westward of the entrance and a buoy about 4.8 miles off. A course **081°** from the sea buoy leads past the inner approach buoy to the entrance. If coming from the southward, keep at least 5 miles off the outer islands until up to the inner approach buoy, then steer **081°** for the light at the entrance. Follow the daybeacons through the numerous oyster bars and dredged channel through Crystal Reefs. The river is entered at the north side of Shell Island where there is a shoal area with a depth of 6 feet, which is the controlling depth that can be taken to Salt River. Midchannel courses should be followed and a lookout kept for shoals. A draft of about 6 feet can be carried into the basin at the head of the river, but only 3 to 4 feet can be taken into the inner basin and to the fish house wharf. Keep close to the west end of a small island when entering the inner basin at Crystal River. An overhead power cable with a clearance of 30 feet crosses the inner basin.

Chart 1259.—Withlacoochee River rises in the central part of the peninsula of Florida and empties into the Gulf about 17 miles southeast of Cedar Keys. A buoy about 3.7 miles west-southwest of the entrance light marks the approach. A Federal project for the river provides for a channel 10 feet deep from the Gulf to Inglis, thence 2 feet for about half the year to Croom, 74 miles above the mouth. Surveys up to August 1961, show project depths obtained to the power plant at Inglis; thence in 1956, the controlling depth was 4 feet to the power plant dam 11 miles above the mouth. Floating logs and other debris obstruct the channel above Inglis. Oil barges drawing better than 8 feet are taken upriver to the power plant without too much difficulty. The approach channel to Withlacoochee River is well marked by lights and daybeacons. The lock in the dam

is 133 feet long and 36 feet wide. Although the lock is in working order, small fishing boats are hauled around the dam at the power company's expense. The lock can be opened if the boats are too large to be hauled by truck. The pool created by the dam extends nearly to Dunnellon, 24 miles above the mouth.

Port Inglis, at the mouth of the river is virtually abandoned. A launching ramp and boat rental are available. **Yankeetown** (P.O.), the principal settlement on the river, is a small winter resort and fishing village 3 miles above Port Inglis. Yankeetown has a hotel and store; gasoline, oil, and provisions are obtainable. **Inglis** (P.O.) is a small settlement 7 miles above the mouth of the river; gasoline, oil, fresh water, and provisions are obtainable. A large electric plant is located at Inglis. Overhead power cables crossing the river in the vicinity of the power plant have a minimum clearance of 65 feet. A highway bridge just above Inglis has a fixed span with a width of 35 feet and a clearance of 7 feet.

Tides and currents.—The mean range of tide is 2.5 feet. Off the mouth of the river a tidal current sets easterly during the flood and westerly during the ebb. The ebb is said to attain a velocity of 3 knots at times, and this must be taken into account by vessels coming in from the entrance buoy. A strong northeasterly wind may increase the velocity of the ebb current and a southwesterly wind may decrease it.

Waccasassa River, 10 miles northward from Withlacoochee River, is of little navigational importance because of the extensive Waccasassa Reefs off its mouth.

Cedar Keys, 95 miles northward from 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 south side of the key. **Seahorse Reef,** a dangerous shoal with little depth over it, extends 11 miles southwestward 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 bell buoy is 2.5 miles southwestward of the light.

Main Ship Channel leads in a general northeasterly direction between East Bank and West Bank, eastward of Seahorse Key and Grassy Key; thence by a crooked and winding channel westward of Atsena Otie Key into Cedar Key Harbor. Federal project depth is 10½ feet from the Gulf to Cedar Key. In June 1961, the controlling depth was 9½ feet. The channel is well marked by lights and daybeacons. Extreme caution must be exercised at two hairpin curves.

Northwest Channel, leading from the westward between North Bank and South Bank, in June 1961, had a controlling midchannel depth of 4 feet; the channel is marked by lights and daybeacons. Small craft bound up the coast should enter by Main Ship Channel and leave by Northwest Channel rather than cross Seahorse Reef. Local Fishermen report a controlling depth of 4 feet in **Deadmans Channel,** which is unmarked and should not be used without local knowledge.

South Bar Channel, the approach channel to Cedar Key from the eastward, had 4 feet in June 1961. The channel is marked by an entrance light and several daybeacons.

Fog.—This area has considerable fog during the winter months; southerly winds bring it in and northerly winds clear it away.

Tides and currents.—The mean range of tide at Cedar Keys is 2.5 feet. Outside the entrance channel the current sets eastward on the flood and westward 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 (P.O.) is a small town on **Way Key.** The most prominent object in the town is the municipal water tank, 140 feet high. A draft of 8½ feet can be taken through the main channel to the city dock which has depths of 8 to 15 feet alongside; there is 4 feet alongside the fuel pier. Gasoline, diesel oil, water, ice, some provisions, and supplies for small boats are available. The largest of two marine railways here can haul out craft up to 45 feet in length for hull repairs. A mechanic can be called in to repair engines. See Appendix for **storm warning displays.**

Suwannee Sound, 7 miles northward 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,** 4 miles northwestward from Cedar Keys. Federal project depth is 6 feet for a dredged channel through Derrick Key Gap into Suwannee Sound. In June 1961, the controlling midchannel depth was 4 feet. The channel is marked by daybeacons.

Steamboat Gap, Ranch Bar Gap, and **West Gap** are unmarked secondary channels with depths of 4 feet or less, and should not be entered without local knowledge. **Shell Bar Channel,** about 1 mile northwest of Ranch Bar Gap, has a controlling depth of about 3 feet through an unmarked channel.

The passage through Suwannee Sound from Derrick Key Gap is west of **Lone Cabbage Reef,** which extends northwesterly from **Lone Cabbage Island** to East Pass; the reef bares in spots at low water and is to be avoided.

Suwannee River empties into the sound through the two mouths known as **East Pass** and **West Pass.** East Pass is the main entrance. West pass is little used and good only for shallow-draft boats. Federal project depths are 5 feet for a channel dredged through the shoals off the entrance to East Pass; 5 feet in the river up to Branford; thence 4 feet to Ellaville. In June 1961, the dredged channel had a controlling depth of 1 foot.

Once inside a draft of about 3 feet can be carried up Suwannee River to **Branford,** 65 miles above the mouth; a draft of 2 to 3 feet can be carried to the rapids 2 miles below **Ellaville,** 110 miles above the mouth; and at high stages small boats can go to **White Springs,** 150 miles above the mouth.

The mean range of tide at the mouth of the river is about 2.4 feet. Extreme fluctuations occur due to freshets. Low river stage occurs in the winter and high river stage in the fall months. There is little commerce on the river. Water is available at the fish camp at **Vista,** 9 miles above the mouth. A marine railway there can haul out craft up to 40 feet in length for painting. A mechanic can be called in for engine repairs. Gasoline, water, and provisions can be obtained at **Fowler Bluff,** 11 miles above the mouth. Gasoline, water, and provisions are obtainable at **Suwannee Gables** and at U.S. Highway 19 bridge, 21 miles above the mouth of the river. This bridge, the first above the mouth, has a fixed span with a clearance of about 30 feet at low river and 15 feet at high river stage. The minimum channel span widths of the bridges crossing the river above Old Town are 48 feet and the minimum clearance is 2 feet. See **§ 203.245,** Chapter 2, for **drawspan regulations** for the railroad drawbridge near Old Town.

Boiler Gap, 2 miles northwestward from Suwannee River, is a staked channel with a controlling depth of 1 foot. The gap is used by local boats going up **Salt Creek** to **Suwannee** (P.O.), a village 1 mile above the mouth of the creek. The village has several dwellings, fish houses, and a store where limited supplies are available. A State highway extends to **Old Town.**

Shired Island is a village at the mouth of **Shired Creek,** which is about 18 miles northwestward from Cedar Keys. The village can be reached from the south by a winding staked channel through the oyster bars which has a controlling depth of about 1½ feet.

Chart 1260.—Horseshoe Beach (P.O.) is a village on **Horseshoe Point,** which is 5 miles west-northwestward from Shired Creek. Gasoline, oil, and limited supplies are available. A boatyard can haul out craft up to 48 feet in length for hull and engine repairs. A paved road connects Horseshoe Beach with **Cross City** and U.S. Highway 19. Federal project depth is 6 feet in a dredged channel from the Gulf to a turning basin at Horseshoe Beach; project depth was obtained in October 1961. Lights and daybeacons mark the channel. Spoil banks are on either side of the channel about the middle of the dredged cut.

Pepperfish Keys, 29 miles northwestward from Cedar Keys, 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 behind the same key where depths are 6 to 8 feet and the bottom is sand with patches of boulders. The approach to the anchorage is through an unmarked channel which extends in an east-southeast direction. Boats of less than 4 feet in draft can enter by keeping in dark water; the shoals are discernible by their lighter color.

Steinhatchee River empties into **Deadman Bay** 37 miles northwestward from Cedar Keys. Federal project depth is 6 feet in a channel from the Gulf through Deadman Bay and the river to Steinhatchee. The channel is marked by lights and daybeacons. In June 1961, the controlling midchannel depth was 5 feet.

Steinhatchee (P.O.), a small settlement on the north side of the river, is connected by State roads with U.S. Highway 19. Gasoline, diesel oil, water, and provisions are obtainable. A boatyard can haul up craft 40 feet in length and 5 feet in draft, for hull repairs. A highway bridge about a mile above Steinhatchee has a swing span with a width of 50 feet and a clearance of 8 feet. The overhead power cable about 2 miles east of the town has a clearance of 43 feet.

Dallus Creek, 5 miles northwestward from the 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 second-class road connects with the main highway.

The high pine trees on **Piney Point,** 10 miles northwestward from Steinhatchee River, are visible from well offshore on a clear day. Several small settlements northward of Piney Point have roads connecting with the main coastal highway, but offer no supplies. **Fish Creek** (village) is 0.5 mile above the mouth of **Fish Creek,** 2 miles northward from Piney Point. **Keaton Beach,** a fishing settlement 4 miles from the point, has small docks and a small-boat channel. **Jug Island,** a summer resort 5 miles from the point, has a small-boat wharf and about three dozen houses. **Adams Beach** is a small settlement 8 miles from Piney Point. **Yates Creek Landing** and **Spring Warrior** are small landings on the creeks of the same names 9 and 11 miles north-northwestward from the point.

Fenholloway River empties into the Gulf of Mexico eastward of Apalachee Bay and 64 miles northwestward from Cedar Keys. A draft of 3 feet can be taken into the river on a favorable tide, but a knowledge of local conditions is needed. The entrance is not marked. 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 second-class road connects the landing with the coastal highway.

6. APALACHEE BAY TO MOBILE BAY

Charts 1114, 1115.—The coast consists of a chain of generally narrow and wooded sand islands that trends southwestward for about 40 miles from Apalachee Bay to Cape St. George, thence northwestward for 95 miles to Choctawhatchee Bay, and thence about 80 miles westward and southwestward to Mobile Bay. **A danger zone** for a guided missiles test operations area extends well offshore between Apalachee Bay and Choctawhatchee Bay; see **§ 204.135,** Chapter 2, for limits and regulations.

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 eastern 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 westward.

Chart 1261.—Apalachee Bay, about 170 miles northwest of Tampa Bay, is formed by the bend in the coastline from a northwesterly to a southwesterly 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.

Boundary lines of inland waters.—The line established for Apalachee Bay is described in **§ 82.89,** Chapter 2.

Danger Zone.—An Air Force rocket-firing range has been established in the Gulf south of Apalachee Bay; limits and regulations are given in **§ 204.111,** Chapter 2.

Econfina River, entering the eastern part of Apalachee Bay, is used mostly by local fishermen as an anchorage. The river channel is rocky and should be used with caution. In 1961, depths were about 1 foot in the entrance. **Econfina Landing,** 2 miles above the mouth, has facilities for small craft. Gasoline, oil, ice, water, and fishing tackle are available at the fish camp. A State highway joins the main coastal highway.

Aucilla River flows into Apalachee Bay 4.5 miles northwestward of Econfina River. A depth of 1 foot can be taken into the river on a favorable tide, but the approach for a distance of 3 miles is a narrow winding channel, unmarked and difficult for strangers.

St. Marks National Wildlife Refuge covers the coastal area between Aucilla River and Shell Point, about 5 miles west of St. Marks River.

Chart 484.—St. Marks River flows into the head of Apalachee Bay 83 miles northwestward of Cedar Keys and 54 miles northeastward of Cape St. George. The river is the approach to the town of St. Marks about 5.5 miles above the mouth. Fishing is the principal industry, but considerable oil is brought in by barges.

Currents.—The tidal current in St. Marks River averages about 0.5 knot at strength. Daily current predictions for the area may be obtained from the Tidal Current Tables.

St. Marks Light (30°04.3′ 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 entrance range.

In 1961 the controlling depth was 9 feet to the town of St. Marks, thence about 7 feet to Newport, 4 miles above St. Marks. The highway bridge at Newport has a 40-foot bascule span with a clearance of 9 feet; at St. Marks the overhead power cable clearance is 74 feet. The channel is well marked.

Wakulla River enters St. Marks River 5 miles north of St. Marks Light. A draft of 7 feet can be taken upriver for about 0.4 mile above the confluence, and 3 feet to Wakulla Springs, 7 miles above St. Marks. Grass obstructs the channel and local knowledge is needed to carry the best water.

Spanish Hole is an anchorage between the oyster bars in the mouth of St. Marks River, 0.5 mile westward of St. Marks Light. Depths of 10 to 19 feet are in the anchorage with shallow water close-to on all sides. A wreck visible at high water is on the northeast side of Spanish Hole.

The mean range of tide is about 2.4 feet. See Appendix for **storm warning displays.**

A land cut, about 500 yards long, has been dredged from the east side of Spanish Hole, about 0.3 mile northwestward of St. Marks Light, for the St. Marks Bird Refuge boat anchorage. In June 1961, the controlling depth was 2½ feet.

Several privately owned wharves in St. Marks are open to the public. Gasoline, diesel fuel, ice, provisions, and water are available. Other supplies can be obtained on short notice from Tallahassee. The larger of two marine ways can haul out boats up to 60 feet in length for hull and engine repairs. There are several abandoned marine railways at Newport. A concrete launching ramp is just above the bridge, at Phillips State Park.

Chart 1261.—A beach resort is at **Shell Point,** about 5 miles west of St. Marks River. Only small boats can be accommodated at the pier. Gasoline and water are available. Mean range of tide is about 2.5 feet.

King Bay is 4.5 miles southwestward of Shell Point. In 1961, depths of 2 feet could be carried through a bush-

staked channel to **Panacea** on the west side of the bay. No services are available on the waterfront.

Ochlockonee Bay, on the west 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 southern half of the mouth is closed entirely by oyster bars. The entrance is between **Ochlockonee Point** on the north and **Bald Point** on the south. A narrow channel good for about 4 feet, leads into the bay near the northern point of the mouth.

Craft up to 50 feet long can dock at the long pier on the north side of the Ochlockonee Bay entrance; gasoline and water are available. The fixed highway bridge about 2.3 miles above the entrance has a 36-foot channel span and clearance of 13 feet.

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 westward to the junction of Crooked River and then turns northward and finally eastward. A depth of 5 feet, with local knowledge, can be found for 29 miles. The fixed highway bridge about 6 miles above the mouth has a 33-foot channel span and clearance of 10 feet. The river is little used. About 8 miles above the mouth, piling of a former bridge is a hazard in the river.

Crooked River, a narrow, crooked tidal stream 22 miles long, connects Ochlockonee River with Carrabelle River. In June 1961, Crooked River was completely blocked by trees and growth about 10 miles above the eastern mouth.

Ochlockonee Shoal, lying about 8 miles southeastward of Ochlockonee Point, has depths ranging from 3 to 15 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 southeast of the shoal.

Charts 1261, 1262.—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, 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 the cut through St. George Island south of Apalachicola are the principal entrances to the sound and the bay from the Gulf, and thence into the towns of Carrabelle and Apalachicola.

St. James Island is the 20-mile long portion of coast from **Lighthouse Point,** on the westerly side of Apalachee Bay, westward to Carrabelle. The island is separated from the mainland by Ochlockonee Bay, and by Ochlockonee, Crooked, and Carrabelle Rivers.

About 11.4 miles west of Lighthouse Point there is a 669-foot high radio tower, marked by obstruction lights, which can be seen from far off in clear weather.

South Shoal extends southward from the east end of St. James Island for about 6 miles. The sea breaks on portions of the shoal even in good weather. A buoy marks the southern end of the shoal.

Duer Channel, unmarked and subject to frequent change, lies at the eastern 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.

Alligator Harbor, a shallow, unimportant body of water at the easterly end of St. George Sound, is formed by a long, narrow spit of land which extends westward from Lighthouse Point. There is good anchorage north of **Peninsula Point** in depths of 5 to 7 feet, hard sand bottom. A crooked and unmarked channel with a depth of 7 feet leads to the anchorage from Duer Channel; local knowledge is essential to follow this channel.

Dog Island Reef, lying 5 to 6 miles offshore south of St. James Island, extends from a point about 5 miles west-southwestward of Lighthouse Point to the eastern 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.

Dog Island, a narrow, sparsely wooded island over 5 miles long, is the first land sighted in approaching East Pass from southeastward. A toll-ferry runs from Carrabelle to the small cove on the north side about a mile from the eastern end of the island. Several houses are on the island and rental rooms are available near the ferry landing. In June 1961, the controlling depth was 10 feet to the ferry slip.

East Pass, the principal entrance to St. George Sound, lies between Dog and St. George Islands about 31 miles southwestward of St. Marks Light.

Approaching East Pass from southeastward on a clear day, the first objects to be seen are the sand dunes on Dog and St. George Islands. On closer approach, the trees on the mainland can be seen over the islands and a few pine trees will be noticed near the west end of Dog Island.

Crooked River Light (29°49.6′ N., 84°42.1′ W.), 115 feet above the water, is shown from a square skeleton tower, lower half white, upper half red, on the north shore of St. George Sound, about 3 miles northwestward of the west end of Dog Island.

Federal project depth is 27 feet in East Pass to Dog Island, and thence 25 feet through the sound and Carrabelle River to the town turning basin. In June 1961, a depth of 18 feet could be taken to the harbor entrance channel by navigating with great caution along the westerly edge of the channel passing the westerly point of Dog Island; thence, 17 feet could be taken to Carrabelle. The controlling depth was 8 feet in the channel along the north side of the river. The channels are well marked.

In heavy seas, deep-draft vessels should stay in depths of 30 to 40 feet until Carrabelle Channel lighted whistle buoy 1 is picked up.

Vessels may anchor in St. George Sound behind the western end of Dog Island in depths of about 20 feet and to the northwestward of the east 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 east end of St. George Island or at various points in the sound where depths are suitable.

Tides and currents.—At East Pass the diurnal tidal range is about 2.0 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.

Carrabelle River flows into St. George Sound 5 miles north-northeastward of East Pass. River currents are rather strong on the ebb. A highway bridge about 0.4 mile above the basin has a 40-foot swing span with a clearance of 9 feet; the nearby overhead power cable has a clearance of 78 feet.

Carrabelle (P.O.) is a small fishing village on the east bank of Carrabelle River about 0.5 mile above the mouth. Arrangements can be made for pilots to take yachts from Carrabelle to Tampa or vicinity. A 400-horsepower towboat is available. Carrabelle is a port of entry. See Appendix for **storm warning displays.**

Diesel oil, gasoline, and fresh water are available. The larger of the three marine ways can haul out boats up to 65 feet in length. A ferry operates to Dog Island. Carrabelle has hotels and stores.

Chart 1262.—St. George Island extends about 24 miles westward from East Pass. The island is densely wooded except at its eastern end, which is a low and barren spit. A ferry runs from **Cat Point** to St. George Island. Privately maintained daybeacons mark the ferry route from Cat Point westward of Bulkhead Shoal. A marked channel leads to the town of **Eastpoint** (P.O.), a mile northeastward of Cat Point. In June 1961, the channel had depths of 5½ feet. Gasoline, water, and limited supplies are available. There are marine ways at Eastpoint capable of hauling out small craft up to 25 feet in length.

Bulkhead Shoal, which extends from Cat Point southward to **Bulkhead Point** on St. George Island, marks the dividing line between St. George Sound and Apalachicola Bay. The Gulf 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.

Federal project depth is 10 feet for the channel dredged through St. George Island, about 4.9 miles east of Cape St. George Light. In February 1962, the controlling depth was 7 feet. A lighted bell buoy marks the seaward approach and a lighted range and buoys mark the cut.

An Air Force **restricted area,** for drone recovery, is close westward of the cut; see **§ 204.113,** Chapter 2, for limits and regulations.

Cape St. George Shoal extends 11 miles southward from **Cape St. George,** the southwestern tip of St. George Island. The shoal consists of several detached spots with moderate depths between them. A whistle buoy marks the southern end of the shoal.

West Pass enters Apalachicola Bay between **Sand Island,** the northwestern tip of St. George Island, and **St. Vincent Island.** The pass is an approach to Apalachicola Bay and the town of Apalachicola.

Apalachicola is on the north shore of Apalachicola Bay at the mouth of the Apalachicola River. The principal industry is fishing.

Cape St. George Light (29°35.2′ N., 85°02.8′ W.), the most conspicuous object in the West Pass area, is 72 feet above the water, shown from a white conical tower on the west end of the island. From inside the pass on the approach to Apalachicola, the water tank and highway bridge show up prominently.

Federal project depth is 10 feet from the Gulf through West Pass and Apalachicola Bay to Apalachicola. In 1961, the controlling depth was 8 feet. The channel is subject to frequent change and should be used with caution. Shoals extend more than 3 miles offshore. The approach is marked by a bell buoy and several other buoys which are shifted to conform to changes in the channel. Several buoys and three ranges mark the channel through Apalachicola Bay to the Intracoastal Waterway and the town of Apalachicola.

A swash channel, used considerably by local fishermen, lies inside **East Bank** and Sand Island. The channel has a depth of about 3 feet and is passable in all but very severe weather.

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 west 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 east side of the channel are ruins of a wooden jetty extending 2 miles southward of the highway bridge.

Vessels may anchor anywhere in Apalachicola Bay where depths are suitable. Good anchorage in depths of 12 to 15 feet may be found in **Lower Anchorage,** eastward of Sand Island. Another good anchorage is about 1 mile south of the channel leading to Apalachicola.

Tides and currents.—The diurnal range of tide at West Pass is about 1 foot. 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 the channel at a point inside the bar about 1.2 miles eastward of the bell buoy. The ebb current runs out through West Pass and divides, part going to the southward over the breakers and part following the deeper water to the bar, the latter being the stronger.

In Apalachicola River, the mean range of tide is about 1 foot at Apalachicola and the current is principally ebb. With strong winds from the north and east 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 westward of Bulkhead Shoal, the ebb current flowing eastward through the cut.

See Appendix for **storm warning displays.** There are

no pilots at Apalachicola; local guides for yachts can be employed at Carrabelle. An **outpatient office,** of the Public Health Service is in Apalachicola; a county hospital is here. Apalachicola is a port of entry and marine documents are issued; customs officers are stationed in the Post Office Building.

The John Gorrie Memorial Bridge, a highway causeway, crosses the bay from **East Point** to Apalachicola. The bridge has a swing span across the channel at Apalachicola; clearances are given in Chapter 12. About 2.7 miles east of the draw opening is a small-boat opening 36 feet wide with a clearance of 16 feet; this leads into **East Bay.** North and south of the bridge are numerous private docks at which passing yachts may berth. The municipal pier and basin are about 300 yards south of the bridge. In June 1961, the pier had 3 feet at the outer face, and depths were 5 feet into the basin.

Supplies are limited generally to the needs of fishing craft and small yachts. Diesel fuel, gasoline, oil, groceries, and water are available. Hotels, numerous stores, and a small machine shop are in the town. Good facilities for making repairs to small craft are available. The largest marine ways can haul out boats up to 65 feet in length, for hull and engine repairs.

Apalachicola is served by the Apalachicola Northern Railroad and is on the Tallahassee-Pensacola highway.

Apalachicola River, formed by the junction of Flint and Chattahoochee Rivers, flows south for about 98 miles into the northern part of Apalachicola Bay. The Gulf Intracoastal Waterway extends through the lower part of Apalachicola River, branching westward through **Jackson River** at its confluence with Apalachicola River about 5 miles above the latter's mouth. Federal project depth is 9 feet for the channel in Apalachicola River to its junction with Flint and Chattahoochee Rivers.

The **Jim Woodruff Dam,** about 0.2 mile below the confluence of the Chattahoochee and Flint Rivers, has a navigation lock 82 feet wide and 450 feet long; the depth over the sills is 14 feet, and the maximum lift is 33 feet.

Apalachicola River is crossed by a railroad bridge 3.7 miles above the mouth; see Chapter 12 for clearance note.

St. Vincent Sound is a shallow and unimportant extension of Apalachicola Bay at its northwestern end. The sound can be entered from eastward through Apalachicola Bay or from the westward 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 west-northwestward of Cape St. George, is low and wooded. **Cape San Blas Light (29°40.3′ N., 85°21.4′ W.),** 101 feet above the water, is shown from a 96-foot white square skeleton tower inclosing a stairway cylinder. A radiobeacon is near the light.

Cape San Blas Shoals, with depths of 18 feet or less, extend 4 miles southward from the cape. Depths of 24 to 30 feet are found 10 miles south and southwestward of the cape. A lighted bell buoy is moored about 13.5 miles southwestward 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 south of east and northwest, 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 south 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 the foundation of a former lighthouse, covered by 5 feet, is marked by a buoy.

A **danger zone** of an air-to-air firing practice range is in the Gulf south and west of Apalachicola; limits and regulations are given in § **204.114,** Chapter 2.

Chart 1263.—St. Joseph Bay, which extends about 12 miles northward of Cape San Blas, is separated from the Gulf by the long, narrow strip of land and sand hills, wooded in places, that curves north-northwestward from the cape. St. Joseph Bay, recognized as one of the best harbors on the Gulf, is easily entered at any time.

Port St. Joe is a town on the eastern shore of St. Joseph Bay. A large paper mill and an adjoining oil storage depot along the waterfront furnish the main industry for the town. Fumes from the paper mill may discolor paint overnight if docked or anchored on the windward side of the stack. Shipping consists mainly of paper and petroleum products.

Prominent features.—The stack and buildings of the paper mill are the most prominent objects visible from the Gulf. Several water tanks are conspicuous at a closer distance inshore.

Channels.—From the Gulf, the dredged channel leads across the 18-foot shoals to the deeper water inside. Federal project depths are 37 feet to North Channel inside St. Joseph Point, thence 35 feet to the turning basin, and 27 feet in South Channel.

The maintained channels are marked by ranges, lights, and buoys. Port St. Joe Entrance Channel lighted range on top of the paper mill is visible on the range line only. Smoke and fumes from the paper mill often make it difficult to see the range in the daytime.

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 which has a depth of 8 feet.

Gulf County Canal provides a connection between St. Joseph Bay and the Gulf Intracoastal Waterway. Federal project depth is 9 feet. In June 1961, the controlling depth in the canal was 6 feet. Near the bay entrance the canal is crossed by a bascule bridge with a clearance of 10 feet. The overhead power cable at Highland View has a clearance of 85 feet.

Anchorages.—The entire bay, except for the southern third and a narrow shelf along the sides, is free from

shoals and has depths of 24 to 37 feet, hard sand or hard mud bottom. Explosives anchorage areas and regulations are given in § **202.193a**, Chapter 2.

In St. Joseph Bay the mean range of **tide** is 1.5 feet. See Appendix for **storm warning displays.**

Pilotage.—Pilotage is compulsory for vessels in foreign and coasting trades drawing more than 6 feet of water, except coasting vessels having on board a pilot licensed by the U.S. Coast Guard. Masters desiring a pilot should wire the Port St. Joe Pilots Association at least 18 hours in advance, as telegraph service is not available at night. Pilots board incoming vessels in the vicinity of the sea buoy.

Towboats are available in Port St. Joe.

Quarantine.—There is no quarantine station, but vessels subject to visitation are boarded for inspection anywhere in the harbor by a representative of the Public Health Service. A hospital is in the city.

Time.—Port St. Joe is on the Eastern Standard Time, but **Beacon Hill,** site of St. Joseph Point Lighted Range A, marks the dividing line between the Eastern and Central Standard Time zones.

Customs.—Vessels bound for Port St. Joe notify the customs officer at Pensacola of their arrival. Port St. Joe is a port of entry. The customs officer comes to the vessel at the first opportunity. The records for St. Joe are maintained at Panama City.

Immigration affairs are handled out of the Mobile, Ala., headquarters.

Wharves.—A large paper mill and an adjoining oil storage depot have a dock 0.5 mile long with depths of 32 feet alongside on the waterfront. Dock space for small boats is available along the Gulf County Canal, just north of the highway bridge.

Supplies.—Gasoline and oil fuels, groceries, water, and ice are available; waterfront services can be obtained along the canal.

Repairs.—A marine way on the canal can haul out boats up to 40 feet in length for minor engine and hull repairs.

Communications.—Port St. Joe is served by the Apalachicola Northern Railroad and is on the Tallahassee-Pensacola highway.

Bell Shoal is the broken ground north of the entrance channel making off from St. Andrew Point, 6.5 miles northwest of St. Joseph Point.

Crooked Island is a narrow island extending 7 miles northward from St. Andrew Point. The island encloses **St. Andrew Sound,** a shallow, unimportant body of water.

Chart 489.—St. Andrew Bay, a narrow irregularly shaped harbor, lies 27 miles northwestward 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, forms a passage from the Gulf to St. Andrew Bay.

Panama City is the seat of Bay County. One of the largest paper mills in the world is at **Bay Harbor.** Shipping consists mainly of paper and petroleum products, fertilizers, and small amounts of fish.

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. 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 upper mill at Bay Harbor and two 130-foot water tanks at **Tyndall Field** about 5 miles south-southeastward of the stacks. An aviation light is atop the black-and-white checked easterly tank. Next seen are the tall Hotel Dixie Sherman and the elevated water tank at St. Andrew, a subdivision of Panama City.

St. Andrew Bay Entrance Light 6 (30°07.4′ N., 85°-43.4′ W.), 66 feet above the water, is shown from a red triangular slatted daymark on a post on the southeasterly side of the dredged entrance.

Channels.—Federal project for Panama City Harbor provides for an entrance cut through **Shell Island** 34 feet deep, thence 32 feet deep in the bay. In June 1961, the controlling depth was 31 feet.

East Entrance, southeastward of Shell Island, is not marked, is constantly shifting, and is considered unsafe for navigation.

Anchorages.—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 westward of **Redfish Point** in depths of 35 to 40 feet.

Dangers.—Restricted areas for small arms firing ranges are southeastward of the entrance to St. Andrew Bay; limits and regulations are given in § **204.120,** Chapter 2.

Prohibited areas with lighted platforms and fog signals are 11 miles southwestward and 2.3 miles westward of the entrance to St. Andrew Bay; limits and regulations are given in § **204.126,** Chapter 2.

A **danger zone** marked by buoys is 4 miles northwestward of the entrance to St. Andrew Bay; limits and regulations are given in § **204.131,** Chapter 2.

Tides.—The mean range of tide is about 1.5 feet. Winds greatly affect the tide. Long-continued southerly winds raise the water level in the bay and northerly winds lower it.

Currents.—A strong ebb current sets outward through the dredged cut and causes heavy tide rips if the wind is southerly and of moderate strength. Small vessels bound in or out, when there is a moderate southerly or westerly breeze, should endeavor to reach the entrance during flood current.

See Appendix for **storm warning displays** in the St. Andrew Bay area.

Pilotage.—Licensed pilots are stationed at Panama City. Pilotage is compulsory for vessels in foreign trade drawing more than 6 feet of water, except coastwise vessels having on board a pilot licensed by the Coast

Guard. The taking of a pilot for pleasure craft and Government-owned vessels is optional with the master of the vessel.

Pilots may be obtained by radio request to the St. Andrew Bay Pilots Association, Panama City. Vessels are boarded at the sea buoy off the dredged entrance cut.

Towage.—Towboats may be had at Millville or Bay Harbor. These are small towboats used for towing barges and assisting large vessels in docking.

Quarantine.—There is no quarantine station, but vessels subject to visitation are boarded for inspection at the docks by a representative of the Public Health Service. An outpatient office is in the city.

Customs.—The U.S. Customs officer is on duty 10 a.m. to 12 noon, Mondays through Fridays, but can be reached at any time if needed. The office is in the Post Office Building. Panama City is a port of entry.

Immigration.—The Immigration Service has no offices at Panama City. Vessel agents are required to notify the immigration office at Mobile and the service will be handled by that office.

Harbormaster.—The harbormaster assigns anchorages and berths and enforces the rules and regulations of the port.

Wharves.—The principal commercial wharves at the port are at Bay Harbor, on the southeast side of the city proper. These wharves have rail connections and ample warehouse facilities, and can accommodate deep-draft vessels.

Along **Watson Bayou,** an irregular-shaped body of water with depths of 9 to 17 feet, there are several piers for light-draft vessels. Over the eastern arm, near **Millville,** are two fixed bridges with minimum width of 26 feet and clearance of 13 feet. The channel is unmarked except at the entrance.

In **Massalina Bayou,** north of Bunkers Point, are many landings for small craft. The bayou has depths of 5 to 10 feet. A highway bridge over the entrance has a 40-foot bascule span with a clearance of 7 feet.

A submerged jetty extends along the northwest side of the channel into Massalina Bayou; a light is at the outer end. The drawspan of the bridge and the prominent tank 1 mile to the northeastward form a good range for the channel. A depth of 9 feet can be carried to the marine service stations just above and below the bridge. About 400 yards northwest of Massalina Bayou is the municipal yacht basin. Depths along the face of the inner fuel area were 9 feet, in 1961. It is exposed to wind and seas from the southwest through the northwest. Northwest of the municipal pier is a pier used for receiving petroleum products; depths at the face are more than 10 feet. Another municipally owned long pier, at St. Andrew north of **Buena Vista Point,** is used as a public landing for sport fishermen.

Supplies.—Gasoline and fuel oil can be obtained at Panama City, and water, ice, and provisions are available in large quantities. Marine hardware in limited amounts and yacht supplies are obtainable.

Repairs.—The largest boatyard, in Watson Bayou, has a railway which can haul out vessels up to 110 feet in length, for hull and engine repairs. Other yards in Massalina Bayou and Grand Lagoon have railways, travel lifts and machine shops.

Communications.—Panama City is served by the Atlanta and St. Andrew Bay Railway and has bus connections to all points. A freight steamer makes weekly trips to New Orleans and Tampa. There is some foreign and coastwise shipping. A maritime radio service is in operation.

Chart 1263.—Grand Lagoon extends about 5 miles northwestward from just within the dredged entrance to St. Andrew Bay. A depth of 4 feet can be taken to the marinas near the fixed highway bridge 1.6 miles northwest of the entrance; the bridge has an opening 23 feet wide with a clearance of 8 feet. Gasoline, diesel oil, water, ice, and supplies are available.

East Bay, an arm of St. Andrew Bay extending in a general east-southeasterly direction, is about 18 miles long. The several small settlements on East Bay are of little commercial importance.

West Bay, the northwesterly arm of St. Andrew Bay, is generally free from dangers except for several oyster bars with depths of 5 to 8 feet over them.

Panama City Beach, Long Beach, Edgewater Gulf Beach, Florida Beach, Gulf Resort Beach, and **Laguna Beach** are sections of the residential and resort areas. **St. Andrews State Park** is just northwest of 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 1115.—From St. Andrew Bay westward 85 miles to Pensacola Bay, the shoreline is a gently curving sand beach, unbroken except at the entrance to Choctawhatchee Bay, 44 miles westward 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 southerly winds. Small craft bound westward from St. Andrew Bay should use the Intracoastal Waterway.

Chart 1264.—Topsail Bluff, a slightly elevated knoll, is about 10 miles eastward of the entrance to Choctawhatchee Bay, and can be seen for several miles.

Choctawhatchee Bay Entrance, about 44 miles west-northwest of St. Andrew Bay entrance, extends into the western part of Choctawhatchee Bay between Moreno Point and Santa Rosa Island. Federal project depths are 12 feet in the channel from the Gulf into the bay, and 6 feet in the channel to the harbor at Destin.

From close offshore the entrance is easily identified by the tall fixed highway bridge crossing the channel just inside the east end of Santa Rosa Island. The bridge has a clearance of 38 feet. Seaward of the bridge the channel is marked by an entrance light and a lighted buoy.

The channel shoals rapidly across the bar after each dredging, and shifts frequently. To carry the best depths, mariners should be guided by the color of the water. Passage should not be attempted in rough weather. In 1961, the midchannel controlling depth was 7½ feet in the entrance, and in the side channel to Destin.

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 west to east with 18 to 38 feet in the western two-thirds, except near the shores, and 9 to 12 feet in the eastern third. Traffic in Choctawhatchee Bay consists principally of travel along the Intracoastal Waterway and oil deliveries to Freeport. A small amount of pulpwood is hauled from Black Creek to Panama City. There are good highway connections to Pensacola and Panama City on both the north and south shores of the bay.

A causeway over the bay at **Wheeler Point** has a draw opening at the Intracoastal Waterway channel; clearances are given in Chapter 12. A fixed span, near the point, has an opening 23 feet wide with a clearance of 8 feet.

The **danger zones** of aerial gunnery and bombing ranges are in Choctawhatchee Bay; limits and regulations are given in **§ 204.130,** Chapter 2. The **danger zone** of a guided missiles test operations area is in the Gulf south of Choctawhatchee Bay; limits and regulations are given in **§ 204.135,** Chapter 2.

Choctawhatchee River empties into the eastern end of Choctawhatchee Bay. **Cypress, Indian,** and **Mitchell Rivers** are branch outlets northward of the main river. The mouth of Choctawhatchee River is very shallow, and boats enter through either Cypress or Mitchell River, the latter route being more generally used. In 1961, an area of exposed piling about 1,000 yards wide lay just off the mouths of the several rivers in this system. Cypress River entrance, marked by a light, in June 1961, had 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.**

Freeport (P.O.), a small town on **Fourmile Creek** which empties into **LaGrange Bayou,** is a distribution point for diesel oil, gasoline, fuel oil, and molasses which are brought in by barge. There are no facilities for docking, but vessels may obtain diesel oil, gasoline, fuel, water, ice, and provisions at the oil company's landing. Federal project depth in the channel is 12 feet from Choctawhatchee Bay to the turning basin at the fixed highway bridge at Freeport, which is the head of navigation. In June 1961, the controlling depth was 6 feet, but a depth of 9 feet could be carried with local knowledge to Freeport. The channel is well marked. The bridge has a channel span width of 18 feet and clearance of 5 feet.

Boggy Bayou, about 7 miles north-northeastward from the bay entrance, leads to **Niceville** (P.O.), a small town where diesel oil, gasoline, water, ice, and groceries can be obtained; berthing facilities are limited. The bayou entrance channel is buoyed. Depths of 8 feet or better can be taken to the wharves.

Valparaiso (P.O.) is a small town at the intersection of **Toms Bayou** and Boggy Bayou. Diesel oil, gasoline, water, ice, and groceries are available. A boatyard here can haul out craft up to 65 feet in length for hull repairs. Drafts of 10 feet can be carried to the wharves. See Appendix for **storm warning displays** in the area. A fixed highway bridge across Toms Bayou has a channel span width of 33 feet and a clearance of 11 feet.

A **restricted area** has been designated in **Weekley Bayou,** an arm of Boggy Bayou; limits and regulations are given in **§ 207.175a,** Chapter 2.

Joes Bayou, 2 miles northeast of the bay entrance, is entered through a buoyed channel which, in June 1961, had a controlling depth of 7 feet. The bayou affords good anchorage for small craft. A marine railway here can haul out craft up to 40 feet in length.

Garnier Bayou and **Fivemile Bayou** have a common entrance at the northwest corner of Choctawhatchee Bay, and each has depths of 7 feet or more and excellent anchorage against bad weather. About half a mile above the entrance there are fixed highway bridges with minimum clearance of 19 feet. A yacht club and three marinas are in the bayous; gasoline, water, ice, and some supplies are available. The marina at **Shalimar** has a travel-lift that can hoist 25-foot boats. A marine railway above the bridge in Garnier Bayou can haul out craft up to 50 feet in length, for hull repairs.

Fort Walton Beach (P.O.), at the western end of Choctawhatchee Bay, is on the Intracoastal Waterway; see Chapter 12.

See Appendix for **storm warning displays** in this area.

Destin is a small fishing village and resort on **Moreno Point.** Gasoline, diesel oil, water, ice, and groceries are procurable in the harbor south of the bridge.

Chart 1115.—Santa Rosa Sound and its eastern 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 western 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; limits and regulations are given in **§ 204.134** and **§ 204.136,** Chapter 2.

Charts 1265, 490.—Pensacola Bay lies 110 miles west-northwestward of Cape San Blas and 125 miles northeastward 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 fre-

quently 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 northward and eastward, respectively, from its eastern 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 eastward 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 westward 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 east or west of the entrance, the 10-fathom curve approaches the coast much more closely eastward of the entrance. Depths of 10 fathoms less than 3 miles off the beach indicate the vessel is eastward 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. The principal articles of coastwise trade are petroleum products, chemicals, and naval stores; the principal articles of foreign trade are coal, lumber, naval stores, chemicals, and fertilizer.

Prominent features.—The 220-foot water tank 26.5 miles east of the entrance, the water tank at Pensacola Beach and nearby building 9 miles east of the entrance, and a hotel 6.5 miles west of the entrance show prominently from seaward. The wreck of the old battleship Massachusetts on the point of Caucus Shoal west of the entrance can be seen for several miles.

In Pensacola, the large water tank, a church steeple, the radio mast atop the telephone building, and the Florida National Bank Building, the highest building in town which has a small square elevator house on top, can be identified from offshore. At night the numerous radio towers with occulting red lights on top and the aviation lights are easily seen.

Pensacola Light (30°20.7′ N., 87°18.5′ W.), 191 feet above the water, is shown from a 171-foot conical brick tower, lower third white, upper two-thirds black, on the shore north of the entrance.

Chart 413.—Channels.—The entrance to Pensacola Bay is 0.6 mile wide and is obstructed by shoals extending about 1.5 miles seaward. **East Bank,** with depths of 15 to 18 feet, extends 1 mile southward from the western part of Santa Rosa Island. **Caucus Shoal,** with depths of 2 to 18 feet, extends 1.5 miles from the western side of the entrance. **Middle Ground,** between the two, has depths of 8 to 18 feet; it is marked by a lighted bell buoy off the northwestern tip of the shoal, opposite Fort Pickens.

Caucus Channel, the entrance to Pensacola Bay, extends between Middle Ground and Caucus Shoal. Federal project depth is 32 feet, and the Navy provides additional depth to 37 feet in the bar channel and 35 feet in the channel to the turning basin off the naval air station.

Fort Barrancas lighted range is on an azimuth of 000°. The front range light, 30 feet above the water is shown from a white square pyramidal structure about 350 yards 180° from Pensacola Light. The rear light, 54 feet above the water, is shown from the dwelling of the light station. The light is visible 3° each side of the channel centerline.

Chart 490.—From the deep water of Pensacola Bay, three approach channels lead to the principal piers and wharves at Pensacola. Federal project depths are 30 feet in the channels. The easternmost channel leads to the old Muscogee Wharf, which has been partially removed; the outer end of the channel is marked by a lighted buoy. The central and western channels lead to the Pensacola Port Authority Pier 2 and the Tarragona Street pier. The western channel is marked by a privately maintained unlighted range. A spur channel, unmarked, leads from the western channel to an oil dock; in June 1961, the midchannel depth was 9 feet, but local knowledge was essential to find the best water.

Federal project depth is 21 feet into Bayou Chico, and thence 20 feet into the turning basin. In June 1961, the midchannel depth was 11 feet to off old Shipyard Wharf, and thence 4½ feet to the basin. The channel is marked by lights and daybeacons.

Anchorages.—Good anchorage can be found in any part of the bay except southward of the Naval Air Station. The usual anchorage is off the city of Pensacola where the holding ground is good.

Tides.—Daily predictions of the high and low waters are given in the Tide Tables. Northerly winds sometimes lower the water surface 1.5 feet. Hurricanes may raise the water surface 2 to 9 feet. The diurnal range of tide at the Pensacola waterfront is 1.3 feet.

Currents.—The currents have considerable velocity on the bar at the entrance. 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 southward somewhat across the channel. The flood has less velocity and sets along the channels. The flood has greater velocity following a norther than at other times. Daily current predications for a location in midchannel, southeast of Pensacola Light, may he obtained from the Tidal Current Tables.

Weather.—Northers blow occasionally during the winter, but have little effect on shipping at anchor in the harbor, except to lower the water. From January to April, considerable hazy or misty weather is brought in by southerly winds and cleared away by northerly winds.

See Appendix for **storm warning displays.**

The **danger zone** of a Navy firing range is off Santa Rosa Island; limits and regulations are given in § 204.-140, Chapter 2. A seaplane **restricted area** is in Pensacola Bay; limits and regulations are given in § 207.176, Chapter 2.

Pilotage.—Pilotage is compusory for vessels in foreign

trade and for other vessels, except when having on board a pilot licensed by the Coast Guard. For Government-owned vessels and pleasure craft the taking of a pilot is optional with the master. Pilotage is also optional for vessels drawing 6 feet of water or less, if such vessels have a coastwise license.

Pilots can be obtained by making signal outside the bar or by radio or telegram to the Pensacola Bar Pilots. The pilots have a lookout station about 1 mile east of Pensacola Light and use a small cabin cruiser to meet vessels off Caucus Cut lighted whistle buoy 1. Vessels are taken in day or night.

Towage.—Towboats are available at Pensacola for towing over the bar, up any of the bays, for assistance in docking, and aiding vessels in distress. The towing companies in the area specialize in towing through the Intracoastal Waterway.

Quarantine.—Vessels subject to quarantine must make prior arrangemnts with the Public Health Service at Mobile, Ala. There are several good hospitals in Pensacola. The Public Health Service maintains an outpatient office.

Customs and Immigration.—The offices of both the Customs and Immigration Services ar located in the Post Office Building. Pensacola is a port of entry and marine documents are issued.

Harbormaster.—A harbormaster directs the port and enforces rules and regulations.

Bridges.—No bridges cross Pensacola Bay between the entrance and Pensacola. A highway causeway over the bay between the eastern part of the city and **Town Point** has a fixed span with a clearance of 50 feet.

Wharves.—The piers and wharves at Pensacola have depths alongside ranging from 10 to 30 feet. With the exception of the fish wharves, all have rail connections, four have transit sheds, and most cargo is handled directly from or to cars or sheds.

The principal piers and wharves are owned by the city and are managed by the Pensacola Port Authority. Both main piers have mechanical equipment for handling lumber and general cargo. The Municipal Recreation Pier is just west of the Tarragona Street pier.

The main slip at the Naval Air Station has a general depth of 29 feet. A smaller slip has depths of 9 to 15 feet. Between the two is a long wharf with a depth of about 40 feet off its face.

Supplies.—An unlimited supply of fresh water, suitable for drinking or boilers, is available at all the piers. The oil bunkering facilities have a capacity of 600 barrels per hour. Ice, gasoline, diesel oil, groceries, and marine hardware can be obtained.

Repairs.—Facilities are available for making repairs to hulls and machinery. The largest marine railway, in Bayou Chico, can haul out vessels up to 175 feet in length.

Communications.—Pensacola is a seaport terminal for two railroads. Sailings are made to Atlantic coast, European, Mediterranean, South and Central American, and Caribbean ports, in addition to the Gulf barge service. A U.S. Navy radio station, NAS, and three commercial transmitters operate here. Air transportation is available.

Small-boat facilities.—For short stops, small boats usually berth at the smaller wharves between the railroad piers, particularly between Baylen and Palafox Streets. The municipal Recreation Pier is at the foot of Palafox Street; the large auditorium building is prominent. There are several yacht-storage basins in **Bayou Chico,** on the southwest side of the city. Gasoline and diesel oil can be procured at numerous marine pumps. The two bridges over the mouth of Bayou Chico have bascule spans with minimum clearance of 1 foot. See **§ 203.245** for **drawspan regulations** of the highway bridge. West of these bridges there are two repair yards which can haul out small craft. A small-boat channel with a reported midchannel depth of 4 feet, in June 1961, leads from Santa Rosa Sound through Sabine Inlet to **Pensacola Beach.**

Bayou Texar joins the bay just east of the highway causeway to Town Point. In this bayou a depth of 2 feet can be taken to a marina where gasoline and water can be obtained. Two fixed bridges cross the bayou. The railroad bridge at the mouth has a channel span width of 20 feet and a clearance of 16 feet. The highway bridge about 0.5 mile upstream has a channel span width of 39 feet and a clearance of 12 feet.

Warrington is a suburb of Pensacola on Bayou Grande, which is 3 miles southwest of the center of the city. A dredged channel for seaplanes leads westward through the shoals at the entrance to the bayou and then southward to a turning basin at the Naval Air Station. In June 1961, the controlling depth was 2 feet.

A fixed highway bridge over Bayou Grande at **Jones Point** restricts navigation westward to small craft. The bridge has an 11-foot opening with a clearance of 7 feet.

Chart 1265.—Escambia Bay extends 9 miles northward 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. The channel is through the west draw. The depths in the bay shoal gradually from 15 feet at the mouth to 7 feet in the upper reaches. Federal project depth is 10 feet to the mouth of Escambia River, and thence 10 feet for about 6 miles. In September 1961, controlling depth was about 9 feet through the bay, and thence the same depth in the river for about 6 miles. The channel is marked by lights and buoys.

North of **Devil Point** are shoals and submerged obstructions along the western 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 northwestward, extends northward for 48 miles to the Alabama State line where it is known as the **Conecuh River.** The highway bridge about 1.5 miles above the mouth has a fixed span with a clearance of 43 feet. There is some

commerce in cypress logs and gasoline on this river, the latter barged to a pumping plant about 5 miles above the bridge.

East Bay, an eastward 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 northern arm of East Bay. The dredged channel through Blackwater Bay is narrow, and vessels drawing close to maximum draft must keep on the ranges. Federal project depths are 9 feet through the bay and river to Milton. In October 1961, the controlling depth to Milton was 8 feet.

Numerous wrecks, submerged piling, and other obstructions constitute hazards in Blackwater River. **Wright** and **Marquis Basins** are filled with such obstructions. A boatyard 3 miles below Milton, opposite **Shields Point,** has a marine railway capable of hauling out boats up to 45 feet in length, for hull and engine repairs.

Milton (P.O.) is a small town about 8 miles above the mouth of Blackwater River. Dock facilities are limited at the town; a marina above the highway bridge offers covered dockage for craft up to 25 feet in length. Gasoline, fresh water, and groceries are available; diesel oil must be trucked in. The two drawbridges at Milton, rail and highway, have minimum clearance of 4 feet.

Chart 1115.—The coast between Pensacola Bay and Mobile Bay appears as a low, thickly wooded, unbroken beach. The openings at Perdido Pass and Little Lagoon are not distinguishable from offshore unless approached closely. Depths of 5 fathoms or less extend as much as 4 miles offshore between the two bays.

Charts 1265, 872.—Big Lagoon, which extends westward 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.

Perdido Bay, an irregularly shaped body of water, lies 13 miles west of Pensacola Bay entrance and 26 miles east of Mobile Bay entrance. Depths of 7 to 20 feet are found in the bay and in **Perdido River,** the latter being the river that serves as boundary between the States of Florida and Alabama. **Arnica Bay** and **Bay La Launch** connect Perdido Bay with **Wolf Bay** on the westward. Bayou St. John and Perdido Pass connect the bay with the Gulf to the southward.

The highway causeway over Perdido Bay at **Cummings Point** has an opening 40 feet wide with a clearance of 12 feet.

Perdido Pass, extending between **Florida Point** and **Alabama Point,** is easily distinguished from a mile offshore by the highway bridge across its entrance with two openings. The fixed span over Perdido Pass Channel has a clearance of 35 feet. The fixed span over Cotton Bayou Channel has a fixed span with a width of 47 feet and a clearance of 29 feet. The natural channel through the pass is subject to change and should be used only with local information. The buoys do not always mark the best water. In June 1961, the depth over the bar was 5 feet. The channel extends in a general northeast-southwest direction, with breakers showing on either side.

From the pass a depth of 4 feet can be taken to the Intracoastal Waterway in the lower part of Perdido Bay through a marked channel in **Bayou St. John.** A depth of 2 feet can be carried into **Terry Cove** and **Johnson Cove** through a narrow channel which turns sharply at Alabama Point and passes close to westward of the daybeacon southwest of **Robinson Island.** In Terry Cove there is a boatyard with ways capable of hauling out craft up to 30 feet in length, for general repairs. Gasoline, ice, and water can be procured, and facilities for berthing several yachts are available. In Johnson Cove is a marine service station where gasoline can be obtained. Good anchorage is available in both coves. A marine railway in Johnson Cove can haul out craft up to 45 feet in length, for engine and hull repairs.

A depth of about 3 feet can be taken into **Cotton Bayou** to a marine service station where gasoline and ice are available.

Old River enters Perdido Pass from eastward between Florida Point and **Ono Island.** The mouth of the river is shoal and cannot be entered from the pass except by shallow-draft boats. The Florida-Alabama State boundary passes through Old River.

Chart 1266.—Little Lagoon is a shallow body of water about 6 miles in length and 0.5 mile in width lying just back of the beach between Perdido and Mobile Bays. The lagoon is connected to the Gulf by a small opening, 15 miles east of Mobile Point, through which it is reported that small craft up to 4 feet in draft can enter at high tide during good weather. On the north shore near the eastern end is a boatyard that can haul out small craft for hull repairs. On the north shore east of the entrance there is a small marina where gasoline and oil are available. A launching ramp is at the marina.

7. MOBILE BAY TO MISSISSIPPI RIVER

Charts 1266, 873.—Mobile Bay, 40 miles west of Pensacola and 90 miles northeast of South Pass, Mississippi River, is the approach to the city Mobile and to the Alabama and Tombigbee Rivers. The bay has depths of 9 to 12 feet outside the dredged channels. The entrance is 3 miles wide between Mobile Point on the east and Pelican Point on the west, but most vessels will prefer to follow the dredged ship channel rather than chance passage between the breakers and shoals that extend 4 miles southward on both sides.

Prominent features.—The general appearance of the land is a guide to finding the entrance to Mobile Bay. For a distance of 40 miles eastward of the entrance, the shore, although low, is wooded and unbroken. For 50 miles westward 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 **Sand Island Light (30°11.3′ N., 88°03.0′ W.),** 131 feet above the water shown from a 132-foot black conical tower just west of the bar channel. A two-story white house is on the northwest side of the light. Two conspicuous white radar domes are on the easterly end of Dauphin Island.

Boundary lines of inland waters.—The lines established from Mobile Bay to Mississippi Passes are described in § **82.95,** Chapter 2.

Channels.—Main Ship Channel leads between **Southeast Shoal** and **Mobile Point** on the east and **Sand Island Shoal** and **West Bank** on the west. Federal project depth is 38 feet over the bar. The project is maintained, and controlling depths are given in the Notice of Mariners. In addition to the dredged channel across the bar the natural channel has depths of 21 feet or more. Inside the bar the depths in the channel increase to as much as 60 feet, with a least width of 500 yards between the shoals which rise abruptly from the deep water of the channel. The wreck of the MAGNOLIA, on the eastern side of the channel 0.7 mile southwest of Mobile Point, is marked by a lighted buoy; the masts extend about 20 feet above the water. The channel is marked by lighted buoys, buoys, Sand Island Light, and a lighted range on Mobile Point. The radiobeacon is at the rear range light. This particular station is also equipped for special radio-direction-finder calibration; see the Light List for operational information. See Appendix for **storm warning displays.**

From the westward, 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 Pelican Island and Dauphin Island; thence eastward into Pelican Bay. The best water is obtained by passing to the south of the southern end of **Dauphin Island Spit** before shaping a course northward into Mobile Bay.

From the eastward, only about 4 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 to the Mobile River. Federal project depths in the dredged channel are 36 feet. Although the channel is subject to shoaling, the project depth is generally maintained. The channel is well marked by lights and buoys.

Anchorages.—The best anchorages in the lower bay for deep-draft vessels are found northward and northwestward of Mobile Point and southward of Middle Ground, where depths range 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 has been established just north of Mobile Point; see § **202.194,** Chapter 2, for limits and regulations. Two other anchorages have been designated, one near Cedar Point and the other in Mississippi Sound south of Biloxi; see § **202.194a,** Chapter 2, for limits and regulations.

Small boats sometimes anchor north and east of Fort Morgan in **Navy Cove.** Several rock piles are reported in this locality.

Dangers.—Middle Ground, a tongue-shaped shoal with a least depth of 12 feet, extends into the channel from the eastward 1.5 miles north of Fort Morgan. A nearly continuous spoil bank extends along either side of the bay channel from Middle Ground to the mouth of Mobile River. Through these spoil banks are several openings for passage to various points in Mobile Bay. These openings are charted.

Tides and currents.—The tides are chiefly diurnal and the rise and fall is very small, averaging about 1 foot at the entrance and 1.5 feet at Mobile. During the winter months, 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 11.5 feet.

Daily predictions of the current in Mobile Bay entrance are contained in the Tidal Current Tables, and similar predictions for a number of locations in Mobile Bay vicinity may be obtained from data given in those tables. In this area strong winds have considerable effect in modifying the times and velocities of the current, and in using the tables allowance should be made for such effects.

The tidal current near the outer end of the Main Ship

791-379 O - 65 - 7

Channel is rotary. Both the flood and ebb current set somewhat to the left of the channel direction before reaching their strengths, along the channel at 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.

Weather.—Considerable fog occurs during the early spring months with southerly breezes; northerly breezes clear it away.

The prevailing winds are southerly and southeasterly in spring, southerly in summer, northerly in fall, and northerly and easterly in winter. Severe northers, which blow occasionally during the winter, lower the water in the bay so as to interfere with the deeper-draft vessels bound through the dredged channel. During heavy southerly gales it is not always safe for vessels of over 25-foot draft to attempt to cross the bar. See Appendix for **storm warning displays** in the Mobile area.

Pilotage is compulsory for vessels in foreign trade but not for vessels in coastwise trade having on board a licensed pilot. The pilot boats will be found cruising outside the bar in rough weather or at anchor in smooth weather, near the entrance buoy. The boats are equipped with radiotelephone. Vessels drawing up to 35 feet are taken in or out at any time day or night.

Charts 1266, 872.—Bon Secour Bay, extending about 14 miles eastward of Mobile Bay entrance, has depths of 8 to 10 feet. Oyster beds are very extensive along the northeast shore of the bay. The bay is the route of the Intracoastal Waterway which crosses Mobile Bay Channel at a point 2.6 miles north of the latter's entrance. The waterway is described in Chapter 12.

Bon Secour River empties into the eastern end of Bon Secour Bay. The river is shoal at its mouth. Privately maintained buoys mark a channel leading along the northern shore to the deep water in the upper river, and as far as Bon Secour. In July 1961, the channel had a controlling depth of 5 feet. Small boats go up the river as far as **Coopers Lodge**, about 5 miles above the mouth, but the river is shoal and local knowledge is required beyond the marked channel.

The town of **Bon Secour** (P.O.) is located on the north bank of the river. The post office is about 1.5 miles above the mouth where several oyster and fish houses are located. Gasoline, water, and some provisions are available. In the vicinity are two small boatyards. The larger, located in the bayou leading to Oyster Bay, can haul out boats up to 50 feet in length for hull repairs.

A highway bridge having a fixed span limits navigation to skiffs between Bon Secour River and **Oyster Bay**, a shallow bay south of Bon Secour.

Chart 1266.—Weeks Bay, on the east bank of Mobile Bay about 6.8 miles northwest of Bon Secour River, has an average depth of 2 to 5 feet. A channel with a controlling depth of about 4 feet leads through the entrance and across the bay to **Fish River**. The approach to the bay is marked by a light. About the same depth can be carried into **Magnolia River**. Pulpwood is cut on both rivers and carried to Mobile by barges. Small boats go to **Marlow** on Fish River and **Magnolia Springs** on Magnolia River. A highway bridge over Fish River north of Yupon has a fixed span with a clearance of 35 feet. A small marina at the bridge has gasoline, oil, water, bait, tackle, and a launching ramp.

Pass aux Herons, between Cedar Point and Dauphin Islands, is described in Chapter 12.

East Fowl River enters the west side of Mobile Bay about 13.8 miles northward of the bay entrance. It extends generally southwestward. The entrance is marked by a light, stakes and three privately maintained buoys. With local knowledge, craft drawing up to 3 feet can enter. Just inside the entrance, there is a marina, where limited dockage, gasoline, diesel fuel, water, and some provisions are available. About 0.5 mile above the mouth is a fixed highway bridge with a 43-foot span and a clearance of 24 feet. There are two small piers near the bridge where gasoline is available.

Fowl River, the northwest 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 east side of the bay about 16 miles northward of the entrance; the shoals extending westerly from the point are marked by a light.

Point Clear (P.O.), **Battles Wharf** (P.O.), **Seacliff**, and **Daphne** (P.O.) are summer resorts along the eastern shore. Many of the numerous boat landings are in ruins and constitute a danger to small boats navigating close inshore. Small boats up to 36 feet in length and 2½ feet in draft can be hauled out at the marina and boatyard at Battles Wharf, for hull repairs. Gasoline, oil, fresh water, ice, and marine hardware are available. Covered storage for craft up to 36 feet in length is also available.

Fairhope (P.O.), on the eastern side of the bay about 17.6 miles above the entrance, is a town with telephone, highway, and bus connections. A depth of 9 feet is off the municipal pier. The yacht club is located in **Fly Creek**. The entrance to Fly Creek is marked by a light. Federal project depths are 6 feet for the channel and turning basin. In July 1961, project depths prevailed. There are docks and anchorage in the basin. Small craft use the basin as a refuge during tropical storms and the facilities of the club are open to the public. Gasoline, oil, water, and ice can be obtained.

Hollingers Island Channel leads westward from a point in Mobile Bay Channel, 18 miles north of the entrance, to a dock and turning basin on the western shore of Mobile Bay. The channel is well marked by lights and daybeacons. In July 1961, the controlling midchannel depth was 21 feet.

Dog River, emptying into the western side of Mobile Bay at a point about 21 miles north of the entrance, is used considerably by yachts and small boats. Boats approaching Dog River generally leave Mobile Bay Channel at Light 36 where 5 feet can be carried through a channel marked by a light and daybeacons between the spoil banks. This depth can be carried from the bay into

the river, and for about 7 miles upriver to a railroad bridge having a fixed span with a width of 22 feet and a clearance of 8 feet. The entrance is marked by lights and a daybeacon. A highway bridge crossing the mouth of Dog River has a bascule span with a clearance of 11 feet. An overhead cable crosses at the bridge with a clearance of 80 feet. Gasoline, oil, water, and some provisions can be obtained just inside the bridge and at a marine service station farther up the river. Hull and engine repairs can be made at two shipyards on Dog River. The larger yard can haul out boats up to 70 feet in length. There is a 32-ton travel lift at a marina and repair facilities to handle pleasure craft. Numerous basins for yacht storage are available throughout the river.

Along the western shore of the bay, north and south of Dog River, there are numerous small-boat landings; many, however, are in ruins.

Mobile, 28 miles north 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 naval stores, paper products, lumber, coal and bunker oil, iron and steel products, and fertilizer. The principal foreign imports are bauxite, mahogany, crude rubber, sugar, ores, bananas, and molasses. The coastwise trade consists mainly of petroleum products, lumber, iron and steel products, chemicals, and food products. Inland waterway transportation facilities for handling iron and steel products, ore, sugar, 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 white water tank at Great Point Clear and a water tank on the skyline at Fairhope are conspicuous. On nearing the city, two tall buildings near the waterfront are first seen. The easterly building, which is the higher one, has a pointed finial. Next are seen the water tanks west of Garrows Bend. At night, the aviation light shown from the easterly of the two buildings in Mobile can be seen from almost all points in the bay. The fixed red light on the water tank at Great Point Clear and the fixed white light from the tank at Fairhope are visible from the ship channel. An aviation light at Brookley Field, south of Mobile, and the occulting red lights on the radio towers at the mouth of Tensaw River, are prominent.

Channels.—From a point 25.7 miles north of the main entrance, **Arlington Channel** leads west-northwestward into a turning basin in the westerly part of Garrows Bend. Federal project depth is 27 feet. The channel is marked by lights, buoys, and daybeacons. **Mobile River Channel** extends from the bay channel for 4 miles to the bridge at **St. Louis Point.** Federal project depth is 36 feet from the mouth of the river to, and inside, a turning basin opposite the Alabama State Docks, and thence 25 feet to the mouth of **Chickasaw Creek.** In the latter creek, project depth is 25 feet for about 2 miles to just below **Shell Bayou** entrance. Depths at, or near project dimensions are maintained in these channels and turning basins, but not in the channels above the basins. Controlling depths are published in Notice to Mariners.

Threemile Creek, which leads westward from **Magazine Point,** in July 1961, had a controlling depth of 13 feet into the Industrial Canal.

The old ship channel around the south end of **Pinto Island,** which leads to Tensaw River, has a controlling depth of 8 feet. The channel is marked by buoys. **Pinto Pass** has a depth of 5 feet in an unmarked channel from Mobile River to the highway-railroad bridge which has a fixed span with a width of 20 feet and a clearance of 6 feet. An overhead cable crosses just west of the bridge. Beyond this point the depths shoal to 2 feet.

Anchorages.—With the extensive berthing space available in Mobile there is little need for anchoring in the harbor. Vessels with permission of the harbormaster may anchor abreast the city eastward of the dredged channel, but must maintain position parallel with the channel; not more than one vessel can be anchored abreast.

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 a 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 a railroad bridge with a swing span with a clearance of 6 feet; the channel is through the south draw; see § **203.491,** Chapter 2, for **drawspan regulations.**

Across Threemile Creek there are five bridges to a fixed highway bridge at the head of navigation. The first, a railroad bridge, has a swing span with a clearance of 10 feet. The channel is through the north draw. The second, a railroad bridge, has a swing span with a clearance of 4 feet. The channel is through the north draw. Beyond the Industrial Canal are a highway and a railway bridge with swing spans having a minimum clearance of 1 foot. The channel is through the north draw. See § **203.245,** Chapter 2, for **drawnspan regulations.** About 0.3 mile above these bridges a railroad bridge has a fixed span with a clearance of 10 feet.

The **Bankhead Tunnel** crosses under Mobile River between Government Street and **Blakeley Island.**

Towage.—Tugboats and oceangoing tugs are available at Mobile.

Quarantine.—The quarantine station is in the Courthouse and Customhouse Building. Vessels subject to quarantine are boarded at the dock from 6 a.m. to 6 p.m. There is a Public Health Service outpatient clinic in the Courthouse and Customhouse Building. Mobile has several hospitals.

Customs.—Mobile is a Customs District Headquarters and port of entry. Marine documents are issued.

Immigration.—The Immigration and Naturalization Service maintains an entry office in Mobile.

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 edge of the outer bar

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 assigns berths and enforces the rules and regulations of the port. Ships are handled by the pilots between the sea and the docks only; the harbormaster and his deputies have charge of shifting between berths in the harbor. The harbormaster's office is in Administration Building at the State docks.

Speed limit.—No vessel, except launches, shall exceed the speed of 6 miles per hour in the inner harbor between Mobile Channel Light 40 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 terminal facilities for 24 general-cargo berths, five bulk-handling berths, and several oil terminals. Most piers and wharves, which extend along the west bank of Mobile River, have depths of 36 feet alongside. A depth of 13 feet can be carried into Industrial Canal.

The **Alabama State Docks** comprise a modern port terminal, open to all users alike. The facilities include many concrete wharves, fireproof shipside transit sheds and covered warehouse space, bulk material-handling plant, bonded general cargo warehousing, terminal rail connections, cold storage and quick-freeze plants, and numerous auxiliary facilities including a 75-ton electric derrick, locomotive cranes, lift trucks, tractors and conveyors.

A municipal wharf 1,500 feet long is centrally located on the waterfront. The wharves at the bay entrance, just inside Mobile Point, are in ruins and the broken piling are a menace to small craft.

Supplies.—Full stocks of deck and engineer's supplies are carried in the city. Water almost chemically pure is piped to the principal facilities. Oil companies provide oil-bunkering facilities with capacities up to 1,000 barrels per hour and some State docks are piped for fuel oil with a loading capacity of 1,000 barrels per hour. The State coal-handling plant has a bunkering capacity of 600 tons per hour. Floating equipment is available for delivering bunker coal and bunker fuel oil to ships anywhere in the harbor.

Repairs.—Excellent facilities for practically any class of repair work to the hull or machinery of steel or wooden vessels are available at Mobile. There are three large shipyards. The shipyard located on Pinto Island has drydocks with capacities of 2,500 to 45,000 tons; the largest can accommodate ships 650 feet in length. There are ways for building commercial freighters, and many repair berths. Another shipyard is on Blakeley Island, and the repair yard at the State docks makes topside repairs only, but has berths for several large ships. Smaller shipyards with marine ways are located at the mouth of Blakeley River, south of Fairhope, and in Dog River.

Salvage tugs, seagoing and equipped for heavy work, are available. Barges, derricks, pumps, and diving outfits may be procured for virtually any type of work.

Small-boat facilities.—The principal basins for yachts and small boats are in Dog River. Limited facilities for berthing may be obtained in the west part of Pinto Pass and the smaller docks along the waterfront. All types of supplies and repairs are available. A small-boat basin at Fort Morgan, which is a State Park, has gasoline, oil, fresh water, hotel, and restaurant accommodations. Air taxi service to Mobile and charter boat hire are available. The basin can accommodate boats up to 42 feet in length.

Communications.—Mobile is served by trunk-line railroads, several airlines, and highway connections. Regular steamer communication with most major ports in the world and all the important Gulf, Atlantic, 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 business between the hours of 0430 and 2315. Radio Station WNU, New Orleans, handles traffic for station WLO between the hours of 2315 to 0430. The Harbormaster's office is equipped with VHF–FM Marine Radio, "Channel 16", 156.8 mgc, and "Channel 12", 156.6 mgc.

Mobile River and **Tensaw River** are formed by the confluence of Alabama River and Tombigbee River about 39 miles above Mobile. The controlling depth to the confluence is about 14 feet.

Tensaw River is crossed at its mouth by a highway bridge. The vertical-lift span has been permanently converted to a fixed span with a clearance of 23 feet. An overhead power cable with a clearance of 74 feet crosses the river just north of the bridge.

The **Mobile-Tensaw Rivers Cutoff** connects the two rivers about 8 miles above Mobile. Depths in the cutoff are 20 to 26 feet. From the cutoff the channel into Tensaw River is marked by buoys and an unlighted range on the east bank of the river, but in October 1961, the controlling depth on the range was 13 feet. For vessels drawing more than 13 feet, it is necessary to turn south at the eastern end of the cutoff and pass around the south end of Gravine Island and then proceed upriver in the eastern branch.

A railroad bridge over Mobile River, 8.3 miles above the city, has a swing span with a clearance of 4 feet.

Tensaw River, for several miles north and south of the cutoff, is a United States Maritime berthing area; see **§ 207.900**, Chapter 2, for limits and regulations.

A railroad bridge crossing Tensaw River about 13 miles above the mouth has a swing span with a clearance of 11 feet. See **§ 203.245**, Chapter 2, for **drawspan regulations.**

Light-draft boats can reach Tensaw River either by going up Mobile River to Spanish River and thence down that stream, or from the main channel through the channel south of Pinto Island.

Highway bridges cross the **Blakeley River** and **Apalachee River** at their mouths. They have fixed spans

with a minimum width of 30 feet and minimum clearance of 10 feet. About 0.4 mile south of **Vessel Point** is a small boatyard with marine ways. Boats up to 46 feet in length can be hauled out for hull and engine repairs. A fish camp has gasoline, oil, fresh water, bait, and tackle.

Chart 1115.—Mississippi Sound extends 70 miles west of Mobile Bay between a chain of narrow, low, sand islands and the mainland, providing a sheltered route for the Gulf 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. Mississippi Sound can be entered from Mobile Bay through Pass aux Herons or Grants Pass; 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.

Charts 1266, 873.—Pass aux Herons connects the southwestern corner of Mobile Bay with the eastern end of Mississippi Sound and is a part of the Intracoastal Waterway; see Chapter 12.

Grants Pass, 0.3 mile north of Pass aux Herons, connects Mobile Bay and Mississippi Sound. The channel is unmarked and is used only by small boats.

Dauphin Island (P.O.) is a fishing village and summer resort on Dauphin Island. Federal project depth is 7 feet for a dredged channel from Mississippi Sound through Bayou Aloe to a turning basin of like depth at Dauphin Island village. The controlling depth, in July 1961, was 6 feet. The channel is marked with lights and daybeacons. Gasoline, water, and some provisions are available.

Dauphin Island Bay, eastward of the bridge, accommodates small craft. Gasoline, diesel fuel, lubricants, fresh water, ice, supplies, provisions, and a restaurant are available at a marina. A 12-ton lift can haul out craft up to 40 feet in length for hull and engine repairs. About 0.2 mile northward of **Pelican Point,** the eastern end of Dauphin Island, a Federal project provides for a 7-foot channel from Mobile Bay to a 7-foot anchorage basin, and a 4-foot connecting channel from the basin to Dauphin Island Bay. In May 1962, there were controlling midchannel depths of 7 feet in the entrance channel; 7 feet in the basin; and 4 feet in the connecting channel. The entrance to the channel is marked by a light and a buoy. The recommended entrance to Dauphin Island Bay is through this channel and basin and northward through the connecting channel into the bay. A privately maintained and marked channel leads along the south and west shores of the bay from the connecting channel to the marina and northward and westward into Mississippi Sound. A highway bridge over the northern part of this route has a fixed span with a width of 40 feet and a clearance of 25 feet.

Heron Bay is a shallow bay used mainly by crabbing and oyster boats. A small boatyard at the north end of the bay can haul out small craft up to 35 feet in length and 3 feet in draft for general repairs. Local knowledge is required to reach this yard.

Heron Bay Cutoff, locally known as **The Cutoff,** about 1.8 miles north of Cedar Point, is a pass joining Heron Bay with Mobile Bay. Tidal currents of considerable velocity run through this pass and it is used only by small boats. A highway bridge over the pass has a fixed span with a width of 31 feet and a clearance of 16 feet. Gasoline, oil, water, and limited amounts of provisions can be obtained at the bridge.

Charts 1266, 874.—West Fowl River enters **Fowl River Bay** about 4 miles northwest of Cedar Point. It extends northeastward along the west side of Mon Louis Island, separating it from the mainland, and is joined to East Fowl River by a narrow passage, obstructed by overgrowth, called The Narrows.

Coden (P.O.) is a small fishing village on **Bayou Coden** on the north shore of **Portersville Bay,** northeast of Isle aux Herbes. It has highway and telephone connections. Federal project depth in the Bayou Coden channel is 4 feet to the fixed highway bridge, which has a width of 15 feet and a clearance of 6 feet. In October 1961, the controlling depth was 3 feet. The channel is marked by lights and daybeacons. There is a small marine railway capable of hauling out boats up to 40 feet in length, for hull repairs. Gasoline, diesel fuel, ice, water, and provisions are available.

Charts 1267, 874.—Bayou la Batre, a tidal stream about 9 miles long, empties into Mississippi Sound 1 mile northwest of Isle aux Herbes. Federal project depth is 9 feet from Mississippi Sound to the highway bridge at the town of **Bayou la Batre** (P.O.). In October 1961, project depth was obtained. The channel is marked by a lighted range, lights, and daybeacons. The bridge has a bascule span with a clearance of 8 feet. A fishing and party-boat fleet operates out of Bayou la Batre, and several large canneries are located in the town. Bus and highway connections lead to Mobile and Pascagoula. The nearest railroad connection is at **Irvington, Ala.** Gasoline, diesel fuel, water, ice, and small-boat supplies are available. Along the bayou are four boatyards with marine ways. The largest has facilities for hauling out vessels up to 75 feet in length for general repairs. Machine shop facilities are available. See Appendix for **storm warning displays.**

Petit Bois Pass, an entrance from the Gulf between Dauphin Island and Petit Bois Island, is used primarily by fishing vessels drawing not more than 8 feet. The channel is marked but changes frequently; it can generally be followed by the deep green water during calm weather and by avoiding the breakers during rough weather. In July 1961, a depth of 15 feet could be carried over the bar by following the buoyed channel.

Chart 414.—Horn Island Pass, a deep-draft pass into Mississippi Sound, leads between **Petit Bois Island** and **Horn Island.** The pass is the approach to Pascagoula.

Bayou Casotte has been developed as part of the Pascagoula Commercial Development, under the Jackson County Port Authority. The Federal project depth is 30 feet in the approach channel from Pascagoula Channel to and including the turning basin. In July 1961, the controlling midchannel depth into the basin was 19½ feet. There are two large chemical plants located in the bayou. The industrial area is on the east side of the bayou, with small fish camps along the west bank. Fuel is available. The entrance channel is well marked by a lighted range, lights and buoys. An elevated tank about 0.4 mile east of the mouth of the bayou is conspicuous.

Pascagoula is a shipbuilding port on the north shore of Mississippi Sound, at the mouth of Pascagoula River, 9 miles northwestward of Horn Island Pass. By water route, the port is 72 miles west of Mobile and 51 miles east of Gulfport. The principal industry is shipbuilding and repairs. Exports consist mainly of steel products, grain, fertilizer, general cargo, and chemicals. Imports include pulpwood and logs.

Prominent features.—The most conspicuous object is a tall concrete grain elevator, on the west side of Pascagoula River, which may be seen for several miles. The cranes of the shipyard, a tall elevated tank 0.5 mile eastward of the mouth of the river, and the twin tanks in Pascagoula are prominent from the sound. The structure of the abandoned light on Round Island can be seen from the pass.

Horn Island Light (30°13.4′ N., 88°29.2′ W.), 47 feet above the water is shown from a white wooden dwelling on black piles, 1 mile northeasterly of the western tip of Petit Bois Island.

Channels.—Horn Island Pass and **Pascagoula Channel** connect **Pascagoula Harbor** with the Gulf. Federal project depths are 35 feet across the outer bar at Horn Island Pass; thence 30 feet to the L & N Railroad bridge at Pascagoula; and thence 22 feet to the highway bridge at Moss Point, and thence 12 feet through Robertson and Bounds Lakes and for 3.5 miles up Escatawpa River. Depths are generally maintained and are reported in the Notice to Mariners. In July 1961, a controlling depth of 14 feet was found in Pascagoula River above the L & N Railroad bridge. The channels are well marked with lighted ranges, lights, and buoys.

Anchorage for vessels up to 15-foot draft is available in Mississippi Sound on either side of the channel. The spoil bank is generally to the west of the channel. Deeper-draft vessels may anchor outside the bar, weather permitting.

Tides and currents.—The diurnal range of tide at Horn Island Pass and at the mouth of the river is about 1.7 feet. In Horn Island Pass the tidal current floods northward and ebbs southward. 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.—Northers occur occasionally during the winter months but do not greatly affect vessels at anchor if provided with good ground tackle.

See Appendix for storm warning displays.

Pilotage is compulsory for all foreign vessels and for United States vessels of over 250 tons unless having a licensed pilot aboard. Pilots meet vessels by previous arrangements and go aboard vessels outside the bar in the vicinity of the sea buoy.

Towboats are stationed at Pascagoula.

Quarantine.—Vessels subject to inspection must make arrangements through the Quarantine Station at Mobile.

The nearest marine hospital is at New Orleans. There are outpatient offices at Biloxi and Gulfport. The Jackson County Hospital is at Pascagoula.

Customs.—Pascagoula is a port of entry, but marine documents are not issued.

Harbor regulations.—The movement of all vessels is handled by the harbormaster. No oceangoing vessel shall proceed in excess of 8 miles per hour in the channel from Horn Island Pass to the entrance to Pascagoula Harbor and shall not exceed 5 miles per hour while passing any wharf, dock, or moored craft.

Bridges.—No bridges cross the channel from the Gulf to the municipal wharf. A railroad and a highway bridge cross Pascagoula River about 1.3 miles above the mouth. The railroad bridge has a swing span with a clearance of 7 feet. The highway bridge has a bascule span with a clearance of 31 feet at the center.

Wharves.—The existing municipal wharves are on the west bank of the river. The main wharf is 525 feet long with depths of 27 feet alongside, and is controlled by the Jackson County Port Authority. A new wharf and a two million bushel grain elevator has been constructed on the west bank of the river south of the main wharf. The old municipal wharf on the east bank of the river is now owned by a large fish cannery. A small section of this wharf is still used by fishing vessels for taking on ice. A small-boat basin that has berthing facilities for craft up to 40 feet in length is entered from the east side of Pascagoula River by an unmarked channel 0.5 mile long. In July 1961, the controlling depth was 9 feet to the Coast Guard wharf and 5 feet to the harbor.

Supplies.—Gasoline, diesel fuel, water, ice, marine supplies, and provisions can be obtained in Pascagoula.

Repairs.—The **Ingalls Shipyard** has facilities on its 10 ways for building ships up to 630 feet in length, 86-foot beam and 18,000 tons. The shipyard has 9 berths of about 600-foot length each for any type of engine room and topside repairs.

Several smaller shipbuilding and repair yards are in Pascagoula where numerous tugs, barges, and small craft are built. The largest of these has marine ways with facilities for hauling out vessels up to 1,000 tons and 240 feet in length, for general repairs. Machine shops are in operation.

Communications.—Pascagoula is served by air, railroad, and highway communications. Telephone and telegraph connections are available.

Charts 1267, 875.—Pascagoula (Singing) River, and its tributary, **Escatawpa (Dog) River,** are navigable for 9 miles above Pascagoula to a paper mill, three fish-meal factories, and a chemical plant beyond Moss Point. In July 1961, it was reported that 5 feet could be carried up

Pascagoula River above its junction with Escatawpa River to **Dead Lake**, and thence 3 feet to the junction of **Leaf** and **Chickasawhay Rivers**. Escatawpa River is crossed by two bridges in the vicinity of Moss Point with swing spans. The first, a highway bridge about 0.7 mile above the mouth, has a clearance of 8 feet, and the second, a railroad bridge 2.6 miles above the mouth, has a clearance of 5 feet. Two overhead power cables at the railroad bridge have a clearance of 80 feet.

About 0.5 mile north of the highway bridge at Pascagoula, a dredged canal, with a controlling depth of 7½ feet in July 1961, leads through **Marsh Lake** to West Pascagoula River.

The Pascagoula River channel for three miles above Pascagoula is marked by lights and lighted ranges. Lights mark the cutoff route through Escatawpa River. The controlling depth in the cutoff was 12 feet in April 1960.

About 2.5 miles northward of the highway bridge at Pascagoula, a cutoff leads from Pascagoula River through **Bayou Chemise**, **West Pascagoula River**, and **Middle River** to Mississippi Sound. It is marked by a light at its eastern entrance and a daybeacon in Bayou Chemise. The controlling depth was 7½ feet in July 1961. West Pascagoula River is crossed, about 0.8 mile from the mouth, by a railroad bridge with a fixed span with a clearance of 7 feet, and about 1 mile from the mouth by a highway bridge with a fixed span with a clearance of 12 feet. Three overhead power cables crossing the river between the bridges have a minimum clearance of 12 feet. **Mary Walker Bayou**, entering the river about 0.2 mile north of the highway bridge, has a fishing camp just inside the entrance where gasoline, oil, water, fishing tackle, and boat rentals are available.

Moss Point (P.O.) is about 2 miles above the junction of Escatawpa River with Pascagoula River, about 7 miles above the town of Pascagoula. Gasoline, diesel fuel, water, and provisions are available.

Dog Keys Pass forms a connection between Mississippi Sound and the Gulf at the west end of Horn Island. In 1961 the pass had a depth of 10 feet over the bar and was 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 a lighted buoy, and a light near the western end of Horn Island.

Isle of Caprice formerly existed midway between Horn Island and Ship Island. A large casino was on the island. The island and casino were destroyed by hurricane about 1917, leaving only a pipe from an artesian well. In 1961 this pipe was reported still intact and discharging fresh water.

Charts 875, 876.—Biloxi, a resort on the north shore of Mississippi Sound, is 40 miles west of Mobile Bay and 11 miles east of Gulfport. The city has an excellent beach and a number of large hotels. Biloxi is the center of a large sea-food industry with hundreds of shrimp and oyster boats operating during the season. Numerous large shrimp and oyster canneries are along the eastern length of the waterfront and in Back Bay of Biloxi.

Prominent features.—The tank and radio tower at Ocean Springs, five checkered tanks at **Keesler Field**, the lighthouse, and several large hotels in and west of Biloxi are prominent from offshore. At night the aviation light at Keesler Field, the red lights on the radio tower, and the red neon sign on the hotel at **Beauvior**, are 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 north of the channel.

Channels.—Federal project depths are 10 feet in the channel west of Deer Island to the south waterfront of Biloxi and to deep water in Back Bay of Biloxi, 6 feet in the Coast Guard channel, 6 feet in the channel on the northerly side of U.S. Highway 90 bridge, and 8 feet through Big Lake Bayou into Bernard Bayou. In general, project depths are maintained, but in August 1961, the controlling midchannel depth in the channel west of Deer Island was 8½ feet and the channel north of Deer Island had a controlling depth of 7½ feet; 8 feet could be carried through Back Bay of Biloxi and in Cranes Neck Channel through Big Lake into Bernard Bayou.

A new access channel has been dredged by the Harrison County Development Commission to a depth of 15 feet from the Intracoastal Waterway, at a point about 2.7 miles northward of Dog Key Pass, through **Biloxi Bay** to within 0.5 mile of Highway 90 bridge, with a lateral channel to a turning basin and connecting with the main channel in Biloxi Harbor. The channel is marked by lights and daybeacons.

A side channel leads to a small-boat basin at **Ocean Springs**. The channel is marked by a light and daybeacon. In July 1961, the controlling depths in the basin were 8 feet and 5 feet in the approach channel from the main channel in Biloxi Bay. Gasoline and diesel fuel are available.

Anchorages.—Small craft 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. An anchorage area for unmanned barges and scows is in Mississippi Sound south of Biloxi; see **§ 202.194a**, Chapter 2, for limits and regulations.

Tides.—The diurnal range of tide at Biloxi is about 1.8 feet.

See Appendix for **storm warning displays.**

Pilotage.—No regular pilots are stationed at Biloxi.

Quarantine.—A Public Health Service outpatient office and a municipal hospital are available.

Customs officers are stationed in Biloxi.

Bridges.—Three drawbridges cross Biloxi Bay between Plummer Point and Biloxi. The first, the new Highway 90 bridge, has a double bascule span with a design clearance of 41 feet. The second, the old Highway 90 bridge has a swing span with a clearance of 14 feet. The third, the L&N Railroad bridge has a swing span with a clearance of 4 feet; the channel leads through the west draws

of the swing bridges. Other bridges in the Biloxi area are covered under their respective waterways.

Wharves.—There are many docks along the southern waterfront. Some of these are private facilities for fishing companies but several are open to the public. The city dock is located north of the west end of Deer Island.

Supplies.—Water, ice, provisions, and marine supplies are available. Diesel fuel, gasoline, and oil are available at marine service stations.

Repairs.—Several shipyards are located in Back Bay of Biloxi. The largest has marine ways capable of hauling out vessels up to 80 feet in length for general repairs. The yard also builds boats.

Communications.—Biloxi is served by rail and highway communications. Telephone and telegraph service are available.

Back Bay of Biloxi extends westward from Biloxi Bay to **Big Lake.** Two highway swing bridges cross Back Bay. The one at **Shipyard Point** has a clearance of 10 feet. The fender piling is through the north draw. An overhead power cable crossing just west of the bridge has a clearance of 89 feet. The bridge at **Deep Point** has a clearance of 11 feet.

Tchoutacabouffa River empties into Biloxi River about 1 mile north of Big Lake from the northeast. The river is reported navigable for drafts up to 5 feet to **New Bridge,** about 7 miles above the mouth, and for drafts of 3 feet for an additional 6 miles. Cedar Lake bridge, about 4 miles from the mouth, has a swing span with a clearance of 12 feet. 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 was inoperative in August 1961; the channel is on the north side of the pivot pier; the clearance is 14 feet.

Biloxi River empties into the northeast 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. Chumbula Bridge, about 4 miles above the mouth, has a swing span with a clearance of 9 feet; the channel is on the west side of the pivot pier. A power plant is on the river, and barges carry pulpwood from logging camps upriver.

Bernard Bayou, which empties into Big Lake from westward, is good for a draft of 8 feet through buoyed Cranes Neck Channel in Big Lake to the artificial lake at Gulfport Field. With local knowledge, a reported draft of 3 feet can be carried 1.5 miles father to the head of navigation. The highway bridge at **Handsboro** has a bascule span with a clearance of 12 feet.

The larger of the two shipyards on Bernard Bayou, just to the northeast of Handsboro bridge, has facilities for hauling boats up to 120 feet in length; for complete repairs. Welding and machine shops are at the yard. Boats and barges are built, and sandblasting and metalizing are available.

A basin, 10 feet deep, just below the larger shipyard, and a small basin of the same depth just above Handsboro bridge, are used as harbors of refuge during storms.

Charts 1267, 876.—Ship Island Pass lies immediately westward of **Ship Island,** 47 miles westward of Sand Island Light, and 11 miles northward of the northernmost of the Chandeleur Islands. The pass is the approach from the Gulf to Gulfport and adjoining towns.

Gulfport, the seat of Harrison County, is a growing port and tourist center. It is about midway between Mobile and New Orleans by rail, is on U.S. Highways 49 and 90, and is served by the Louisville and Nashville and Illinois Central Railroads, and by airlines. The city has hotels, motels, and tourist courts.

Gulfport Harbor is a rectangular ship basin between two moles about 0.3 mile apart and extending 0.8 mile offshore. A light marks the outer end of the west mole.

Prominent features.—On a clear day vessels from eastward, bound for Ship Island Pass, usually sight first the trees on the western part of Ship Island, then the light and **Fort Massachusetts,** a semicircular brick fort with sodded parapet, located on the western part of Ship Island. Vessels approaching from southward may see Chandeleur Light first.

Ship Island was cut in half by the September 1947 hurricane and the break-through, about 0.6 mile in width, can be observed from the channel entrance.

Ship Island Light (30°12.5′ N., 88°57.7′ W.), 70 feet above the water, is shown from a white skeleton tower. An abandoned lighthouse is about 0.3 mile northwestward of the light.

Chandeleur Light (30°02.9′ N., 88°52.3′ W.), 99 feet above water is shown from a 107-foot tower, brown below the gallery and black above, near the northwest end of the northernmost of Chandeleur Islands. A lighted bell buoy is about 2.2 miles north-northwest of the light.

On the approach to Gulfport, the conspicuous objects are a large hotel halfway between Gulfport and Biloxi; two water tanks, and the large buildings in Gulfport. At night a red neon sign on top of the easterly large building in Gulfport and the occulting red lights on the tops of the two radio towers can be seen from the sound. An aviation light is shown from a 62-foot tower at the municipal airport.

Channels.—Federal project depth is 32 feet in Ship Island Bar Channel, and 30 feet in the Gulfport Channel and ship basin. Spoil banks border on the western side of the channel. The channels are well marked. The Gulfport range daymarks are difficult to make out in the daytime. Controlling depths are reported in the Notice to Mariners.

The Federal project also provides for the maintenance of a commercial small-boat harbor and entrance channel to a depth of 8 feet close westward of the main harbor. In July 1961, the controlling midchannel depth into the small-boat harbor was 7 feet.

In July 1961 the controlling depth into the yacht basin east of Gulfport Harbor was 6½ feet. Two lights are on the east side of the channel. Berthing facilities are available, and a dockmaster is on duty.

Anchorages.—Large vessels can anchor outside the

bay anywhere westward of a line between Chandeleur and Ship Island Lights and have rather smooth water. An especially good anchorage in stormy weather is west of Chandeleur Light in 4 to 5 fathoms. Just south of the bar the holding ground is good and bar pilots report good anchorage 0.5 mile south of Ship Island Pass lighted bell buoy 26.

Ship Island Harbor, northward 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. Depths in the harbor range from 20 to 30 feet, soft bottom.

Tides and currents.—The diurnal range of tide is about 1.7 feet but the tides are greatly affected by the winds. Northeast to south winds raise the level of the water and southwest to north winds lower the level. A continued norther makes a current on Ship Island Bar of as much as 4 knots. Current velocities up to 1.5 knots have been measured in Ship Island Pass under normal weather conditions.

See Appendix for **storm warning displays.**

Dangers.—The shoal making off from the western end of Ship Island at **West Point** is moving westward. The channel is dredged frequently and when shoal water occurs the buoy is moved westward to mark the channel. Mariners should exercise caution to keep to the westward of this buoy. Mariners are warned not to cut corners at the bends in the channel.

Pilotage is compulsory for all vessels in foreign trade and for coastwise vessels of over 250 tons unless they have a licensed pilot aboard. Arrangements for pilots are made through the shipping agents. Pilots meet vessels outside the bar in a small powerboat. Ships are taken in or out, day or night.

Towage.—Towboats are not stationed permanently at Gulfport, but arrangements can be made with the harbormaster for towage. Vessels usually enter and leave under their own power and use tugs only for docking, undocking, and shifting berths.

Quarantine.—Vessels subject to quarantine must make arrangements through Mobile. A Public Health Service outpatient office is at Gulfport and there are private hospitals. The nearest marine hospital is at New Orleans.

Customs and immgration officers are stationed at Gulfport. Gulfport is a customs port of entry and marine documents are issued.

Harbor Regulations.—The harbormaster at Gulfport has control of anchoring and berthing all vessels at Gulfport.

Speed Limit.—The maximum speed for all oceangoing vessels shall not exceed 8 miles per hour through the channel between Ship Island Bar and the entrance to the Gulfport Harbor, and shall not exceed 5 miles per hour 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 necessary precaution to avoid collision.

Wharves.—Port facilities at Gulfport mostly are on or near the two moles enclosing the harbor proper. Along the west mole is a reinforced concrete pier nearly 2,000 feet long on which are several steel warehouses. The east mole has a reinforced concrete wharf 925 feet in length with steel warehouses. The harbor is serviced by railroad. A high-density cotton compress is in service.

Supplies.—Numerous stores in Gulfport have marine hardware and provisions of all kinds. Fresh water suitable for drinking or for boiler use is piped direct to the docks. Bunker oil can be obtained from tank cars. Gasoline, diesel fuel, ice, and water are available in the commercial small-boat harbor.

Repairs.—No shipyard facilities are available in Gulfport.

Small craft facilities.—The Burt Jones Yacht Basin, in the yacht harbor close east of the main harbor, has berthing facilities for more than 50 yachts and launching facilities for outboard-motor craft. Diesel fuel, gasoline, ice, and fresh water are available.

Communications.—Gulfport has regular steamer connections with Europe, South America, and Far East Ports. The city is served by two railroads, air, and highway connections.

Charts 1268, 877.—Cat Island Channel and its extension **South Pass,** lying between Cat Island, and Isle au Pitre, form the most westerly connection between the Gulf and Mississippi Sound. The buoyed channel has a depth of 14 feet but leads to depths of 7 and 8 feet in the sound. The passage is little used, except by small local craft. The current has an average velocity of 1.5 knots in the channel. **Cat Island** is wooded nearly its whole length east and west. The eastern shore of the island extends in a south-southwesterly direction for 4.5 miles with **Great Sand Hill** on the north and a low, narrow sandspit on the south.

Isle au Pitre, on the south side of Cat Island Channel, is low and marshy with scattered clumps of bushes.

Abandoned Cat Island Light, a 48-foot square house on piles, is near the western part of the island.

Pass Marianne is an alternate passage through the shoals extending across the western end of Mississippi Sound; natural depths are 9 to 14 feet. The pass is south 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. **Grand Pass,** connecting Oyster Bay with Mississippi Sound is marked by a light.

Long Beach (P.O.) a summer resort midway between Gulfport and Pass Christian, has a small-boat harbor which is protected on its east side by a breakwater about 1,000 feet long. A draft of about 3 feet can be carried into the harbor. There is no protection from the southwest.

Pass Christian (P.O.) is a summer resort 8 miles west of Gulfport on the north shore of Mississippi Sound. Federal project depth is 7 feet in the entrance channel and harbor. There are two approach channels, one from the east, and the other from the southwest; both are marked by lights. In July 1961, project depths were obtained.

There is a marine service station in the harbor. Berthing space is available for small craft. Supplies can be obtained. See Appendix for **storm warning displays.**

Henderson Point is at the western extremity of Pass Christian and on the east side of the entrance to St. Louis Bay. Just north of the point, and between the bridges over the bay, is a small-boat basin which is the base for many shrimp and oyster boats. A seafood processing plant is along the entrance channel. In July 1961 the controlling depth into the basin was 3½ feet. Shrimpers entering from Mississippi Sound steer by the water tank at the United States Navy School Facility on Henderson Point until the light on Square Handkerchief Shoal is made out. The entrance to the small-boat basin is crossed by several highway bridges with fixed spans with a minimum width of 10 feet and a minimum clearance of 4 feet. Gasoline, diesel fuel, oil, bait, and water are available at the first bridge.

St. Louis Bay is an indentation in the north shore of Mississippi Sound, 11 miles west of Gulfport. Depths in the bay vary from 5 to 7 feet and decrease gradually toward the shore. The bottom is soft. Two bridges cross St. Louis Bay, the first a railroad which has a swing span with a clearance of 10 feet through the west draw, and the four-lane highway bridge which has a bascule span with a clearance of 17 feet. An overhead power cable about 25 yards north of the highway bridge has a clearance of 60 feet except at the drawspan where the clearance is 80 feet.

Bayou Portage, which empties into the eastern side of St. Louis Bay, is used by small craft as a harbor of refuge during minor storms. The bridge about 1 mile above the mouth has a single-leaf bascule span with a clearance of 12 feet. An overhead power cable crossing just east of the bridge has a clearance of 48 feet. A draft of 5 feet can be carried from St. Louis Bay to a point 1 mile above the bridge.

Wolf River empties into the east side of St. Louis Bay just above Bayou Portage. Federal project depth is 7 feet from the bay into the river; in July 1961 the controlling depth was 4 feet. The channel is marked by a light and daybeacons.

De Lisle (P.O.) a small village on **Bayou de Lisle,** near the mouth of Wolf River, has a boatyard that provides fresh-water storage for small craft and can haul out boats up to 50 feet in length. In July 1961, the controlling depth from Wolf River to the yard was 4 feet.

The dome of a private school at **Shell Beach,** about 3 miles westward of De Lisle, is prominent from seaward.

The highway bridge over Wolf River near De Lisle has a bascule span with a clearance of 13 feet. An overhead power cable west of the bridge has a clearance of 88 feet.

The highway bridge crossing Wolf River about 4.8 miles upstream has a swing span with a clearance of 9 feet. The channel is through the right draw.

Jourdan River flows from westward into St. Louis Bay. Federal project depth is 7 feet; in August 1961, the controlling depth was 5 feet. A small boatyard on **Joes Bayou,** just inside the river entrance, can haul out boats up to 30 feet in length for repairs.

Watts Bayou (Bayou Galere) empties into Jourdan River about 1 mile above the latter's mouth. The controlling depth in the bayou was 3 feet in July 1961. A small boatyard on Watts Bayou can haul out boats up to 30 feet in length.

Bay St. Louis (P.O.) is a summer resort on the west side of St. Louis Bay. A depth of 6 feet can be carried to within 0.3 mile of the town. See Appendix for **storm warning displays.**

Bayou Caddy empties into Mississippi Sound 7 miles southwest of St. Louis Bay. A draft of 3 feet can be carried into the bayou and about 1 mile upstream to an abandoned shrimp factory. The channel leading into the bayou is marked by a privately maintained light and daybeacons. Inside the entrance are landings and stores where gasoline, diesel fuel, and limited supplies can be obtained. Two marine ways are located in the bayou. The first, just inside the entrance, can haul out craft up to 65 feet in length.

Three Mile Pass and **Blind Pass** lead to Bay Boudreau from the southern part of the extreme western 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 1270, 1272.—Chandeleur and **Breton Sounds** lie southward of Mississippi Sound and northward of the Mississippi River Delta; no clear line of demarcation lies between them—Chandeleur is the northerly of the two sounds.

Chandeleur Islands, forming the eastern boundary of Chandeleur Sound, comprise a narrow, crescent-shaped chain of low islands starting 10 miles southward of Ship Island and continuing in a general south-by-west direction for a distance of 23 miles. Southwestward from these islands are **Errol Shoal, Grand Gosier Island** and **Breton Island,** marking the eastern limit of Breton Sound. Chandeleur Sound offers smoother water than the passage eastward of the islands to shallow-draft vessels bound from Mississippi Sound to Mississippi River.

North Islands, Freemason Islands, New Harbor Islands, and **Old Harbor Island Shoal,** are on the eastern 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.

Ostrica Canal leads into Mississippi River at the village of **Ostrica,** 21.5 miles above Head of Passes. The canal locks are 250 feet long, 40 feet wide, and 22 feet deep. The canal affords passage from Breton Sound through **Quarantine Bay** and **Bayou Tortillon** to Mississippi River. In October 1961, the controlling depth was 4½ feet from the Mississippi River to Quarantine Bay.

The western 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 southern part of Breton Sound to the river bank, only the Ostrica Canal leads 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 westward.

The waterways connecting Lake Borgne and Chandeleur Sound via Lake Eloi are discussed under Lake Borgne.

Charts 1270, 1271. A light off Mozambique Point marks the north side of the entrance to Black Bay from Breton Sound. Another light on the north side of Black Bay marks the entrance to **Bayou Terre aux Boeufs.** In March 1959, a draft of 5½ feet could be carried up the bayou to Delacroix. Overhead power cables crossing the waterway have a minimum clearance of 30 feet. **Delacroix** is a small settlement on the waterway about 8 miles south of Lake Borgne. There are marine ways capable of hauling out vessels up to 60 feet in length. Vessels can berth at the wharf. Gasoline, diesel fuel, water, ice, provisions, and limited supplies may be obtained. From Delacroix, a highway extends to Poydras on the Mississippi, and thence to New Orleans. The marsh lands about Black Bay are used extensively for hunting, trapping, and oil development.

Chart 1268.—Lake Borgne, the westward extension of Mississippi Sound, is partly separated from Mississippi Sound by **Grassy, Grand, and Le Petit Pass Islands** and their outlying shoals. Between the islands and shoals are several navigable passages including Grand Island and Le Petit Passes. On the northeast 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. 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. Lake Borgne is tidal, but the tides are small and greatly modified by the winds. The tidal currents through Grand Island Pass have velocities exceeding 1.5 knots at times.

Vessels coming from eastward generally enter Lake Borgne through **Grand Island Pass,** which leads between Grand Island and **Lower Point Clear.** The channel is marked and is a portion of the Intracoastal Waterway.

Le Petit Pass, between Le Petit Pass Island and **Malheureux Point,** is little used.

East Pearl River, the principal mouth of **Pearl River,** empties into **Lake Borgne** from northward. Principal commerce on the river is gravel, sand, and pulpwood. A Federal project provides for a channel 9 feet deep from Lake Borgne into East Pearl River. The midchannel controlling depth was 7½ feet in February 1961. The channel is marked by a light, a daybeacon, and buoys. It is reported that a depth of 8 feet can be carried to Logtown, 12 miles upriver. A railroad bridge with a swing span having a clearance of 14 feet crosses the river at **Baldwin Lodge,** about 1 mile from the mouth. The channel is through the east draw. A highway bridge at **Pearlington,** 8.5 miles above the mouth, has a swing span with a clearance of 10 feet through the east draw.

About 3.5 miles above the mouth, East Pearl River connects with West Pearl River and the Rigolets through **Little Lake Pass, North Pass, East Mouth,** and **West Mouth.** In August 1961, a depth of 6 feet could be carried through the buoyed channel in Little Lake Pass. A depth of 4 feet can be carried from Little Lake Pass to Rigolets through **Little Lake** and **East Pass.** The channel is generally marked by brush stakes, but in August 1961, it was only partially marked and local knowledge was needed to find the best water.

West Pearl River empties through West Mouth into the eastern end of the Rigolets. A Federal project provides for a channel 7 feet deep from the mouth of West Pearl River to **Bogalusa,** La., a distance of about 50 miles; three locks, each 65 feet wide and 310 feet long, with 10 feet over the sill, control the depth in the channel. The controlling depth was 7 feet in June 1961. 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. A railroad bridge and a highway bridge near the town of **Pearl River** (P.O.) have swing spans with minimum clearance of 7 feet; see **§ 203.245,** Chapter 2, for drawspan regulations. The nearby overhead power cables have clearance of 60 feet. In 1961, a new twin highway bridge was under construction, just east of the existing railroad bridge, with fixed spans with design clearance of 30 feet.

The **Rigolets** is a deep passage 7 miles long and about 0.4 mile wide connecting Lakes Borgne and Pontchartrain. Depths range from 20 to 60 feet in the passage bound by low and marshy shores. The entrance from Lake Borgne is 8 miles west of Grand Island Pass. Two swing bridges cross the Rigolets. The first, a railroad bridge about 0.4 mile west of **Catfish Point** in Lake Borgne, has a clearance of 11 feet; navigation is through the east draw. The second, about a mile eastward of Lake Pontchartrain, is a highway bridge that has a clearance of 14 feet.

Currents are very irregular and greatly influenced by winds. They set with great velocity through the Rigolets at times, and especially through the draws of the bridges. Velocities of 2.5 knots off West Rigolets Light and 3.8 knots at the railroad bridge have been observed. At the railroad bridge westerly currents set west-southwest onto the fender on the southwesterly side of the draw, and easterly currents set east by north onto the fender on the northeasterly 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.

Rigolets (P.O.) is a small settlement and railroad station on Rabbit Island. A draft of 12 feet can be carried to the landing on **Little Rigolets** by entering via the Intracoastal Waterway. Good anchorage for small craft is available in Little Rigolets either north or south of the waterway crossing. There is a small boatyard at Rigolets capable of hauling out vessels up to 35 feet in length for general repairs. A power cable over Little Rigolets 250 feet north of the railroad bridge has a clearance of 25 feet.

Fort Pike, an old circular brick fort with sodded top, is just inside the western entrance to Rigolets. To the south of the old fort are several small-boat slips. To the north of the bridge is a boat basin. There are marinas, boatyards, and boat slips, some with complete boatyard facilities, on the Rigolets and on **Geogheagan Canal**. Craft up to 43 feet in length can be hauled out for general repairs. Gasoline, diesel fuel, fresh water, ice, provisions, and marine hardware are available. Covered boat storage for craft up to 40 feet in length is available.

Chef Menteur Pass, a connecting passage between Lake Borgne and Lake Pontchartrain, is located about 9 miles southwestward of the Rigolets. The pass is about 6 miles long and 0.2 mile wide. Considerable depths range in the pass with shallow water off the entrances. The pass, used by pleasure craft and fishing boats, is usually entered through the Intracoastal Waterway. A light marks the entrance from Lake Borgne and two lights mark the Intracoastal Waterway crossing. Chef Menteur Pass is crossed by two swing bridges. The railroad bridge has a clearance of 10 feet. The highway bridge has a clearance of 11 feet. Gasoline, diesel fuel, water, and some other supplies are available at the settlement of **Chef Menteur** (P.O.) between the bridges. The largest marine way can haul out vessels up to 35 feet in length for hull and engine repairs. There are several small-boat slips. See Appendix for **storm warning displays.**

Chart 1271.—Bayou Dupre empties into the southwestern end of Lake Borgne at **Martello Castle.** Petroleum products and fish are the principal commerce on the bayou. Federal project depths are 6 feet from Lake Borgne into Bayou Dupre and thence through Bayou Dupre and **Lake Borgne Canal** to the highway bridge at **Violet** (P.O.). A levee has been built through the abandoned lock which connected the Mississippi with Lake Borgne Canal at Violet. The controlling depth from Lake Borgne through Bayou Dupre and Lake Borgne Canal to the turning basin at Violet was 5½ feet in March 1959. The upper end of Lake Borgne Canal has shoaled to about 3 feet and has many stumps and snags. It is used principally by shrimp fishermen who report that it is difficult to navigate during winter low water. A light and daybeacons mark the entrance to the bayou.

From their common head at the small settlement of **Yscloskey, Bayou la Loutre** flows southeasterly for 25 miles to **Eloi Bay** (chart 1270), and **Bayou Yscloskey** northeasterly for 2 miles to Lake Borgne. **Bayou St. Malo** leaves Bayou la Loutre 8 miles eastward of Yscloskey and flows northwesterly 5 miles to Lake Borgne. Principal waterway cargoes are crude petroleum and steel-mill products.

Federal project depths are 5 feet from deep water in Lake Borgne to the shoreline at the mouth of Bayou Yscloskey; 6 feet from deep water in Lake Borgne through Bayou St. Malo, Bayou la Loutre, and **Bayou Eloi** (chart 1270) to deep water in **Lake Eloi;** and 5 feet in Bayou la Loutre between Hopedale and Bayou St. Malo. The entrances to Bayou Yscloskey and Bayou Eloi are marked by lights. In March 1959 controlling depths were 6½ feet over the bar in Lake Eloi and through Bayou la Loutre to its junction with Bayou St. Malo, and thence 5 feet to Hopedale; thence 6 feet to Bayou Yscloskey; in April 1960, 4½ feet in Bayou St. Malo into Lake Borgne; in January 1961, 5 feet over the bar in Lake Borgne to Bayou Yscloskey, and thence, in March 1959, 5½ feet through Bayou Yscloskey to its junction with Bayou la Loutre.

The marine ways at Yscloskey can handle boats up to 40 feet in length. Gasoline, diesel fuel, water, ice, provisions, and limited quantities of other supplies are available. The bridge over Bayou la Loutre at Yscloskey has a vertical-lift span with a width of 45 feet and vertical clearances of 2 feet down and 50 feet up. Overhead power cables crossing Bayou Yscloskey and Bayou la Loutre have a minimum clearance of 30 feet.

Hopedale, 3 miles southeastward along Bayou la Loutre from Yscloskey, has a 150-foot wharf. Gasoline, diesel fuel, water, ice, and provisions are available.

Chart 1269.—Lake Pontchartrain, a fresh-water lake roughly elliptical in shape, is 36 miles long, 22 miles wide at the widest part, 10 to 16 feet deep, and lies northward 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 and foodstuffs.

The periodic tide is negligible but the variation in the water level due to winds may have 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 northwest winds prevail.

A highway and a railroad causeway cross the eastern end of Lake Pontchartrain. On the highway causeway are two bascule bridges; one about 1 mile south of **North Shore** has a clearance of 13 feet; the other, about 0.5 mile north of Point aux Herbes, has a clearance of 12 feet. On the railroad causeway are two swing bridges; one about 1 mile south of North Shore has a clearance of 2 feet; the other about 1.5 miles north of **South Point** has a clearance of 1 foot. Overhead cables cross at both highway bridges with clearances of 12 feet but are submerged at the channels.

In 1960, a new highway causeway and bridges were under construction across the easterly part of the lake.

The **Greater New Orleans Expressway** extends 20.9 miles across Lake Pontchartrain from Indian Beach Shore to

Lewisburg. Five bridge openings, alternately fixed and bascule, are spaced at intervals of about 3.4 miles along the causeway, the first one north from Indian Beach Shore being a fixed structure. The minimum clearances are 22 feet for the fixed bridges and 18 feet for the drawbridges.

A pipeline crosses the lake beginning at a point in the vicinity of **Bayou Piquant** and extends in a northeasterly direction to Mandeville. Lights mark the pipeline.

Middle Ground is the shoal portion of Lake Pontchartrain near the Rigolets. A dredged channel extends across the northeastern part of Middle Ground between the Rigolets and deeper water in the vicinity of the northeasterly pair of drawbridges. Lighted ranges and buoys mark the channel which in August 1961 had a controlling depth of 8½ feet.

Bayou Bonfouca, which empties into Lake Pontchartrain 3 miles northwest of the north railroad swing bridge, is the approach to the town of Slidell. Federal project depth is 10 feet from deep water in Lake Pontchartrain to Slidell. In October 1961, the controlling depth over the bar was 4½ feet. The highway bridge at Slidell has a swingspan with a clearance of 2 feet through the west draw. 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.

Slidell (P.O.), a town on a main highway and railroad to New Orleans, has a well equipped shipyard. The facilities for construction or repair of steel or wooden vessels include several marine ways and a commercial graving dock 327 feet long. Tugs, barges, and diving equipment are available for towing or salvage work. Gasoline, diesel fuel, water, ice, provisions, and some boat supplies are available by truck. Other facilities include three loading slips and one wharf with a tramtrack connection.

Lacombe Bayou empties into Lake Pontchartrain 4.5 miles westward of Bayou Bonfouca. A Federal project provides for a channel 8 feet deep through the entrance bar in Lake Pontchartrain and the removal of snags and overhanging trees in Lacombe Bayou as far as the fish hatchery. The controlling depth in October 1961, over the bar was 6½ feet; thence 5½ feet to the highway bridge at Lacombe about 6 miles above the mouth; thence 8 feet, in August 1961, to the fish hatchery 1 mile above the highway bridge. The entrance channel is marked by a light and an unlighted range. Overhanging trees obstruct the bayou above the fish hatchery.

A railroad bridge about 4.5 miles above the mouth and a highway bridge at **Lacombe** (P.O.) have swing spans with a minimum width of 45 feet and clearances of 5 feet; see **§ 203.245,** Chapter 2, for **drawspan regulations** of the highway bridge. Overhead power cables crossing at the bridges have a minimum clearance of 60 feet. Commerce on the bayou includes shipments of scrap iron, petroleum products, and drilling equipment. Gasoline, diesel fuel, oil, and fresh water are available 0.5 mile below the railroad bridge.

Mandeville (P.O.) is a summer resort on the north shore of Lake Pontchartrain 20 miles north of New Orleans. Many of the boat landings on the north shore are in ruins. A protected landing is in **Bayou Castine.** In August 1961, the controlling depth over the bar was 7 feet. To enter the bayou, pass 30 feet from the daymarker at the east jetty. There are berthing facilities, and engine repairs can be made. Gasoline and provisions are obtainable by truck.

Tchefuncta River flows into Lake Pontchartrain about 21 miles northward of New Orleans. Federal project depth is 10 feet from that depth in Lake Pontchartrain for 3.5 miles up Tchefuncta River; thence 8 feet in the river and its tributary, **Bogue Falaya,** for 11.5 miles to **Covington,** Louisiana. In October 1961, the controlling depth was 10 feet over the bar and for 9.5 miles in the river; thence 2 feet for another 3 miles. The entrance is marked by a lighted range, a daybeacon, and buoys. A highway bridge crossing the river at Madisonville has a swing span with a clearance of 1 foot. The overhead power cable at the bridge has a clearance of 71 feet. Commerce on the river includes fish, lumber, ship repair, and shipbuilding.

Tows through the bridges are limited to 1 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 (P.O.), a town 1.5 miles up Tchefuncta River, has public landings at either side of the bridge. Diesel fuel and gasoline are available by truck, and water and provisions can be procured.

A marina, located about 0.4 mile above the highway bridge, has gasoline, oil, fresh water, and covered storage. The larger of two marine railways, near Madisonville, can haul out craft up to 100 feet in length. There is one tug available.

An overhead power cable extends generally around the perimeter of the western part of Lake Pontchartrain, from the shore near Madisonville to a point about 6.4 miles west of New Orleans. Clearance is 40 feet throughout except at the entrances of Pass Manchac, where the clearance is 90 feet, and Tangipahoa River, where the clearance is 60 feet. Privately maintained lights partly mark the cable.

Tangipahoa River, flowing into Lake Pontchartrain 6 miles southwestward of Tchefuncta River, is a narrow stream. In November 1961, the controlling depth on the bar was 2 feet, with deeper water inside. Lights mark the entrance channel. Gasoline is available 12 miles above the mouth.

Pass Manchac is a passage 5.5 miles long connecting Lake Pontchartrain with Lake Maurepas. Depths in the pass range from 23 to 50 feet, but the approaches in both lakes, across long bars, restrict navigation to drafts of about 5 feet. From Lake Pontchartrain there are two approach channels, **North Channel** and **South Channel,** the east side of the entrance to each being marked by a light. Both lead to Pass Manchac Light on the north point at the easterly end of the pass. In November 1961, the controlling depth was 5 feet over the bars at the North and South Channels at the east end of the pass, and in May 1961, 23 feet in the pass. In November 1961,

the controlling depth was 4 feet in the west approach channel along the north shore in Lake Maurepas, and in March 1959, along the south shore was 5 feet.

The west end of the pass is crossed by two bridges, rail and highway; the railroad bridge has a swing span with a clearance of 4 feet, and the highway bridge has a fixed span with a clearance of 51 feet. On the north side of the pass between the bridges is a wharf where boats up to 40 feet in length and 4 feet in draft may berth. Water, ice, provisions, and gasoline are available, but diesel fuel must be trucked in.

Lake Maurepas, lying west of Lake Pontchartrain, is 11.5 miles long in a northeast and southwest direction, and from 4 to 8 miles in width. Depths range between 10 and 12 feet. 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.

To enter Lake Maurepas from Lake Pontchartrain, pass 125 feet west of South Channel Light and head for Pass Manchac Light. Haul around the point at a distance of 150 to 200 yards, and steer midchannel courses through the pass to the bridges. Then follow the north shore at a distance of 200 to 300 yards for 1.5 miles to avoid the middle ground in the lake entrance.

To go to Tickfaw River, steer **310°** for 3 miles until the light off the entrance opens well clear of the east side of the entrance, then steer for the light on a **000°** course. To get to Amite River, steer **270°** for 6 miles keeping the light a little on the port bow. Leave the entrance markers and the light to the southward and take a midchannel course into the river.

Tickfaw River flows into the northerly end of Lake Maurepas over a bar with a controlling depth of 4½ feet in November 1961. The river had depths of 10 feet for 13.5 miles and above that is blocked by overhanging trees. The entrance channel is marked by a light and a daybeacon on the west side of the mouth and by daymarkers. On the east side of the entrance are stumps, and on the west side, a large shoal. The tributaries of this river, **Natalbany** and **Blood Rivers,** join it 1.7 and 7 miles, respectively, above its mouth. There is a highway bridge 7 miles above the mouth, just south of the junction of Blood River, which has a swing span with a width of 43 feet in the north draw and a clearance of 1 foot. An overhead power cable over the river has a clearance of 70 feet. Gasoline, oil, and fresh water are available near the bridge. **Pontachoula River** is a tributary of Natalbany River, 3.5 miles above its junction with the Tickfaw. All of these streams are navigable in part for any draft that can be taken across the outer bar. Principal shipments on the rivers are lumber and shells.

Amite River empties into Lake Maurepas 8 miles westward of Pass Manchac. The entrance is marked by a light. Principal shipments on the river are shells.

In entering Amite River, pass well to the eastward of the light. In November 1961, the controlling depth on the bar was 4½ feet at the entrance. After crossing the bar, the controlling depth, in November 1961, was 13 feet for about 22 miles; thence 7½ feet in March 1959, to its junction with Bayou Manchac, about 31 miles above the mouth. From a point about 12 miles above the mouth, there are overhanging trees and snags. In Bayou Manchac, in March 1959, the controlling depth was 1½ feet across the bar; thence 4½ feet to the head of navigation at the Airline Highway bridge, about 6.5 miles above the mouth, which is the head of navigation.

Three highway bridges cross Amite River between the mouth and Port Vincent, about 28 miles above the mouth. The bridge at **Clio,** about 5 miles above the mouth, has a swing span with a width of 40 feet in the north draw and a clearance of 4 feet. There is a wharf at the bridge with berthing facilities for craft up to 40 feet in length. Gasoline, fresh water, electricity, and provisions are available. The bridge at **French Settlement,** about 19 miles above the mouth, has a swing span with a clearance of 15 feet; see **§ 205.245,** Chapter 2, for **drawspan regulations.** The bridge at **Port Vincent** has a swing span with a clearance of 3 feet.

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. 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 railroad trestle is about a mile above the Airline Highway bridge.

Blind River enters Lake Maurepas 5.7 miles south of Amite River. In November 1961, the controlling depth over the bar was 5 feet; thence 11 feet to the Airline Highway, which is the head of navigation. The south side of the entrance to the river is marked by a light.

The **Bonnet Carre Floodway** is located on the southwestern 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 which may be deposited into the lake due to the operations 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 sea wall has been built along the south shore of the lake from West End Park eastward to New Orleans Airport.

At **West End Park** is a protected yacht harbor which is entered from eastward. Gasoline, diesel fuel, water, small-boat supplies, and both open and covered berthing for over 600 craft up to 80 feet in length and 10 feet draft are available in the yacht harbor. Marine hardware and repairs are available adjacent to the basin. See Appendix for **storm warning displays.**

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 south side of the entrance; a fog signal is at the light.

Pontchartrain Beach, a pleasure resort, is east of Spanish Fort. Two 130-foot floodlight towers make good landmarks.

Measured Course.—A measured statute mile on the bearing 084°30′, is off Pontchartrain Beach.

The Lake Pontchartrain entrance to the Inner Harbor Navigation Canal is marked by a light. Floodlighted towers at **Lincoln Beach Park,** 4 miles northeastward from the airport, are good landmarks.

8. MISSISSIPPI RIVER

Charts 1115, 1116.—Mississippi River empties into the north 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 east of Galveston, and 440 miles east of Corpus Christi. The river is the access to 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. For more detailed information, see Distance between United States Ports, Third (1961) Edition.

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°54.4′ N., 89°25.6′ W.),** 51 feet above the water, is shown from atop a lookout tower on a white dwelling on black piles, near the outer end of the East Jetty. A radiobeacon and fog signal are at the light.

South Pass Light (29°00.9′ N., 89°10.0′ W.), 108 feet above the water, is shown from a 116-foot pyramidal skeleton tower, enclosing a cylindrical stair well and dwelling, painted white below the gallery, black above, located on the west side of the pass about 2.2 miles from the outer end of the jetties. A radiobeacon and fog signal are at **South Pass West Jetty Light,** near the outer end of the West Jetty at the mouth of the pass. This particular station also is equipped for special radio-direction-finder calibration; see Light List for operational information. Two tanks southeastward of Southwest Pass Entrance Light are the next most prominent objects.

The discolored water discharged 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 northerly 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, course grass and weeds.

Boundary lines of inland waters.—The lines established from Mobile Bay to Mississippi Passes, Mississippi River, and Mississippi Passes to Sabine Pass, are described in §§ **82.95, 82.100,** and **82.103,** Chapter 2.

Channels.—The improved ship channels into Mississippi River are 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 30-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 35 feet to Baton Rouge.

In early 1962, work was rapidly nearing completion on the Federal project to dredge the **Mississippi River-Gulf Outlet Seaway Canal,** 66 miles long and 36 feet deep, from the Inner Harbor Navigation Canal at New Orleans southeasterly along the shore of Lake Borgne and thence to the 38-foot contour in the Gulf eastward of Breton Island.

Bridges.—General rules and regulations for the operation of drawbridges over the Mississippi River and its navigable tributaries and outlets are given in § **203.555,** Chapter 2.

Anchorages.—In heavy weather all 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. Anchorage areas at Pilottown and New Orleans are described in § **202.195,** Chapter 2.

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.

Flocculation, locally known as **Slush,** is a 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 over-run by the encroaching marshland.

A shoal with depths of 9 to 16 feet extends along the west side of the approach channel to Southwest Pass for about a mile beyond the end of the west jetty. The position of this shoal and its depths are rather constant except for changes during and after high-river stages in the spring.

Tides.—In the passes the tide has generally but one high and one low water in 24 hours, the diurnal range varying from 1.6 to 1.8 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 southeastward 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 north and east.

During a light southerly wind a northeasterly set of 2.2 knots has been observed 13 miles southeast of South Pass entrance, and at the same time there was an easterly set of 0.5 knot at the lighted whistle buoy off the entrance.

At Southwest Pass entrance midchannel lighted whistle buoy the current is due chiefly to the discharge of the river. In general it sets southwestward 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 southeastward 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 21 feet, the mean difference is about 14 feet. Zero on the Carrollton gage is 0.13 foot below Mean Gulf 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 westerly set. At Southwest Pass it sets straight out from between the jetties, thence spreading out fan shaped, with slightly greater velocity to westward.

Weather.—From December to June, fog may be encountered anywhere from 60 miles off the passes to the city of New Orleans. Southerly and easterly winds bring it in, and northerly and westerly winds clear it away. See Appendix for **storm warning displays.**

Routes.—Approaching the mouth of the river from Florida Straits, deep-draft vessels usually set a course direct to the passes from a position about 10 or 12 miles southwestward of Dry Tortugas Light on Loggerhead Key. Low-powered vessels of moderate draft sometimes pass northward from Florida Straits through Rebecca Channel, to the westward of Rebecca Shoal Light, and for 200 miles set a course 10° to 20° northward of the course to the passes of the river, and then change course for the passes. 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 southwestward 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.

Vesels bound to Southwest Pass sometimes fall westward of the Mississippi River delta, a situation which the mariner can quickly ascertain by watching the lead. 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 northeastward of the lighted whistle buoy off South Pass and then follow the curve southwestward until the buoy is located. During thick weather, vessels might ground northeastward of South

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Pass and northward 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.

Pilotage.—The port of New Orleans has three associations of pilots: The Branch Pilots for the bar, the Crescent River Port Pilots for the river between Pilottown and New Orleans, and the New Orleans-Baton Rouge Steamship Pilots for the river between New Orleans and Baton Rouge. The bar pilots will generally be found outside the entrances to South and Southwest Passes or they can be signaled for from the lighted whistle buoys outside the entrance to the passes. They use motorboats for boarding outside the bar and take vessels up to Pilottown, 2 miles above the Head of Passes. The river pilots take vessels from Pilottown up the river to New Orleans and if continuing upstream, will notify the upper river pilots for pilotage to destinations above New Orleans.

At the bar, pilotage is compulsory for vessels in foreign trade and also for vessels in domestic trade except those under 100 tons lawfully engaged in coasting trade, and coastwise steam vessels having on board a pilot licensed by the United States Coast Guard. Pilotage on the river is also compulsory with the above exceptions and also with the exception of sailing vessels, and barges in tow of river or harbor towboats.

In Southwest Pass, the Pilot Station is on the East Jetty, about 0.8 mile inside the entrance. In South Pass, the Pilot Station is a small settlement on the west bank about 0.5 mile above the end of the jetties.

Towage.—Tugs, ranging up to 2,500 horsepower, are available for assisting in docking and undocking, towing in the harbor and canal, and towing to sea. At the Port of New Orleans the public berthing facilities are of the marginal wharf type, and vessels are usually able to dock and undock without the aid of a tug. 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.

Quarantine.—The quarantine station is on the west bank of the river about 0.5 mile above Chalmette Slip. Vessels come to anchor in front of the station where they are boarded by quarantine officers. The anchorage site is 3,000 feet long. The upper end is indicated by a quarantine anchorage sign. Service is maintained from 6 a.m. to 6 p.m. Outside of these hours, vessels will be boarded on request, but a charge is made for services. Inspection services for Baton Rouge and Belle Chasse are performed by personnel from the New Orleans station. Port Sulphur is served by personnel from Morgan City. A U.S. Public Health Service Hospital is at New Orleans.

Customs.—New Orleans and Baton Rouge are ports of entry and marine documents are issued. 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 services at the port facilities at Avondale, Belle Chasse, Braithwaite, Chalmette, Destrahan, Gretna, Harvey, Marrero, Norco, Port Sulphur, St. Rose, and Westwego. There is an office at Baton Rouge for processing vessels crew arrivals.

Harbor regulations.—Federal regulations for navigation of the river are given in § **207.200**, Chapter 2.

Supplies.—An unlimited supply of ship stores, marine hardware, and provisions can be obtained at New Orleans. Fresh water is available at all piers and wharves. 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 under-water hull and engine repairs. The largest floating drydock has a capacity of 20,000 tons for a length of 650 feet. Shipbuilding and ship repair plants are well equipped with machine shops and foundries. Floating cranes up to a capacity of 300 tons are available. There are marine railways and boatyards for repair of medium and small craft.

Salvage facilities.—Equipment necessary for heavy salvage work at sea or in port is available at New Orleans, including floating derricks, dredges, barges, pumps, diving equipment and ground tackle.

Chart 1272.—Southwest Pass, the westernmost of the passes of the Mississippi, is 18 miles west-southwestward of South Pass entrance and 295 miles eastward 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 southward from the jetty ends. From the buoy to abreast of Southwest Pass Entrance Light Station, the channel is marked by lighted buoys on the west 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.

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.

In the pass the banks are a sufficient guide. Lights are on the east and west banks and a lighted range for entering the pass is at its head.

Burrwood is on the southeast bank 5 miles above the jetties. Gasoline and provisions in limited quantities are available here. See Appendix for **storm warning displays.**

South Pass, one of the two important commercial entrances to Mississippi River from the Gulf lies 425 miles northwestward of Dry Tortugas and 90 miles southwestward 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 easterly or southerly direction.

The entrance approach is marked by a lighted whistle buoy, 1.5 miles southeastward of the end of the jetties, and by a lighted bell buoy marking the shoal ground lying between 0.2 and 0.5 mile off the end of the jetties on the west side of the channel. This dangerous shoal has depths of 3 to 17 feet over it. The lighted bell buoy marks the eastern 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 west side of the channel.

Stand in for the lighted whistle buoy and bring the South Pass West Jetty Lighted Range on the bearing **297°.** Steer this range, passing to the northeastward of the lighted bell buoy and about 250 feet to the westward of the end of the east 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 east jetty is approached. The vessel should be headed to meet the current, and by the time she is abreast the east 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 east and west banks and a lighted range for entering the pass is at its head.

The passes begin to diverge 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 30-foot Federal project for South Pass. Dredging is necessary to maintain both channels to near project depths. 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 the point from which measurement is made of all distances on the river southward or below to the mouth of the passes, and northward or above to Cairo, Ill.

Pass a Loutre and its branches, **Southeast Pass, North Pass,** and **Northeast Pass,** flows easterly 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 whistle buoy and a bell buoy, and Southeast Pass by a bell buoy.

An abandoned lighthouse, a 76-foot black and white spirally-banded tower, is on the north side of Pass a Loutre, 2 miles inside the entrance. Another abandoned lighthouse, a grayish-white tower, is about 0.5 mile north of Northeast Pass and 2 miles west of the entrance to the pass.

The marsh lands south of Main Pass are used extensively for hunting, oil operations, and 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 36 to 193 feet. There are a few shoals along the river banks, the outer limits of most of which are marked by lighted buoys. On both sides of the river the land is dry, and in the lower reaches it is covered mostly with course grass and willows.

Above Bohemia on the east side and The Jump on the west, levees prevent overflow at high water. Below Bohemia a 10-mile break in the levee permits flood waters to move eastward 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 east side, formerly laid out in sugar and rice plantations, now is given over to pasturage, and market gardens. Extensive orange groves are back of the levees on the west side. New Orleans is reached by river boats and also by railroads and highways which extend down the west bank to Venice (The Jump) and down the east bank to Pointe a la Hache, 9 and 42.5 miles, respectively, above Head of Passes. There is a private road from Pointe a la Hache to Huling.

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 the Standard Oil plant immediately above 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 guide. The distance from Head of Passes to New Orleans is 82.5 miles.

Pilottown (P.O.) is a small settlement on the east bank of the river about 2 miles above Head of Passes. Vessels inbound from sea drop the bar pilot and pick up the river pilot, and outbound in reverse. There is an oil storage area and a wharf for oceangoing vessels. There are a few piers where small vessels can obtain gasoline, oil, or provisions in limited quantities. The wingdams in the vicinity of Pilottown, and the pilot associations wharves and lookouts are marked by lights. See Appendix for **storm warning displays.**

Cubits Gap is an opening in the east bank 3 miles above Head of Passes, at which **Raphael,** Main, and **Octave Passes** meet and connect with the river. These passes are navigable for small craft, but Main Pass is the only one having navigable connection with the Gulf. A sill of willow brush weighted down by rocks has been laid across the entrance to each of these passes; at certain spots these may be crossed by drafts of 5 to 9 feet, with local knowledge.

Cubits Gap Light, on the southeast side of the gap, is a light of 1,200,000 candlepower shown from an 80-foot white skeleton tower; a fog signal at the light is sounded continuously from November 1 to April 30.

Main Pass has a depth of about 4 feet over the bar, at the Gulf entrance, and about 9 feet over the sill at the river entrance at Cubits Gap. The passage over the sill is marked by a daybeacon and an unlighted range. This pass is used considerably by fishing vessels and oil companies operating in Chandeleur and Breton Sounds.

The Jump is an opening in the west bank 9 miles above Head of Passes, where Grand 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 the pass into the Gulf.

Venice (P.O.) and **Boothville** (P.O.) are small settlements on the west bank 10, and 14 miles, respectively, above Head of Passes. At Venice there is a marine ways capable of hauling out vessels up to 65 feet in length for general repairs. Diesel fuel, gasoline, fresh water, ice, and provisions are available; there is a 200-foot wharf. A bus connection is maintained to New Orleans.

At Boothville there is a wharf 100 feet long where fresh water and provisions may be procured. Gasoline is available by truck.

At **Olga,** across the river from Boothville, a small machine shop and boatyard are in operation. Marine ways there can haul out boats up to about 90 feet in length for general repairs. Some supplies may be obtained. From behind the levee, a canal leads to **Grand Bay** where there are numerous oyster camps.

The Ostrica Canal, described in Chapter 7, has its Mississippi River entrance at Ostrica, a small settlement opposite Buras.

Chart 1271.—Buras (P.O.), 21.5 miles above Head of Passes, Empire and connecting canal and lock, and Myrtle Grove are discussed in Chapter 9.

Docking facilities for ocean-going vessels are available at **Port Sulphur** (P.O.), 33 miles above Head of Passes. The wharf has a face of 5,000 feet along the river, with dolphins and mooring clusters providing berthing space of about 6,000 feet. Depths alongside are 30 feet or more.

The wharf is equipped with sulphur-handling machinery. See Appendix for **storm warning displays.**

Pointe a la Hache, 42.5 miles above Head of Passes and 40 miles below New Orleans, is the seat of Plaquemine Parish which embraces most of the lower Mississippi River. Gasoline, fresh water, and some provisions can be obtained. There is 4 feet of water at the old ferry wharf, north of the new ferry float, but at low water boats must anchor out and get supplies by skiff. A ferry crosses the river here. There is a new ferry in operation between **Belle Chasse** (P.O.), and **Scarsdale** about 65 miles above Head of Passes.

Harvey Canal, at Harvey opposite New Orleans, and the Algiers Lock opposite Chalmette, connect Mississippi River with an extensive network of inland waterways west of New Orleans.

Charts 1269, 497.—New Orleans is one of the largest cities on the Gulf and one of the largest ports in the United States. Located on both banks of the river about 96 and 102 miles, respectively, above the entrances to South and Southwest Passes, it is a natural gateway to and from the vast central and southern 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 sugar, molasses, bananas, coffee, sodium nitrate, creosote oil, jute, vegetable oils, logs, sisal, paper, and chemicals. The chief exports are petroleum products, lumber, grain and flour, cotton and other textiles, iron and steel products, paper, lard, tobacco, carbon black, molasses, syrup, rosin, salt, sulphur, and chemicals.

New Orleans is a popular winter resort with many fine

hotels, theaters, restaurants, parks, and places of historical interest. Among the latter is the famous French Quarter 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 club known as the **International House** is in a 9-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 northward to Lake Pontchartrain which is connected to the river by the Inner Harbor Navigation Canal along the eastern 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 a part of New Orleans; **Gretna**, **Harvey**, and **Westwego**. All are connected with New Orleans by ferries and by the Greater New Orleans Highway Bridge. Several shipyards, and a naval station are at Algiers.

A special **radio direction-finder calibration station** is at the Naval Station; see Light List for operational information. The antenna is located 200 feet 305° from the easternmost radio tower at the station.

Chalmette, about 5 miles below Canal Street on the same side of the river, has extensive terminal and cargo-handling facilities.

New Orleans Harbor extends for nearly 15 miles along Mississippi River, from Westwego and Southport on the northwest to Chalmette, 5 miles below Canal Street. Virtually all wharves parallel the river bank, and for 10 miles along the bank of the river there is an almost continuous quay. Transit sheds cover most of the wharf area. Modern handling devices suitable for the varied commodities entering the port are provided on the wharves and in the sheds. Almost all wharves have rail connections. Depths at the wharves range from 10 to 40 feet, with about 30 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.

Anchorages.—Within the port limits, vessels may anchor or berth only as directed by the Superintendent of Docks.

Designated areas of anchorage at New Orleans are described in **§ 202.195**, Chapter 2.

Federal regulations for navigation of the river are given in **§ 207.200**, Chapter 2.

Dangers.—Submerged revetments are located on the river bottom on both sides in the port area; anchorage is prohibited in these areas which are shown on the chart.

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.

Weather.—There are two rainy periods. The period of localized, scattered, summer showers lasts from mid-June to mid-September. Winter rains are generally slow, and continuous, lasting several days, and usually occur from mid-September to mid-March. Fog is infrequent, usually occurring in the winter months. See Appendix for **storm warning displays.**

Pilotage is discussed under the general description of the river at the beginning of this chapter.

Towage.—Tugs up to 2,500 horsepower 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. A United States Public Health Service and numerous public and private hospitals are in New Orleans.

Customs.—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. New Orleans is a customs port of entry and marine documents are issued.

Immigration.—Immigration inspectors board vessels at the quarantine station or alongside wharves. The Immigration and Naturalization Service maintains a district office at New Orleans.

Bridges.—A high-level fixed highway bridge connecting Algiers and New Orleans, 0.6 mile above Canal Street, has a clearance of 150 feet over a central 750-foot width. The Huey P. Long Bridge, a combined highway and railroad bridge crossing the river 9.6 miles above Canal Street, has a clearance of 135 feet for a channel span width of 500 feet. These are the only bridges over the Mississippi in the New Orleans vicinity.

Harbor Regulations.—Traffic control in the river in the vicinity of Algiers Point is subject to regulations stated in **§ 207.200**, Chapter 2. In addition, 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 15 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 hours. Tows should not proceed downstream with more than seven tons per horsepower; and further, terminal-operators and fleet-owners should observe extra precautions 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.

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.

The Board of Commissioners of the Port of New Orleans, a State agency generally known as the **Dock Board**, has full control of the port except for matters pertaining to levees or to the municipal belt-line railroad. About two-thirds of the improved wharf frontage is owned by the State of Louisiana and operated by the board. The office of the Superintendent of Docks is on Canal Street near the river.

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 reasons 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 miles per hour. . . .

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.

In 1961, steel-pile dolphins and other facilities were installed on the east and west banks downstream from the lock forebay to provide "ready" mooring areas for barges and tows awaiting lockage. These craft are under the direction and control of the lockmaster.

Wharves.—More than 7 of the 10 miles of wharves are covered by steel sheds. Floating derricks, locomotive cranes, and most other handling devices are available as needed. There are more than eight miles of wharves, most of them with transit sheds, under control of the Board of Commissioners. There are also some privately owned and operated wharves. These facilities are located along the Mississippi River and the shores of the Harvey Canal and Inner Harbor Navigation Canal. Most of the facilities, including the Public Commodity Warehouse Wharf and the Foreign Trade Zones Wharf, are used for handling general cargo. In addition, at one terminal, trailers loaded with general cargo are run onto end-loading vessels. Another terminal handles the loading of railroad cars into seatrain oceangoing carriers. Several wharves are used for handling of oilfield supplies

and equipment, and logs. Vessels may be fueled by tank barges while at the wharves.

About 7 million square feet of covered warehouse space is available for storage of coffee, sugar, and general merchandise. All wharves are equipped with lift trucks for handling and stacking cargo. Molasses and alcohol are handled by pipelines beneath the wharves, directly from ships.

The two cold storage plants are privately operated.

The terminal for the inland barge lines to the Mississippi and Warrior, Alabama, Rivers is on the Inner Harbor Navigation Canal just above the locks.

All port facilities on the east bank of the river are served by paved roadways and also by belt-line railway connections to the trunk line railroads entering New Orleans.

The public grain elevator, 4 miles above Canal Street, on the east bank of the river, has a capacity of 7.5 million bushels and can accommodate three oceangoing vessels at any one time. There is also a privately owned grain elevator with a capacity of 2.5 million bushels, on the west bank of the river.

The Inner Harbor Navigation Canal, also known as the **Industrial Canal,** offers deep-water connection between Mississippi River and Lake Pontchartrain, a distance of about 5 miles. The lock is 0.5 mile north 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 loud speaker, lights, and radio. North from the lock, in August 1961, the controlling midchannel depths were 33 feet to the Chef Menteur Highway Bridge; thence 29 feet to the Southern Railroad Bridge, at the north end of the waterway; thence 15 feet to the light at the entrance to Lake Pontchartrain.

About 0.5 mile inside the lock is a turning basin. Several bascule highway and railroad bridges cross the canal, with minimum width of 75 feet and minimum clearance less than 1 foot. A highway bridge over the canal, about 0.7 mile above Mississippi River, has a vertical-lift span with clearances of 41 feet, down, and 156 feet, up. Minimum clearances of the overhead power cables crossing the canal are 132 feet.

The river entrance to the canal is marked by lights on both sides and by a lighted range. The lake entrance is marked by a light and buoys along the east side. The canal provides an additional 10 miles of waterfront to the port of New Orleans with virtually constant water level. This affords additional facilities as well as sites for industrial development.

Repair yards on the canal are equipped to repair hulls above the waterline, deck equipment, and machinery.

The Inner Harbor Navigation Canal public wharves are open to commerce on the same terms as those on the river front. The canal locks are toll free.

Port Charges.—About two-thirds of the improved waterfront at the port is operated by the Dock Board. A copy of the rules and regulations giving the port charges can be obtained from the board.

Supplies.—An unlimited supply of purified river water is available at all piers and wharves. This water, while excellent for drinking purposes, contains a small percentage of sulphate 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.

Marine hardware of all kinds is obtainable and provisions are plentiful.

Repairs.—New Orleans has numerous commercial plants which can haul out 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 has a capacity of 20,000 tons, a length of 650 feet, and a width of 92 feet. Also available are numerous other floating docks, small graving docks, and marine railways. The largest marine railway has a capacity of 1,000 tons and has hauled out vessels up to 300 feet in length. Marine repair plants are operated in connection with the drydocks, the larger plants having well equipped shops and all other facilities necessary for complete repairs to wood or steel vessels. There is a large shipbuilding plant at Avondale which builds all types of vessels up to 600 feet in length.

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, diving equipment, and ground tackle.

Small-boat facilities.—Most small-boat facilities are on the canals inside the locks from the river and at the Municipal Yacht Basin at West End Park on Lake Pontchartrain. The Municipal Yacht Basin has both open and covered berths for over 600 boats ranging in size up to 80 feet in length and 8 feet draft. All types of supplies and repairs are available adjacent to the basin. Gasoline, diesel fuel, water, provisions, supplies, and repair facilities are available along the Inner Harbor Navigation Canal and at Harvey.

Communications.—New Orleans is the terminus of numerous trunk-line railroads to all parts of the United States. Improved highways lead in all directions along the Gulf coast and to the interior.

Nearly 70 steamship companies operate on regular schedules out of New Orleans. Coastwise service reaches all important Gulf, Atlantic, and Pacific coast ports, and foreign service includes all world ports, particularly West Indian, South American, and European.

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 the Warrior River. The barge-line terminals are on the Inner Harbor Navigation Canal, just above the locks. There are inside freight routes out of New Orleans eastward to Mobile, Pensacola, Panama City, and Apalachicola, and westward to New Iberia, Port Arthur, Galveston, and Houston. Small steamers handle passengers

and freight to the several small towns on the lower Mississippi River—Buras, Boothville, Venice, Pilottown, Burrwood, and Port Eads.

Three airports serve New Orleans, the principal one being Moisant International Airport located about 11 miles northwest of the city.

Two commercial radio communication stations are located in New Orleans; the Tropical Radio Company offers radiotelegraph connections with marine and other units; the Southern Bell Telephone Company offers ship-to-shore radiotelephone service through its marine exchange.

Charts 1269, 1050.—Above New Orleans, the Mississippi River is used by oceangoing vessels to Baton Rouge, 116 miles above Canal Street. The controlling depth was 35 feet in June 1959. Private terminals for handling oil and other products are on both sides of the river; most places have only bankside landings.

Boundary lines of inland waters.—Pilot Rules for Western Rivers are used in the Mississippi River and its tributaries above the Huey P. Long Bridge; see § **82.100,** Chapter 2.

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 yachts is not recommended because of the hazard of floating obstructions.

An overhead power cable crossing the river a mile above Huey P. Long Bridge and 10.7 miles above Canal Street (New Orleans) has a clearance of 149 feet.

At **Avondale,** on the south bank 11.9 miles above Canal Street, are the storage tanks and offices of an oil exporting company, the Southern Pacific Railroad yard, and a large shipyard. There is a marine ways capable of hauling out vessels up to 300 feet in length and a capacity of 1,000 tons. At the shipyard are machine and fabrication shops.

Harahan (P.O.), on the north bank 12.2 miles above Canal Street, has facilities for dry barge cleaning. Fuel and some supplies may be obtained on call.

St. Rose (P.O.), on the north bank 20.4 miles above Canal Street, has a large oil company depot.

Luling (P.O.), on the south bank 22.6 miles above Canal Street, has several small industrial enterprises and a large chemical plant. **Destrehan** (P.O.), across the river from Luling, is the site of a new 4-million bushel grain elevator which was under construction in August 1961. A vehicular ferry crosses the river between these places.

Good Hope (P.O.), on the east bank 26.5 miles above Canal Street, is the site of a large oil storage area. At **Norco** (P.O.), on the north bank 26.9 miles above Canal Street, there is an oil refinery with wharves for two vessels. A ferry crosses the river 0.5 mile above Norco. A mile above Norco is a large chemical plant.

The **Bonne Carre Spillway** is on the north bank 28.7 miles above Canal Street. 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 south bank to avoid possible cross currents or draw resulting from water being diverted through the spillway and flowing toward and into Lake Pontchartrain.

A cargo transfer anchorage is on the north side of the river near the Bonne Carre Spillway; limits and regulations are given in § **202.195,** Chapter 2.

An overhead power cable crossing the river 29.5 miles above Canal Street has a clearance of 150 feet.

Laplace (P.O.), on the north bank 33.9 miles above Canal Street, is a truck-farming center and prosperous sugar section. **Reserve** (P.O.), 38 miles above Canal Street, has a large sugar refinery and is the trading center and shipping point for a very productive sugarcane region. A ferry crosses the river at Reserve. **Garyville** (P.O.), 40 miles above Canal Street, is a lumber town. **Gramercy** (P.O.), 44 miles above Canal Street, has a large aluminum reduction and chemical plant, and a sugar refinery. Berths are available at both plants. **Lutcher** (P.O.), 46 miles above Canal Street, has a lumber mill and a factory for processing perique tobacco; a vehicular ferry crosses the river here.

At **Burnside** (P.O.), on the north side of the river 65 miles above Canal Street, is a terminal that can handle 4,800 tons of bulk cargo per hour; a barge, berths, storage facilities, and complete equipment are available.

Donaldsonville (P.O.), on the south bank 70 miles above Canal Street, is a large town at the former junction of the river and Bayou Lafourche. Just south of the ferry landing is a barge where boats may tie up to take on fuel and provisions which are trucked in. A vehicular ferry crosses the river to **Darrow.**

Geismar (P.O.), on the north bank 78 miles above Canal Street, has two large chemical plants.

Plaquemine (P.O.), on the west bank 98 miles above Canal Street, is at the junction of the Mississippi and Bayou Plaquemine. A vehicular ferry crosses the river just below Plaquemine. The town is discussed in Chapter 12.

Baton Rouge, the capital of Louisiana, on the east bank 116 miles above Canal Street (New Orleans), is a river port of considerable importance. The port area includes the general cargo handling facilities at **Port Allen,** directly opposite the city. The principal industries of the port area are oil refining, petroleum products, synthetic rubber, chemicals, lumber, and wood products, stone and clay products, food and staples, furniture and fixtures, primary metals, fabricated metals, machinery, and transportation equipment. At Port Allen, the northern end of the Intracoastal Waterway (Port Allen to Morgan City section) is connected with the Mississippi River by the Port Allen Lock; see Chapter 12. A vehicular ferry crosses the river between Baton Rouge and Port Allen.

Prominent features.—The most conspicuous object in the city is the State Capitol Building, a tall white structure.

Just below the ferry landing on the east side of the river is a bulletin board on the levee, which shows the river stage. The highest stage ever recorded was 47 feet in 1927. A highway-railroad bridge across the river 4.5

miles above Baton Rouge has a fixed channel span width of 620 feet and a clearance of 65 feet. This bridge is the limit of deep-draft navigation on the river.

Anchorages.—Limits and regulations for anchorage areas at Baton Rouge are given in **§ 202.195,** Chapter 2.

Towage.—Tugs are available at Baton Rouge.

Quarantine.—Quarantine services are provided by personnel from the New Orleans station. The U.S. Public Health Service maintains an outpatient office at Baton Rouge.

Customs.—Baton Rouge is a port of entry and marine documents are issued.

Immigration.—The Immigration and Naturalization Service maintains a port of entry at Baton Rouge for the arrival and departure of seamen in merchant vessels.

Harbor Regulations.—Federal regulations for the navigation of the river are given in **§ 207.200,** Chapter 2. Local regulations of the port are under the jurisdiction of the Greater Baton Rouge Port Commission and the movement of vessels is under the control of the Superintendent of Operations.

Wharves.—The Port of Baton Rouge operates several installations including a modern 1,400-foot general cargo wharf, a 7.5-million bushel grain elevator, a modern bulk handling unit, a slack-water barge channel and terminal, an 8-million gallon tank terminal, and a public commodity warehouse. There are private docks and facilities of an oil company, an aluminum company, and a processing concern. Three railroads serve the port.

Supplies.—Provisions, ice, fresh water, gasoline, and diesel oil can be obtained. Vessels can receive bunker fuel from tank barges while alongside the wharves.

Repairs.—There are no drydocks or marine railways at Baton Rouge. Above water repair can be made at a barge dock on the east side of the river just above the ferry landing. A machine shop is in operation.

Small-boat facilities are limited; no docks suitable for small craft are available. Temporary berths may be had along one of the several barges moored alongside the river bank.

Above Baton Rouge, a depth of 9 feet is available in the Mississippi River and the Illinois Waterway to Chicago and Lake Michigan, 1,228 miles from Canal Street (New Orleans). Limiting clearances of the Illinois Waterway are: Bridges; 75 feet wide, 17 feet high; locks; 110 feet wide, 600 feet long.

Navigation maps of the Mississippi River and its tributaries are published by the Corps of Engineers; see Appendix.

9. MISSISSIPPI RIVER TO SABINE PASS

Chart 1116.—From the delta of the Mississippi River to Sabine Pass, a distance of 250 miles, the coast has a general westerly 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 stretches of marshy ground.

The off-lying water is shoal for long distances from the beach and, except for the first 50 miles west of Southwest Pass, the 10-fathom curve is 20 to 35 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 to the eastward of Atchafalaya Bay are dangerous to enter except during fair weather. The channels change frequently due to storms, and local knowledge is generally necessary.

Calcasieu Pass is the first and only deep-draft channel from the Mississippi River westward to Sabine Pass. An extensive network of bayous and canals with depths of 2 to 9 feet covers the country for about 50 to 75 miles back from the coast. The waterway from Empire to the Gulf, about midway between New Orleans and Southwest Pass, is the only canal below New Orleans entering the Mississippi from westward.

The low swampy coastal country is but 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.

Inside the 100-fathom curve from Southwest Pass to Sabine Pass the current sets westerly 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.

Charts 1272, 1273.—From Southwest Pass to Barataria Pass, at the entrance of Barataria Bay, the shoreline is broken by numerous small and unimportant passes and shallow bays, seldom frequented except by small craft and canoes, and never approached by seagoing vessels.

Grand Pass, 10 miles northward 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 (P.O.) a town on the Mississippi River 21.5 miles above Head of Passes, has several stores where gasoline, distillate, fuel oil, provisions, and some supplies are available. As at most river towns, the only water is rain or distilled river water, inasmuch as the well water is brackish. Hull and engine repairs can be made at a repair yard which has a machine shop and marine ways capable of hauling out boats up to 65 feet in length. Numerous fishing boats operate in the waters to the westward of the river, bringing their catch to the fish canneries at Buras. Rail, highway, and telephone communications extend to New Orleans.

Scofield Bayou about 23 miles northward of Southwest Pass, provides an entrance from the Gulf to the lakes and bayous to the southward of and through the Fasterling Canal to Buras. An entrance channel was dredged in 1957 and marked with daybeacons. A schooner wreck is just west of the channel.

Empire (P.O.) is a small settlement 3.5 miles north of Buras and on the same side of the river. There are stores, a machine shop, and a shipyard with three marine ways, the largest of which can haul out boats up to 60 feet in length for general repairs. Gasoline, diesel fuel, water, ice, provisions, and general supplies may be obtained.

The State-owned Empire Waterway lock through the Mississippi River levee at Empire is 225 feet long, 40 feet wide, and 10 feet deep.

Federal project depth is 9 feet for the Empire Waterway through **Bayou Long, Bayou Fontanelle,** and the cut through Pelican Island to the Gulf of Mexico. Stone jetties protect the Gulf entrance. The controlling depth was 6 feet from Empire to the Gulf in May 1960. The approach to the Gulf entrance is marked by a lighted bell buoy and the entrance off the jetties by a lighted buoy and a buoy.

The waterway, in conjunction with the Ostrica Canal, offers a water route for craft drawing up to 4½ feet across the Mississippi Delta between Barataria Bay and Breton Sound.

Doullut Canal extends westward from Empire Lock to Adams Bay. The canal has a depth of about 3 to 4 feet which depth can be taken to the Gulf or to Barataria Bay. The route to the Gulf is across **Adams Bay,** which usually is marked by stakes, and thence through **Meyers**

Canal and **Grand Bayou.** Somewhat less draft can be carried by way of Bayou Cook and Bastian Bay. To reach Barataria Bay, Grand Bayou is followed to the northward to its junction with the Freeport Sulphur Company Canal, which connects with Lake Grande Ecaille, and then with Barataria Bay.

Port Sulphur (P.O.), is a small town about 11 miles above Buras on the west bank of the river. **Freeport Sulphur Company Canal** extends from the river to **Lake Washington** and **Lake Grande Ecaille,** a distance of about 8 miles. Boats drawing up to 3 feet can pass through these lakes into Barataria Bay and adjacent waters, but there is no connection with the Mississippi River.

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 **Socola** (Chart 1271) leads to Grand Bayou, and thence either to the Gulf or to Barataria Bay. **Wilkinson Canal** at **Myrtle Grove** (Chart 1271) leads to Barataria Bay.

Bastian Bay, 26 miles northwestward of Southwest Pass, is 1 to 2 feet deep. The bay is separated from the Gulf by **Bastian Island. Bastian Pass,** east of the island, is not navigable. **Grand Bayou Pass,** west of the island, is the main entrance to Bastian Bay and also to Grand Bayou. Federal project depth is 6 feet for the channel through the entrance bar of the pass; the controlling depth is about 4 feet. A daybeacon marks the west side of the outer end of the channel. The daybeacon marking the west side of the passage leading into Bastian Bay also marks the east side of the passage to Grand Bayou.

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. Three feet can be carried to the canals north of Empire which lead to the river levee and to 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 north end of Bastian Bay, leads to Adams Bay and thence through Doullut Canal which connects with the Mississippi River. The shallow depths across the southern portion of Bastian Bay limit this route to about 2 feet on a favorable tide.

Chaland Pass is a shallow, unfrequented pass 3 miles west of Bastian Bay.

Quatre Bayous Pass, 5.5 miles east of Barataria Bay Light, is the entrance to **Bay Ronquille** and **Cat Bay.** The approach is marked by a lighted bell buoy and the west side of the entrance to the pass by a light. This pass and Grand Bayou Pass to Grand Bayou are the only passes east 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 northwest of the light at the entrance. A light is on the west side at the north 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 to the Freeport Sulphur Company Canal which connects with the Doullut Canal into the Mississippi River and other canals leading to the river levee and to the highway to New Orleans.

To enter Quatre Bayous Pass, approach the light from southeastward. Barataria Bay is entered by passing close eastward of the light and following the southwest 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 westward. The passage from Cat Bay into Barataria Bay is about 1 mile northwestward of the cutoff light. The tidal currents in Quatre Bayous Pass averages 1.3 knots and in Pass Abel averages 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 settlements on the bay are Grand Isle and Manilla Village.

Barataria Pass is the main entrance to Barataria Bay. It is marked on the easterly side by **Barataria Bay Light (29°16.4′ N., 89°56.7′ W.),** 65 feet above the water, shown from a white skeleton structure on the parapet of Ft. Livingston. Oil derricks are conspicuous in the general vicinity of Barataria Pass, in 5 to 10 fathoms of water. A lighted bell buoy, 3 miles southeastward of the light, marks the approach to the dredged channel across the bar. In February 1961, the controlling depth was 12 feet. The channel is marked by a light and buoys.

A leading light marks the channel through the pass on the bearing 311°. Power cables cross the pass between Grand Isle and Grand Terre Islands; the supporting towers are marked by lights. The cables are submerged at the channel, on the bearing of the leading light, and have a clearance of 35 feet elsewhere. A stone jetty extends 200 yards southeastward from the eastern tip of Grand Isle and is marked on the end by a light. To carry the best water into Barataria Pass, proceed through the dredged channel and then follow the leading light the rest of the way into Barataria Pass.

Hard sand bars with from 2 to 5 feet over them extend for about a mile offshore on each side of the channel. The bar off the entrance channel shows in heavy winds. Inside the bar, depths up to 12 feet extend northward as far as **Independence Island.** The tidal currents in Barataria Pass average about 1.4 knots.

Bayou Rigaud, on the north side of Grand Isle, is the approach to the town of Grand Isle, 4 miles west of Barataria Pass. A 12-foot dredged channel leads from the pass through **Bayou Fifi** and Bayou Rigaud to a turning basin at an oil company's docks. In October 1961, the controlling depth was 10 feet. Lights and buoys mark the channel.

Grand Isle (P.O.), the largest town in the Barataria Bay area, 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. The town has several small hotels, stores, and restaurants. An improved highway connects with New Orleans via Bayou Lafourche. The local airport is owned by a private company which flies passengers to New Orleans and nearby points. The only docks are in Bayou Rigaud. See Appendix for **storm warning displays.**

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.

Supplies.—Gasoline, diesel fuel, fresh water, ice, provisions, and some marine hardware items are available.

Repairs.—A small boatyard on Bayou Rigaud has marine ways capable of hauling out vessels up to 45 feet in length for painting and minor hull repairs.

Bay des Ilettes, Bay Joyeux, Bay Tambour, and **Caminada Bay** are on the westerly 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.

Manilla Village is on the north side of the entrance to Grand Bayou near the northwest end of Barataria Bay. Gasoline and small quantities of some provisions can be obtained.

Note.—In the Barataria Bay area the name Grand Bayou appears on two bodies of water. The first is to the westward of Bastian Bay, and the second is off the northwest side of Barataria Bay.

Caminada Pass, about 7 miles southwestward 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. Just inside the pass, an old highway trestle-bridge, now used as a fishing pier, has a fixed span with a width of 30 feet and a clearance of 14 feet. A new highway bridge, on the northeast side of the trestle, has a clearance of 14 feet. An overhead power cable crossing at the bridge has a clearance of 23 feet. The tidal current in Caminada Pass averages 1.5 knots.

Charts 1271, 1273.—Inside routes from Barataria Bay.—The channel northward through Barataria Bay leads between Queen Bess Island and Independence Island, and close to the westward of the light marking Shell Reef.

The main route north is through **Bayou St. Denis** and connecting waterways to the Intracoastal Waterway at the village of Barataria on **Bayou Barataria.** The entrance to the bayou is marked by lights. Four miles above the entrance to Bayou St. Denis the route branches to the northeast into Bayou Cutler; thence through Dupre Cutoff Canal, **Bayou Dupont, and Barataria Bayou** to the Intracoastal Waterway at the junction of Barataria Bayou and Bayou Villars.

The overhead power cable that crosses Barataria Bayou north of **Lafitte Village** has a clearance of 60 feet, and the highway swing bridge at **Barataria** (P.O.) has a clearance of 7 feet.

In February 1961, the controlling depths were 12 feet over the bar at Barataria Pass, thence 6½ feet through Barataria Bay to Bayou Cutler, thence 9 feet through Bayou Cutler and Dupre Cutoff Canal to Bayou Dupont, thence 10 feet to Bayou Barataria and 11 feet to the Intracoastal Waterway. The channel through Bayou St. Denis, from the north end of Barataria Bay to Bayou Cutler, is marked by lights and buoys.

Former routes northward through **Grand Bayou, Little Lake, Turtle Bay, Harvey Cutoff,** and **Bayou Rigolettes** (see chart 1050) are little used as shoaling has occurred. The south entrance to Grand Bayou is marked by a light at Manilla Village on the east side of the entrance. Both Grand Bayou and Bayou St. Denis lead into Little Lake with a depth of about 3 feet. This depth can also be carried across the lake.

A channel from the junction of Dupre Cutoff Canal with Bayou Cutler that leads eastward across **Round Lake** and **Lake Laurier** into **Lake Hermitage** is marked by privately maintained buoys; the controlling depth was 6 feet in July 1956. There is passage to Myrtle Grove through Wilkinson Canal.

Wilkinson Canal enters Barataria Bay about 1.5 miles eastward of Bayou St. Denis. Eleven miles in length, the canal leads to Myrtle Grove on the Mississippi River, but does not enter the river. The canal depth is about 3 feet. Other similar canals north 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.

Pass Fourchon was formerly the easterly of two entrances to Bayou Lafourche from the Gulf. It is now closed.

Charts 1050, 1274.—Belle Pass was formerly the westerly and is now the only direct entrance into Bayou Lafourche from the Gulf of Mexico. The mouth of the pass is protected by stone jetties. **Belle Pass Light (29°04.8′ N., 90°13.5′ W.),** 25 feet above the water, is shown from a pile cluster off the outer end of the east jetty.

Bayou Lafourche was formerly an outlet of the Mississippi River at Donaldsonville, 70 miles above Canal Street, (New Orleans), but for purposes of flood prevention it was blocked off from the river by levee construction. From Donaldsonville, Bayou Lafourche extends in a southeasterly direction for 93 miles, emptying into the Gulf at Belle Pass, 19 miles southwestward of Barataria Bay Light.

The bayou varies in width from 75 to 150 feet. The Intracoastal Waterway crosses the bayou at Larose. Federal project depth through the jettied entrance at Belle

Pass and thence to Larose is 6 feet. In August 1961, the controlling depth was 6 feet across the bar, through the entrance at Belle Pass, and to Larose; thence 4½ feet to Thibodaux in September 1960. Above Thibodaux, navigation is restricted by dead vegetation.

Many bridges cross the bayou. The controlling width is 50 feet at the vertical-lift bridge at Thibodaux, and the controlling clearance is 59 feet, up, for the vertical-lift bridge at Raceland. Drawspan regulations for the bridges crossing Bayou Lafourche are stated in **§ 203.245,** Chapter 2.

A highway bridge at Leeville 12 miles above the mouth has a swing span with a clearance of 8 feet. The channel is through the west draw. The overhead power cable on the south side of the bridge has a clearance of 60 feet. Gasoline, diesel fuel, provisions, water, and limited supplies are available at Leeville.

Along the bayou are numerous private warehouses, wharves, and stiff-leg derricks for handling sugar cane. The banks of Bayou Lafourche are thickly settled throughout the greater part of its length. Larose, Lockport, **Raceland** (P.O.), and **Thibodaux** (P.O.) are principally agricultural towns. On the lower part of the bayou there is considerable commerce in oil barges.

Golden Meadows (P.O.), 20 miles above the mouth, is the principal fishing settlement. There is a shipyard which has two vertical lifts and a marine railway capable of hauling out craft up to 65 feet in length for general repairs. A machine shop is at the yard. Gasoline, diesel fuel, ice, water, marine hardware, and provisions are available. An overhead power cable crossing the bayou just off the town has a clearance of over 100 feet.

Galliano (P.O.), a town 3.3 miles above Golden Meadow, has a pontoon bridge. Gasoline, diesel fuel, and provisions are available.

At **Cut Off** (P.O.), a town 10.5 miles above Golden Meadow, there is a pontoon bridge. A marine railway can haul out vessels up to 60 feet in length for general repairs. Gasoline, diesel fuel, provisions, water, ice, and limited supplies are available.

At **Larose** (P.O.), a town about 34 miles above the mouth of the bayou, another pontoon bridge crosses Bayou Lafourche. There is a shipyard with marine ways that can haul out boats up to 80 feet in length for general repairs. Machine shop facilities and complete marine radio service are available. Fuel, water, provisions, and marine supplies can be obtained.

At **Valentine,** 4.9 miles above Larose, is a pontoon bridge. **Lockport** (P.O.) is a town on the bayou about 10 miles above Larose. The highway bridge at Lockport has a swing span with a clearance of 6 feet. The larger of two boatyards has marine ways able to haul out vessels up to 80 feet in length for general repairs. Fuel, water, ice, and provisions are available. A pontoon bridge crosses the Company Canal near Lockport. Lockport has rail connections to New Orleans.

A pontoon bridge is at **Mathews** (P.O.), 3 miles above Lockport.

Charts 1273, 1274.—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,** 12.5 miles above the bayou mouth. The section of the canal east of the bayou is known as **East Louisiana Canal,** and the section west, **West Louisiana Canal.** The canal is about 10 miles long and 5 feet deep, with shoaler depths at the western approach. With a favorable tide about 3½ feet can be carried through Caminada Bay, the eastern approach, and about 3 feet across **Little Lake,** the westerly approach. **Deep Bayou** and **Bayou Blue** 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 which are not charted. 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.

A fixed highway bridge crosses the eastern end of the West Louisiana Canal, making it necessary to enter the canal from Bayou Lafourche through a short cutoff.

Chart 1274.—Greys Canal, 3 miles south 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, 8 feet can be taken through a locally marked channel. Bayou Blue also joins Little Lake.

Havoline Canal, 7 miles south of Leeville, is a dredged cut with a reported controlling depth of 7 feet which extends from Bayou Lafourche into Timbalier Bay. The southwestern approach channel leading to the cut is marked by lights. A channel then continues from the end of the approach channel across Timbalier and Terrebonne Bays to Cat Island Pass. Havoline Canal is open to the public without charge. Another channel, marked by privately maintained buoys, leads westward across Timbalier and Terrebonne Bays to Troiscent Piquets Bay and into Bayou Petit Caillou.

Timbalier and **Terrebonne Bays** 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 6 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. Numerous oil well structures are located within this area.

Channels and routes, Timbalier and Terrebonne Bays.—From inside Cat Island Pass, a channel extends northward across the central portion of Terrebonne Bay to Pass Barre, which connects with Lake Barre. A depth of about 7 feet can be carried to Lake Barre.

The shortest and best marked route extends from inside Cat Island Pass to Lake la Graisse; and across Lake la Graisse into Bayou Terrebonne. This route is good for a draft of about 5 feet.

From the east and west channel crossing Terrebone and Timbalier Bays, a channel extends northeastward into Lake Raccourci passing through Philo Brice Islands northwest of the light and thence continuing eastward to the southwest 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.

A route leads from Seabreeze Pass across Lake Barre, which is partly marked by privately maintained lights and buoys into Lake Felicity, thence to Grand Pass Felicity and across Lake Raccourci to Bayou Blue or Deep Bayou to Bayou Lafourche. A marked channel leads through Lake Chien to Bayou Jean Lacroix.

The main route to Bayou Terrebonne is through the southern entrance to Lake la Graisse. The channel through the lake is marked by lights and buoys and a depth of 5 feet can be carried into the bayou. A second route by Bayou Terrebonne from Lake Barre through Seabreeze Pass is good for 4½ feet.

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 easterly end of Timbalier Island has been washed away and the west end built up to the westward a like amount. East Timbalier Island has built up especially to the westward all but closing Grand Pass Timbalier.

Grand Pass Timbalier, at the west end of East Timbalier Island, has been filling up and is little used. The channel is narrow and winding, and difficult to navigate; with local knowledge about 4 feet can be taken through the pass into Timbalier Bay. Timbalier Daybeacon, an abandoned lighthouse, is a white square tower about 56 feet high on a wooden dwelling on piles, on the west side of the pass. About 800 yards east-northeast of the abandoned lighthouse, part of the steel framework of a wrecked lighthouse projects about 10 feet above water.

Little Pass Timbalier, two miles westward 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 western branch being considered the safer and more generally used. It is reported that this pass is working westward.

Caillou Pass has good anchorage in 10 feet of water between Timbalier Island and Caillou Island.

Cat Island Pass, 60 miles westward 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 buoys, three of which are lighted. The channel across the bar has a controlling depth of 13 feet. Anchorage area inside the bay has depths of 12 to 21 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 knot.

Houma Navigation Canal, a State of Louisiana project, in March 1962, was reported dredged to a depth of 15 feet, through a channel from Cat Island Pass across Terrebonne Bay in a northwesterly direction, thence a dredged cut northward to an intersection with the Intracoastal Waterway about a mile below Houma. The southern end of the canal through Terrebonne Bay is marked by privately maintained lights and daybeacons.

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 in the vicinity of Caillou Island, **Brush Island,** and East Timbalier Island. Mariners should use the waters in this area only with local knowledge.

Lake Barre is northward of Terrebonne Bay. The general depths are 4 to 6 feet. **Seabreeze Pass** provides a passage marked by a light and buoys into Bayou Terrebonne and to **Lake la Graisse** at the northwest end of Terrebonne Bay; **Pass Barre** connects with Terrebonne Bay; and at the northeast corner of the bay, several passages lead to Lake Felicity.

Old Lady Lake is a shoal body of water between Lake Raccourci and Lake Barre and southward 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 north of Old Lady Lake. Many bayous and passes connect with adjacent bays and lakes. Most of the bayous to the east and north 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 entrances to Lake Felicity and Bayou Jean Lacroix are marked by lights and the channel across the lake is marked by buoys.

Lake Raccourci is a shoal body of water lying northward 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.

Charts 1050, 1274.—Bayou Terrebonne is navigable to the town of Houma, 33 miles above its southern mouth. For the lower 4 miles of its course, the bayou flows through a long, narrow delta separating Lake Barre and **Lakes Jean Pierre** and **Saint Jean Baptiste.** From each of these are several entrances into the bayou. **Seabreeze Pass,** connecting Lake Barre and Lake la Graisse, crosses the northern end of the delta and provides the main entrance into the bayou from both Lake Barre and Terrebonne Bay.

The Federal project depth is 6 feet from Bush Canal to Houma. In September 1960, controlling depths were 6 feet from Sea Breeze Pass to Bush Canal; thence 5 feet to Montegut Bridge; thence 4½ feet to Bourg; thence, in March 1959, 2½ feet to Houma. In September 1960, 5 feet was available at Bourg in Company Canal to the Intracoastal Waterway. The head of navigation is at St. Louis Canal, at Houma.

Below Seabreeze Pass the bayou is shallow. Across this section, **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. At its southern end, Bayou Terrebonne empties into Pass Barre. In March 1959, the controlling depth was 2½ feet from the mouth to Seabreeze Pass.

Tides.—The diurnal range of tide is 1.3 feet at the mouth of Bayou Terrebonne and 0.5 foot at Houma. 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.

Lights and buoys mark the entrances to the bayou from Lake la Graisse and from Lake Barre.

Bayou Terrebonne crosses the Intracoastal Waterway at Houma and is joined by Bayou Petit Caillou 4 miles below Houma. At Bourg, 8 miles below Houma, a section of the Company Canal furnishes a cutoff between the bayou and the waterway, good for 5 feet in September 1960. Several other canals enter Bayou Terrebonne and are used by small boats. A highway bridge at Montegut has a swing span with a width of 45 feet and a clearance of 5 feet.

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. A State highway extends south along the east bank of the bayou for 6 miles below Montegut to Lapeyrouse. At **Montegut** (P.O.) there are two boatyards with marine ways capable of hauling out boats up to 40 feet in length and 4 feet in draft for general repairs. Gasoline, diesel fuel, fresh water, provisions, and limited marine supplies are available. There is a large sugar mill at Montegut.

At **Port Barre** (P.O.) there are facilities for launching outboard motor boats.

At **Lapeyrouse** an oil company has a repair yard and construction camp. Marine ways and repair facilities are restricted to company and charted vessels.

Bayou Terrebonne is crossed by several highway bridges with swing and lift spans with ample openings, and by numerous overhead cables with clearance of 60 feet. A road connects Montegut with Bayou Petit Caillou.

The bridge at Bourg has a swing span with a width of 47 feet and a clearance of 7 feet. The bridge at Presquille has a vertical lift span with a width of 45 feet and clearances of 3 feet down and 48 feet up. The bridge just east of Houma has a swing span with a width of 40 feet and a clearance of 3 feet. The highway bridge crossing Company Canal at Bourg has a vertical lift span with clearances of 5 feet down and 50 feet up.

Bayou Petit Caillou empties into **Troiscent Piquets Bay** on the west side of Terrebonne Bay, about 5 miles north of Wine Island Pass. A light marks the south side of the passage between Terrebonne and Troiscent Piquets Bays. Off the mouth of the bayou the controlling depth is 4½ feet. In August 1956, the controlling depth was 6 feet to Cocodrie; thence 6½ feet in April 1959 to Robinson Canal; thence 3½ feet to the junction with Bayou Terrebonne. Bayou Petit Caillou is 29 miles in length to its junction with Bayou Terrebonne 4 miles east of Houma. Several canals enter the bayou: Bush Canal leading to Bayou Terrebonne, and Boudreaux and **Robinson Canals** 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.

The lower portion of Bayou Petit Caillou is used considerably by local oystermen and fishermen. A highway extends south along the west shore to **Cocodrie**, 6 miles above the mouth of the bayou. Launching facilities for outboard boats are at Cocodrie and Rabbit Bayou. At **Boudreaux Canal**, 15 miles above the mouth, is a shrimp and oyster cannery. There are several boatyards in the vicinity of **Chauvin**. Boats up to 60 feet in length can be hauled out for general repairs. Gasoline, diesel fuel, lubricants, water, ice, and provisions can be obtained at several places along the bayou.

Four bridges cross the waterway between the mouth and the junction with Bayou Terrebonne. Three of the bridges have swing spans with a minimum width of 40 feet and a minimum clearance of 4 feet. The highway bridge at Presquille has a vertical lift span with a width of 45 feet and clearances of 3 feet down and 48 feet up. Overhead power cables crossing the waterway have minimum clearances of 60 feet.

The approach to Bayou Petit Caillou through Troiscent Piquets Bay has been described earlier in this chapter under Havoline Canal.

A channel from Bayou Petit Caillou through Boudreaux Canal, **Lake Boudreaux** and **Bayou Dulac** to Bayou Grand Caillou is marked with lights and daybeacons. The controlling depths in April 1959 were 5 feet in Boudreaux Canal, 2 feet through Lake Boudreaux, and 1 foot through Bayou Dulac.

Wine Island Pass is 3.5 miles west of Cat Island Pass, and forms a passage between Wine Island and Isle Dernieres from the Gulf to Lake Pelto and Terrebonne Bay. The pass has depths of 7 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 tidal current in Wine Island Pass averages about 1.3 knots. In Caillou Boca the current at flood averages about 1 knot and at ebb averages about 0.5 knot.

Whiskey Pass forms another passage from the Gulf to Lake Pelto through Isles Dernieres. The depths are 4 to 5 feet at the north end of the unmarked 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 **Pas la Poule** which is good for a draft

of 3 to 4 feet is marked by privately maintained buoys.

Lake Pelto, west of Terrebonne Bay and north 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 westward through Lake Pelto and **Caillou Boca** to Caillou Bay. The channel is marked by lights and buoys.

Charts 1050, 1274, 1275.—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 north and east of **Raccoon Point** at the western end of Isles Dernieres. An anchorage site with a depth of 7 to 8 feet is close inside Raccoon Point.

Coupe Colin (Western Pass), 3 miles east of Raccoon Point, is shallow, changeable, difficult to follow, and is not used even by local fishermen.

Bayou Grand Caillou empties into Caillou Bay 6.5 miles north of Raccoon Point. Grand Caillou Light is 0.3 mile west of the entrance. Depths of 5 to 6 feet are off the entrance and in July 1956 the controlling depth was 8 feet from the mouth of Bayou Grand Caillou to **Dulac** (P.O.) about 20 miles above the mouth.

Federal project depths are 5 feet from Bayou Dulac through Bayou Grand Caillou, Bayou Pelton, and Bayou la Carpe to the Intracoastal Waterway at Houma. In April 1960, controlling depths from Bayou Dulac through Bayou Grand Caillou and Bayou Pelton were 7 feet, and 7½ feet through Bayou la Carpe to the Intracoastal Waterway. The approach and the entrance to Bayou Grand Caillou are marked by lights and the bar and bayou channels are marked by daybeacons and buoys as far as Trouble Bayou, about 9 miles above the mouth.

Ashland Canal which connects Bayou Grand Caillou with Bayou la Carpe had a controlling depth of 6½ feet in 1958. A highway extends south along the east bank of Bayou Grand Caillou to below Dulac and connects with the road along Bayou Petit Caillou about 1.7 miles below Robinson Canal. A highway bridge over the bayou at Dulac has a clearance of 5 feet. A highway bridge at Boudreaux has a swing span with a width of 45 feet and a clearance of 3 feet. The highway bridge over Bayou Dulac, at Dulac, has a swing span with a width of 40 feet and a clearance of 3 feet.

There are two boatyards between Dulac and Boudreaux. The larger has marine ways capable of hauling out vessels up to 65 feet in length for hull repairs. There are canneries, ice plants, and several places where gasoline, diesel oil, water, provisions, and some marine supplies are available. There is a pontoon bridge over Bayou la Carpe southeast of Houma. Overhead cables crossing this bayou have minimum clearance of 50 feet. These cables will be removed upon 24 hours advance notice, to permit passage of vessels requiring higher clearance.

Grand Bayou du Large extends between **Caillou Lake** and Caillou Bay. Depths of 5 to 6 feet are off the south 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** (P.O.) and thence to **Lake Theriot** through **Marmande Canal** or to Bayou Grand Caillou via **Bayou Provost.** The swing highway bridge across Bayou Provost at Theriot can be opened by prior arrangement with the State Road Department.

Bayou du Large is often dry in several spots above Theriot during the winter months. There are several overhead cables crossing the bayou south 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. A highway extends south along the east side of the bayou for about 7 miles below Falgout Canal. This section of the bayou is thickly populated and there are several places where gasoline and provisions are available. There are three small boatyards with marine ways capable of hauling out vessels up to 40 feet in length for hull and minor engine repairs, and several facilities for launching outboard motor craft. The highway drawbridges in the Theriot area have a minimum width of 20 feet and a minimum clearance of 1½ feet. Usually, these bridges are left open. Bayou du Large empties into **Taylors Bayou** which flows into the Gulf 4 miles west of Bayou Grand Caillou entrance. A privately maintained daybeacon marks the mouth of Taylors Bayou.

Oyster Bayou, 13 miles northwestward 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 eastward. Through the bayou are several oyster reefs which usually are marked by pipes.

Oyster Bayou Light, 47 feet above the water, is shown from a white house on pile foundation at the east side of the entrance.

The route across the south end of Fourleague Bay is marked by lights and by a line of closely-spaced daybeacons. Boats follow close along the east side of the daybeacons in a channel slightly deeper than the general bay depths. A light on Halters Island Point marks the entrance to Fourleague Bay from Atchafalaya Bay. **Blue Hammock Bayou** on the east side of Fourleague Bay is another entrance to the network of shallow inside waters in this vicinity. Boats drawing 2 to 3 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 1274, 1275.—Ship Shoal, lying about 10 miles southward of Raccoon Point, is about 25 miles long in a general east-and-west direction, 1 to 3 miles wide, and has depths ranging from 5 to 18 feet. For 6 miles of its length it has a depth of less than 12 feet. 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 be avoided best by using the lead or fathometer. Heavy rips have been reported about 15 miles southwest of Ship Shoal.

Oil drilling structures, marked by lights, are located on all sides of Ship Shoal up to 60 miles offshore and throughout the delta section. Mariners should always be on the lookout for them.

Ship Shoal Light (28°54.8′ N., 91°04.3′ W.), 105 feet above the water, is shown from a brown pyramidal skeleton structure inclosing a stair cylinder and cylindrical dwelling on piles. It is in 14 feet of water, 86 miles westward from Southwest Pass Entrance lighted whistle buoy. A lighted whistle buoy is moored on the 10-fathom curve 18.5 miles southward of the light.

Currents.—Daily 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 1276.—Atchafalaya Bay is a large indentation in the coast of Louisiana 112 miles westward of Southwest Pass, Mississippi River. The bay is about 28 miles long in nearly an east-and-west 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 eastern end being known as Point au Fer Shell Reef. The bay is the approach to Lower Atchafalaya River and 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.—The lighthouse on Eugene Island and the abandoned lighthouse on Southwest Reef are the only conspicuous objects in the Point au Fer Shell Reef area. **Belle Isle,** on the north shore of the bay northward of the light, is 75 feet high and conspicuous from some distance offshore. Oil well structures and obstructions are throughout the area.

Point au Fer Reef Light (29°22.3′ N., 91°23.1′ W.), 54 feet above water, is shown from a white wooden house on pile foundation on Eugene Island on the westerly side of the dredged channel. A radiobeacon and fog signal are at the light.

Southwest Reef Daybeacon, 6.5 miles west of Point au Fer Reef Light, is a black square pyramidal tower, connected to a square house on piles with a pyramidal tower on the roof. The structure is an abandoned lighthouse and makes a prominent landmark for vessels approaching close inshore from westward.

Boundary lines of inland waters.—The lines established for this section of the coast are given in **§ 82.103,** chapter 2.

Channels.—Atchafalaya Bay Ship channel extends in a northeasterly direction from the Gulf to the mouth of the Lower Atchafalaya River. Federal project depth is 20 feet for the dredged channel from the 20-foot curve at the mouth of the Lower Atchafalaya River to the 20-foot curve in the Gulf. In October 1961, the controlling depth was 10 feet. Depths in the river were 24 feet or more to Morgan City in October 1961.

Lights and buoys mark Atchafalaya Bay ship channel. Point au Fer Reef Light 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 northerly winds and extreme low tides.

A cut-off channel from the mouth of Lower Atchafalaya River westward 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 and are covered at high water, and accordingly constitute a danger to navigation.

Deer Island, on the east side of the Lower Atchafalaya River entrance, can be approached through a short dredged channel just southwest of the island. The channel has a depth of 7 feet.

Fog is most frequent during January, February, and March. Southerly winds bring it in and northerly 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. Northerly winds lower the water surface at Morgan City as much as 1 foot, and southeasterly 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 southward into the northeastern corner of Atchafalaya Bay; it is the outlet for an extensive system of southern 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 extends northward from Atchafalaya Bay about 20 miles to Sixmile Lake, and has a crooked channel with depths from 24 to 125 feet over widths from 300 to 600 yards with deepest water usually in midstream.

Bayou Shaffer is a deep water passage branching northeastward to Bayou Boeuf from Sweetbay Lake in the Lower Atchafalaya. An overhead power cable with clearance of 130 feet crosses Bayou Shaffer near the junction with Bayou Boeuf.

Little Wax Bayou, which branches westward 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

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and described in Chapter 12, joins the Lower Atchafalaya from eastward at Morgan City. The Intracoastal Waterway follows Lower Atchafalaya southward for 2.5 miles to Little Wax Bayou.

An alternate route of the Intracoastal Waterway, from Morgan City northward to Port Allen on the Mississippi River, and Bayou Grosse Tete, is described in Chapter 12.

Charts 880, 881.—Berwick Bay is the section of the Lower Atchafalaya from Bayou Boeuf northward to Sixmile Lake. Morgan City is on the east bank of the bay and Berwick on the west bank.

Two bridges across Berwick Bay link Morgan City and Berwick. The railroad drawbridge has a swing span with a clearance of 13 feet. A fixed highway bridge has three spans with a width of 583 feet each and a clearance of 53 feet in the center span and 50 feet in the two adjacent spans. The centers of these spans are marked by green lights at night. Special regulations to govern navigation through Berwick Bay in the vicinity of the railroad bridge are stated in § **207.240**, Chapter 2.

Morgan City, on the east bank 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. Numerous inland waterways that radiate from the city make it a center for offshore oil exploration and development, and the center for a considerable local commerce in oil, fishing, shell dredging, and sugarcane raising. Gasoline, fuel oil, fresh water, provisions, and boat supplies are available. Ice is sold from a dock between the two bridges and put aboard with a mechanical loading device. There are no marinas in Morgan City and dockage is limited to fueling piers, fishing company docks, and oil company docks.

Berwick, a small town opposite Morgan City on the west bank of Berwick Bay, has several seafood plants; gasoline, diesel fuel, water, ice, provisions, and marine supplies are available.

In Morgan City and on Bayou Boeuf there are several shipyards with marine ways and floating drydocks. Vessels up to 135 feet and barges up to 280 feet in length can be hauled out for general repairs. There are machine shops and shops specializing in engine repairs. Marine supplies are available.

There are tugs up to 1,000 horsepower operating out of Morgan City. An outpatient office is at Morgan City; the nearest U.S. Public Health Service Hospital is at New Orleans, but there is a private hospital at Morgan City. Vessels are boarded by both Customs and Quarantine Officers at the various wharves along the waterfront. Morgan City is a customs port of entry and marine documents are issued.

See Appendix for **storm warning displays.**

The Morgan City Harbor and Terminal District has been established covering St. Mary Parish east of R 11 E (Longitude 91°17.4′ W.). The Board of Commissioners will issue regulations governing the commerce and traffic in the district.

Charts 880, 1050, 1051.—Bayou Teche is a navigable waterway in southern Louisiana parallel to and 35 miles westward of the Mississippi River, meandering for about 120 miles northwesterly from its eastern end at Berwick Lock to its source in St. Landrys Parish. Bayou Teche has been dammed off from Berwick Bay at Berwick Lock about 1.5 miles above Morgan City. The lock has a length of 300 feet, width of 45 feet, and depth over the sill of 9 feet at mean low water.

There is little through traffic on the bayou. Shell barges are the principal users; shrimp boats operate to Patterson and logs are shipped as far as Garden City.

The main State highway between New Orleans and Lake Charles follows the bayou through the principal towns.

A Federal project for improving Bayou Teche provides for a channel 8 feet deep from Berwick Lock to New Iberia, 53.5 miles, thence 6 feet for 16 miles to Keystone Lock, thence 6 feet for 30 miles to Arnaudville, and for construction of lock, dam, and regulating works.

In October 1961, the controlling depth was 6 feet from Berwick Lock to Charenton Canal, a distance of about 32 miles, thence in 1959, 5½ feet to the head of the project.

A shipbuilding yard about one mile above the lock has marine ways capabale of hauling out steel vessels up to 50 feet in length for hull repairs.

An overhead power cable with clearance of 60 feet crosses the bayou at **Idlewild** about 5 miles above Berwick Lock. **Patterson**, 6 miles above the lock, has two boatyards with machine shops and marine ways, and vessels up to 140 feet in length can be hauled out for general repairs. Diesel fuel and ice are available.

A highway bridge about 7 miles above Berwick Lock has a swing span with a clearance of 6 feet. A pontoon bridge is at **Avalon**, about 10 miles above the lock.

Bayou Teche crosses the Wax Lake Outlet channel at **Calumet**, about 12 miles above Berwick Lock. Floodgates closed on both sides of Wax Lake Outlet during high water stages also close the bayou to through traffic; opened, width is 45 feet through the floodgates.

About 14 miles above Berwick Lock a highway bridge has a swing span with a clearance of 4 feet, and about 17 miles above the lock there is a highway bridge with a swing span having a clearance of 5 feet.

Garden City, 18.5 miles above Berwick Lock, is the site of a large lumber mill. A highway bridge about 20 miles above the lock has a swing span with a clearance of 7 feet.

Hanson Canal is 20.2 miles above Berwick Lock; little used for navigation, it leads southward from Bayou Teche at Garden City, turns westward and enters and follows Bayou Portage to a cut with a controlling depth of about 2 feet that joins the Intracoastal Waterway in Bayou Bartholomew. Near the junction of the canal and Bayou Teche there is a lock 937 feet long, 26½ feet wide, and 5 feet deep; three bridges with fixed channel spans having a minimum width of 29 feet and clearance of 6 feet; overhead pipelines with clearance of 7 feet; and overhead power cables with clearance of 35 feet.

Franklin, about 22 miles above Berwick Lock, is an

agricultural center that has several small industries, and is the seat of St. Mary Parish. **Franklin Canal,** southwest of Franklin, connects with the Intracoastal Waterway at Bayou Bartholomew and had a controlling depth of 3½ feet in 1958. There is a highway bridge crossing the canal with a swing span having a clearance of 7 feet. Overhead power cables crossing the canal have a clearance of 60 feet.

A highway bridge with a swing span having a clearance of 8 feet crosses Bayou Teche, 22.5 miles above Berwick Lock. A privately owned pontoon bridge is about 3.5 miles above the highway bridge. The railroad bridge that crosses the bayou about 26.5 miles above the mouth has a swing span with a width of 49 feet and a clearance of 4 feet. A highway bridge with a swing span having a clearance of 6 feet crosses the bayou 27 miles above the lock. A pontoon bridge is about 2 miles above the highway bridge. Seven more bridges with swing spans cross the bayou at 31.1, 35.5, 35.9, 39.8, 43.9, 45.4, and 48.1 miles above the lock; minimum clearance is 4 feet.

Jeanerette is about 44 miles above Berwick Lock and is chiefly a market town; its principal products are sugar, oil, pecans, and peppers.

A guy cable near **Olivier** that has a clearance of 68 feet can be removed for vessels requiring greater clearance; 24 hours advance notice must be given the Orange Grove Sugar Company, Inc., New Iberia. The highway bridge that crosses the bayou 50 miles above Berwick Lock has a swing span with a clearance of 5 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, several small manufacturing industries, and is a supply center for the oil development of the surrounding area. There are three highway bridges across the bayou at New Iberia: a swing span at 53.0, a bascule span at 53.7, and a swing span at 54 miles above the mouth. The minimum clearance is 4 feet.

Five highway bridges and one railroad bridge at 56.9, 58.0, 60.4, 60.6, 61.9, and 67.6 miles above the mouth of the bayou have swing spans with a minimum width of 50 feet and a minimum clearance of 4 feet.

A shipbuilding plant at **Loreauville,** about 6 miles above New Iberia, constructs steel hull boats up to 65 feet in length. In an emergency they can haul out boats up to 40 feet in length for hull repairs. Gasoline, diesel fuel, lubricants, water, ice, and provisions are available. Marine supplies can be obtained at the yard.

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 70.6 miles above Berwick Lock, and halfway, by highway, between New Iberia and St. Martinville. A Federal project provides for rebuilding the dam at the locks and raising the crest 1½ feet.

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. 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.

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. Bayou Teche is cluttered with snags and trees above this point and navigation is difficult, even for outboard motor craft.

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 § **203.245,** Chapter 2, for **drawspan regulations.**

The Lower Atchafalaya River leads northward from Berwick Bay through Stouts Pass to Sixmile Lake. The marked channel northward through **Sixmile Lake** and **Grand Lake** is part of the Atchafalaya River navigation project discussed in Chapter 12.

Wax Lake Outlet, the deep drainage canal south-southwestward 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. Two bridges with fixed channel spans and a minimum clearance of 13 feet control navigation in the canal southward of Bayou Teche. An overhead power cable about 150 yards south of these bridges has a clearance of 60 feet.

Chart 1276.—Little Wax Bayou, branching westward 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 northern end of the bayou has been straightened by dredged cuts to form the route of the Intracoastal Waterway westward 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 western part of the bay.

Charts 1051, 1277.—Marsh Island, on the south side of Vermilion Bay and west 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 south point of the island. The foul area should not be entered without local knowledge. **Shell Keys,** a low group of small islands 4 miles south-southwest of **Mound Point,** the southernmost point of Marsh Island, are only about 2 feet high.

Trinity Shoal lies about 25 miles southward of Southwest Pass, Vermilion Bay, and 60 miles 285° from Ship Shoal Light. The shoal is about 20 miles long in a west-southwesterly and east-northeasterly direction, and has depths of 11 to 18 feet. It is fairly steep-to on its southern side, the 5- and 10-fathom curves being distant only about 1 and 5 miles, respectively. In calm weather Trinity Shoal can be discerned by a difference in the color of the water; in stormy weather it is indicated by a choppy sea. Owing to its greater depth, the sea does not break so heavily on Trinity Shoal as on Ship

Shoal. Trinity Shoal is marked off the south end of its southwesterly part by a lighted whistle buoy moored in 10 fathoms.

Southwest Pass extends between the western 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 and had a controlling depth of 6 feet over the bar in 1956. Although not difficult to enter, the pass may be difficult to recognize and local assistance is advisable.

East Cote Blanche, West Cote Blanche, and **Vermilion Bays** together make up a large body of water extending west-northwestward from the northwestern side of Atchafalaya Bay, and are separated from the Gulf by Marsh Island. This water area has a length of about 32 miles, with widths varying from 5 to 15 miles, and depths averaging from 5 to 9 feet. With the exception of Cote Blanche Island, Weeks 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 northwest shore in West Cote Blanche Bay, and on **Terrapin Reef.**

Boats bound from Atchafalaya Bay to East Cote Blanche Bay generally use **Morrison Cutoff,** which is between **Point Chevreuil** on the east and **Rabbit Island** on the west. 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 northeast corner of West Cote Blanche Bay, is a short channel having a least depth of about 4½ feet connecting the bay with the Intracoastal Waterway and with **Charenton Canal.** The entrance from the bay is marked by a light.

Cote Blanche Island, on the northerly side of West Cote Blanche Bay, is about 70 feet high, presenting on the bay side a reddish-yellow steep bluff. **Ivanhoe Canal,** westward of the island, connects West Cote Blanche Bay with the Intracoastal Waterway. The canal is marked by aids, and has a privately maintained fog signal at the bay entrance. **Cypremort Point,** in Vermilion Bay, is the site of a large summer resort. There are several private slips dredged into the banks. A boatyard has marine ways capable of hauling out vessels up to 65 feet in length and 6 feet in draft for hull and minor engine repairs. Gasoline, diesel fuel, water, and ice are available. Private mooring slips are available. A state road connects the point with the town of **Cypremort.**

Weeks Island, 204 feet high, is east of **Weeks Bay,** the northeasterly extension of Vermilion Bay. The Intracoastal Waterway passes close along the west side of the island. Two water tanks and the mine buildings make prominent landmarks from the bays; salt is mined on the island. There are rail and highway connections to **Baldwin** on Bayou Teche. A large oil field is on the north side of Weeks Island.

Bayou Carlin and **Weeks Bayou,** at the northeast corner of Weeks Bay, offer passage for drafts of not more than 3 feet from Vermilion Bay to the Intracoastal Waterway.

The **Port of New Iberia** is located 4 miles south of New Iberia, on the Commercial Canal which connects with the Intracoastal Waterway through **Rodere Canal,** the **New Iberia Southern Drainage Canal, Wilkins Canal,** and Bayou Carlin. The canal is 80 feet wide and in 1956, had a controlling depth of 12 feet. The port is 7 miles north of the Intracoastal Waterway and is about 8 miles from Weeks Bay. The canal and port are governed by the Board of Directors of the Port Commission, New Iberia Port District. There are loading and docking facilities, with electric power lines, and a telephone at the Public Dock and at the Public Boat Slip about 0.5 mile south of the public dock. Boat stalls and sheds are available. Gasoline, fresh water, and power are obtainable at the port. A shipyard has marine ways capable of hauling out vessels up to 70 feet in length for general repairs. There are highway and railroad connections to the port area. Overhead power cables with clearance of 65 feet cross the canal at two places.

Avery Canal (Chart 882) leads northwestwardly from Vermilion Bay to a junction with Bayou Petite Anse at the Intracoastal Waterway. The entrance is marked by lights; stumps and tree trunks are near the mouth of the canal. Federal project depth is 7 feet in Avery Canal. In September 1961, controlling depths were 2 feet over the bar in Vermilion Bay and 5 feet in Avery Canal.

Bayou Petite Anse has a Federal project depth of 9 feet from the Intracoastal Waterway for about 5.3 miles northward to the fixed highway bridge at the northern end of Avery Island. The controlling depth in the bayou was 5 feet in September 1961.

Avery Island is eastward of Bayou Petite Anse, and has a water tank and 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 southward as Avery Island.

About 2.8 miles above the Intracoastal Waterway, **Bayou Carlin** branches northwesterly from Bayou Petite Anse for about 2.5 miles to a junction with Bayou Tigre and Delcambre Canal. **Delcambre Canal** continues northward to **Lake Peigneur.** Bayou Carlin and Delcambre Canal have a Federal project depth of 9 feet and had a controlling depth of 6½ feet in September 1961.

Delcambre is on Delcambre Canal, 2 miles south of Lake Peigneur, and is the fishing center for Iberia Parish. There are several seafood processing plants and public wharves at the town. There are two shipyards for general repairs, the largest having marine ways capable of hauling out vessels up to 75 feet in length and 10 feet in draft. Gasoline, diesel fuel, lubricants, fresh water, ice, provisions, and marine supplies are available. Highway and railroad bridges with vertical-lift spans cross the canal at Delcambre. Each bridge has a width of 40 feet; the railroad bridge has a clearance of zero feet down and the highway bridge has a clearance of 44 feet up.

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 is a tortuous and shallow waterway extending from Bayou Petite Anse to **Erath,** navigated only by small craft at high tide. Four bridges cross the bayou; the minimum width is 15 feet, and the bridge with a fixed channel span has a clearance of 3 feet.

Lights and daybeacons in Vermilion Bay mark the entrance channel into **Boston Bayou.** The aids are privately maintained.

Vermilion River, flowing from the northward, crosses the Intracoastal Waterway and enters Vermilion Bay. **Vermilion River Cutoff** (Chart 882) leads in a north-northwesterly direction 4 miles from Vermilion Bay to the intersection of the Vermilion River with the Intracoastal Waterway, and had a controlling depth of 7 feet in October 1961. The entrance shoals rapidly after dredging and may be difficult to enter during the winter months when strong winds from the north lower the water in the bay. Lights mark the eastern side of the entrance channel in Vermilion Bay. Vermilion River is also known as **Bayou Vermilion** and is so marked at the bridge crossings.

The controlling depth in Vermilion River above the waterway was 10 feet in October 1961 for about 21 miles to Abbeville, thence in April 1961, 6 feet to the head of navigation at **Pinhook Bridge,** about 2 miles below Lafayette. Cutoffs have been dredged and some of the bends eased in the section of the river between the Intracoastal Waterway and Abbeville. Mariners may expect strong currents in the river.

A marina just north of the waterway has gasoline, diesel fuel, and water; controlling depth to the marina is about 5 feet. Two boatyards near the marina have marine ways capable of hauling out boats up to 50 feet in length for general repairs.

An overhead power cable with clearance of 60 feet crosses the river about 2.7 miles above the Intracoastal Waterway.

A cable ferry crosses the river at **Bancker,** a small village about halfway between the Intracoastal Waterway and Abbeville. An overhead power cable at the town has clearance of 60 feet. About 2 miles above Bancker, an overhead power cable with a clearance of 65 feet crosses the river near the town of Rose Hill.

Perry is a small village 2 miles southwest of Abbeville. The highway vertical-lift bridge at Perry has a clearance of 10 feet down and 55 feet up. A shipyard has marine ways capable of hauling out vessels up to 85 feet in length and 7 feet in draft for general repairs. There is a wood shop at the shipyard.

There are three vertical-lift bridges and two swing bridges crossing the river above Perry and below Pinhook Bridge at the outskirts of Lafayette; minimum width is 50 feet, minimum clearance is 4 feet down and 50 feet up. Overhead power cables at Abbeville have clearance greater than the vertical-lift bridges.

Abbeville, the seat of Vermilion Parish, is the center of an agricultural area. Gasoline, diesel fuel, water, ice, and provisions are available but there are no mooring facilities. A shipyard has marine ways capable of hauling out vessels up to 100 feet in length, 3 feet in draft forward and 7 feet aft, for general repairs.

Lafayette, the seat of Lafayette Parish, is 22 miles above Abbeville and is the oil center of the area. Unlimited supplies and provisions are obtainable in Lafayette but there are no mooring facilities. The Pinhook Bridge has a swing span with a clearance of 12 feet; see **§ 203.245,** Chapter 2, for drawspan regulations.

Schooner Bayou (Chart 883), emptying into the extreme western extension of Vermilion Bay, forms a part of the former inside route of Mermentau River through White and Grand Lakes and connecting passages. The controlling depth in the bayou was 10 feet in October 1961. The best approach to Schooner Bayou is through Schooner Bayou Cutoff, the dredged canal which takes off from the Intracoastal Waterway near Intracoastal City. The controlling depth was 7 feet in October 1961. **Warren Canal, Isle Marrone Canal,** and **North Prong** connect Schooner Bayou with the Intracoastal Waterway to the westward of Vermilion Lock.

The entrance channel to the bayou from Vermilion Bay via Mud Point is no longer maintained, and in 1956 its general depth was 4 feet. To enter by this route, follow the old Vermilion River entrance to the mouth of the bayou which is marked by a light.

Schooner Bayou Control Structure, constructed 4 miles inside the bayou to prevent salt water from flowing through the canal into White Lake, has floodgates 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, which attains velocities up to 5 knots. Vessels can by-pass the floodgate by going through North Prong-Schooner Bayou into the Intracoastal Waterway southeastward of Forked Island. This route carries about the same water as the one through Schooner Bayou and Schooner Bayou cutoff.

From Schoner Bayou Canal, the route crosses White, Turtle, Alligator, Collicon, and Grand Lakes. Several lights and daybeacons mark this route. During dry summer months when farmers pump water to irrigate their rice fields, water in the lakes lowers enough to hamper navigation. Controlling depths in October 1961 in various sections of the route were: Intracoastal Waterway to Schooner Bayou, 7 feet; thence 10 feet to White Lake, thence 5 feet to and through Grand Lake to Mermentau River.

White Lake is 12 miles long, 6 miles wide, and has depths of 4 feet or more over a mud bottom. The east entrance from the lake is marked by a light and the west entrance by a daybeacon, both aids being on the north side of the channel. The course across the lake passes about 0.5 mile off the point in the middle of the north shore of the lake. The channel is not marked.

Approach the east entrance with the line of the Schooner Bayou Canal in range ahead. The channel is narrow and the spoil bank on the south side is marked

by stakes. At the west end of the lake, pass about 10 to 15 yards south of the daybeacon 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 in depth. On the west side of this lake an earth dike extends along the north 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 southeast end of the lake, the entrance from Collicon Lake leads within 5 to 10 yards along the south 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 easterly 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 northward, and about the same distance off **Umbrella Point,** the second point to northward. From Umbrella Point, pass about 0.25 mile east of Grassy Point, and when beyond this point haul to westward and pass well off the easterly 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 eastward, follows the river for about a mile and exits to westward. The river channel is deep.

A network of canals south from Schooner Bayou to Cheniere au Tigre and west to Pecan Island have been dredged through the marsh. The widest and deepest of these canals is **Sixmile Canal,** connecting to the south side of Pecan Island. Sixmile Canal leaves Schooner Bayou about 1.5 miles east of Schooner Bayou Control Structure and extends in a southerly direction 6 miles to **Belle Isle Bayou,** near the northwest end of Belle Isle. The main canal then follows **Belle Island Bayou** southward about 2 miles to **Belle Island Canal,** thence southwest through Belle Island Canal about 3 miles to **Freshwater Bayou** and the **Louisiana Fur Company Canal,** thence northwest 1.7 miles in Louisiana Fur Company Canal to **Humble Canal,** thence about 5 miles west and north to Pecan Island. Humble Oil Company operates a large oil field south of Pecan Island and maintains the canals to carry a draft of at least 4 feet from Schooner Bayou to Pecan Island.

Access to this network of canals is through Schooner Bayou and Sixmile Canal, or **Deepwater Bayou,** which enters Vermilion Bay about 1.5 miles south 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 Island, west 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 west end of Belle Isle Lake.

Cheniere au Tigre, 4 miles south of Belle Isle, is a wooded ridge about 3 miles long with its east end on the Gulf Coast. The 12-foot elevation on the ridge is the highest natural elevation in the locality.

Pecan Island, south of White Lake, is a long, wooded ridge about 10 feet high. **Pecan Island,** a village on the south end of **Pecan Island Canal,** has a few stores with limited supplies. Gasoline may be obtained by portage. A Federal project provides for a channel 5 feet deep from White Lake to Pecan Island. The controlling depth across the bar was 1 foot in 1956. A light shown from a black triangular slatted pile structure marks the northern entrance of the canal. A small cattle-loading pen and ramp are near the head of the canal.

Charts 1051, 1278.—Mermentau River empties into the Gulf of Mexico 86 miles westward of Atchafalaya Bay Entrance and 12.5 miles eastward of Calcasieu Pass. The entrance channel shifts frequently and should be approached with caution. From the Gulf, the Mermentau leads eastward through Lower Mud Lake and Upper Mud Lake, thence northward into the southwesterly side of Grand Lake, out of the north 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 Bayous Nezpique and des Cannes, where the river is formed.

In September 1961, the mouth of the river had shoaled and bares in places; inside, controlling depths were 1 foot to Grand Cheniere and 2½ feet through Grand Lake to the Intracoastal Waterway. A Federal project provides for a channel 9 feet deep from the Intracoastal Waterway to the junction of Bayous Nezpique and des Cannes; in September 1961, the controlling depth was 5½ feet.

In the Mermentau River below Grand Lake, a drainage canal 13 to 15 feet deep and more than 100 feet wide was dredged in 1947. The lock was abandoned in 1951; dikes that prevent the inflow of salt water have gates that are opened for passing boats.

Numerous aids mark the channel in the Mermentau River north of the Intracoastal Waterway. Ranges and daybeacons mark the lower part of Lake Arthur and buoys mark the upper part. Near the center of the lake, the channel passes through a constriction known as **The Narrows.**

Mermentau River is crossed by the following bridges and cables: 2.3 miles west of Grand Cheniere an overhead power cable with a clearance of 72 feet is on the south side of the highway bridge with a swing span having a clearance of 13 feet; about 1 mile west of Grand Cheniere, an overhead power cable with a clearance of 68 feet; at Lake Arthur, a highway bridge with a fixed span having a clearance of 28 feet; at Mermentau there is a railroad bridge with a swing span that has a clearance of 10 feet and a highway bridge with a fixed channel span having a clearance of 20 feet. Mariners are directed to 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 vessel shall be made rigid abreast or astern of the barge.

Grand Cheniere (P.O.), a small settlement on the east bank 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.

Lake Arthur (P.O.), a town on the northwest 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 many piers at Lake Arthur. A boatyard and machine shop has marine ways that can haul out vessels up to 45 feet in length for general repairs. Gasoline, diesel fuel, lubricants, water, ice, and provisions are available.

Mermentau, 16 miles above Lake Arthur, is a rice milling center that has railroad and highway connections with New Orleans and Lake Charles.

From the head of Mermentau River, Bayous Nezpique and des Cannes were navigable for depths and distances as follows: Bayou Nezpique, 12 feet in October 1961 to the swing bridge; Bayou des Cannes, 9 feet for about 4 miles in February 1961.

A highway bridge with a fixed channel span having a clearance of 30 feet and a highway bridge with a swing span having a clearance of 8 feet cross Bayou Nezpique northeast of Jennings. See **§ 203.245,** Chapter 2, for **drawspan regulations.**

On **Bayou des Cannes,** a highway bridge with a fixed channel span having a width of 45 feet and a clearance of 1 foot crosses at **Evangeline.**

Bayou Plaquemine Brule empties into Bayou des Cannes about 1 mile above Mermentau River. Controlling depths in Bayou Plaquemine Brule in 1959 were 10 feet for about 5 miles, thence 5½ feet in 1956 to the head of the improvement about 16.5 miles above the mouth. A railroad bridge with a swing span that has a width of 47 feet and a clearance of 7 feet crosses the bayou north of **Midland.** See **§ 203.245,** Chapter 2, for **drawspan regulations.** A cable ferry crosses the bayou north of **Esterwood.**

Chart 591.—Calcasieu Pass, the outlet of Calcasieu Lake, is about 98 miles westward of Atchafalaya Bay entrance and 78 miles eastward of Galveston entrance. It is the first and only deep-draft channel west of the Mississippi River and east 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. The yellow courthouse building at Cameron, with the small radio tower atop, and a church spire 7.5 miles east of the jetties, are seen among the trees but are not conspicuous.

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. Federal dredging depths are 37 feet in the outer bar channel and 35 feet to the wharves at Port of Lake Charles and in Clooney Island Loop; the controlling depth was 33 feet in September 1961.

A lighted whistle buoy marks the outer end of the dredged channel. A lighted range leads across the bar between the jetties and into the pass.

Anchorages.—Large vessels usually anchor off Calcasieu Pass. Vessels up to 12 feet in draft can obtain excellent anchorage in the bend in the river at Cameron. While waiting for daylight or for fog to lift, ships can anchor out of the fairway anywhere in Calcasieu River. No anchorages exist in the land cuts and ships entering cuts are expected to complete passage.

Tides and currents.—Diurnal range of tide in Calcasieu Pass is 2.0 feet; in Calcasieu Lake and River it is less than 0.5 foot. Flood waters may increase the normal river level at Lake Charles 1.5 feet. There is little current in the river except during freshets.

Dangers.—Seaward of the jetties, a moderate to strong current sweeps across the channel, normally setting in a westerly direction. Mariners should exercise caution and be on the alert. A mud slush lying on the bottom and extending approximately 6 feet above the hard bottom frequently will be found in the channel seaward of the jetties and at various places above the pass. This material can barely 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. Deep-draft vessels can go through the soup and slush, but it will retard the ship's speed and may affect the steering.

Pilotage is compulsory for all vessels engaged in foreign trade, and for all vessels over 100 tons in coastwise trade that do not have on board a pilot licensed by the Coast Guard. The pilot station maintains a 24-hour watch and can be called on 2738 k.c. Incoming ships or their agents usually notify the Lake Charles Pilots of time of arrival off the sea buoy. Day or night, pilots take ships to and from Lake Charles. The pilot boat is stationed at Cameron; it flies the flag **P**, and usually meets incoming ships at buoy 21.

Cameron (P.O.), the seat of Cameron Parish, is a fishing village on the eastern shore of Calcasieu Pass 2.5 miles above its entrance. The village has stores, several shrimp-packing houses, and two large fish-oil plants. Gasoline, diesel fuel, water, ice, provisions, and some marine supplies are available. A small shipyard has a floating drydock capable of hauling out vessels up to 90 feet in length for general repairs. Small craft may find dock space or can anchor in the bend of the river near Cameron in depths from 12 to 30 feet. An auto ferry crosses the ship channel northwest of Cameron. Another smaller auto ferry connects Cameron with the island formed by the river and the ship channel, crossing the river at Cameron. An overhead power cable with clearance of 84 feet crosses the river at Cameron. See Appendix for **storm warning displays.**

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 entrances at either end is 5 feet, but the bottom is so soft that slightly greater drafts can drag through. A row of piles marks the west side of the channel across the lake. Along the

southern end of the lake is an old revetment, partly submerged, extending about 1.5 miles.

Grand Lake, a summer resort on the northeast side of Calcasieu Lake, has boat landings with depths of 2 to 4 feet alongside.

Hackberry, on the northwest side of the lake, is an oil drilling center. Both towns have highway connection to Lake Charles.

Chart 592.—Calcasieu River and Ship Channel.—Northward of Calcasieu Pass, the ship channel cuts across points of land along the west side of Calcasieu Lake to a junction with the Calcasieu River at **Choupique Island.** The channel is straight and is well marked by lights, buoys, daybeacons, and lighted range at the northern end.

Calcasieu River empties into the northern part of Calcasieu Lake. Three miles above the mouth of the river, the Intracoastal Waterway leads to the eastward, and 2 miles farther, at the west end of **Devils Elbow,** the ship channel connects with the river and at the same place, the Intracoastal Waterway leads to the westward through **Choupique Cutoff.**

Northward of the intersection with the Intracoastal Waterway, the ship channel follows the natural channel of Calcasieu River to the north side of **Moss Lake,** thence by-passing the river through a land cut about 1 mile long to the westerly 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 south end of **Coon Island;** thence, the eastern or right fork for about 1.5 miles to the port docks 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 on the west side of the Calcasieu River just north of its junction with the ship channel, is the site of a shipbuilding company which has marine ways capable of hauling out vessels up to 180 feet in length for general repairs. The yard also has a floating drydock under construction capable of hauling out vessels 200 feet in length and 53 feet in width. The yard has a machine shop and wood shop.

Haymark Terminal, Vincent Landing, and **Rose Bluff** are sites of extensive oil refining, storage, and shipping on the Calcasieu River below Port of Lake Charles.

A highway bridge at the northern end of Rose Bluff Cutoff, about 1.5 miles below Port of Lake Charles, has a fixed channel span with a clearance of 125 feet.

Note.—Considerable damage, including bank erosion, is being suffered by properties along the river, particularly in the vicinity of Vincent Landing and the south or lower portion of Moss Lake. The damage results principally from wave action of light tugs and light or partially loaded ships. See **§ 207.180,** Chapter 2, for navigation regulations. Mariners are directed to exercise every caution and to proceed at slow speed.

Bayou d'Inde, branching westward from Rose Bluff Cutoff, is crossed by a removable span highway bridge 1.9 miles above the cutoff. This bridge has a width of 37 feet and a clearance of 2 feet. Two more removable span bridges and several overhead cables cross the bayou above this point; see **§ 203.245,** Chapter 2, for **drawspan regulations.** The head of navigation is 6.6 miles above the cutoff, which is 0.3 mile below Sulphur.

Contraband Bayou branches eastward from Calcasieu River just south of Port of Lake Charles deep-water terminals. A highway bridge with a fixed channel span having a clearance of 15 feet crosses the bayou 2.6 miles above it's mouth. Two boatyards on the bayou have marine ways and two basins have covered storage. The larger is capable of hauling out vessels up to 40 feet in length for general repairs. The controlling depth to the bridge was 9 feet in October 1961.

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 down stream. The controlling depth in the loop was 33 feet in October 1961. A large alkali plant is on a dredged channel that leads westward off the northwest side of the loop; in October 1961, a draft of 18 feet could be taken to the first wharf in the channel, and 7 feet beyond the wharf.

The **Port of Lake Charles** docks are on the east side of Calcasieu River opposite Clooney Island.

Lake Charles, the seat of Calcasieu Parish, is the only major port in western Louisiana. The city is on the main State highway westward from New Orleans, and is served by three trunk line railroads and two airlines. There are frequent sailings to coastwise and foreign ports. The principal exports are petroleum, agricultural and dairy products, lumber, fish oil, and chemical products. The major imports are Chilean nitrate of soda and barite ore.

Towage.—Two towing companies maintain offices at the Port of Lake Charles. Tugboats are available for harbor, intracoastal, coastwise, and ocean towing. Divers are available.

Quarantine.—Vessels are boarded by quarantine officers at any of the docks within the port limits.

Hospital facilities are available at Lake Charles. The nearest United States Public Health Service outpatient clinic is at Port Arthur, Texas.

Customs.—Vessels are boarded by customs officers at the dock. The Customs Service maintains an office at the Port of Lake Charles, a port of entry, and issues marine documents.

Immigration.—Immigration officials board vessels at any dock within the port limits. The Immigration Office is in the Federal Building.

Harbor regulations.—Federal regulations applicable to Lake Charles are those usually in force at most seaports in 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 northern end of Calcasieu Lake northward to Westlake.

Wharves.—The public facilities, owned by the Lake Charles Harbor and Terminal District and operated by the board of commissioners for the port, are located on a point on the east side of Calcasieu River, 31 miles from

the Gulf and near the southern limits of the city of Lake Charles. There are two wharves, 1,600 feet long and one 1,000 feet long, each with depths of 31 to 34 feet alongside. The transit sheds on the wharves have about 500,000 square feet of covered storage and are equipped with modern fire fighting apparatus. Double railroad tracks serve both front and rear of the transit sheds. Between the wharves are several warehouses and a high-density cotton compress and several storage warehouses. There are storage facilities for nitrate of soda, creosote, cotton, and general cargo.

Supplies.—Bunker fuel is obtainable, by prior arrangement at the numerous oil terminals along the river, at rates of 2,000 to 2,500 barrels per hour. Fresh water is piped to several wharves. Marine hardware and provisions are available.

Repairs.—Shipyards and marine railways in the Port of Lake Charles area are at Calcasieu Landing and Contraband Bayou.

About a 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 eastern shore. The river channel extends along the western side of the lake.

Facilities are very limited for small boats. Two piers on Lake Charles have covered storage for 50 boats. A small pier on the south side of the lake has gasoline, diesel fuel, and facilities for docking a few small boats and skiffs. 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 west bank of the Calcasieu River about 2 miles above the port docks. The highway bridge that crosses the river and the northern 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 north of the highway bridge are two railroad bridges with swing spans having a minimum clearance of 1 foot. The prescribed navigable west draw openings are protected with fender systems; any craft navigating the east draw opening does so at its own risk. About 0.2 mile above these bridges there is an overhead power cable with clearance of 110 feet. About 6.6 miles above Westlake is an overhead power cable with clearance of 136 feet, and about 7.5 miles above Westlake there is a railroad bridge with a swing span having a clearance of 7 feet.

West Fork of Calcasieu River branches westward about 6.5 miles above Westlake. Overhead power cables cross the fork about 3 miles above Calcasieu River, and a cable ferry and an overhead power cable cross the fork about 4 miles above the river.

Houston River branches westward from the West Fork of Calcasieu River. A ferry and a railroad bridge cross Houston River about 5 miles above its mouth. The railroad bridge has a swing span with a width of 27 feet and a clearance of 6 feet. See **§ 203.245,** Chapter 2, for **drawspan regulations.**

English Bayou branches eastward from the Calcasieu River about 7.5 miles above Westlake. A highway bridge with a swing span having a width of 45 feet and a clearance of 2 feet crosses the bayou about 1 mile above its mouth; see **§ 203.245,** Chapter 2, for **drawspan regulations.**

At **Moss Bluff,** about 10 miles above Westlake, a highway bridge with a vertical-lift span has a clearance of 10 feet down and 45 feet up.

In 1959, Calcasieu River had a controlling depth of 21 feet for about 7 miles above Westlake, thence 13 feet to Moss Bluff.

Chart 1279.—**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 westward 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 whistle buoy, south of Calcasieu Pass, marks the eastern end of Sabine Bank.

A lighted bell buoy about 2.2 miles eastward of Sabine Bank Light marks the west side of a 1.5-mile wide passage through the bank; a lighted whistle buoy marks the east side. Known locally as **Hole in the Wall,** this is the most used passage through the bank; its 32-foot depth may be reduced as much as 3 feet during northers.

To the southward 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. These shoals lie near the track of vessels making the passage through Hole in the Wall from the southeastward.

Northward of Sabine Bank, general depths are 36 to 40 feet.

Approaching Sabine Pass from eastward, deep-draft vessels should avoid Ship Shoal, Trinity Shoal, Sabine Bank, and the extensive area of broken ground between them.

From Dry Tortugas to Sabine Pass, a course set directly to Hole in the Wall will clear most of the offshore oil well structures. Extreme caution is necessary in making a landfall southward of Trinity Shoal and Sabine Bank.

Light-draft vessels coming from eastward can follow along the coast westward of Trinity Shoal, keeping seaward of the 5-fathom curve until the lighted whistle buoy off the Sabine Pass entrance is sighted.

Approaching Sabine Pass from southwestward, deep-draft vessels should make landfall off Galveston, taking care to pass northward of Heald Bank, and then set a course for the lighted whistle buoy off Sabine Pass.

Light-draft vessels, when eastward of Galveston entrance, can follow the coast at a distance of about 5 miles, but must increase this distance to 7 miles when approaching the lighted whistle buoy 7 miles southwestward of the entrance.

10. SABINE PASS TO SAN LUIS PASS

Chart 1116.—Sabine Pass and its connecting channels comprise an extensive system of deepwater routes leading inland as far as Beaumont and Orange, Texas. From Sabine Pass the coast follows a general west-southwest direction for 50 miles to Galveston Entrance. Except in the eastern part, deep water extends fairly close inshore. The coast is low and devoid of prominent features, with the exception of High Island. Off the coast, Heald Bank has depths of 25 to 35 feet and constitutes 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 has extensive foreign and coastwise trade.

Chart 517.—Sabine Pass, 244 miles westward of Southwest Pass, Mississippi River, and 50 miles east-northeastward 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 northward from the Gulf.

Prominent features.—The most prominent objects seen when approaching Sabine Pass are the east jetty light, the abandoned pilot station and the dredging range towers. Also prominent are the abandoned Sabine Pass Lighthouse, a television tower, entrance range lights, the oil and water tanks west of Sabine Pass, the tall hotel buildings, and a stack at Port Arthur. At night the television tower lights can be seen for a considerable distance.

Sabine Pass East Jetty Light (29°38.7′ N., 93°49.4′ W.), 67 feet above the water, is shown from a red square skeleton structure on piles on a concrete block at the south end of the jetty. A fog signal and a low power radiobeacon are at the light.

Sabine Pass radiobeacon is on the west side of the pass at the site of the former Coast Guard lifeboat station about 1.5 miles from the shore end of the jetty. About 0.5 mile above the radiobeacon on the opposite side of the pass is an abandoned lighthouse, a black-and-white horizontally banded 81-foot tower. Sabine Pass Coast Guard station, the lifeboat station, and the Captain of the Port are at the site of the old Quarantine Station on the west bank of the pass about 3.5 miles above the jetty.

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 southerly direction from shore. The general depths between jetties, outside the channel, are 8 to 16 feet. Federal project depth on the outer bar channel is 37 feet, decreasing to 36 feet at the inner end. Inside the jetties, the project provides for a channel 36 feet deep through the pass and in Port Arthur Canal, Taylor Bayou, and the three turning basins at Port Arthur.

A lighted whistle buoy, 2.5 miles off the jetties, marks the west side of the entrance to the bar channel; lighted ranges and buoys mark the channel over the bar, and through the jetties and the pass. 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 northwesterly about 6 miles to Sabine Lake. The bottom outside the channel for the most part is soft, and vessels can touch without injury, but there are occasional patches of oyster bars dangerous to vessels striking them. An extensive oyster bar exists on the east side of the channel opposite Sabine, and a smaller one on the same side opposite the village of Sabine Pass.

The channels are under constant maintenance, and controlling depths are reported in the Notice to Mariners.

Anchorages. Deep-draft vessels usually anchor outside of the pass entrance. Vessels of light draft can find good holding ground 7 to 8 miles westward 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.

The portion of the former channel off the town of Sabine Pass is now a designated anchorage area; see **§ 202.196,** Chapter 2, for limits and regulations.

Boundary lines of inland waters.—The lines established for Sabine Pass are described in **§ 82.103** and **§ 82.106,** Chapter 2.

Tides and currents.—The diurnal range of tide at the entrance of Sabine Pass is 2.1 feet and about 1.5 feet at Port Arthur. The currents off the entrance of Sabine Pass are dependent upon the direction and velocity of the wind. Following continued north to easterly winds, a southwesterly to westerly current will be found off the entrance, frequently with a velocity of 1 knot and sometimes as much as 2 knots. Following southerly and southwesterly winds, the currents will be in the opposite direction, but with less velocity. Current velocities up to 2.5 knots have been observed in Sabine Pass. Information upon which to base current predictions is lacking.

Weather.—The waters are navigable throughout the year. The prevailing wind direction is north in December and January, east in September, October, and November, and southerly throughout the spring and summer. Gulf storms may occur from July to October.

See Appendix for **storm warning displays.**

Pilotage.—Pilotage is compulsory for foreign vessels and American vessels under registry, but is not compulsory for coastwise vessels having on board a pilot licensed by the United States Coast Guard.

The Sabine Pilots have a station on the west side of the channel inside the jetties. A pilot boat, usually on watch near the seaward end of the jetties, will come out to a vessel making signal.

Towage.—Vessels usually proceed without assistance through the pass to Port Arthur. Towboats and ocean-going tugs are available at Port Arthur. The towboat companies are equipped to perform wrecking and salvage operations.

Quarantine.—The quarantine station is at Port Arthur, Texas, and vessels subject to visitation are boarded at the docks.

An outpatient clinic of the Public Health Service is located in the Post Office and Customhouse at Port Arthur. There are hospitals in the city.

Customs.—Vessels are boarded upon arrival at berth. Headquarters of the Customs Service is in the Post Office and Customhouse at Port Arthur. Port Arthur and Sabine are ports of entry and marine documents are issued at Port Arthur.

Immigration.—Inspectors board vessels upon arrival at berth. The Immigration Office is in the Post Office and Customhouse.

Texas Bayou, on the west side opposite the abandoned Sabine Pass lighthouse, has facilities for small craft to dock and obtain gasoline, diesel fuel, water, and ice.

Sabine (P.O.) is a village on the west shore of the pass, about 5 miles above the outer end of the jetties. The southerly of the two old slips is used as a small-boat harbor where gasoline, diesel fuel, water, and ice are available.

Sabine Pass (P.O.) is a village on the west shore of the pass about 1.5 miles north of Sabine. The town is a shipping point for crude petroleum.

Sabine Lake has an average depth of about 6 feet in its 15-mile length. At the southern end, where it empties into Sabine Pass, the depth is 4 feet. A highway bridge over the southern end has a swing span with a clearance of 9 feet. The lake is of little commercial importance and 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 2 to 3 feet in draft.

Johnson Bayou, in the extreme southwestern part of Louisiana, empties into the southeastern part of Sabine Lake, directly east of Port Arthur. The entrance to the bayou is marked by a pile. The dredged channel leading to the entrance has filled to the lake bottom level. The controlling depth was 2½ feet into the mouth of the bayou in 1956. Inside the entrance, the bayou is deeper and is navigable for about 4.5 miles to the settlement of **Johnson Bayou**; a highway connects the settlement with **Sulphur.**

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 western shore of Sabine Lake. Lights and lighted ranges mark the channel to Taylor Bayou.

Port Arthur, an important oil-shipping center, is on the west shore of Sabine Lake 17 miles above the Sabine Pass entrance. The principal industrial development is on Taylor Bayou, at the southwestern outskirts of the city, sometimes known as **West Port Arthur.** The port has extensive domestic and foreign trade in crude petroleum and its refined products. There is some commerce in wheat, chemicals, lumber, iron and steel products, and general merchandise.

Wharves.—Port Arthur has several wharves with depths ranging from 10 to 38 feet. Just inside Taylor Bayou are two adjoining turning basins; the basins are maintained at, or near, project depth of 36 feet. An oil company has 3,000 feet of docking space on the east side of the easterly basin. At the upper end of the basin are general cargo facilities, including extensive warehouses and sheds, and a total docking space of 6,500 feet in two slips. The grain elevator has a capacity of 1,500,000 bushels. Along the north side of the western basin is a lumber wharf 1,765 feet long.

A third turning basin is about a mile farther up the bayou; the basin and connecting channels are maintained at, or near, project depths. The port is served by adequate rail and highway connections. All facilities are privately owned, and the oil terminals are used only for company business.

Supplies.—Provisions and general supplies can be obtained at the numerous stores in Port Arthur. Fresh water of good quality is available alongside the wharves or can be delivered in barges. Oil bunkering facilities with a loading rate of 4,000 to 5,000 barrels per hour are available. Small boats can secure gasoline, oil, water, and supplies along the city waterfront of the Sabine-Neches Canal. A mooring basin is on the west side of the canal just above the bascule bridge, and docks are on the west side of the canal just below the bridge. A small marina on the Intracoastal Waterway is west of the bascule bridge which is west of Port Arthur Canal.

Repairs.—There are two shipyards on the west bank of S bine-Neches Canal at Port Arthur. The yard 0.8 mile southwest of the highway bridge has two floating drydocks with a maximum capacity of 4,000 tons, 300 feet in length. The second yard is 4 miles northeast of the highway bridge and can haul out vessels up to 250 feet in length. Barges up to 300 feet in length can be hauled. Both yards have machine, electrical, and carpenter shops, and make general repairs.

Communications.—Radio station WPA provides ship-to-shore service. The port is served by two railroads and by commercial airlines.

Taylor Bayou has a navigable depth of about 4 feet for about 30 miles above the upper turning basin at West Port Arthur. Across Taylor Bayou above the turning basin are two adjacent drawbridges with a minimum width of 38 feet and a clearance of 5 feet. Timber trestles carrying

overhead pipelines have 20-foot wide bays and clearance of about 5 feet. Overhead power cables crossing the bayou have minimum clearance of 30 feet. About 1.7 miles above the bridge is a lock with a length of 200 feet, width of 30 feet, and a depth of 10 feet over the sills; see **§ 207.185,** Chapter 2, for navigation regulations.

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, northeasterly to the mouth of Neches River, thence easterly through the open water of the northerly part of Sabine Lake to the mouth of Sabine River. Federal project depths are 36 feet to the mouth of Neches River; thence 30 feet to the mouth of Sabine River. Controlling depths are published in Notice to Mariners. Lights, lighted ranges, and buoys mark the canal.

A highway drawbridge crossing the canal at Port Arthur has a bascule span with a clearance of 10 feet.

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 533.—Neches River, emptying into Sabine Lake from the northwestward, extends in a ship canal 18.5 miles to Beaumont. The Federal project provides for a channel 36 feet deep to a turning basin at Beaumont 34 feet deep, thence 30 feet to the Bethlehem Shipyards. Controlling depths are published in Notice to Mariners. Depths are several feet greater during high-river stages which occur usually from January to the last of April. Lights, ranges, and buoys mark the improved section of the river.

A highway 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. Three overhead power cables with a clearance of 182 feet cross the river between the fixed bridge and Beaumont.

The marsh island north 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 United States Maritime Administration and has a controlling depth of 18 feet; see **§ 207.900,** Chapter 2, for **regulations restricting navigation** in the vicinity of the decommissioned ships.

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.

Port Neches (P.O.), on the river 6 miles above Sabine Lake, is an important oil refining center. Three private oil-handling terminals have a total berthing space sufficient for five ships. A dry cargo terminal has a transit shed with rail connections for the movement of general cargo. Petroleum products, asphalt, and roofing materials are exported. There are rail and highway connections with Port Arthur and Beaumont.

Beaumont, on Neches River 18.5 miles above Sabine Lake and 43 miles from the Gulf, is the largest city in eastern Texas. Numerous rail lines and improved highways radiate to all parts of the country. Steamship companies maintain freight service out of Beaumont to coastwise and foreign ports, and petroleum interests operate fleets of tankers to carry their products all over the world. The principal commerce is in oil and petroleum products. Other commodities are flour, rice, cotton, iron and steel, and chemical products.

Anchorages.—There are no anchorages at Beaumont and only emergency anchorage is permitted in Neches River. Vessels may be tied up to the banks of the river for a limited period provided permission is obtained from the Corps of Engineers.

Tides and currents.—Periodic tides are practically negligible in Neches River. The rise and fall of the water depends upon meteorological conditions. During high-river stages, the velocity of the current in the river is about 2.5 knots.

A highway and two railroad bridges cross the improved channel above the turning basin at Beaumont. The first railroad bridge is a vertical-lift structure with a clearance of 11 feet down and 145 feet up. The second railroad bridge has a bascule span with a clearance of 10 feet. The highway bridge has a fixed channel span with a clearance of 43 feet.

Towage.—Towboats are available at Beaumont.

Quarantine.—Vessels subject to visitation are boarded at the docks. The nearest United States Public Health Service outpatient clinic is at Port Arthur; hospital facilities are available at Beaumont.

Customs.—The Customs Service maintains an office in the Federal Building. Beaumont is a port of entry and marine documents are issued.

Immigration.—The Immigration Service maintains an office in Port Arthur.

Harbor regulations.—The harbor regulations are administered and enforced by the Port Commission.

Wharves.—The municipal wharves and warehouses are on the south side of the city, on the protruding point just north of the turning basin. Virtually all of the general shipping of the port is handled at this terminal. Extending along both sides of the point, the seven public wharves have berthing space of about 3,500 feet. The transit sheds have floor area of 246,000 square feet, and there are 200,000 square feet of open-storage space. The port has railroad and highway connections. The Superintendent of Docks has an office at the terminal.

Along the river below Beaumont are extensive petroleum-handling terminals, the larger ones being facilities of the Mobil Oil Company and the Sun Oil Company, 1 and 5 miles, respectively, below the turning basin.

Warehouse facilities at the port provide ample storage for general cargo, cotton, and cold storage.

Small-boat facilities.—Landings for small craft are in the bend below the turning basin and along the river above the railroad bridges. A boatyard at the mouth of **Brakes Bayou** can haul out craft up to 50 feet in length for general repairs. Gasoline, oil, and water are avail-

able at the boatyard and at a small boat basin on the river above the fixed highway bridge. The boatyard has limited facilities and had a controlling depth of 5 feet in October 1961.

Supplies.—Numerous stores in Beaumont stock provisions, general supplies, and marine hardware. Fresh water of good quality is available at the municipal wharves and at most of the wharves along the river. Bunker oil is available at four of the oil terminals along the river; the maximum rate is 7,000 barrels per hour.

Repairs.—A shipyard on the west side of the river above the railroad bridges has a marine railway capable of hauling out vessels of 2,500 tons, 345 feet in length, and 13 feet in draft. There are 4,000 feet of dock space available for topside repairs. The yard has a floating drydock with a capacity of 15,000 tons and 586 feet in length. The yard's equipment can handle almost any repair work on wood or steel vessels; equipment includes a derrick barge with a capacity of 75 tons.

An iron works can handle any kind of foundry or machine work.

Communciations.—The radio station WPA at Port Arthur provides ship-to-shore service. The port is served by four railway systems and one terminal line.

Pine Island Bayou, emptying into Neches River 9 miles above Beaumont has a navigable depth of about 8 feet for about 10 miles to the pumping plant of the Neches Water Company. The only commerce on the bayou is the transportation of fuel oil to this plant.

Sabine River empties into Sabine Lake from the northward. **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 section of the river from the mouth to Orange, which is part of the Sabine-Neches Waterway, has been improved by dredging a deeep-draft channel, which with land cuts, has eased or by-passed the sharp bends in the river. Vessels drawing 10 feet can be taken 10 or 15 miles above Orange.

Channels.—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 at Orange, and 25 feet in the channel around Harbor Island at Orange. These channels are maintained and controlling depths are published in Notice to Mariners. Lights, lighted ranges, and buoys mark the channel as far as Orange.

Anchorages.—There are no anchorage areas for commercial vessels in the port. Vessels may tie up along the banks 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.

See Appendix for storm warning displays.

Towage.—Tugs are available at Orange.

Customs.—Orange is a port of entry but marine documents are not issued. Vessels are boarded at the docks.

Quarantine.—Vessels subject to quarantine are boarded at the docks. The nearest U.S. Public Health Service outpatient clinic is at Port Arthur. Local hospital facilities are available.

Harbor regulations.—The local regulations are administered by the Orange County Navigation and Port District of the Port of Orange. A **restricted area** for vessels of a Navy reserve fleet has been established at Orange; see § **207.184,** Chapter 2, for limits and regulations. The harbormaster has an office on the wharf at the Municipal Terminal.

Wharves.—The municipal terminal, located on a slip 2 miles below the city, has a wharf 1,200 feet long and transit sheds with a floor area of over 90,000 square feet. Rail and highway connections are available. In October 1961, a depth of 32 feet was along the face of the wharf. Along the waterfront of the city are several smaller wharves.

Supplies.—Provisions and some marine hardware are available. Fresh water of good quality can be obtained either at the municipal wharf or along the river front in town. Bunker fuel is available by barge or truck from Port Arthur. Small boats can obtain gasoline, diesel fuel, water, and provisions at the wharves in Orange.

Repairs.—Orange has two marine repair yards with facilities for building, hauling, and repairing moderate-size vessels. The larger yard has two floating drydocks which can accommodate vessels of 3,500 tons and 350 feet in length. This yard also has marine ways. The second shipyard has marine ways capable of hauling out vessels up to 200 feet in length and 9 feet in draft. Both yards have machine shop facilities.

Communications.—The port is served by two railway systems.

Cow Bayou is a crooked stream flowing into Sabine River 4 miles above Sabine Lake. A channel has been dredged to eliminate the bends in the bayou. Federal project depth is 13 feet from Sabine River to the highway bridge at **Orangefield.** In September 1961, the controlling depth was 11 feet. A draft of 4½ feet can be carried about 15 miles above the turning basin. Below the basin, two highway bridges over the bayou have swing spans with a clearance of 8 feet; the third highway bridge at the upper end of the turning basin has a swing span with a width of 45 feet and a clearance of 3 feet; see § **203.245,** Chapter 2, for drawspan regulations. Overhead power cables at the Orangefield bridge has a clearance of 72 feet; those 0.5 mile above the bridge have a clearance of 54 feet. In the side channel just below the second bridge, there is a marine railway capable of hauling out boats up to 45 feet in length for general repairs, and work is done on wood or steel hulls. Gasoline and oil are available at the second highway bridge.

Adams Bayou empties into Sabine River 1.5 miles above Cow Bayou. A Federal project provides for a channel 12 feet deep to the first fixed bridge. The controlling midchannel depth in the improved portion was 12 feet in October 1961. The highway bridge has a fixed channel span with a clearance of 8 feet. Just below the bridge is

a shipyard with two marine ways capable of hauling out vessels up to 85 feet in length for general repairs. The yard was not open to the general public in October 1961. Also below the bridge is a yacht basin with covered storage facilities for yachts up to 45 feet long, and open storage for yachts 65 feet in length. Gasoline, diesel fuel, water, and charter boats are available. Topside and engine repairs are made. Halfway between the Sabine River and the fixed bridge is a large plant of the Dupont Chemical Company; its docks are not available to the public.

Chart 592.—Lake Charles Deepwater Channel, a part of the Intracoastal Waterway, enters Sabine River 0.7 mile above Adams Bayou and extends eastward 22 miles to the Calcasieu River at a point 13 miles below Lake Charles. This affords an inside passage between Port Arthur and Lake Charles; in April 1959, the controlling depth was 15 feet. Lake Charles is described in Chapter 9.

The Intracoastal Waterway route continues along Sabine River and the Sabine-Neches Canal; see Chapter 12.

Chart 1280.—High Island, a small settlement on the mainland about 30 miles westward 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 constitutes a conspicuous landmark for vessels making, or standing along, the coast. Numerous oil derricks are on the mound and, about 1.5 miles northward, are two 132-foot towers for a transmission line crossing the Gulf Intracoastal Waterway.

Heald Bank, lying 34 miles eastward of Galveston and 27 miles offshore, is nearly 5 miles long in a northeast and southwest 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 southeastward. 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 whistle buoy is 3 miles southwestward of the bank. Another lighted whistle buoy, about 11 miles southwestward of the bank, marks a 33-foot spot. These two buoys mark the seaward approach to Galveston Entrance from the southeastward.

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 southwestward direction was observed; a northerly 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 westward direction.

Chart 1282.—Bolivar Peninsula, southwest of High Island, extends to the Galveston Bay Entrance. The land is low with few prominent features. An abandoned lighthouse on the southern end of the peninsula is a white and black horizontally banded conical tower, 116 feet high. Numerous wrecks lie in the shoal water along the Gulf coast off Bolivar Peninsula. It is reported that several fishing vessels have been wrecked by these obstructions.

Routes, Galveston Entrance.—Approaching from eastward, vessels should make High Island and then follow alongshore, taking care to be off far enough to clear the jetty. The bottom is fairly regular and the only known dangers within 15 miles of the coast outside of the 3-fathom curve are oil well structures which are usually lighted and have a fog signal.

Approaching from southwestward, keep in 5 to 6 fathoms in winter and deeper in summer, because of the prevailing southerly winds and swell.

See Chapter 3 for information about routes to Galveston Bay from Dry Tortugas.

Charts 1282, 886.—Galveston Bay is a large irregularly shaped shallow body of water on the coast of Texas about 285 miles westward from Southwest Pass and 690 miles westward from Dry Tortugas. The bay is about 30 miles long in a general north-northeast and south-southwest 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 two parts by **Red Fish Bar,** a chain of small islets and shoals, through which the Houston Ship Channel has been dredged. Northward of Red Fish Bar the bay is known as the Upper Bay and southward as the Lower Bay. The northeastern 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 north jetty extends to Bolivar Peninsula and the south jetty extends to the north end of Galveston Island.

Galveston Jetty Light (29°19.7′ N., 94°41.5′ W.), 91 feet above the water, is shown from a cream-colored cylindrical brick tower with black pilasters on skeleton structure near the outer end of the south jetty. A fog signal and radiobeacon are at the light. The station also provides special radio-directionfinder calibration service; see Light List for operational information.

Boundary lines of inland waters.—Lines established off Galveston Bay entrance are described in **§ 82.106** and **§ 82.111,** Chapter 2.

Prominent features.—Approaching the entrance to Galveston Bay, among the first objects sighted on a clear day will be the 240-foot grain elevator on the Galveston Channel at 28th Street, the Buccaneer Hotel near the sea wall, and Galveston Jetty Light on the south jetty. The abandoned lighthouse on Bolivar Point, the Santa Fe Building, and the hospital of the University of Texas show conspicuously on closer approach, and are easily identified. Vessels approaching from eastward near the coast

will first sight High Island, and those approaching from southwestward will probably first sight the hotel near the sea wall and then the grain elevator.

Channels.—Federal project depth is 38 feet over the outer bar and 36 feet over the inner bar and **Galveston Channel.** The project is under constant maintenance and controlling depths are published in the Notice to Mariners. A lighted whistle buoy about 2 miles off the jetties, marks the channel entrance. A light is shown near the end of each jetty. Inside the jetties, the channel first passes close by the north jetty, and then crosses to the south side. The channel is well marked with lighted buoys and a lighted range.

Galveston Harbor is the name generally applied to the larger deep-water area between the jetties extending westward between Bolivar Peninsula on the north and Pelican Island and Galveston Island on the south. On the south and west it connects with the ship channels to Galveston, Texas City, and Houston. **Bolivar Roads** is the western part of the harbor.

Anchorage.—Vessels prevented from entering due to northers can anchor in about 5 fathoms with the abandoned lighthouse bearing about northwest. The holding ground is good with little sea. Bolivar Roads affords good anchorage in depths from 22 to 41 feet, with good holding bottom, at all seasons except during hurricanes, when refuge is taken at Houston.

Because of heavy traffic, Galveston Channel can be used only for temporary anchorage by steamers preparing to haul into berth at the 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.

Temporary, permanent, and **explosives anchorages** have been established in Galveston Harbor; see **§ 202.197,** Chapter 2, for limits and regulations.

Bridges.—A rail and highway causeway with a bascule bridge crosses Galveston Channel and connects Galveston Island with Pelican Island; the drawspan has a clearance of 12 feet; when open, the single bascule leaf overhangs the channel and caution is necessary. Galveston is connected with the mainland by three parallel causeways 1.75 miles long, crossing the Intracoastal Waterway at the southwesterly end of Galveston Bay; see Chapter 12 for clearances.

Tides and currents.—The diurnal range of tide at Galvestion Bay entrance is about 2 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 east and southeast. A strong wind blowing steadily from the north for several days may lower the water to a level 2 or 3 feet below mean low tide.

The currents are also modified frequently by the winds. Easterly or southeasterly winds may cause a continuous flood current between the jetties at the entrance for a period of a day or more, and westerly or northwesterly winds sometimes set up a continuously outgoing current for a similar period.

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 current predictions for Galveston Bay Entrance are published in the Tidal Current Tables. Daily predictions for a number of other places in Galveston Bay can be obtained through the use of table 2 of the same publication.

Weather.—The prevailing winds are northerly from November to March, throughout which time northers occur frequently. These gales, although occasionally blowing with a velocity of over 35 knots, are not dangerous to vessels anywhere close to the coast, as they blow offshore and the sea is not heavy; the Weather Bureau warning of their approach gives vessels ample time for preparation. From April to October the prevailing winds are southerly, and hurricanes occur occasionally; these are dangerous to shipping near the coast because the wind is onshore. Hurricanes of marked violence at Galveston have occurred as follows: September 1875, September 1877, September 1900, August 1915, and September 1961. The wind attained a velocity of 87 knots in August 1915.

See Appendix for **storm warning displays.**

Pilotage is compulsory for foreign vessels and American vessels under registry, but is not compulsory for coastwise vessels having on board a pilot licensed by the United States Coast Guard.

The Galveston-Texas City and Houston pilot boats will be found cruising off the bar and anchored near the end of the jetties, providing vessels are due. There are separate pilot boats for the two destinations; the signal for a Galveston-Texas City pilot is four long blasts or light flashes, and two long and three short for a Houston pilot. The Galveston Pilot Boat has a black hull and the Houston Pilot Boat a gray hull.

All pilot boats go directly alongside the vessel to be boarded. A speed of 4 to 7 knots by the vessel, offering a good lee to the pilot boat approaching from the ship's quarter, will facilitate the boarding operation. This method is mandatory unless wind and sea are calm. Vessels under way near the sea buoy are given priority over vessels at anchor, which usually have to get under way before the pilot can be boarded. All pilot boats are equipped with radiotelephone. The Houston pilots call signal is WC–6250 and the Galveston pilots call signal is WB–3650.

Galveston occupies the entire width of the eastern end of **Galveston Island.** The wharves are built along Galveston Channel on the north side of the city, and the south side fronts upon the Gulf from which the city is protected by a concrete seawall 17 feet high. Though widely known as the major seashore resort in the southwest, Galveston

is essentially and primarily a place of maritime commerce and industry. The short route to the sea, together with the deep and easily navigated channel and excellent port facilities, enable Galveston to handle cargo most expeditiously and economically.

Both foreign and domestic commerce are extensive, the principal exports are cotton, grain, flour, rice, sulphur, and metals. The main imports are bagging, bananas, creosote, 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. The ferry channel has a controlling depth of about 13 feet and the turning basin, 7 feet.

Pelican Island, an artificial island with a dike along the southern side, protects Galveston Channel from northers. A Coast Guard Buoy Depot and a large shipyard are on the island.

Towage.—Towboats and seagoing tugs are available at Galveston.

Quarantine.—The national quarantine station is located in the Customhouse. Vessels are boarded at the docks from 6 a.m. to 6 p.m., and will be boarded at any other hour when requested by the vessel's agent, and may be boarded at anchorage if the vessel remains at anchor more than 24 hours.

A Public Health Service hospital is located in Galveston. The medical school and hospital of the University of Texas, and other hospitals, are in the city.

Customs.—Vessels are usually boarded at the docks, but may be boarded at anchorage if a vessel remains at anchor more than 24 hours. The Custom Service maintains an office in the Customhouse. Galveston and Port Bolivar are ports of entry; marine documents are issued at Galveston.

Immigration.—Vessels are usually boarded at the dock, but may be boarded at anchorage if the vessel remains at anchor more than 24 hours. The Immigration Office is in the Post Office Building.

Wharves.—All shipping terminal facilities are located on the city waterfront along the south side of Galveston Channel.

Most facilities are owned and operated by the Board of Trustees of The Galveston Wharves, a city-owned corporation; their properties extend along the central portion of the city waterfront for about 2 miles and include 32 piers and wharves with total berthing space for 40 ships. The three piers of the Southern Pacific Terminal Company, just to the westward, have a total berthing space of about 6,000 feet. Depths up to 31 feet could be carried to the wharves in September 1961.

Practically all piers and wharves have transit sheds, there being 30 waterfront warehouses with a total storage space of about 4,350,000 square feet. All have both rail and highway connections, and nearly all have shipside tracks. The port has a total storage capacity of 10,000,000 square feet.

The port facilities have been especially developed for the efficient handling of cotton, grain, sulfur, and bananas, as well as general merchandise. Numerous cotton warehouses with compresses are located near or on the waterfront. An electrically operated concrete grain elevator has a capacity of 6,000,000 bushels, with a sacking plant in connection, and one other grain elevator has a 1,000,000 bushel capacity. The larger elevator unloads barges at the rate of 12,000 bushels per hour. Vessels can be loaded at the rate of 120,000 bushels per hour. On one pier there are three electrically operated banana conveyors, and there are special facilities for handling sulfur.

The properties of the terminal companies are administered directly by the respective companies.

Supplies.—Provisions and supplies including marine hardware are available. Fresh water for boiler use or drinking may be obtained at all piers. Several companies furnish fuel oil from either trucks or barges. The maximum capacity is about 3,000 barrels per hour.

The slips between piers 15 and 22 are used by small craft. A yacht basin with a depth of 8 feet in the entrance channel is located east of pier 9. Gasoline, oil, and provisions can be secured in the basin. Fresh water is piped to the piers and there are berths under sheds.

Repairs.—On Pelican Island a drydock firm has four drydocks, one with a rated lifting capacity of 15,000 tons, two of 10,000 tons, and one of 1,000 tons. Vessels up to 600 feet in length can be hauled out. A derrick barge of 50-ton capacity can be hired. There is berthing space where topside repairs 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 is well equipped with 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 east of pier 9, are three shipyards with marine ways, the largest of which can haul out vessels up to 300 tons, 120 feet in length for general repairs. A machine and carpenter shop operates in connection with the shipyard.

Tugs, lighters, pumps, derricks, diving equipment, and other facilities are available for wrecking and salvage operations.

Communications.—A radio station provides ship-to-shore service. Weather broadcasts are made. Galveston is served by six railway systems and one terminal railroad. Commercial air lines, bus, and trucklines provide service to all parts of the country.

Texas City, on the west side of Galveston Bay about 7 miles northwestward from Galveston, is a port of considerable commercial importance. It has extensive foreign and coastwise trade in petroleum, chemicals, and tin ore. There are connections with the railroads entering Galveston and with the State highway between Galveston and Houston.

Channels.—**Texas City Channel** extends from deep water in Galveston Harbor through the lower end of Galveston Bay to a turning basin off the wharves at Texas City. Federal project depths are 36 feet to and including the turning basin; controlling depths are published in Notice to Mariners. The channel is well marked.

On its northerly side for about 4.5 miles out from the mainland, the channel is protected by a double dike (a pile dike with a rubble-mound dike along the south side); the dike is about 900 feet north of the channel at the eastern end and about 2,300 feet at the western end. The harbor is further protected by a large spoil bank, named **Snake Island,** extending along the eastern side of the turning basin, and by a narrow strip of land at the south end. A private barge canal, which had a controlling depth of 12 feet in October 1961, extends southward and westward for about 2 miles.

About midway in Texas City Channel, a small-boat channel between the dike and the dredged channel leads northwesterly to a landing and small-boat basin at the inshore end of the dike. The channel has a controlling depth of about 6 feet, and is used by fishing and pleasure boats; gasoline is available on the dike.

A natural small-boat channel about 5 to 7 feet deep, marked by daybeacons and buoys, leads southward from the Texas City Channel to the Intracoastal Waterway through the lower Galveston Bay.

See Appendix for **storm warning displays.**

Towage.—Vessels usually proceed without assistance from the bar to Bolivar Roads. Tugboats are available at Texas City for docking, undocking and shifting.

Quarantine.—The Quarantine Station is located in the Customhouse at Galveston. Vessels are boarded at the dock.

The nearest Public Health Service hospital is at Galveston.

Customs and Immigration officers are located in the Customhouse in Galveston. Texas City is a port of entry; marine documents are not issued.

Wharves.—Texas City port facilities are privately owned. There is a wharf for a seatrain (railroad car ferry) and wharves with berthing space for six oil tankers. General and liquid cargo are also handled by ship. There are additional berthing facilities for barges.

Chart 1282.—East Bay is a large and shallow bay extending eastward about 16 miles from the southern end of Galveston Bay and lying northward of Bolivar Peninsula. The depths in the bay range from 2 to 7 feet. **Hanna Reef,** a chain of low sand islands and shoals, lies east 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 northeast of the upper part of Galveston Bay. Depths in the bay proper range from 7 to 9 feet. Extensive oil-drilling operations are in progress in the Red Fish Bar, Houston Point, and Trinity Bay areas. Numerous oil well structures and derricks are visible to the eastward of the Houston Ship Channel. The derricks are moved as soon as wells are brought in or abandoned. In the northern and western part of the bay between Trinity River and Umbrella Point, there are numerous pipes, piles, and abandoned oil wells which constitute a menace to navigation. Mariners are advised to keep clear.

Lake Anahuac is separated from the northern 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 northeasterly from Houston Ship Channel to **Smith Point,** thence follows the easterly shore northward 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.

Double Bayou, 8 miles northeast of Smith Point, flows into Trinity Bay and is used mainly by oil and fishing interests. The entrance channel is marked by lights and daybeacons along the south side of the channel. Federal project depth is 6 feet from Trinity Bay to the mouth of the bayou; in January 1962 project depth was obtained. 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 small marine way at Double Bayou can haul out boats up to 30 feet in length. Owners must arrange for their own repairs. A bridge crosses East Fork, 5 miles from the junction of the bayou.

Anahuac Channel, a 6-foot Federal project, leads from deep water in the upper part of Trinity Bay to Anahuac and **Browns Pass,** and is the entrance channel to Trinity River. The channel is marked by lights and intermediate aids. Controlling depth was 5 feet in December 1961. Mariners should be on the lookout for floating logs.

Anahuac (P.O.) is a town at the northeastern end of Trinity Bay, opposite the mouth of Trinity River. There is a depth of 5 feet at the small landing used mostly for loading shells. 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 northeastern end of Trinity Bay. Entrance to the river is through Anahuac Channel and Browns Pass, and not through Trinity River Channel. A Federal project authorizes a channel 9 feet deep in Trinity River. In April 1961, controlling depth was 8 feet as far as the sulfur plant docks at **Moss Bluff.** From there, a draft of 2½ feet can be carried upriver to Liberty, except where snags and sand bars obstruct traffic. Sulfur is moved by barge from Moss Bluff 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.

In the open waters of Trinity Bay about 2 miles westward of Anahuac Channel, a 0.5-mile long overhead power cable with a clearance of 29 feet is strung in a northwest-southeast direction on poles about 200 feet apart.

A marked privately maintained mile-long channel leads northwestward from the 6-foot depth contour in Trinity

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Bay to an oil company terminal at **Point Barrow.** At the inshore end an overhead power cable extends about 1,250 feet bayward, strung on poles about 250 feet apart; cable clearance is 19 feet.

Off **Houston Point,** a small dredged channel that had a depth of 6 feet in 1956 leads to an oil company dock.

Charts 1282, 588.—Cedar Bayou is a crooked stream flowing in a southerly direction into the northwestern corner of Galveston Bay, 2.5 miles east of Morgan Point and 25 miles north of Galveston.

The principal commerce is in crude oil and shells, handled mostly in barges. A channel with Federal project depth of 10 feet, protected by submerged jetties at the entrance to the bayou, has been dredged across the flats from Houston Ship Channel to the first bend above the mouth of the bayou; in September 1961, the controlling depth was 8½ feet in this channel.

The Cedar Bayou entrance channel across the flats is marked by two lights and intermediate aids. A light marks the offshore end of the submerged jetty on the north side of the entrance. About 0.5 mile inside the mouth, the bayou is crossed by a highway bridge having a bascule span with a clearance of 13 feet.

Shallow **Tabbs Bay** is at the northwestern end of Galveston Bay, and contains numerous oil well structures and overhead power cables. A dredged channel from Houston Ship Channel follows the western end of **Hog Island** and Tabbs Bay to **Baytown** on the north shore; an overhead power cable crossing the channel has a clearance of 44 feet. **Goose Creek,** on the north side of Tabbs Bay, is completely shoaled across at the entrance and bares at low water.

Barbour Cut is opposite Hog Island and extends about 1.2 miles westward from the Houston Ship Channel to a turning basin. The entrance is shoal and the entrance channel is very narrow, and had a controlling depth of 6½ feet in October 1961. The cut widens and deepens westward, has depths up to 30 feet in the basin at the head, and provides excellent shelter for vessels up to 150 feet in length.

Several private commercial wharves are in the cut. Two yacht basins have covered and open storage facilities for 175 yachts up to 75 feet in length. The larger marine railway can haul out vessels up to 90 feet in length and 9 feet in draft. Both yards make general repairs; the larger yard has machine and carpenter shops. Available supplies include gasoline, diesel fuel, water, and ice.

Chart 1282.—Morgan Point is on the northwest end of Galveston Bay on the western side of Houston Ship Channel. **La Porte,** a town 2 miles southwest of Morgan Point, has rail and highway connections with other parts of the state.

From Morgan Point southward to **Red Bluff** are resort hotels and summer homes with numerous boat landings along the shore. The Houston Yacht Club is 1.5 miles north of Red Bluff. The club maintains a range leading to the yacht basin. A wrecked barge awash at low water lies 1.5 miles off Red Bluff.

Clear Creek empties into the west side of Galveston Bay 20 miles northwestward of Galveston; 2 miles above its mouth the creek broadens into shallow **Clear Lake,** 2.5 miles long. A Federal project provides for a channel 7 feet deep from Galveston Bay to the county highway bridge at **League City.** In October 1961, there was a controlling depth of 6 feet to the western end of Clear Lake, thence 4 feet to League City, but vessels drawing up to 9 feet could pass on an average tide to a yacht basin at the lake entrance. The entrance channel is marked by lights, buoys, and a lighted range; both range lights are visible from seaward but when entering, a building obscures the rear range light for a considerable distance.

At the entrance to Clear Creek, an overhead power cable has a clearance of 99 feet, and adjacent highway and railroad bridges, one a bascule and the other a swing, have minimum width of 40 feet and clearance of 6 feet; see § **203.245,** Chapter 2, for **drawspan regulations.** In 1962, a highway bridge with a bascule span having a design clearance of 40 feet was being built just eastward of the existing bridge; the old one will be removed upon completion of the new bridge. About 6 miles above the entrance, an overhead power cable has a clearance of 55 feet.

Seabrook (P.O.) is a town on the north side at the entrance to Clear Creek, and is headquarters for fishing and pleasure boats. **Kemah** (P.O.) is a town on the south side of the entrance to Clear Creek. Gasoline, diesel fuel, water, and provisions can be obtained at both towns.

There are several boatyards having marine ways, stiff-leg cranes and travel lifts in Seabrook and Kemah. The largest marine ways can haul out vessels up to 300 tons and 136 feet in length. All types of repairs can be obtained. There are covered storage facilities at four yacht basins for yachts up to 80 feet in length, and up to 150 feet in length in the open.

See Appendix for storm warning displays.

A privately maintained channel 3 miles southeastward of Kemah leads to a small dock at the headquarters of an oil company. The entrance is marked by fixed lights and a lighted range. In October 1956 the controlling depth was 6 feet.

Dickinson Bayou empties into **Dickinson Bay,** a small indentation in the western side of lower Galveston Bay, between **April Fool Point** and **Miller Point,** about 13 miles northward of Galveston. The Federal project provides for a channel 6 feet deep through Dickinson Bay and Dickinson Bayou to the railroad bridge at **Dickinson.** The entrance channel is marked by lights and intermediate aids, and in October 1961, the controlling depth was 6 feet to **Dickinson** (P.O.), a small settlement about 7 miles up the bayou.

Adjacent rail and highway bridges that cross the bayou a mile above its mouth have a bascule span and a swing span having minimum width of 40 feet and clearance of 8 feet. The overhead power cables at the bridges have a clearance of 79 feet. A small boatyard above the bridges has a marine way capable of hauling out boats up to 35 feet in length. At Dickinson two bridges cross the bayou.

The railroad bridge has a fixed channel span with a width of 23 feet and a clearance of 15 feet; the highway bridge has a fixed channel span with a width of 30 feet and a clearance of 11 feet. The overhead power cable at the railroad bridge has a clearance of 42 feet.

Moses Lake is a shallow unimportant lagoon south of Dickinson Bay.

Charts 1282, 588, 589, 590.—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 northwest end of Bolivar Roads, between Port Bolivar and Texas City channels. The entrance is marked by a lighted range, and by a lighted buoy on the northeast side of the channel. The channel through the bay is marked by numerous pairs of lights, lighted ranges, and buoys.

The Federal project provides for a channel 36 feet deep from the bay to and including the Houston Turning Basin. The controlling depths are given in Notice to Mariners.

North of Bolivar Peninsula, spoil banks on both sides of the channel extend northward 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 westward to Dickinson Bayou. Another gap, 500 feet wide and 6 feet deep, opens westward about 2.8 miles above Red Fish Bar. Along the east side of the channel north of Red Fish Bar, two openings through the continuous spoil bank permit passage into the northwestern portions of Galveston Bay. The first is about 1.8 miles above Red Fish Bar and has a depth of 7 feet; the second is a dredged channel marked by buoys opposite Red Bluff and about 8 miles above Red Fish Bar that had a controlling depth of 8 feet in 1960. Part of the spoil material shows above water and forms a dike protection for the channel; for several miles south of Morgan Point this dike is relatively high.

From Morgan 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. There are no bridges across the ship channel, but 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 Morgan Point Cut and another one between **Pasadena** and Galena Park.

Chart 588.—Morgan Point, 23 miles northwestward 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 Morgan Point, is the site of the Humble Oil Refineries and is the shipping port for their products. The oil company has two concrete wharves 600 and 400 feet long, respectively, and a barge wharf 250 feet long. A Deputy Collector of Customs is stationed here to facilitate entries and clearances.

Chart 589.—San Jacinto River branches northward from the ship channel at **Lynchburg,** 8 miles above Morgan Point, 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 54 feet. Twin highway bridges, 1.8 miles above the mouth, have fixed spans with minimum clearance of 25 feet. A 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 south side of the channel 9 miles above Morgan 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.

Chart 590.—Boggy Bayou Basin is a tanker loading terminal on the south side of the channel about 3 miles above Lynchburg.

Greens Bayou, entering the channel from northward at a point 5.2 miles above Lynchburg, is navigable for a draft of 8 to 10 feet for about 5 miles, and a draft of 4 to 5 feet can be taken 5 miles farther. The bayou is crossed by four bridges with fixed channel spans having a minimum clearance of 23 feet. Two overhead power cables cross below the bridges with an approximate clearance of 75 feet. A shipyard and floating drydock are at the mouth of the 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 landings for pleasure craft, unloading rigs for sand and shell, boat repair yards, machine shops, material yards, and other facilities. The controlling depth in the channel was 3 feet in September 1961. A highway bridge to Brady Island over the bend, 0.2 mile south of Brays Bayou, has a fixed channel span with a width of 40 feet and a clearance of 10 feet. The bend is crossed by an overhead power cable with a clearance of 67 feet, about 150 yards south of the bridge.

A shipyard on Brady Island has marine ways capable of hauling out vessels up to 1,200 tons in weight, 270 feet in length, 60 feet in width, and 18 feet draft. General repairs are made on all types of vessels, but the yard specializes in work on towboats and barges. Machine shops are nearby. Gasoline, diesel fuel, water, and provisions are available.

Brays Bayou, branching off the western entrance to

Harrisburg Bend, is a center for laying up and repairing pleasure craft and tugs. There are storage yards and a shipyard with a 30-ton stiff-leg crane. A highway bridge just above the bayou mouth has a vertical-lift span having a width of 40 feet and clearance of 12 feet down, and 29 feet up; see **§ 203.245,** Chapter 2, for **drawspan regulations.** Three highway and three railroad bridges with fixed channel spans having a minimum width of 14 feet and clearance of 15 feet cross the bayou above the vertical-lift bridge. Overhead power cables that cross the bayou have minimum clearance of 47 feet.

Buffalo Bayou, above the Houston Turning Basin, has a depth of about 7 feet for 6 miles to Main Street in Houston, and is used considerably by barges. 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 30 feet for the bascule, swing, and vertical-lift spans, and 25 feet for the fixed spans; see **§ 203.245,** Chapter 2, for **drawspan regulations.** Numerous overhead cables cross the bayou; minimum clearance is 67 feet.

Houston is the largest city in Texas and one of the busiest ports in the country. The head of Houston Ship Channel is 22 miles above Galveston Bay and 44 miles above Galveston Entrance. The city is the principal distribution point for Texas and one of the main distribution points for the west and southwest parts of the United States.

Houston has trunkline railroad and highway service to all parts of the nation. Regular steamship service is maintained to the principal Gulf and Atlantic ports as well as most of the important world ports. Of Houston's extensive foreign and domestic commerce, its principal exports are petroleum products, cotton and cottonseed products, chemicals, and grain and grain products. Major imports are crude oil, iron and steel products, sugar, bagging material, molasses, coffee, and general merchandise.

The turning basin at the head of the ship channel is on the southeast side of the city. The commercial terminals are on and just below the turning basin, and many industrial plants extend along each side of the channel for several miles below the basin. Between Morgan Point and Houston are numerous oil terminals along the ship channel.

Anchorages.—Vessels are prohibited from anchoring in the Houston Ship Channel or turning basin except in cases 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 is less than 1 foot.

Towage.—Towboats are available at Morgan Point and Houston.

Quarantine.—Vessels subject to quarantine inspection are boarded at the dock.

A Public Health Service outpatient clinic is in Houston, and a Public Health Service hospital is in Galveston. Several public hospitals are in Houston; also a large medical center for treatment and research.

Customs.—Houston is a port of entry and marine documents are issued. A deputy Collector of Customs has an office in the Federal Office Building and suboffices in the United States Appraisers Stores, 7300 Wingate Street, and at Baytown. Vessels are boarded at the dock.

Immigration.—The Immigration Service maintains offices in the Federal Office Building.

Harbor regulations.—Local rules and regulations of the Port of Houston are enforced by a **General Manager** and the **Director of Port Operations**; offices are in the Port Commission Building at Crawford and Capitol Streets. No vessel shall exceed a speed limit of 8 knots in any part of the harbor and no vessel shall pass any dock or wharf at a greater speed than 5 knots.

Wharves.—The public terminals surrounding the turning basin and upper channel are operated by the Board of Navigation and Canal Commissioners of the Harris County Houston Ship Channel Navigation District. There are wharves with 13,000 feet of berthing space which can accommodate about 25 vessels; 1,542,000 square feet of transit shed and warehouse covered storage space, and 1,225,000 square feet of open storage. Most wharves handle general merchandise and several are equipped with conveyors, cranes, lift trucks, and other devices. A public 3,500,000-bushel grain elevator is equipped with two automatic freight car unloaders and six power shovels. A private grain elevator has a 2,000,000-bushel capacity. Most wharves have pipe connections for oil bunkering. Private wharves and slips between the turning basin and Morgan Point have berthing space for about 65 vessels and barges at the following places: Long Beach, Manchester, Clinton, Sinco, Galena, Pasadena, Norsworthy, Boggy Bayou Basin, Ordnance Depot, Baytown, Lynchburg, Shell, and Barbour Cut.

Supplies.—Provisions and general supplies of practically any kind can be obtained at Houston. Fresh water is piped to all wharves and piers.

Vessels can secure bunker oil through pipelines on the public wharves at the turning basin, and at Houston compress wharves while loading or discharging cargo, or at wharves of oil companies on Houston Ship Channel. Numerous companies furnishing fuel oil in or near Houston have oil barges for bunkering.

The principal small-boat facilities are on Harrisburg Bend, Brays Bayou, and Barbour Cut. Gasoline, diesel fuel, water, provisions, and supplies are available at Brays Bayou, Barbour Cut, and Houston.

Repairs.—A shipyard at Greens Bayou has a drydock with a lifting capacity of 12,000 tons. The marine ways at the port are used for repairs to barges, small towboats, and such craft, up to 1,200 tons. These ways are located in Brays Bayou, on Brady Island, and in Barbour Cut. Houston has machine shops, foundries, and welding plants capable of handling most repairs to hull or machinery above the waterline.

No firms in Houston make an exclusive business of wrecking and salvage, but harbor tugs, derricks, and barges are available when required. Divers and other equipment can be obtained on short notice from Galveston or Beaumont.

Communications.—The port is served by six trunk railway systems that serve all parts of the southwest. Numerous commercial airlines provide passenger, mail, and freight service to all coastwise and inland cities.

Charts 1282, 886, 887.—From Galveston Entrance to San Luis Pass, a distance of 27 miles, the Gulf coast trends in a general southwest-by-west direction. The southwestern 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.

West Bay is a shallow body of water which extends 16 miles southwestward from the southwestern part of Galveston Bay, between Galveston Island and the mainland. The bay proper is of no commercial importance.

Offatts Bayou extends from off the south side of West Bay to the southwest limits of Galveston. The entrance channel leaves the Intracoastal Waterway about 0.3 mile west 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 out of Galveston.

In October 1961, the controlling depth was 3 feet in the dredged channel from the waterway to the fork at Teichman Point. From there the controlling depth leading to the turning basin near the airport was 7 feet. Daybeacons mark the channel into Offatts Bayou which had a controlling depth of 7 feet in October 1961. A small-boat repair yard on Teichman Point has marine ways capable of hauling out boats up to 35 feet in length. Gasoline and water are available at the boatyard. A fill for Sixty-First Street, Galveston, forms the upper limit of the basin. It is about 2.5 miles above the mouth of the bayou.

Chocolate Bay is an arm extending about 5 miles northwestward from the western end of West Bay. **Chocolate Bayou** empties into the head of Chocolate Bay from the northward and is reported navigable for about 10 miles to a highway bridge near **Liverpool** (P.O.). About 4 miles above the mouth of the bayou, there are several boatyards, two with marine ways capable of hauling out craft up to 44 feet in length for general repairs. Gasoline, water, ice, and storage for craft up to 35 feet in length, are available.

Federal project depth is 4 feet for a dredged channel from the Intracoastal Waterway for about 5.4 miles through Chocolate Bay into Chocolate Bayou; in September 1961, project depth was obtained. The channel is marked by buoys. In May 1962, it was reported that private interests had deepened this channel to 10 feet, and had dredged a new 10-foot channel, about 3.2 miles long, through land cuts, eliminating the natural bayou bends, from the mouth of the bayou to the wharf of a chemical plant.

About 4 miles eastward of the western end of Galveston Island, an 8-foot dredged channel leads southward to a boat basin of the same depth on the north shore of the island.

San Luis Pass, an unmarked channel 0.2 mile wide and 9 feet deep, leads westward from the Gulf and passes between the shoals southward from Galveston Island and eastward from **San Luis Island;** 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 light draft craft.

Off the northeast side of San Luis Island there are depths up to 25 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 west side of San Luis Island.

A depth of 7 feet can be carried from San Luis Pass to the west side of San Luis Island, thence southward in Cold Pass to **Moodys Island** and westward for a short distance into Christmas Bay; a draft of 4 feet can then be taken to and through **Bastrop Bay.** Privately maintained aids mark the channel through 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 I. W. Mile 637.7 to the railroad bridge at Mims, Texas. Land cuts eliminate the bends in the bayou and bypass Cox Lake. Controlling depth was 7 feet in March, 1960. Total length of channel from I. W. to railroad bridge is about 4.7 miles. Bridge has removable span with width of 24 feet and clearance of 11 feet.

Hoskins Mound is an oil and sulfur field about 3 miles northwest of Bastrop Bay. A tall concrete stack and a water tank show prominently from offshore.

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 south end of Christmas Bay leads into and through **Drum Bay** and thence southwesterly to a connection with the Intracoastal Waterway. This channel is used only by small fishing craft with draft of 2 to 3 feet.

Oyster Creek (Chart 1283), emptying into the Intracoastal Waterway about 2.5 miles northeastward of Brazosport, is a tortuous stream of no importance used as a storm refuge by small craft; a fixed highway bridge crosses the creek about 3 miles above its mouth.

11. SAN LUIS PASS TO THE RIO GRANDE

Chart 1117.—From San Luis Pass to the entrance to Matagorda Bay at Pass Cavallo, the coast trends for 80 miles in a general southwest-by-west direction. From Pass Cavallo it curves gently southwestward for 100 miles to latitude 27° N., where the trend is south; thence it curves gently a little east of south 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 depths on them.

Boundary lines of inland waters.—The lines established from Galveston to the Rio Grande are described in §§ **82.111, 82.116,** Chapter 2.

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 southwestward 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.

The **danger zones** of Air Force gunnery, bombing, and rocket ranges are in the Gulf of Mexico off Matagorda Peninsula and Matagorda Island, Tex.; see § **204.162,** Chapter 2, for limits and regulations.

Currents.—Along the west side of the Gulf of Mexico between Tampico and Corpus Christi is a northward 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 westward toward the coast and the possibility of being carried inshore by such current should be guarded against. The grounding of a vessel at a location 9 miles southwest of Aransas Pass was reported caused by strong westward currents which accompanied winds from the north and northeast.

Charts 1283, 887.—Freeport Harbor, lying 40 miles southwestward of Galveston entrance, is the harbor for the towns of **Freeport, Brazosport,** and **Velasco.** 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. Old Brazos River has been dammed about 7 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 of the large chemical plant at Brazosport and the smoke rising from the stacks are prominent. An elevated bridge and a tall tank also are outstanding. On closer approach, the Brazos River Light and the water tanks in Freeport and Velasco can be identified. At night the glow from the many lights at the chemical plant and the obstruction lights on the radio towers at Freeport and Velasco are conspicuous.

Brazos River Light (28°56.7′ N., 95°18.5′ W.), 98 feet above the water, is shown from a pyramidal skeleton structure painted brown below the gallery and black above.

Channels.—The ship channel has been improved by construction of jetties on either side of the entrance. Federal dredging depths are 38 feet in the channel from deep water to the seaward end of the jetty, thence 36 feet to the upper turning basin, thence 30 feet to and in Brazos Harbor turning basin, thence 25 feet to and in Stauffer turning basin. The controlling depths are published in Notice to Mariners.

Above Stauffer turning basin, a depth of 10 to 12 feet can be carried to the docks at Freeport and Velasco.

Anchorage can be found in the river anywhere the depth is suitable; however, swinging room for large vessels is limited.

Dangers.—About 6 miles southwestward of the entrance to Freeport Harbor, Brazos River has generated a shoal extending about 5 miles into the Gulf. 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. A lighted whistle buoy marks the southeast end of the shoal.

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.

Bridges.—No bridges cross the channel from the entrance to the upper turning basin. A railroad bridge with a swing span having a clearance of 11 feet crosses the river at Freeport about 1 mile above the head of the

project; see § **203.245,** Chapter 2, for **drawspan regulations.** A highway bridge that has a fixed channel span with a width of 36 feet and a clearance of 20 feet is about 0.3 mile above the railroad bridge.

An overhead power cable at Valasco 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 westward, with a countercurrent near the beach, largely influenced by the direction of the wind. The bar is rough with an easterly breeze.

Strong cross winds and currents at the jetty entrance make navigation difficult for larger vessels. Difficulty in naviagtion is experienced with larger vessels at the junction with the Intracoastal Waterway when strong currents are flowing from the canal, and in the comparatively sharp curve at the Brazosport turning basin. Large vessels are difficult to turn in the smaller upper turning basin.

See Appendix for **storm warning displays.**

Pilotage.—Pilotage is compulsory for foreign vessels, for American vessels under registry, and coastwise vessels who do not have a pilot aboard licensed by the Coast Guard. Pilots in small power boats will meet vessels at the entrance lighted bell buoy when previous arrangements have been made through the vessel's agents.

Quarantine inspection is made at the dock by Public Health Service officials from Galveston. The nearest Public Health Service hospital is in Galveston. Freeport has two hospitals.

Customs and Immigration.—Freeport is a port of entry. Customs inspectors maintain an office at Freeport. Immigration officials come from Houston and Galveston when needed.

Wharves.—A dock on the south side of the basin at Brazosport has rail connections with a shuttle chute for loading coal and sulfur. The berthing space is about 500 feet with 30 feet depths alongside. In **Big Bend,** an oil dock on the southwest side has berthing space for two large tankers, and a chemical plant on the northeast side has berthing space for two ships and four barges. These facilities are not open to the public.

Brazos Harbor and terminal is on the west side of Big Bend, and except for two private holdings on the south side, is under the jurisdiction of the Brazos Harbor Navigation District. Berthing space in 1961 could accommodate two fairly large ships. For general cargo storage there is more than 50,000 square feet in transit sheds and 5 acres of improved open space.

Small-craft facilities.—Small craft can find excellent protection in the river at Freeport. Numerous small docks are along the waterfront. Just downstream from the railroad bridge there is a yacht basin with limited accommodations for boats up to 50 feet in length. Two small marinas, located on the Intracoastal Waterway near the fixed bridge, had a controlling depth of 3 feet in October 1961. Gasoline, water, and limited accommodations are available at each.

Supplies and repairs.—Gasoline, diesel fuel, fresh water, ice, provisions, and supplies are available, but no bunkering facilities for large ships. Three shipyards have marine ways, machine and carpenter shops, and the largest is capable of hauling out vessels up to 300 tons and 115 feet in length. All yards make general repairs. There are three small boatyards on the Intracoastal Waterway near the entrance to the channel.

Communications.—Highway and rail connections extend to Angleton and Houston.

Chart 1283.—Brazos River enters the Gulf through the diversion channel about 6 miles southwest of Freeport Harbor entrance. Due to 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 waterway.

Overhead power cables having a minimum clearance of 44 feet cross Brazos River between the waterway and the highway bridge about 4 miles above the waterway. The highway bridge has a swing span with a clearance of 15 feet; see § **203.245,** Chapter 2, for **drawspan regulations.** 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, 5½ feet at high-river stages.

San Bernard River flows into the Gulf 3.5 miles southwestward from the mouth of Brazos River. San Bernard River is obstructed at the mouth by a shifting sand bar 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 waterway. The Federal project depth is 9 feet; in September 1961, the controlling depth was 5½ feet to the head of the improvement.

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.

Between the waterway and the upstream limits of the improvement, San Bernard River is crossed by draw and fixed bridges; the minimum clearance is 14 feet. Limiting clearance of overhead cables is 38 feet.

Cedar Lakes, East Matagorda Bay, Caney Creek, Live Oak Bay, Live Oak Bayou, Old Gulf, Colorado River, and Matagorda are described in Chapter 12.

Charts 1284, 888.—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 and shown from a black conical tower on **Matagorda Island**, about 1.5 miles west of Pass Cavallo, marks the approach to Matagorda Bay.

Pass Cavallo, 108 miles southwestward of Galveston Entrance, and the 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 which 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. A lighted whistle buoy and other buoys mark the bar channel but these cannot be depended upon to mark the best water.

Fishing and shrimp boats drawing up to 5 feet use the pass under favorable conditions, but strangers are warned not to enter without local knowledge. Information on bar conditions can be obtained by radio from the Coast Guard station which is located at the entrance to Saluria Bayou, about 3.8 miles northward of Matagorda Light.

Inside the bar, the channel, marked by lights, extends along the eastern shore to Matagorda Island, passing about 0.5 miles east of Saluria and Big Bayous, and thence off the Port O'Conner jetties into the open waters of the bay.

Pelican Island, marked by a light, and generally shoal areas lie along the east side of the pass. There is a passage with a depth of 9 feet or more through these shoals in a northeasterly direction, from off Saluria Bayou. This channel is particularly subject to change. The ruins of West Shoal Lighthouse along the south side of this passage are submerged and marked on the north side by a lighted buoy. A day beacon marks the north side of the passage. The ruins of old East Shoal Lighthouse, about 0.3 mile to the northeastward of the daybeacon, are submerged and charted as a sunken rock. These obstructions are to be avoided.

Anchorages.—With northerly winds or smooth sea, fair anchorage may be had outside the bar in 4 to 6 fathoms. Good anchorage for small craft may be found on the west side of the pass 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 are: **Chocolate Bay**, with depths of 3 feet; Lavaca Bay, on the east side to the north 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.

Tides.—The periodic tide in Matagorda Bay is small and the water surface is dependent largely on the wind. During strong northers the water surface may be depressed 2 feet.

The tidal current at times in Pass Cavallo is believed to attain a velocity of 2 knots.

Halfmoon Reef extends about 3 miles off **Palacios Point**, the southwest point of the tongue of land extending between the eastern and northern 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; it marks the inshore side of a channel across the inner end of the reef.

Tres Palacios Bay, about 4 miles north of Palacios Point, is a small shallow bay on the northeast side at the center of Matagorda Bay. A Federal project provides for a channel with a depth of 9 feet from deep water to the turning basins on the southern shore of the town of Palacios; in January 1962 the controlling depth was 9 feet. Lights and daybeacons mark the easterly side of the channel.

Palacios, a fishing and farming community, is on the west side of Tres Palacios Bay. An elevated water tank in the town, a similar tank at Camp Hulen, and a smaller tank at the airport show prominently from the bay. See Appendix for **storm warning displays.** Two turning basins are at the head of the channel into Palacios. Board of Directors of Navigation District No. 1 of Matagorda County operates the turning basins through a **harbormaster** who has offices at the harbor.

In September 1961, controlling depths were 7 feet into the west turning basin and 9 feet into the east turning basin. Berthing facilities are available.

A boat basin for small pleasure craft is on the north side of town; the dredged entrance channel has a controlling depth of about 4 feet. The larger of two shipyards can haul out vessels up to 105 feet in length. General repairs are made and machine shop facilities are available. Highway and railroad connections lead to inland points.

Carancahua Bay, 6 miles west of Tres Palacios Bay, is a shallow, unimportant body of water frequented only by a few small boats. Depths of 3 feet are in the entrance with somewhat greater depths inside. A 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.

Lavaca Bay, an arm of Matagorda Bay at its northwestern corner, has a general depth of 5 to 7 feet with several reefs near the head of the bay. Dredged channels, marked by aids, lead to the important facilities. The main channel has a Federal project depth of 9 feet and extends from deep water in Matagorda Bay through **Sand Point Reef** and **Gallinipper Reef** to the town of Port Lavaca on the southwestern shore. In September 1961, controlling depth was 8 feet to Gallinipper Reef, thence 6 feet to Port Lavaca and 7½ feet into the turning basin in Lynn Bayou.

Three dredged auxiliary channels, each about a mile apart, branch off from the main channel. The first, a privately dredged channel, leads northward through Gallinipper Reef to the turning basin on the north side of the bay where terminal facilities are available at **Point Comfort**, site of a large aluminum plant. Controlling depth in the channel and basin was 12 feet in September 1961.

The second channel with Federal project depth of 9 feet leads southwestward to Port Lavaca **Harbor** of

Refuge on the northwestern side of **Chocolate Bay.** Controlling depth in the channel and harbor was 7 feet in September 1961.

The third is a Federal project that provides for a channel 6 feet deep that leads northward to about the midpoint of the upper bay northward of **Noble Point,** then turns westward and passes through the opening of the bascule span of the old causeway and underneath the fixed span of the highway causeway and underneath an overhead power cable, then turns northward and enters **Lavaca River,** continuing to the junction with the **Navidad River,** thence up the Navidad to the town of **Red Bluff.** The controlling depth was 5½ feet in October 1961 to Lavaca River, thence 4 feet to Red Bluff in April 1962. Northward of Noble Point the former causeway, from which the bascule span has been removed, limits the width to 37 feet. Overhead clearance is 43 feet at the fixed span of the new causeway, and 69 feet at the power cable 0.2 mile westward. A highway bridge having a removable-span and a railroad bridge having a swing span cross Lavaca River near its junction with the Navidad in the vicinity of the towns of **Vanderbilt** and **Lolita.** The railroad bridge has a clearance of 12 feet; see **§ 203.245,** Chapter 2, for **drawspan regulations.**

Keller Bay, an arm on the east 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 east side of the bay. Barges drawing 6 feet were being brought in to Olivia in September 1961.

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.

Port Lavaca, on the western shore of Lavaca Bay, is a city in a fishing, farming, and growing industrial area. See Appendix for **storm warning displays.** The municipal harbor is under the jurisdiction of the Port Commission and a **harbormaster** administers the local regulations. Several small boat basins with depths from 6 to 9 feet are maintained along the waterfront by local fishing, dredging, and oil companies. Gasoline, diesel fuel, water, ice, provisions, and some marine supplies are available. Three shipyards, two with marine ways, are equipped to make general repairs. The larger yard has marine ways capable of hauling out vessels up to 85 feet in length.

Port O'Connor (P.O.) is a small settlement at the southwestern end of Matagorda Bay north of Pass Cavallo, and has telephone service. The town is approached via the Intracoastal Waterway route between two jetties which extend into the bay. Mariners are cautioned to keep in the channel between the jetties; shoal areas with rocky bottom lie outside the channel. Along the Matagorda Bay shore 0.4 mile northwest of the jetties are the piles of an old pier. **Storm warning displays** are given in the Appendix. Numerous docks and slips for shrimp boats and pleasure craft are along the north side of the waterway at Port O'Connor. Gasoline, diesel fuel, water, ice, and provisions are available. An improved highway leads to Port Lavaca and Seadrift.

Barroom Cut, 0.3 mile south of the jetties of the Intracoastal Waterway, is the abandoned route of the original inland waterway. Jetties extend about 0.3 mile off the east end of the cut. In 1961 depths through the cut into **Barroom Bay** had shoaled to about 3 feet.

Charts 1285, 890, 891.—Espiritu Santo, San Antonio, Mesquite, and Aransas Bays are a series of shallow bodies of water extending southwesterly along the coast for a distance of 50 miles from Pass Cavallo to Aransas Pass, separated from the Gulf by Matagorda Island and **St. Joseph 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 eastern part of the bay a dredged ferry channel extends from the waterway southward to a military base on Matagorda Island. The channel is marked by lights, daybeacons and buoys, and in September 1961, had a controlling depth of 10 feet. The bay is entered from Matagorda Bay through the Intracoastal Waterway and the ferry channel.

San Antonio Bay has depths up to 5 and 6 feet. It is separated from Espiritu Santa Boy by the **First Chain of Islands,** through which are South Pass and Steamboat Pass. **South Pass,** an old unmarked dredged cut, had a depth of 4 feet in September 1961. The channel extends between two islands and close to the privately maintained markers on the north side of the south island. **Steamboat Pass,** 1.5 miles to the north, had less than 3 feet of water in September 1961.

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 essential.

Northward 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 east, and **Hynes Bay** on the west. **Goff** and **Schwings Bayous** flow into Mission Lake.

Guadalupe River empties into the northern end of San Antonio Bay. A depth of about 2 feet can be carried from the bay into the north 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.

A Federal project provides for a channel 9 feet deep from the Intracoastal Waterway, northwesterly along the east side of San Antonio Bay, to and through Guadalupe Bay and Mission Lake, thence inland to the town of **Victoria;** also, 4.5 miles north of the Intracoastal Waterway, a side channel of the same depth leading to the town of Seadrift. Dredging has been completed as far as Long Mott on Mission Lake; this section of the project is known as **Guadalupe Channel.** Controlling depth in Guadalupe Channel was 9 feet in January 1962, and 7 feet in September 1961 in the side channel to Seadrift.

Seadrift is a small fishing and farming community on the northeast shore of San Antonio Bay, and has highway and rail connections. A private channel leading to the town is marked by stakes and had a controlling depth of 4 feet in September 1961. Gasoline, oil, water, and some provisions are available; diesel fuel can be delivered by tank truck. North of Seadrift, a boat repair yard has marine ways capable of hauling out boats up to 40 feet in length for general repairs.

Long Mott (P.O.) is a small town on Mission Lake that has railroad and highway connections to the interior. Guadalupe Channel leads to the town, and a large chemical plant is at the head of the channel.

Mesquite Bay lies between **Ayres Reef** and **Third Chain of Islands**, and is of no commercial importance except for fish and oysters. A large hunting club is located on Matagorda Island opposite the southeast 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 across Carlos Bay into Mesquite Bay.

Cedar Bayou, separating Matagorda Island from St. Joseph Island, leads in a southerly direction from the southeast corner of Mesquite Bay toward the Gulf. A bar has closed the outlet to the Gulf.

Aransas Bay, 15 miles in length and 3 to 4 miles in width, is used extensively as a shrimping ground. The Intracoastal Waterway crosses the bay, and opposite Rockport turns westward to and through Redfish Bay; at the turn, the channel of the former route of the Intracoastal Waterway continues to Lydia Ann Channel. A privately maintained channel near Blind Pass, at the southeast end of the bay, is marked by a lighted range. The periodic tide throughout the bay has a diurnal range less than 0.5 foot, the variation in water level depending principally on the wind. Many piles along the south 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 northward, is the site of considerable hunting and sport fishing, but commercial fishing is prohibited. There are no communities on the bay. 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. Limited quantities of gasoline are available at two small landings along the west shore.

A privately maintained channel, marked by daybeacons on the east side, leads to an oil loading dock about 0.8 mile east of the north end of the Copano Bay causeway. The channel had a controlling depth of 6 feet in September 1961.

A small-boat basin near the north end of the causeway at Lamar has storage facilities for boats up to 36 feet in length. There is a marine way capable of hauling out vessels up to 30 feet in length. Owners must arrange for their own repairs. A privately maintained and marked channel to the basin had a controlling depth of 4 feet in 1956. Gasoline, water, and ice are available.

Copano Bay, a northwesterly 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 south of **Redfish Point**, inside the bay on the south side at the entrance. Storm anchorages for drafts up to 3 or 4 feet may be had in the southern end of the bay in the small bight at the northeast corner of **Port Bay**. Slightly greater draft can find good protection in the extreme northeast corner of Copano Bay in the bight off Redfish Point. Soft mud bottoms are at these anchorages.

A highway causeway across the entrance to Copano Bay has a bascule span with a width of 42 feet and a clearance of 11 feet.

Mission Bay, on the north shore of Copano Bay, is of no importance; only small skiffs can enter.

Bayside is a small resort town on the northwestern shore of Copano Bay. A large hotel shows prominently from the bay. Highway and telephone communications are available.

Aransas River, emptying into the northwestern end of Copano Bay, is shallow and navigable only for small craft of 1 foot or less. A highway bridge across the mouth has a fixed channel span with a width of 17 feet and a clearance of 9 feet.

Fulton is a small village on the west shore of Aransas Bay. A Federal project provides for a basin 8 feet deep protected by a dike and breakwater, and a channel 8 feet deep from the basin to that depth in Aransas Bay. In September 1961 controlling depth was 8 feet in the channel and basin. The Aransas County Navigation District No. 1 has constructed a yacht basin with a protecting seawall and depths to accommodate drafts of 10 feet. Berthing and storage facilities are available. The **harbormaster**, who has charge of berth assignments and ship movements, has offices at the harbor and in Rockport. A speed limit of 5 miles within the harbor is in force. Gasoline, diesel fuel, water, ice, provisions, and some marine supplies are available. A small shipyard has marine ways which can haul out craft up to 37 feet in length for general repairs. Steel or wood hull vessels are repaired and machine shop repairs are available. The yard has covered slips available for boats up to 32 feet in length.

Rockport is a commercial fishing and resort town on the west shore of Aransas Bay. A water tank shows prominently from Aransas Bay. A spoil bank area extends along the northwest side of the 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. Federal project depth is 9 feet for an entrance channel and basin in the harbor. In Sep-

tember 1961 the controlling depth was 9 feet in the channel and basin. To enter, pass about 50 yards east of the approach light and head directly toward the light on the seawall at the basin entrance. The channel is marked by buoys on the west side. See Appendix for **storm warning displays.**

In the basin are excellent facilities for yachts and other craft. The basin is about 0.3 mile in length and protected by a concrete seawall. Inside is berthing space for more than 100 yachts of all sizes, several private covered piers, and two shipyards. The **harbormaster,** who has charge of berth assignments and ship movements, has his office at the northeastern end of the basin. A speed limit of 5 miles per hour within the harbor limits is in force.

Gasoline, diesel fuel, water, ice, provisions, and marine supplies are available. There are two repair yards in Rockport. One has a vertical lift, the other has marine ways that can haul out vessels up to 110 feet in length for general repairs. About 1 mile south of Rockport is another shipyard, privately owned, operated only for repairing company tugs and barges. However, this shipyard will haul out other craft in emergencies, provided the ways are open. The ways can haul out craft up to 100 feet in length.

Rockport has highway connection with Port Lavaca and Corpus Christi and railroad connections to the interior.

Lydia Ann Channel, along the northeast side of Harbor Island, connects the south end of Aransas Bay with Aransas Pass. The entrance from Aransas Bay is via the section of the dredged channel formerly part of the Intracoastal Waterway. Depths of 12 feet or more are found in the channel. The stranded wreck of the S.S. JOHN WORTHINGTON lies on the east side of the channel east of the abandoned lighthouse. This ship was torpedoed during World War II, and then towed into Lydia Ann Channel for salvage. Barges and other craft tie up alongside the wreck.

Charts 523, 1286.—Aransas Pass, 154 miles southwestward of Galveston Entrance and 113 miles northward 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 St. Joseph Island on the north and Mustang Island on the south. Directly opposite the inner end of the pass is **Harbor Island,** which separates Aransas Bay from Corpus Christi Bay.

Two jetties extend into the Gulf from St. Joseph and Mustang Islands. In the bend in the north jetty are several spurs, now submerged, whose ends are marked by three buoys. Small craft are cautioned not to pass between these buoys and the northeast jetty. There are three submerged spurs in the south jetty. A submerged wreck covered 24 feet lies to the south of the channel inside the jetties.

The approach to Aransas Pass is marked by a lighted whistle buoy 4.5 miles offshore, and a lighted bell buoy a mile off the north jetty. The entrance channel is marked by a lighted buoy at the submerged outer end of each jetty, a lighted range, and lighted buoys and lights.

Prominent features.—In approaching Aransas Pass in daytime, the first objects sighted are the structures of the Carbon Black plant, about 3 miles north of the village of Aransas Pass, and a water tank in Port Aransas. The abandoned lighthouse, a 60-foot red brick octagonal tower, on Harbor Island and the buildings at Port Aransas will be sighted as the pass is approached. The 78-foot tower of a rear range light, toward the south end of St. Joseph Island, shows prominently from the Gulf.

Aransas Pass Light (27°50.3′ N., 97°03.5′ W.), 85 feet above the water, is shown from a skeleton steel tower at the Aransas Pass Coast Guard Station. A radiobeacon is at the light. This station also is equipped for special radio-direction-finder calibration; see light list for operational information.

Channels.—The dredged entrance channel through Aransas Pass is protected by jetties. A Federal project authorizes an outer bar channel 42 feet deep, a jetty channel 42 feet deep decreasing to 40 feet in the inner part, and an inner basin at Harbor Island with a depth of 40 feet, but these channels are not dredged to authorized depths. Federal dredging depths are 38 feet in the outer bar channel, 38 feet in the jetty channel decreasing to 36 feet in the inner part, and 36 feet in the inner basin at Harbor Island.

Corpus Christi Channel extends from Aransas Pass to Corpus Christi on the west side of Corpus Christi Bay. For about 4 miles, at the eastern end, it extends through Turtle Cove between Harbor Island on the north and Mustang Island on the south; thence across Corpus Christi Bay to Corpus Christi. The channel is straight except for a 15° bend at about its midway point just south of Ingleside Cove. The Federal project depth is 36 feet.

La Quinta Channel branches northward from Corpus Christi Channel, and follows the northeast side of Corpus Christi Bay to a turning basin at the town of La Quinta. Project depth in the channel and basin is 36 feet, and controlling depth is maintained at or near project depth.

Deep draft channel controlling depths from the latest available surveys are published in the Notice to Mariners.

Anchorages.—Deep-draft vessels can anchor in the Gulf near the jetties wherever the depth is suitable. Inside Aransas Pass, the only available anchorage is in the Inner Basin east of Harbor Island and north of the channel. The space here is limited and subject to shoaling; caution is necessary. Although holding ground is good, there is no protection from north and east winds. Light-draft vessels up to about 12 feet can anchor in Lydia Ann Channel north 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 area, wherein vessels not more than 65 feet in length are not required to carry or exhibit anchor lights, has been established in Corpus Christi Bay; see **§ 202.75,** Chapter 2, for limits and regulations.

Tides and currents. The diurnal range of tide at Aransas Pass is 1.5 feet. In Corpus Christi and Redfish Bays the periodic tide is too small to be of any practicable importance.

The currents at times have velocities exceeding 2 knots in Aransas Pass; they are greatly influenced by winds. Daily predictions of the tidal current may be obtained from the Tidal Current Tables.

Winds from any easterly direction make a rough bar and raise the water inside as much as 2 feet above normal. Winds from any westerly direction have an opposite tendency. A sudden shift of the wind from south to north makes an especially rough bar for a short time. During summer months, southerly winds prevail, becoming moderate to fresh in the afternoon.

See Appendix for **storm warning displays.**

Pilotage is compulsory for foreign vessels, American vessels under registry, and coastwise vessels except those having on board a pilot licensed by the United States Coast Guard. The pilots maintain a lookout at Port Aransas and have a motorboat to meet vessels near the bell buoy. Arrangements are usually made through the ship's agents. The pilot boat has radio communication, call WB 5796. There is 24-hour pilot service to Harbor Island, La Quinta, and Corpus Christi.

Towboats are available at Harbor Island and Corpus Christi. Divers and salvage equipment may be engaged.

Quarantine.—Ships subject to inspection are boarded alongside the dock at Harbor Island, Port Ingleside, La Quinta, and Corpus Christi.

The nearest U.S Public Health Service Hospital is at Galveston. Several hospitals and a Public Health Service outpatient office are at Corpus Christi.

Customs and Immigration.—The Customs Service maintains offices in the Post Office building and the Immigration Service maintains offices in the Federal building in Corpus Christi. Vessels are boarded at the dock. Officials are on 24-hour call. Corpus Christi is a port of entry and marine documents are issued.

Wharves.—At the port of Corpus Christi there are 9,000 feet of public and private dry cargo docks and oil docks that have extensive fire-fighting equipment, warehouses having 500,000 square feet of floor space, a grain elevator with 4,160,000 bushels storage capacity and 125,000 bushels per hour loading capacity, four 30-ton diesel locomotives, two 25-ton steam locomotives, one 30-ton diesel crawler hoisting crane, 11.9 miles of railroad, 4 miles of roadway, and 1 track scale.

Supplies.—Fresh water is available at all docks. Oil bunkering facilities are available at oil docks and by oil barges. General supplies and provisions are available at the numerous stores, and unusual items generally can be secured quickly from Galveston or Houston.

Repairs.—There is no shipyard with drydocks or marine ways for hauling out large ships, but an excellent machine shop is equipped to make any kind of topside repairs to any size vessel. This shop has a large portable generator, both a.c. and d.c., available for large ships. The nearest drydock for large vessels is at Galveston.

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.—Corpus Christi is served by three railroad systems, and improved highways connect with all parts of the State. Over 100 shipping companies serve the port and provide water transportation to ports on the Gulf, Atlantic, and Pacific coasts, and all world ports.

Port Aransas is a small commercial fishing and resort town on the north end of **Mustang Island** at the inner end of Aransas Pass. A channel leads to a turning basin just inside the pass; in October 1961, the controlling depth was 10 feet in the channel and the basin. Boatyards in the harbor have facilities for 125 boats up to 60 feet in length. Some covered berths are available for drafts up to 5½ feet. Gasoline, diesel fuel, water, ice, and provisions in limited quantities can be obtained. An automobile ferry operates between Port Aransas and Harbor Island. A Coast Guard station is at Port Aransas. See Appendix for **storm warning displays.**

Harbor Island lies at the head of Aransas Pass. There are large oil-handling plants on the east end of the island. A turning basin has been dredged for nearly 2,000 feet along the north side of the ship channel. Berthing space for three large vessels is available at the three open piers. A wharf with a transit shed is about 1,000 feet long. A toll highway from the terminals crosses Morris and Cummings Cut and Redfish Bay, and leads to the town of Aransas Pass on the mainland.

From the Inner Basin off Harbor Island, a Federal project provides for a channel 12 feet deep to a basin of the same depth off the town of **Aransas Pass,** situated on the mainland about 5.5 miles northwestward of Aransas Pass, and 12 feet in a connecting channel to and in Conn Brown Harbor. In October 1961, the controlling depth was 11 feet to **Conn Brown Harbor** and 9 feet inside the harbor. Lights and daybeacons mark the channel. A canal crossing the west end of Aransas Pass Channel extends along the east side of the town, sheltered from Redfish Bay by a spoil bank. South of the causeway the canal offers good protection to small boats. The channel and harbor to the north of the causeway have several seafood processing plants. A large fishing fleet operates out of the town.

There are three shipyards with marine ways, the largest capable of hauling out vessels up to 130 feet in length for general repairs. Gasoline, diesel fuel, water, ice, provisions, and supplies are available.

A speed limit of 4 miles per hour is enforced in the channel and harbor from Harbor Island to the town of Aransas Pass.

The town has both highway and railroad connections to all parts of the State.

Corpus Christi Bayou, at the south end of Aransas Bay, provides small craft a short cut from Aransas Bay via **Morris and Cummings Cut** to Corpus Christi Bay. The bayou entrance is marked by a day beacon on the south side of the channel, and has a controlling depth of about 4 feet; the channel is crooked and difficult to follow, as only a few piles mark the channel. In 1961, the controlling depth through Morris and Cummings Cut was 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 south 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 southward of the dredged channel, the fixed span of a highway causeway bridge has a width of 28 feet and a clearance of 8 feet.

A privately maintained and marked channel leads from the south end of Morris and Cummings Cut to the south end of the town of Aransas Pass; the controlling depth was 5 feet in September 1961.

Redfish Bay is shallow; it extends northward 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 north-to-south 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 westward of Mustang Island and connected with Aransas Pass by the Corpus Christi Channel. The bay is about 15 miles long in an east-and-west direction and 11 miles wide at its widest part. About the eastern 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 and Laguna Madre; see **§ 207.188,** Chapter 2, for limits and regulations.

Shamrock Cove, on the southeast side of Corpus Christi Bay, affords good anchorage for small boats in depths of 7 to 8 feet, soft mud bottom. A light marks the shoal water extending westward from **Shamrock Point.**

Port Ingleside, on the north shore of Corpus Christi Bay about 7.5 miles westward of Aransas Pass, consists of privately owned oil terminals. The oil piers are north of Corpus Christi deep-draft channel; bunkering facilities are available.

La Quinta deep draft channel is along the east side of Corpus Christi Bay, branching off Corpus Christi deep draft channel about 8.5 miles westward of Aransas Pass, and leads northward through **Ingleside Cove** and **Donnel Reef** to a turning basin at the town of **La Quinta.**

Ingleside on the Bay, a fishing community on the east shore of Ingleside Cove, has a marina that can accommodate boats up to 64 feet in length; available supplies include gasoline, diesel fuel, water, and ice. A restaurant is at the marina.

At **Kinney Bayou** on the east side of Ingleside Cove, a marina has dockage for boats up to 65 feet in length, and covered berths for about 50 boats up to 45 feet in length. Gasoline, diesel fuel, water, ice, some provisions, bait, and tackle are available; there is also a restaurant. A boatyard for general repairs has a machine shop, and a vertical lift can haul out boats up to 40 tons in weight. A privately marked channel leads to the marina; the controlling depth was 6 feet in September 1961.

In Ingleside Cove, south of Donnel Reef, there is good small-boat anchorage in depths of 9 to 10 feet.

Encinal Channel, about 9 miles westward of Aransas Pass, bears off in a southwesterly direction from Corpus Christi deep draft channel and continues to a turning basin on the south side of Corpus Christi Bay at Encinal Peninsula. In September 1961 the controlling depth in the center of the channel was 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 and a railway and a highway causeway. The causeways have bridges with bascule spans off **Rincon Point** with a minimum width of 29 feet and minimum clearance of 4 feet; see **§ 203.245,** Chapter 2, for drawspan regulations.

A privately maintained channel with reported depths of 8 to 9 feet in September 1961, led to a marina at the northeast end of the causeway. There is covered dockage for boats up to 40 feet in length, and gasoline, oil, and marine supplies are available. A 10-ton lift can haul out boats up to 40 feet in length for hull or engine repair. The channel is narrow and difficult to follow; local knowledge is essential. **Nueces River,** emptying into the western part of Nueces Bay, is navigable for shallow draft boats for a distance of 9 miles to a dam. The river is of no commerical importance.

Corpus Christi, on the western side of Corpus Christi Bay and 18 miles from Aransas Pass, is the most important city commercially on the coast of Texas southwestward of Galveston. The principal commerce is in petroleum and petroleum products, and cotton and cottonseed products. Other commodities include bauxite ore and aluminum, grain and grain products, canned beef, and other products.

The harbor on the north side of the city consists of inland basins connected by an industrial canal. The basins and connecting canal are landlocked and well protected. Federal dredging depths are 36 feet in Corpus Christi Turning Basin, in Avery Point Turning Basin, and in the channel connecting them, thence 34 feet to and inside the turning basin near Tule Lake. Dredging depths are maintained and controlling depths from the latest available surveys are published in the Notice to Mariners. From Tule Lake Turning Basin a channel has been dredged by private interests to Viola Turning Basin. A controlling depth of 35 feet was reported in the channel and turning basin in 1961.

Bridges.—The fixed highway bridge over the entrance to Corpus Christi Turning Basin has a clearance of 138 feet over a center width of 300 feet.

The former pontoon bridge and its approaches, just west of the Avery Point Turning Basin, have been removed to a clear width of 200 feet. The combination highway and railroad bridge over the Industrial Canal, about a mile west of the basin, has a vertical-lift span with a clearance of 9 feet down and 138 feet up.

Small-boat facilities.—The entire waterfront at Corpus Christi is protected by a breakwater nearly 2 miles long. Depths over the area behind the breakwater range from 7 to 16 feet, not including the ship channel crossing the north end. The main entrance is through the ship channel to the north of the yacht basin. A draft of 7 to 8 feet can be carried southward inside the breakwater to the three large yacht piers. The best water is at the center of the protected waterway. There are four openings in

the breakwater south of the ship channel. The first is shallow with a depth of 3 feet in the middle; the other three have depths of 8 to 10 feet, the most southerly being the deepest.

The yacht basin is opopsite the center of the city and has excellent accommodations for yachts and small vessels. Protected berths for 300 yachts are available in depths of 7 to 11 feet. Gasoline, diesel fuel, oil, and water are available and a repair yard has facilities for hauling out boats up to 40 feet in length. See Appendix for **storm warning displays.**

A general repair yard on the Industrial Canal has a vertical lift capable of hauling out vessels up to 85 feet in length. Wood or steel hull repairs are made; a machine shop is on the premises.

Chart 1117.—Laguna Madre is a shallow body of water extending southward from Corpus Christi Bay for a distance of 100 miles. Depths range from zero to 9 feet with reefs and mud flats throughout. The Intracoastal Waterway traverses Laguna Madre from Corpus Christi Bay southward to Port Isabel, Texas; see Chapter 12. **Padre Island,** a low barren, storm-swept strip of sand beach, separates Laguna Madre from the Gulf.

Charts 1287, 896.—Port Mansfield, 70 miles southward of Corpus Christi Bay, is a popular sport fishing and recreational center, and a base for oil exploration in Laguna Madre. A Federal project provides for a channel 12 feet deep from the Intracoastal Waterway to a turning basin 12 feet deep at Port Mansfield; the controlling depth was 10 feet in February 1962.

The Willacy County Navigation District has a project for a 12-foot channel leading eastward across Laguna Madre from the Port Mansfield turnoff and through Padre Island to the Gulf. In 1961, the Gulf entrance was blocked by a temporary dam erected to facilitate jetty construction.

Port Mansfield has a port director; a port captain assigns vessels to berths. There are berthing facilities, open storage space, and a transit shed with covered storage space. Several wooden-pile wharves and finger piers have berthing facilities for vessels up to 50 feet in length. Gasoline, diesel fuel, water, ice by truck, and a limited amount of provisions are available.

Telephone and bus services are available. 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, hotel, supplies, telegraph communications, and rail and highway connections.

See Appendix for **storm warning displays.**

Small-boat facilities.—A small-craft basin and a commercial fishing harbor connect with the turning basin at Port Mansfield. The small-craft basin has covered facilities for about 100 boats up to 50 feet in length. The controlling depth into the basin in September 1961 was 8½ feet. The commercial fishing harbor had a controlling depth of 12 feet in September 1961, and a marine railway capable of hauling out boats 100-feet in length for hull repair.

Charts 1288, 897.—Arroyo Colorado enters Laguna Madre through **Arroyo Colorado Cutoff,** a dredged channel, 90 miles southward from Corpus Christi. A Federal project provides for a channel 12 feet deep from the Intracoastal Waterway through Arroyo Colorado Cutoff and Arroyo Colorado to a turning basin at Port Harlingen, 22 miles from the mouth. In February 1962, the controlling depth was 9 feet.

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. A shipyard for hull repairs to steel vessels has marine ways capable of hauling out vessels up to 50 feet in length. A mechanic may be called to repair engines. There are railroad and highway connections to the northern part of the State.

The highway bridge at Rio Hondo has a vertical-lift span with a clearance of 27 feet down, and 73 feet up. See **§ 203.245,** Chapter 2, for **drawspan regulations.** Overhead power and telephone cables between the Intracoastal Waterway and Harlingen have minimum clearance of 52 feet.

Port Harlingen, under the jurisdiction of the Arroyo Colorado Navigation District, is east of Harlingen and about 2 miles above Rio Hondo. There are two reinforced concrete wharves with berthing space, three oil unloading docks, and an adjustable ramp for the offloading and loading of truck trailers to barges. A transit shed on the west wharf has covered storage space. Water is available at the west wharf. Gasoline and diesel fuel are available by truck. The principal imports are petroleum products, steel products, and chemicals. The principal exports are grain and crude petroleum. There are railroad and highway connections to **Harlingen** and the interior. At Harlingen and **San Benito** there are hospitals, supplies, transportation, and communication facilities.

Charts 1288, 898.—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 south end of Padre Island and the north end of **Brazos Island.** It lies 236 miles south-southwestward from Galveston entrance, 106 miles southward from Aransas Pass, and 6 miles northward from the mouth of the **Rio Grande.**

Prominent features.—In approaching Brazos Santiago on a clear day, the water tanks and Port Isabel Light are the first objects sighted. Soon thereafter the mariner will pick up Brazos Santiago Light and the Coast Guard station inside the entrance on the north side.

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 Light (26°04.4′N., 97°09.8′W.), 52 feet above the water is shown from the dwelling of the

Coast Guard station at the north side of the entrance to Laguna Madre. The radiobeacon antenna is near the light.

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 dredging depths are 38 feet through Brazos Santiago, 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.** Controlling depths are published in the Notice to Mariners.

Private interests have dredged a ship basin at the south end of Padre Island just inside Brazos Santiago entrance. In August 1961, the basin had shoaled to a depth of 10 feet.

In the 12-mile channel to Brownsville Turning Basin, **Boca Chica Cutoff Passing Basin** is 5.5 miles and **Goose Island Passing Basin** 11.3 miles above the outer end of the entrance jetties.

The entrance to Brazos Santiago is marked by a lighted whistle buoy 2 miles off, a lighted buoy off each jetty, and a lighted range.

Anchorages.—Directly off the entrance to Brazos Santiago the bottom is soft and affords fair anchorage with good holding ground; farther north and south the bottom is harder. After entering the pass, ships must proceed to the wharves. Temporary anchorage can be made in the turning basin at Port Brownsville while awaiting a berth.

Tides.—Inside Brazos Santiago the periodic tide has a diurnal range less than 0.5 foot, the variation in water level depending principally on the wind.

See Appendix for **storm warning displays.**

Pilotage between the bar and the turning basins at Port Isabel and Port Brownsville is compulsory for foreign vessels and American vessels under registry. Pilotage is not compulsory for coastwise vessels having a pilot aboard licensed by the U.S. Coast Guard. The pilots use motor launches to meet vessels. A lookout station is manned at the former lighthouse site on Padre Island near the Coast Guard station.

Towboats are available for Port Isabel or Port Brownsville, or for coastwise towing and salvage work.

Customs.—Brownsville is a port of entry and marine documents are issued. A deputy Collector of Customs has an office in the Federal Building in Brownsville and suboffices at Port Isabel and Port Brownsville. Vessels are boarded at the dock.

Quarantine and immigration.—These services maintain offices at the Gateway International Bridge. Vessels are boarded at the docks.

The nearest Public Health Hospital is in Galveston. A hospital and a Public Health Service outpatient office are in Brownsville.

Port Isabel, about 2.5 miles westward from Brazos Santiago, is an important point for the shipping of petroleum products, cotton, and metals. It has a large fishing fleet, and the town is widely patronized as a resort for sport fishing and recreation. There are several hotels, motels, and stores.

Wharves.—The deepwater facilities at the turning basin in Port Isabel are controlled by the Port Isabel-San Benito Navigation District, and managed by a **port director.** A **harbormaster** at the wharves assigns berths and controls the movement of ships. A speed limit of 4 knots in the harbor and 8 knots in the ship channel is in force. There are two general cargo wharves with more than 1,000 feet of berthing space on the west side of the basin and an oil dock equipped for receiving and loading oil cargoes is on the north side. A transit shed and warehouses on the west wharf have more than 50,000 square feet of covered storage space. There is a precooler plant on the wharf. The open wharf was designed for the handling of fruit. The wharves have facilities for bunkering ships and serving them with fresh water and electricity. The entire terminal is serviced by railroad, highway, and pipeline.

Repairs.—Three shipyards have marine ways, the largest capable of hauling out vessels up to 110 feet in length. Complete repair facilities are available.

Small-boat facilities.—A Federal project provides for a side channel from the Intracoastal Waterway along the southern part of Port Isabel, 12 feet deep and 125 feet wide and a side channel 6 feet deep and 60 feet wide for the use of small craft. The 125-foot channel had a controlling depth of 10½ feet in April 1962 and the side channel had a controlling depth of 10 feet in September 1961. This is known as the **Industrial Channel** and is used principally by fishing boats.

Local interests have dredged a shallow-draft channel from Laguna Madre to Port Isabel Yacht Basin on the northwest side of Port Isabel. Several daybeacons mark the channel; in August 1961, a draft of 5 feet could be taken into the basin. Available supplies include gasoline, diesel fuel, water, ice, and provisions.

A causeway at the south end of Laguna Madre, between Padre Island and Port Isabel, has a fixed channel span with a width of 38 feet and a clearance of 18 feet. A small marine way at the east end of the causeway near Padre Island Park No. 2 is capable of hauling out boats up to 30 feet in length. Repair facilities are limited.

Communications.—Rail and highway connections with San Benito and Rio Grande are available.

Port Brownsville, about 14.5 miles from the inner end of Brazos Santiago, is the port for the city of Brownsville. Exports include cotton, cotton products, lead, agricultural implements, zinc, sulfate, ore, chemicals, and citrus fruit; imports are bananas, steel products, and general merchandise.

Brownsville, about 5 miles west-southwest of Port Brownsville, is a fast growing metropolis and the largest city in the rich agricultural section on the north side of the lower Rio Grande Valley that extends 100 miles westward 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 harbor facilities at Port Brownsville are owned and controlled by the Brownsville Navigation

District. A **director of the port** has charge of management of the port, and a **harbormaster** at the wharves has charge of the movement of ships and the assignment of berths. A speed limit of 4 knots in the turning basin and 8 knots in the ship channel is in force. The turning basin has several thousand feet of berthing space, and there are several hundred-thousand square feet of covered storage space in the transit sheds. Fenced bonded open space also is available. All docks and wharves have water and electric current; bunkering facilities and diesel fuel are available at two of the oil docks. The banana wharf has sheds with unloading conveyors. There are high-density cotton compresses in the port area and warehouse storage capacity for more than 140,000 bales of cotton; additional compresses and warehouses in Brownsville have storage capacity for another 130,000 bales. The port has oil-storage capacity of 500,000 barrels. Vegetable and fish oil are handled at one oil dock. A steam crane of 30-ton capacity and a mobile boom of 15-ton capacity are available.

Small-boat facilities.—Brownsville Fishing Harbor is 3 miles below the turning basin at Port Brownsville. 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 hauling out vessels up to 75 feet in length for hull repairs. Gasoline, diesel fuel, water, ice, and supplies are available. Provisions can be obtained from Brownsville. 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 trunk rail lines. Excellent highways extend throughout the valley area as well as to the northern and northwestern part of Texas. The Rio Grande Valley International Airport, about 5 miles east of the city, has complete airport facilities including customs, immigration, and health officers of the United States and Mexican Governments. Daily scheduled flights reach all parts of the United States and to Mexico City where connections can be made for Central and South American points.

Del Mar (Boca Chica) Beach, on Brazos Island, is a swimming and fishing resort.

The **Rio Grande** empties into the Gulf of Mexico 6 miles southward of Brazos Santiago. 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 and not dependable. The International Boundary Commission has several dams on the Rio Grande to prevent fresh water from wasting into the Gulf.

The east coast of Mexico is described in H.O. Publication 20, Sailing Directions for the East Coasts of Central America and Mexico, published by the U.S. Navy Hydrographic Office.

12. INTRACOASTAL WATERWAY, GULF SECTION

The part of the **Intracoastal Waterway** described here is the toll-free **"canal"** which affords continuous, protected passage behind the Gulf Coast for the more than 900 nautical miles between St. George Sound, Florida, and Port Brownsville, Texas. Supervision of the waterway's construction, maintenance, and operation is divided among three U.S. Army Engineer Districts (Mobile, New Orleans, and Galveston) whose district-office addresses are listed in the appendix.

Mileage.—Intracoastal Waterway (I.W.) mileage in this edition is zeroed at Apalachicola (29°43.5′ N., 84°58.8′ W.), Florida, and progresses westward to I.W. Mile 900.0 at Port Brownsville, Texas. This is a departure from the 1958 edition which zeroed the waterway at Harvey Lock, Louisiana, as do the Engineers, and gave mileages east or west of that lock. Alternate routes are zeroed to takeoff from basic I.W. 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). **All Coast Pilot distances are in nautical miles;** tables for converting nautical miles to the statute miles still used by the Corps of Engineers are on the last page of this volume.

Channels.—The Corps of Engineers project for the Intracoastal Waterway provides for a least depth of 12 feet over a minimum bottom width of 125 feet from Carrabelle Ship Channel to Port Brownsville, Texas. Every issue of the weekly Notice to Mariners contains a tabulation of latest controlling depths reported by the Engineers.

Summary of depths tabulated in Notice to Mariners 24 of June 16, 1962.—Carrabelle Ship Channel to Apalachicola—12 feet.

Apalachicola (I.W. Mile 0.0) to Panama City—10 feet.

Panama City (I.W. Mile 50.7) to Pensacola Bay—9 to 12 feet.

Pensacola Bay (I.W. Mile 145.5) to Mobile Bay—11 feet.

Mobile Bay (I.W. Mile 189.3) to Horn Island Pass—10 feet.

Horn Island Pass (Pascagoula Channel, I.W. Mile 214.4) to Ship Island Pass—12 feet.

Ship Island Pass (Gulfport Channel, I.W. Mile 241.9) to Rigolets—11 feet.

Rigolets (I.W. Mile 275.0) to Mississippi River—12 feet.

Mississippi River (I.W. Mile 300.5) to Bayou Barataria (I.W. Mile 311.2) via Canal Street, New Orleans (I.W. Mile 302.3), and Harvey Lock (I.W. Mile 305.4)—9 to 12 feet.

Mississippi River (I.W. Mile 300.5, A.A. Mile 0.0) to Bayou Barataria (I.W. Mile 311.2, A.A. Mile 12.3) via Algiers Alternate Route (A.A.) and Algiers Lock (A.A. Mile 4.5)—12 feet.

Bayou Barataria (I.W. Mile 311.2) to Morgan City—12 feet.

Morgan City (I.W. Mile 388.3, M.P. Mile 0.0) to Port Allen (M.P. Mile 55.7) via Morgan City—Port Allen Alternate Route—12 feet.

Morgan City (I.W. Mile 388.3) to Vermilion River—12 feet.

Vermilion River (I.W. Mile 443.6) to Mermentau River—12 feet.

Mermentau River (I.W. Mile 481.0) to Calcasieu River—12 feet.

Calcasieu River (I.W. Mile 514.9) to Port Arthur—12 feet.

Port Arthur (I.W. Mile 556.2) to Galveston Bay—11 feet.

Galveston Bay (I.W. Miles 609.1 to 615.4)—11 feet.

Galveston Bay (I.W. Mile 609.1, G.L. Mile 0.0, to I.W. Mile 615.4, G.L. Mile 9.1) via Galveston Loop—9 feet.

Galveston Bay (I.W. Mile 615.4) to Brazos River—11 feet.

Brazos River (I.W. Mile 653.8) to Colorado River—12 feet.

Colorado River (Matagorda, I.W. Mile 689.2) to Port O'Connor—12 feet.

Port O'Connor (I.W. Mile 717.2) to Corpus Christi Channel—9 feet.

Corpus Christi Channel (I.W. Mile 774.3) to Arroyo Colorado Cutoff—9 feet.

Arroyo Colorado Cutoff (I.W. Mile 867.3) to Port Brownsville (I.W. Mile 900.0)—8 feet.

Bridges.—Minimum overhead clearances of Intracoastal Waterway bridges are 48 feet at Fixed Bridge 768.9 and 50 feet at Fixed Bridges 58.0 and 125.5. Minimum width of bridge opening (basic route) is 75 feet. **See 203.240 and 203.241, Chapter 2,** for regulations governing operation of waterway drawspans.

Cables.—Minimum clearances of Intracoastal Waterway overhead cables is 71 feet at Power Cable 688.5. Several others have clearances of 73 to 76 feet.

Locks.—Minimum lock lengths are 425 feet at Lock 305.4 (Harvey), 640 feet at Lock 300.0 (Inner Harbor Navigation), and 760 feet at Lock A.A. 4.5 (Algiers). Minimum lock width is 56 feet at Lock 446.8 (Vermilion). The 425-foot Harvey Lock can be avoided by detouring through the 760-foot Algiers Lock in the Alternate Route. **See 207.180, Chapter 2,** for regulations governing use, administration, and navigation of locks and floodgates.

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Ferries.—Cable ferries still cross the Intracoastal Waterway at several places. The cables are suspended during crossings and are dropped to the bottom when the ferries dock. **Do not attempt to pass a moving cable ferry.**

Aids to navigation.—Intracoastal Waterway aids have characteristic yellow markings which 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.

Charts.—Navigation of the Intracoastal Waterway can be made easier by use of the special 800-series of nautical charts (scale 1:40,000) which the Coast and Geodetic Survey publishes especially for that purpose.

Tides.—Under ordinary conditions the mean tidal range in the waterway is from 1 to 2 feet. In most sections the net change in water level is largely dependent on the force and direction of the wind. Strong northerly winds that occur principally during the winter depress the water surface as much as 3.5 feet below mean low water; southerly winds have the opposite effect. Severe hurricanes have raised the water surface 10 feet or more above low water in some localities.

Weather.—Storm warnings are displayed at various places along the Intracoastal Waterway and connecting channels; see Appendix for complete listing.

Chart 865.—The improved part of the Intracoastal Waterway proper begins at 29°47.5′ N., 84°40.4′ W., in Carrabelle ship channel. Waterway depths are available to **Carrabelle,** 3.7 miles to the north, and to the open waters of the Gulf, 3.3 miles to the south; see Chapter 6.

From Carrabelle channel, the well marked I.W. route is southwestward for 18.0 miles through **St. George Sound** to 29°39.9′ N., 84°58.1′ W., in **Apalachicola Bay,** thence north by west for 3.6 miles to Apalachicola.

The power cable 12.9 miles southwest of Carrabelle channel has a clearance of 40 feet over most of the 3.5 miles between the mainland and the outer beach but is submerged at the I.W. crossing.

Chart 866.—Apalachicola, at **I.W. Mile 0.0,** is on the west side of the entrance to **Apalachicola River.** The town has hotels, numerous stores, and facilities for repair of small craft. Available supplies include fuel, water, and groceries; see Chapter 6. Storm warning displays are listed in the Appendix.

John Gorrie Memorial Bridge is a 4.2-mile east-west combination of highway bridges and causeways over the entrances to East Bay and Apalachicola River. The swing span over the river at **Mile 0.0** has a clearance of 28 feet; the power cable 100 yards north of the bridge has a clearance of 84 feet.

The railroad bridge over Apalachicola River at Mile 3.8 has a swing span with a clearance of 11 feet; the power cable at the bridge has a clearance of 75 feet. Extreme care is advised in the vicinity of the bridge. A half mile west of the bridge is a small pier at which gasoline and water are available.

The I.W. leaves Apalachicola River at Mile 5.0 and proceeds through **Jackson River** to **Lake Wimico,** which is entered at **Mile 9.2.**

Chart 867.—The I.W. leaves Lake Wimico at Mile 14.0 through **Searcy Creek** and a long land cut. There is a submerged fresh-water syphon at Mile 18.6.

The highway bridge over the waterway at **White City, Mile 19.2,** has a lift span with clearances of 10 feet down and 80 feet up. A gasoline station on the highway at White City has some groceries, but there are no berthing facilities.

At I.W. **Mile 20.6, Gulf County Canal** with a depth of 6 feet extends 6 miles southwestward to **Port St. Joe** where fuel and supplies can be obtained; see Chapter 6.

At **Overstreet, Mile 31.3,** a pontoon drawbridge crosses the waterway; the power cable south of the bridge has a clearance of 95 feet.

Chart 868.—North of Overstreet, the I.W. follows a cut in **Wetappo Creek** for a short distance then enters **East Bay** of St. Andrew Bay at Mile 33.7. The channel through the bay is well marked with lights and buoys.

Dupont Bridge, also known as **East Bay Bridge,** crosses East Bay at **Mile 48.6.** The highway swing span has a clearance of 14 feet; drawspan regulations are given in **§ 203.245,** Chapter 2. Extreme care is advised when east of the bridge because of the strong ebb current which has a tendency to carry a vessel southward.

Chart 869.—Panama City, at **I.W. Mile 50.7,** is on the north side of St. Andrew Bay. Berthing and repair facilities, supplies, and fuel are available at the resort town; see Chapter 6. The municipal yacht basin is on the northwest side of the entrance to Massalina Bayou at **Mile 53.1.**

The I.W. continues through a well marked channel in St. Andrew Bay and its northwest arm, **West Bay. Hathaway Bridge,** at **Mile 58.0,** has a fixed span clearance of 50 feet; part of the old highway bridge on the south side still remains. There is a marina at the northwest corner of the bridge; gasoline and water are available.

North Bay extends in a northeasterly direction from I.W. Mile 60.0. The controlling depths are 12 feet to the brigde at **Lynn Haven,** 5 miles above the waterway, and thence 4½ feet to a dam, two miles above the bridge; oyster bars in the middle of the bay with 2 to 6 feet of water over them should be avoided. The highway bridge over the bay at Lynn Haven has a fixed span clearance of 18 feet. Several bayous along North Bay afford anchorage for small craft. A depth of 5 feet is available in **Fanning Bayou,** on the north side of the bay westward of the bridge, to the wharf at **Southport,** at the head of the bayou.

From West Bay, the waterway enters **West Bay Creek** at Mile 68.0. The highway bridge over the waterway at **Westbay, Mile 69.1,** has a lift span with clearances of 10

feet down and 80 feet up. A gasoline station is on the highway near the bridge, but there are no berthing facilities at the small settlement.

Chart 870.—From West Bay Creek, the I.W. follows a long land cut and enters **Choctawhatchee Bay** at Mile 85.0. A power cable crossing the waterway at Mile 71.9 has a clearance of 100 feet; a cable ferry crosses at Mile 83.9.

The channel through the shallow eastern 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 south side. The causeway crossing the bay at **Mile 87.9** 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 107.5. The bay and its tributaries are described in Chapter 6.

Chart 871.—The I.W. leaves Choctawhatchee Bay at Mile 111.0 and proceeds westward for 33 miles through **The Narrows** and **Santa Rosa Sound** to Pensacola Bay. The east part of the route is through a well marked dredged channel while the western 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 113.7 to Mile 127.6; see §§ **204.134** and **204.136,** Chapter 2, for limits and regulations.

The highway bridge over The Narrows at **Mile 111.7** has a swing span with a clearance of 15 feet. The channel is north of the pivot pier; the south draw is not open to navigation.

Fort Walton Beach, on the north side of The Narrows at **Mile 112.3,** has hotels, several stores, and limited repair facilities. Available supplies include fuel, water, and groceries. **Storm warning displays** are listed in the Appendix.

A power cable crossing The Narrows at Mile 116.8 has a clearance of 76 feet. The causeway over Santa Rosa Sound at **Mile 125.5** has a fixed channel span clearance of 50 feet over the waterway.

A highway bridge over the western end of Santa Rosa Sound, at **Mile 141.0,** has a bascule span with a clearance of 20 feet. Gasoline and water are available at two small marinas at the southern end of the bridge.

Chart 872.—At I.W. **Mile 145.5,** a 4.1-mile route leads about north-northeastward through deep water in **Pensacola Bay** to **Pensacola.** The city has complete supply and repair facilities; see Chapter 6.

From Pensacola Bay, the waterway passes through a land cut at Mile 149.7 into **Big Lagoon.** On the north shore west of **Trout Point,** Mile 152.0, gasoline, water, and limited supplies are available. The highway bridge over the western end of the lagoon at **Mile 156.0** has a bascule span with a clearance of 10 feet; approach the bridge at slow speed as the draw is slow to open.

From Mile 156.7, 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 157.2 and 159.6. Perdido Bay and its tributaries are described in Chapter 6.

A small-boat basin with berthing facilities is on the south side of the waterway in Arnica Bay at Mile 161.7; gasoline, water, and other supplies are available. A marina in **Roberts Bayou,** on the north side of Arnica Bay, has gasoline, water, and groceries.

Orange Beach, on the south side of Wolf Bay at Mile 164.2, has a small repair yard for local fishermen, but passing craft can have work done in an emergency. Berthing, fuel, and supplies are available at the small settlement.

From the western end of Wolf Bay at Mile 166.9, the waterway extends through a long land cut to and through **Oyster Bay** and enters **Bon Secour Bay** at Mile 174.2.

The highway bridge crossing the cut at **Mile 170.5** has a swing span with a clearance of 10 feet. The power cables at Miles 170.8 and 171.0 have clearances of 93 feet. Repair facilities are east of the bridge, while fuel and berthing facilities are available west of it. Groceries and marine hardware can be obtained at **Gulf Shores,** 0.7 mile south of the bridge **Storm warning displays** are listed in the Appendix.

Chart 873.—The 20-mile route of the I.W. 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 189.3; Mobile** is 25.2 miles northward. Mobile Bay and its tributaries are described in Chapter 7.

From Mobile Bay, the waterway goes through **Pass aux Herons** to the open water of Mississippi Sound. The highway bridge over Pass aux Herons, at **Mile 194.3,** has a lift span with clearances of 19 feet down and 79 feet up. A power cable on the west side of the bridge has a clearance of 91 feet. The current velocity is 1.3 knots through Pass aux Herons. Berthing and repair facilities, supplies, and fuel are available at **Dauphin Island,** 2 miles southward of the bridge lift span; see Chapter 7.

Chart 874.—The I.W. leaves the well marked Pass aux Herons Channel at Mile 201.7 and enters the open water of Mississippi Sound which has general depths greater than 12 feet until up to Marianne Channel, Mile 254.9, at the western end of the sound.

If bound for **Bayou La Batre,** depart the waterway at the light marking the west end of Pass aux Herons Channel, Mile 201.7, and proceed on a northerly course for 5.4 miles to the entrance channel, thence through the marked channel for 4.6 miles to the town; the controlling depth is 9 feet. Supply and repair facilities are available; see Chapter 7.

The entrance to Mississippi Sound from the Gulf through **Petit Bois Pass** is 2 miles south of Mile 204.6.

The Alabama-Mississippi boundary crosses the waterway at **Mile 208.3.**

At **Mile 210.4,** a lighted buoy, 2.5 miles north of **Petit Bois Island,** marks the waterway route.

Chart 875.—At **Mile 214.4,** the I.W. crosses the deep ship channel in Mississippi Sound between Horn Island Pass and **Pascagoula.** The channel to Pascagoula extends northward for 1.9 miles, thence northwestward for 5.8 miles to the turning basin. Berthing and repair facilities, supplies, and fuel are available; see Chapter 7.

At Miles 219.8 and 221.8, lighted buoys mark turning points in the waterway route. At Mile 227.3, a lighted buoy, 3.4 miles southward of low and rounded **Belle Fontaine Point,** marks the waterway route.

At **Mile 228.9,** a 15-foot dredged channel leads northward and northwestward for 9.4 miles to **Biloxi.**

Chart 876.—At Mile 234.7, a lighted buoy, 2.6 miles north of Ship Island, marks the I.W. route through Mississippi Sound. From the buoy a northerly course in depths of 15 to 10 feet for 4.7 miles leads to a 10-foot marked channel which continues northward and eastward for 3.2 miles to Biloxi. Berthing and repair facilities, supplies, and fuel are available; see Chapter 7.

At **Mile 241.9,** the waterway crosses the deep **Gulfport Channel** between Ship Island Pass and Gulfport. The channel to Gulfport extends northwestward for 6.0 miles to the ship basin. Small-boat basins are on both sides of the ship basin. Berthing and repair facilities, supplies, and fuel are available; see Chapter 7.

Chart 877.—At Mile 248.5, the I.W. route rounds a lighted buoy in Mississippi Sound and turns sharply to the southwestward. If bound for the town of **Pass Christian,** depart the lighted buoy on a west-northwest course and proceed 5.4 miles through depths of 13 to 7 feet to the town's bulkhead boat basin; see Chapter 7.

From Mile 248.5, the southwesward reach proceeds through well marked natural depths and through dredged **Marianne Channel** to Mile 258.5; thence, the route is westward through dredged **Grand Island Channel** to natural depths exceeding 12 feet at Mile 263.7 in the eastern approach to Grand Island Pass.

Chart 878.—The Mississippi-Louisiana boundary follows the I.W. route westward through **Grand Island Pass** to Mile 270.2, then turns sharply northward from the waterway and follows the channel to **East Pearl River.**

From Mile 270.2, the waterway continues westward through dredged cuts and crosses the **Lake Borgne** end of the Rigolets at Mile 275.0. The **Rigolets** (see Chapter 7) is a comparatively deep passage that connects Lake Borgne with **Lake Pontchartrain,** several miles to the westward.

From the Rigolets, the I.W. route is southwestward through nearly 20 miles of **Rigolets-New Orleans Cut.** Pilots should be on the alert for cross currents at waterway crossing of passes and bayous. **Chef Menteur Pass** (see Chapter 7), which is crossed at Mile 285.5, is specially noted for such currents; the pass is another deep link between Lake Borgne and Lake Pontchartrain.

At I.W. Mile 292.3, privately-owned **Michoud Canal,** with depths greater than 12 feet, extends northward from the waterway for 1.5 miles to the town of **Michoud,** which has rail connections.

The basin on the north side of the waterway at Mile 293.5 is said to have depths greater than 17 feet. This is the approximate turning point from east-west reach to southeast reach of the deep **Mississippi River-Gulf Outlet** (see Chapter 8). The waterway continues westward through the deep outlet to Mile 294.1 where it is crossed by a pontoon drawbridge; the power cable on the west side of the bridge has a clearance of 150 feet.

The power cable over the I.W. route at Mile 298.3 has a clearance of 170 feet. The waterway enters the deep **Inner Harbor Navigation Canal** of New Orleans at Mile 298.6 and proceeds southward through the canal to Mississippi River. See also Chapter 8.

The rail-highway bridge over Inner Harbor Navigation Canal at Mile 299.0 has a bascule span with a clearance of 0 feet; the power cable on the north side of the bridge has a clearance of 132 feet.

The marine service station on the east side of the canal at Mile 299.5 has a 440-foot dock with depths of 10 feet alongside. Available supplies and/or services include gasoline, diesel fuel, fresh water, ice, hardware, bottled gas, and electricity. The station's marine railway hauls vessels up to 100 feet in length, and the machine shop handles repairs to gasoline and diesel engines.

The highway bridge over the canal at Mile 299.8 has a lift span with clearances of 41 feet down and 156 feet up.

Inner Harbor Navigation Lock, at Mile 300.0, is 640 feet long, 75 feet wide, more than 30 feet deep over sills, and handles lifts up to 17 feet.

The highway bridge over the canal at Mile 300.1 has a bascule span with a clearance of 0 feet.

Chart 879.—The Intracoastal Waterway leaves Inner Harbor Navigation Canal and enters **Mississippi River at I.W. Mile 300.5.** The basic route follows the **New Orleans** waterfront upriver to **Canal Street, Mile 302.3,** which is 83 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).

From Canal Street, the I.W. route continues up Mississippi River and passes under the high fixed bridge at Mile 303.0. At **Harvey,** on the south side of Mississippi River 3 miles above Canal Street, the route leaves the river and proceeds southward through **Harvey Canal No. 1.**

Harvey Lock, at Mile 305.4, is 425 feet long, 75 feet wide, 12 feet deep over sills, and handles lifts up to 20 feet. The railroad bridge over the canal at Mile 305.5 has a bascule span with a clearance of 9 feet; the power cable on the north side of the bridge has a clearance of 90 feet. The highway bridge at Mile 305.6 has a bascule span with a clearance of 7 feet.

Supplies and services available at Harvey include gaso-

line, diesel fuel, fresh water, ice, groceries, hardware, bottled gas, and electricity. Harvey shipyards can haul out vessels up to 300 feet in length, and the machine shops can repair gasoline and diesel engines.

The power cable over Harvey Canal No. 1 at Mile 306.9 has a clearance of 90 feet. The basic route continues southward and enters Bayou Barataria at Mile 311.2.

The Algiers Alternate Route (A.A.) is zeroed at I.W. Mile 300.5 where the basic route enters the Mississippi. The alternate route swings downriver, departs the river about 6 miles below Canal Street, and continues southwestward through a land cut with same project dimensions as the basic route.

Algiers Lock, at A.A. Mile 4.5, is 760 feet long, 75 feet wide, 13 feet deep over sills, and handles lifts up to 18 feet. The highway bridge over the route at A.A. Mile 5.4 has a lift span with clearances of 4 feet down and 100 feet up; the power cable on the southwest side of the bridge has a clearance of 90 feet.

The railroad bridge at A.A. Mile 7.7 has a lift span with clearances of 2 feet down and 100 feet up; the power cable on the southwest side of the bridge has a clearance of 90 feet.

The power cable over the waterway at A.A. Mile 11.7 has a clearance of 90 feet. The alternate route enters Bayou Barataria and rejoins the basic route at **A.A. Mile 12.3 which coincides with I.W. Mile 311.2.**

From I.W. Mile 311.2, the waterway continues southward and westward for several miles through **Bayou Barataria.** At Mile 314.6 is the town of **Crown Point** which has facilities for hauling out vessels up to 75 feet in length. The highway bridge over the waterway at Mile 316.2 has a swing span with a clearance of 9 feet; use the south opening.

The waterway departs Bayou Barataria at Mile 318.2 and crosses **Bayou Villars** at Mile 318.6. From the crossing, Bayou Villars extends 1.0 mile westward to **Lake Salvador,** which has depths of 5 to 7 feet, and 0.4 mile eastward to a junction with Bayou Barataria at the town of Lafitte. A 20-mile chain of bayous and canals winds southeastward from Lafitte to **Barataria Bay**; see Chapter 9 for bridges, cables, and controlling depths. **Lafitte** has a boatyard that can haul out vessels up to 75 feet in length; available supplies include gasoline, diesel fuel, fresh water, ice, and groceries.

At Mile 322.8, the I.W. route crosses **Bayou Perot** which is another passage from the lakes on the southeast to Lake Salvador on the west. The waterway enters **Harvey Canal No. 2 at I.W. Mile 330.8,** which is 1.2 miles from the canal's Lake Salvador terminus, and proceeds southwestward in the canal to Larose.

The power cables over the waterway at Miles 335.3 and 335.6 have clearances of 90 feet. A pontoon drawbridge crosses the waterway at Mile 335.8.

At Mile 336.1, the I.W. route crosses **Bayou Lafourche** which is described in Chapter 9. On the northeast side of the crossing is **Larose,** which has facilities for hauling out vessels up to 80 feet in length; available supplies include gasoline, diesel fuel, fresh water, ice, and groceries. A pontoon drawbridge crosses Bayou Lafourche at Larose.

The I.W. route westward from Larose is through the **Larose-Bourg Cutoff.** The highway bridge over the cutoff at Mile 336.4 has a lift span with clearances of 35 feet down and 73 feet up; the power cable on the north side of the bridge has a clearance of 90 feet.

At Mile 347.8, the cutoff crosses **Company Canal** which connects **Bourg,** on Bayou Terrebonne, with Lockport, on Bayou Lafourche; see Chapter 9. A cable ferry crosses the I.W. route at Mile 348.6; the power cable on the east side of the ferry crossing has a clearance of 90 feet.

The power cables over the waterway at Miles 352.2, 353.0, and 353.9 have clearances of 90 feet. The route swings sharply southward and crosses an east-west reach of **Bayou Terrebonne at Mile 355.4;** the bayou is described in Chapter 9. The I.W. highway bridge on the north side of the crossing has a lift span with clearances of 8 feet down and 73 feet up; the power cable north of the bridge has a clearance of 90 feet. The highway bridge on the south side of the crossing has a bascule span with a clearance of 4 feet; the power cable south of the bridge has a clearance of 90 feet.

In the southwest angle of the Terrebonne-I.W. crossing is the town of **Houma (Mile 355.5),** which is the seat of Terrebonne Parish and is a customs port of entry where marine documents are issued. Houma is an industrial and agricultural town which is also a petroleum production center and a base for commercial fishing. The town has good rail and highway connections, hotels and theaters, numerous stores, a sugar mill, seafood canneries, and cold-storage facilities. Available supplies include gasoline, diesel fuel, fresh water, ice, groceries, and hardware. The Houma boatyards can haul out vessels up to 60 feet in length, and there are facilities for engine repairs.

The railroad bridge over the I.W. route at **Mile 356.5** has a swing span with a clearance of 3 feet. Immediately south of the bridge, **Bayou Black** branches westward from the waterway and follows a winding 24-mile course through several towns and under numerous bridges and cables to another junction with the waterway at **Mile 378.0 (see Chart 880).** The bayou has a controlling depth of about 4 feet; minimum width through bridges is about 36 feet and minimum clearance is about 40 feet. Bayou Black has very little through traffic, and any such traffic could be difficult at times because of the many vessels that are moored in the bayou.

The highway bridge over the I.W. route at Mile 357.3 has a swing span with a clearance of 5 feet; the power cable on the southwest side of the bridge has a clearance of 90 feet.

Chart 880.—The waterway continues westward through land cuts to **Mile 369.5** where it crosses the southeastern part of **Lake Hackberry;** there are hyacinth booms on both sides of the lake crossing.

The I.W. route enters narrow **Lake Cocodrie at Mile 372.3** and departs the lake at **Mile 375.4;** the channel

through the lake is well marked. Next link is **Bayou Cocodrie**; winding Bayou Black, previously described in connection with Chart 879, comes down from the north to join Bayou Cocodrie at I.W. Mile 378.0.

Bayou Cocodrie joins the northern loop of **Bayou Chene**, which in turn joins **Bayou Boeuf at I.W. Mile 381.1**; this also is **L.R. Mile 0.0 of the Landside Route**, a lesser chain that winds northward through Bayou Boeuf and other waterways for more than 40 miles to a junction with the later-described Morgan City-Port Allen Alternate Route.

The controlling depth through the Landside Route was 9 feet in December, 1960. The fixed highway bridge over Bayou Boeuf at L.R. Mile 1.1 has a clearance of 73 feet. The railroad bridge over the bayou at L.R. Mile 1.6 has a swing span with a clearance of 6 feet; the power cable 0.3 mile north of the bridge has a clearance of 120 feet.

Chart 881.—The Landside Route proceeds northward through land cuts and through **Bayou Milhomme** to L.R. Mile 10.4 where the waterway is crossed by a pontoon drawbridge. Continuing northward, the route is through **Bayou Long** and **Belle River** to L.R. Mile 20.5 where another pontoon drawbridge crosses the waterway.

The next passages are **Big Goddel Bayou, Little Goddel Bayou, Bay Natchez, and Chopin Chute.** A pontoon drawbridge crosses Chopin Chute at L.R. Mile 35.8. 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 42.7 (M.P. Mile 32.4).**

Chart 880.—Returning to the main Intracoastal Waterway, the route westward and northwestward from I.W. Mile 381.1 is through the western reach of Bayou Boeuf. The power cable over Bayou Boeuf at Mile 384.3 has a clearance of 110 feet.

Bayou Boeuf Lock, at I.W. Mile 386.3, is 1,160 feet long, 75 feet wide, 13 feet deep over sills, and handles lifts up to 11 feet.

A cable ferry crosses Bayou Boeuf at I.W. Mile 387.2; the power cable on the west side of the ferry crossing has a clearance of 90 feet. Deep **Bayou Shaffer** branches southward from I.W. Mile 387.4; see Chapter 9.

Chart 881.—At **I.W. Mile 388.3** 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 Atchalfalaya River System, extends northward from the junction for about 2 miles. On the northeast side of the junction is the port of **Morgan City (I.W. Mile 388.3)**; see Chapter 9 for port facilities, services, supplies, and repairs.

I.W. Mile 388.3 also is M.P. Mile 0.0 of the Morgan City-Port Allen Alternate Route and A.R. Mile 0.0 of the Atchafalaya River Route, both of which wind northward to outlets on the Mississippi River near and above Baton Rouge. Both of the alternate routes have the same project dimensions as the basic I.W. route.

The railroad bridge over Berwick Bay at M.P. Mile 0.3 has a swing span with a clearance of 4 feet. The fixed highway bridge that crosses from Morgan City to **Berwick** at M.P. Mile 0.6 has a clearance of 50 feet.

At **M.P. Mile 1.5, Bayou Teche** branches westward from Berwick Bay; see Chapter 9 for depths, locks, bridges, cables, and facilities.

At M.P. Mile 2.0 (A.R. Mile 2.0), the two alternate routes separate. The Morgan City-Port Allen Alternate Route turns sharply to the eastward, then follows winding courses northward through land cuts and bayous.

Bayou Sorrel Lock, at M.P. Mile 31.9, is 760 feet long, 56 feet wide, 14 feet deep over sills, and handles lifts up to 21 feet.

The Landside Route, described previously, comes in from the southeast and merges with the Morgan City-Port Allen Route at **M.P. Mile 32.4 (L.R. Mile 42.7)** in Lower Grand River. A cable ferry crosses the river at M.P. Mile 33.9.

The M.P. route continues northward through land cuts and bayous. Jack Miller Store is on the east side of the waterway at M.P. Mile 37.7, and **Indian Village** is on the same side at Mile 40.0. There are probably some facilities for supplies and repairs at and between the two communities.

Bayou Plaquemine branches eastward from **M.P. Mile 40.2** and proceeds for 6.6 miles to **Plaquemine,** which is on the west bank of Mississippi River 98 miles above Canal Street, New Orleans. **Plaquemine Lock,** formerly the northern terminus of the Alternate Route, is permanently closed, and two former drawbridges 0.2 mile west of the lock are fixed spans with a clearance of 14 feet; the power cables over the bayou have clearances of 70 feet. The dead-ended bayou once had depths of 9 feet, and supplies were available at Plaquemine and at **Crescent,** 4 miles southwestward along the bayou; Crescent also had facilities for hauling out vessels up to 80 feet in length.

From M.P. Mile 40.2, the Morgan City-Port Allen Alternate Route continues northward through parts of Bayou Grosse Tete and through the land cuts of the **Port Allen Canal.** The highway bridge over the waterway at M.P. Mile 40.8 has a swing span with a clearance of 2 feet.

The railroad bridge over Port Allen Canal at M.P. Mile 48.7 has a lift span with clearances of 7 feet down and 73 feet up. The power cable at Mile 49.2 has a clearance of 92 feet.

Port Allen Canal turns northeastward at M.P. Mile 49.5, turns again at Mile 54.3 and heads southeastward to Port Allen Lock. The power cable over the canal at M.P. Mile 54.8 has a clearance of 90 feet. The railroad bridge over the canal at Mile 55.6 has a lift span with clearances of 14 feet down and 73 feet up; the fixed highway bridge on the southeast side of the railroad bridge has a clearance of 65 feet.

Port Allen Lock, at M.P. Mile 55.7, is 1,200 feet long, 84 feet wide, 14 feet deep over sills, and handles lifts up to 47 feet. The lock is the Mississippi gateway of the Morgan City-Port Allen Alternate Route and is on the west side of the river 115 miles above Canal Street, New Orleans.

Chart 881.—Getting back to Berwick Bay, the **Atchafalaya River Route** turns sharply to the northwestward at **A.R. Mile 2.0 (M.P. Mile 2.0)** and follows improved channels through **Stouts Pass** and **Sixmile Lake,** then winds northward to **A.R. Mile 101.5,** which is at the confluence of **Atchafalaya River, Red River** and **Old River.** From the confluence, the route is eastward in Old River to a junction with Mississippi River at **A.R. Mile 106.9,** which is 180 miles up the Mississippi from Canal Street, New Orleans. Navigation maps of Atchafalaya River, with listings of bridges and overhead cables, are published by the Mississippi River Commission, Vicksburg, Mississippi.

Chart 880.—Returning to Morgan City and the basic I.W. route, the waterway continues southwestward in Lower Atchafalaya River. The power cable over the river at I.W. Mile 389.1 has a clearance of 130 feet.

The Intracoastal Waterway departs Lower Atchafalaya River at Mile 390.7 and proceeds westward in **Little Wax Bayou.** The river entrance to the bayou is marked by a light on a small island; the preferred channel is north of the light. The route leaves Little Wax Bayou at I.W. Mile 394.1 and continues westward through a land cut that crosses several other bayous; there are hyacinth booms on the bayou sides of most crossings.

At **I.W. Mile 399.0,** the waterway crosses **Wax Lake Outlet** which is a deep drainage ditch. Alternate channels north and south of the direct crossing facilitate vessels passings during periods of strong cross currents; westbound traffic uses the north detour and eastbound traffic uses the south detour. During relatively slack periods the main (or middle) channel is used by craft going in either direction. There are tie-up dolphins on the north side of the I.W. route a mile on either side of the crossing.

Chart 882.—The town of **North Bend** is at Mile 403.6 on the north side of the waterway. The highway bridge over the waterway at North Bend has a lift span with clearances of 5 feet down and 80 feet up; the power cable on the east side of the bridge has a clearance of 90 feet. Another power cable over the waterway at Mile 403.7 has a clearance of 90 feet.

The I.W. continues in a cut to **Bayou Bartholomew,** where cutoffs at Miles 410.0 and 410.3 lead northward through Franklin Canal to Franklin and through Hanson Canal to Bayou Teche; see Chapter 9.

At Miles 410.9 and 411.9, hyacinth booms block the entrance to **Mud Lake.**

At Mile 412.2, the waterway is crossed by a cut which leads southwestward through The Jaws to West Cote Blanche Bay (see Chapter 9) and northeastward for 5.5 miles through Charenton Canal to Bayou Teche, 0.5 mile below **Baldwin.**

Charenton Canal had a controlling depth of 8½ feet in October 1961 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.

At Mile 418.1, a cable ferry and a power cable with a clearance of 90 feet cross the waterway.

A highway bridge over the waterway at **Cypremort, Mile 421.7,** has a swing span with a clearance of 8 feet. The power cable east of the bridge has a clearance of 90 feet.

Weeks, on the east side of the waterway at Mile 424.5, is the site of the largest salt mine in Louisiana. Just north of the village, at Mile 425.8, **Vermilion Bay** is entered through Weeks Bayou; the route northward to Port of New Iberia is at Mile 427.3 through a cut to **Wilkins Canal;** see Chapter 9.

At Mile 432.0, the waterway is crossed by **Bayou Petite Anse** leading northward through connecting canals to Avery Island and Delcambre; Avery Canal connects with the bayou south of the waterway to provide a passage to Vermilion Bay; see Chapter 9.

Between Miles 443.6 and 444.7, the waterway passes through a cut in Vermilion River. At Mile 443.6, Vermilion River Cutoff leads southeastward to Vermilion Bay. Tows using the I.W. 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 north bank well before entering the river until past the junction.

Repair facilities, supplies, and fuel are available at Perry and Abbeville, 19 to 21 miles north of the waterway on Vermilion River; see Chapter 9.

Chart 883.—**Intracoastal City,** on the north side of the waterway at Mile 444.3, is a base for oil-field exploration and development with several boat slips having depths of 7 feet. Available supplies include gasoline, diesel fuel, water, ice, bottled gas, and some groceries. There is telephone service; a State highway passes through the settlement.

At Mile 445.3, **Schooner Bayou Cutoff** leads southwestward from the waterway through connecting canals to White Lake or the Gulf; see Chapter 9.

Vermilion Lock, at 446.8, is 1,182 feet long, 56 feet wide, 12 feet deep over sills, and handles lifts up to 5 feet. The lock prevents salt water from entering rice fields to the westward. Small boats may anchor or tie up alongside the banks in a small dredged slip at each end of the lock.

A pontoon drawbridge crosses the waterway at **Forked Island,** Mile 452.9. Just northwest of the bridge, at Mile 453.1, is an oil company slip and wharves. A cable ferry crosses at Mile 454.9.

A power cable over the waterway at Mile 465.6, west of **Florence Canal,** has a clearance of 90 feet. Oil company docks and tanks are at Miles 476.0 and 479.8.

The waterway crosses **Mermentau River** between Miles 480.6 and 481.3 and continues westward in a land cut. The Mermentau River is navigable for 32 miles northward of the crossing; southward of the waterway, the

river leads through Grand Lake to the Gulf; see Chapter 9.

Bayou Lacassine (see also Chart 1051) crosses the waterway at Mile 483.6. North of the crossing, the bayou had a controlling depth of 5½ feet in 1959 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 southward of Hayes, has a swing span with a clearance of 5 feet. A railroad bridge over the bayou near Hayes has a swing span with a clearance of 3 feet. **Drawspan regulations** are given in **§ 203.245**, Chapter 2. South of the I.W. crossing, Bayou Lacassine flows through **Mud Lake** into Grande Lake.

At Miles 489.1 and 490.3, a canal on the south side of the waterway leads to **Little Lake Misere,** thence eastward through **The Narrows** to **Lake Misere** and **Bayou Misere** to Mud Lake. The I.W. route arcs to the northward in this section. **Bell City Drainage Canal** crosses the waterway at Mile 489.9.

Chart 884.—A pontoon drawbridge crosses the I.W. at **Gibbstown,** Mile 496.4. A power cable on the east side of the bridge has a clearance of 90 feet.

An oil company loading docks and tanks are on the north side of the waterway at Mile 499.5; a cut here leads to **Sweet Lake.**

A cable ferry crosses the waterway at **Grand Lake Ridge,** Mile 506.4; the power cable on the south side of the crossing has a clearance of 90 feet. A loading dock is near the crossing.

At mile 511.4, a straight canal leads through a lock to Calcasieu River. A cable ferry crosses the canal at Mile 512.1.

Calcasieu Lock, at Mile 512.5, is 1,180 feet long, 75 feet wide, 13 feet deep over sills, and handles lifts up to 4 feet. The lock prevents salt water from entering rice fields to the eastward.

The I.W. enters **Calcasieu River** at Mile 513.1 and continues northward around a bend in the river across deep Calcasieu Channel to Choupique Cutoff. Vessels and tows are advised to use caution at these junctions.

Lake Charles (Chart 592), 9.8 miles up Calcasieu Channel from the I.W. junction at **Mile 514.9,** 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, supplies, and fuel are available; see Chapter 9.

From Mile 514.9, the I.W. passes through Choupique Cutoff and a long land cut for 21 miles to the Sabine River at Orange.

Bayou Choupique is part of the waterway between Miles 515.5 and 515.9. The 12-foot eastern exit leads to Calcasieu Channel while the western exit passes through marshland for many miles. The controlling depth in the western branch is 9 feet to the highway bridge 2.5 miles above the junction; the bridge has a 45-foot swing span with a clearance of 2 feet; **drawspan regulations** are given in **§ 203.245,** Chapter 2. A power cable west of the bridge has a clearance of 60 feet.

At Mile 516.7, 4-foot **Old Canal** leads eastward to the Calcasieu River.

A pontoon drawbridge crosses the waterway at Mile 516.9; a power cable 200 feet northeast of the bridge has a clearance of 139 feet.

A cable ferry crosses the waterway at **Gun Cove Ridge,** Mile 526.2.

Vinton Canal, crossing the waterway at Mile 530.0, had a controlling depth of 4 feet in 1959 to the highway bridge over 6 miles northward of the junction. The canal connects with **Black Bayou** southward of the waterway.

At Mile 535.2, the waterway enters **Sabine River** and continues around the south bend in the river to the deep ship channel.

Orange, 0.9 mile up the Sabine River ship channel from the I.W. junction at **Mile 536.5,** has repair facilities, supplies, and fuel; see Chapter 10.

From Mile 536.5, the I.W. continues for 20 miles down the Sabine River ship channel and the Sabine-Neches Canal to Port Arthur.

Adams Bayou, at Mile 537.1, and **Cow Bayou,** at Mile 539.4, both on the north side of the waterway, are described in Chapter 10.

At **Mile 546.1,** a 15.9-mile channel leads up the **Neches River** to the port facilities at **Beaumont;** see Chapter 10.

Chart 885.—Port Arthur, between I.W. Miles 548.6 and **556.2** (junction with Port Arthur Canal), has complete repair facilties, supplies, and fuel at places along the Sabine-Neches Canal and in Taylor Bayou; see Chapter 10.

A highway bridge across the waterway at **Mile 553.1** has a bascule span with a clearance of 10 feet.

The I.W. leaves the Sabine-Neches Canal at Mile 556.2 and continues for 53 miles through a land cut to Galveston Bay.

A highway bridge across the waterway at **Mile 556.5** has a bascule span with a clearance of 10 feet. The power cable west of the bridge has a clearance of 125 feet.

A small-boat basin on the south side of the waterway at Mile 556.6 has berthing facilities for craft drawing up to 5 feet. Available supplies include gasoline, diesel fuel, and water.

A spillway at Mile 559.6 contains **Shell Lake** and other lakes south of the waterway. Floodgates on the south side of the waterway at Mile 570.9 contain **Star Lake.**

At Mile 578.7, dirt ramps of a cattle crossing are on either side of the waterway.

Railroad and highway bridges over the waterway at **Mile 583.0** have swing spans with clearances of 10 feet. The power cable west of the highway bridge has a clearance of 110 feet. The railroad bridge tender is on duty from 6 a.m. to 6 p.m. Mondays through Fridays and can be contacted by radio; at other times the drawspan is in the open position.

An oil-loading terminal is on the north side of the waterway just eastward of the railroad bridge. High Island, on the highway and railroad 1.5 miles south of

the waterway, is an oil-producing center with numerous oil derricks, but there are no facilities for passing craft. A landing for shallow-draft boats is at Mile 584.7.

The waterway passes through a marked cut in the southeastern part of shallow **East Bay** between Miles 590.7 and 592.3. Berthing facilities for shallow-draft boats are in slips at each side of the bay; gasoline and some groceries are available.

An oil-loading terminal is at Mile 595.1 on the southeast side of the I.W. route. The waterway continues southwestward to Port Bolivar and Galveston Bay.

Bolivar Yacht Basin, at Mile 603.9 on the southeast side of the waterway, can accommodate yachts drawing up to 5 feet; the basin has facilities for hauling out vessels up to 50 feet in length. Available supplies include gasoline, diesel fuel, and fresh water.

Chart 886.—Port Bolivar is at **I.W. Mile 608.2** on the southeast side of the waterway and is near the southwestern end of **Bolivar Peninsula.** Gasoline, diesel fuel, and fresh water are available at some of the town landings.

The Intracoastal Waterway leaves the Bolivar cut and enters **Galveston Bay at I.W. Mile 609.1.** The direct route bypasses Galveston and proceeds southwestward through the lower part of the bay. **Houston Ship Channel** is crossed at **I.W. Mile 609.9**; the port of **Houston** is 43 miles to the northwestward (see Chapter 10). The channel to **Texas City** is crossed at **I.W. Mile 610.4**; the port is 5 miles to the west-northwestward (see Chapter 10). The basic route continues southwestward through dredged cuts to the bridges which separate Galveston Bay from West Bay.

I.W. Mile 609.1 also is G.L. Mile 0.0 of the Galveston Loop, which swings southward into **Bolivar Roads,** then southwestward in **Galveston Channel.** The port of **Galveston** is centered at **G.L. Mile 4.9** on the south side of Galveston Channel; see Chapter 10 for port facilities, services, supplies, and repairs. The **Pelican Island** rail-highway bridge over Galveston Channel at G.L. Mile 6.0 has a bascule span with a clearance of 12 feet. The Galveston Loop leaves the big port's deep water at the bridge and proceeds westward in dredged cuts to rejoin the basic route at **G.L. Mile 9.1 which also is I.W. Mile 615.4.**

The rail-highway bridge over the waterway at I.W. Mile 616.0 has a bascule span with a clearance of 7 feet; the power cable on the southwest side of the bridge has a clearance of 99 feet. The highway bridge at Mile 616.1 has a bascule span with a clearance of 7 feet; the fixed highway bridge on the southwest side has a clearance of 73 feet.

Westward of the bridges an improved channel leads southeastward from **I.W. Mile 616.4 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.

The Intracoastal Waterway continues westward through dredged cuts between the islands in the northeastern part of **West Bay.** At I.W. Mile 621.0 the waterway enters a 10-mile land cut which is never more than 0.2 mile behind the northwest shore of West Bay.

Chart 887.—At Mile 631.2, the waterway leaves the land cut and crosses the northwestern end of West Bay through a buoyed channel with range lights at each end.

A buoyed channel to **Chocolate Bay** leads northward from the waterway at Mile 632.5. Gasoline, water, and repair facilities are available 6 miles up the bay; see Chapter 10.

San Luis Pass and tributaries to the western part of West Bay are described in Chapter 10.

From Mile 634.1, the waterway enters a land cut which passes through and across shallow bays, bayous, and rivers for 29 miles to Mile 663.1 at the northwestern end of Cedar Lakes.

The highway bridge across the waterway at **Mile 647.8** has a fixed span with a clearance of 73 feet. The power cable on the west side of the bridge has a clearance of 97 feet.

Small-boat basins at Miles 647.8 and 648.3 had controlling depths of 3 feet in October 1961. Available supplies include gasoline, diesel fuel, water, and some marine hardware; there are berthing facilities. Marine railways in the basins can haul out boats up to 45 feet in length for general repairs.

The power cables crossing the waterway at Miles 648.6 and 648.7 have clearances of 74 feet.

At Mile 648.8, the private canal on the north side of the waterway is closed to the public by a gate across the entrance.

Freeport, 2 miles up Old Brazos River from the I.W. junction at **Mile 648.9,** has berthing and repair facilities, fuel, and supplies; see Chapter 11.

A power cable crossing the waterway at Mile 649.2 has a clearance of 108 feet. A pontoon drawbridge crosses at Mile 650.8.

The I.W. crosses the **Brazos River** at **Mile 563.8.** The 75-foot wide floodgates on both sides of the river control waterway traffic when crossing conditions are hazardous due to strong current velocities. See **207.180,** Chapter 2, for regulations governing use, administration, and navigation of the floodgates; local information is issued by the Galveston District Engineer, Corps of Engineers.

Information signs concerning the operation of the floodgates are at Miles 653.0 and 654.6. The lockmaster may be contacted by telephone or radio. Mooring piles are on both banks of the I.W. on the canal sides of the floodgates for the mooring of vessels when the floodgates are closed or when tows are limited. Brazos River is described in Chapter 11.

The I.W. crosses **San Bernard River** at **Mile 657.5.** 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. San Bernard River is described in Chapter 11.

Chart 888.—The I.W. continues in a land cut from the north side of Cedar Lakes to Mile 670.9 where it follows a cut along the north shores of shallow East Matagorda

Bay and Matagorda Bay for 31 miles, thence across the open waters of Matagorda Bay to Port O'Conner. Prolonged east winds will create a difference in water level between East Matagorda Bay and Matagorda Bay, thus causing strong westerly currents in the waterway.

The power cable over the waterway at Mile 668.7 has a clearance of 73 feet. A pontoon drawbridge crosses at Mile 668.8. Another power cable on the west side of the bridge has a clearance of 94 feet.

Caney Creek crosses the waterway through a 0.5-mile canal leading to **East Matagorda Bay** at Mile 670.9. A depth of 3 to 4 feet can be taken up the creek to a bridge 25 miles above the waterway. The fixed highway bridge, 9 miles above the I.W. and 2 miles below **Sargent**, has a width of 28 feet and a clearance of 10 feet.

There is a private boat basin with 5½ feet alongside the bulkhead at abandoned **Old Gulf**, on the north side of the waterway at Mile 684.3.

An oil-loading terminal is on the north side of the waterway at Mile 686.8.

The power cable over the waterway at Mile 688.5 has a clearance of 71 feet. A pontoon drawbridge crosses at Mile 688.6.

Matagorda, a small fishing and oystering fleet base, is on the north side of the I.W. at **Mile 689.2**. Gasoline, diesel fuel, water, and some groceries are available in the small-boat slip just east of the bridge at Mile 688.6. There is also a slip west of the bridge. The controlling depth was 3 feet in each slip in September 1961. Matagorda repair yards can haul out vessels up to 50 feet in length. **Storm warning displays** are listed in the Appendix.

Colorado River Locks, at Miles 688.9 and 689.5, are 1,200 feet long, 75 feet wide, 15 feet deep over sills, and handle lifts up to 10 feet. The locks control I.W. traffic when crossing conditions are hazardous due to strong current velocities; see **207.180**, Chapter 2, for operating regulations. Local information is issued by the Galveston District Engineer, Corps of Engineers.

Information signs concerning the operation of the floodgates are at Miles 688.2 and 690.2. The lockmaster may be contacted by telephone or radio. Mooring piles are on both banks of the I.W. on the canal sides of the floodgates for the mooring of vessels when the floodgates are closed or when tows are limited.

Colorado River crosses the I.W. at Mile 689.2 and enters the Gulf through a 5.8-mile flood discharge channel in the isthmus separating East Matagorda Bay and Matagorda Bay. The channel, used by the Matagorda fishing fleet, had a controlling depth of 12 feet in October 1960.

The overhead power cable, crossing the Colorado River just above the I.W. junction, has a clearance of 92 feet. The controlling depths in the river above the I.W. were 10 feet in September 1961, for 1.7 miles, thence 7 feet in January 1962, for 7 miles north of the waterway. Boat operators should be on the lookout for logs and floating debris in the river and discharge channel.

Chart 889.—At Mile 701.5, the waterway enters the open waters of **Matagorda Bay** through a well marked channel and continues across the bay for 16 miles to Port O'Connor. Marked openings are provided through the spoil banks on the north side of the I.W. for passage in depths of 4 to 10 feet through the open waters of the bay to Tres Palacios Bay and Lavaca Bay; see Chapter 11.

Chart 890.—The I.W. channel to **Port O'Connor, Mile 717.2**, is between jetties with lights on the outer ends at the southwestern end of Matagorda Bay. Berthing facilities, fuel, and supplies are available; see Chapter 11.

From Port O'Connor, the I.W. passes through a cut along the north shore of Espiritu Santo Bay for 16 miles to San Antonio Bay.

At Mile 721.5, a marked channel across Espiritu Santo Bay leads to a military base on Matagorda Island, See Chapter 11.

Gasoline is available at a small-boat basin on the north side of the waterway at Mile 727.3; there is a launching ramp.

Chart 891.—At Mile 733.1, the I.W. enters the open waters of shallow **San Antonio Bay** through a well marked channel. A marked channel leads northward from this point to **Seadrift** and other places in the bay; see Chapter 11.

At Mile 740.8, the waterway leaves San Antonio Bay and passes through land cuts and buoyed channels in shallow bays for 9 miles to Aransas Bay. The **Aransas Migratory National Waterfowl Refuge** is on the north side of the waterway.

Chart 892.—At Mile 749.8, the I.W. 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 northwestern side of the waterway provide passage in depths of 3 to 12 feet to Rockport and other places in Aransas Bay; see Chapter 11.

At Mile 759.8, the I.W. route swings westward and follows a cut along the northwestern shore of Redfish Bay to Corpus Christi Bay. The former route continues southwestward and southward through Lydia Ann Channel to Aransas Pass.

Rockport, 1.2 miles north of I.W. **Mile 761.1**, has berthing and repair facilities, fuel, and supplies; see Chapter 11.

Boat operators are advised to stay in the I.W. channel throughout the cut in Redfish Bay to avoid rock formations which may project from the channel slopes.

At **Mile 768.7**, the waterway crosses Aransas Channel which leads westward to the town of **Aransas Pass** and eastward to the Gulf through Aransas Pass. Repair facilities, fuel, and supplies are available at the town; see Chapter 11.

The fixed highway bridge across the waterway at **Mile 768.9** has a clearance of 48 feet. Avoid passing vessels in the vicinity of the bridge where the channel width is only 80 feet.

Chart 893.—At Mile 769.7, the I.W. is crossed by a dredged channel; north of the waterway, the channel

leads to a small-boat basin at the town of Aransas Pass; the channel southward leads to Corpus Christi Bay.

At Mile 774.3, the I.W. joins Corpus Christi Channel and follows it for a short distance before turning southward in Corpus Christi Bay at Mile 776.1 to Laguna Madre.

La Quinta (Chart 523), 4.7 miles northwestward of I.W. **Mile 775.6,** is reached through deep La Quinta Channel.

Corpus Christi (Chart 523), 9.5 miles westward of I.W. **Mile 776.1,** has complete berthing and repair facilities, fuel, and supplies. Corpus Christi and other places in Corpus Christi Bay are described in Chapter 11.

From the Corpus Christi junction, the I.W. continues southward in an arced channel marked by lights and buoys to Mile 777.8 where it crosses the open water of Corpus Christi Bay in a southeasterly direction in depths of 12 feet to Laguna Madre.

At Mile 783.6, the waterway enters a well marked channel that extends for 104 miles through shallow **Laguna Madre** to Port Isabel.

Padre Island Causeway, extending across Laguna Madre, has a pontoon drawbridge across the I.W. at **Mile 787.6.** Another pontoon opening in the causeway is 1.8 miles to the westward; drawbridge regulations are given in **§ 203.245,** Chapter 2. Just north of the causeway, a private channel crosses the waterway; westward to Encinal Peninsula and eastward to Padre Island. **Storm warning displays** are listed in the Appendix.

At Mile 794.8, a privately marked channel extends northwestward to the mainland through an area obstructed by oil wells and pipelines.

Charts 894, 895.—Baffin Bay, extending westward from I.W. Mile 811.0, is a commercial and sport fishing area, and the site of oil exploration and drilling. A privately marked natural channel with depths of 8 to 10 feet extends for about 15 miles up Baffin Bay. Strangers should stay in the marked channel because of the numerous rocks at the entrance and throughout the bay. A boatyard in a small-boat basin at the end of the marked channel can haul out vessels up to 50 feet in length. Available supplies include gasoline, diesel fuel, and water.

Yarborough Pass extends eastward from the waterway at Mile 815.5 across Padre Island to the Gulf. The 6-foot channel was closed at the eastern end in September 1961.

Between Miles 819.9 and 839.3, the waterway passes through a long cut in the sand and mud of Laguna Madre. In this stretch, short oil company side channels extend on either side of the waterway.

At Mile 821.7, a 4-foot private channel extends eastward for a mile to a basin.

Charts 896, 897.—Port Mansfield, 1 mile west of the I.W. at **Mile 854.7,** has berthing and repair facilities, fuel, and supplies; see Chapter 11.

At Mile 867.3, **Arroyo Colorado Cutoff** leads westward from the I.W. and joins **Arroyo Colorado** to form a route to **Rio Hondo** and **Port Harlingen**; see Chapter 11.

Chart 898.—At the south end of Laguna Madre at Mile 885.5, the I.W. enters a reverse curve cut between Port Isabel and **Long Island,** and joins deep Brownsville Ship Channel at Mile 888.4.

The pontoon drawbridge across the waterway at Mile 886.2 connects Port Isabel with Padre Island by a causeway over the southern end of Laguna Madre. A fixed 38-foot span opening at the eastern end of the causeway has a clearance of 18 feet. A small marine way at the east end of the causeway can haul out boats up to 30 feet in length; repair facilities are limited.

Port Isabel, Mile 887.1, has berthing and repair facilities, fuel, and supplies; see Chapter 11.

From Mile 888.4, the I.W. follows the Brownsville Ship Channel for 12 miles to Port Brownsville.

Port Brownsville, at Mile 900.0, the western terminus of the Intracoastal Waterway, and the city of **Brownsville,** 5 miles west-southwestward of the port, are described in Chapter 11.

13. PUERTO RICO

Nine hundred miles east-southeast 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 north of Puerto Rico is the Atlantic Ocean, and on the south 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 free Commonwealth, voluntarily associated with 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.

The island Commonwealth includes the smaller islands of Mona, Culebra, and Vieques. The big island is about 96 miles long, west to east, and about 35 miles wide. The interior of Puerto Rico is mountainous and very rugged. The highest mountains are nearer the south and east 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.

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 south and east sides of the island are short and fall rapidly to the sea, while those on the north and west sides are longer and slope more gently.

Boundary lines of inland waters.—At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries of Puerto Rico for which specific lines are not described, **Inland Pilot Rules** apply shoreward of the outermost buoy or other aid to navigation of any system of aids; **International Pilots Rules** apply outside the aids. Specific lines are described in **Part 82,** Chapter 2.

Control over movement of vessels.—See **Part 124,** Chapter 2, for regulations requiring advance notice of vessel's time of arrival to Captain of the Port.

Anchorages.—Under ordinary conditions, the first requirement for anchorage is shelter from the easterly trade winds. Anchorages are numerous except along the north coast. Strong northerly 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. Along the northern and western coasts of Puerto Rico the tide is chiefly semidiurnal, while along the Caribbean coast it is more or less diurnal.

Currents.—Along the Atlantic and Caribbean coasts of Puerto Rico, the currents are greatly influenced by the trade winds. In general, there is a westward drift caused by prevailing easterly trade winds; the velocity averages about 0.2 knot and is said to be strongest near the island. A decided westerly set has been noted near the 100-fathom curve along the Caribbean coast from Isla Caja de Muertos to Cabo Rojo. 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 northward of Isla Caja de Muertos and Cayo Berberia.

Predictions of the tidal current in Canal Guanajibo and at three locations off the east 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 Mona Passage are 2 to 3 hours later than in Canal Guanajibo. The times of southward and northward currents in the passages eastward of Puerto Rico, as far as Isla Culebrita, are believed to be about the same as the times of westward and eastward currents, respectively, in Pasaje de Vieques.

In Mona Passage, on the northwest end of the bank about 13 miles westward of Punta Guanajibo, there is a current velocity of about 1 knot; slacks and strengths occur about 15 minutes later than in Canal Guanajibo.

In Sonda de Vieques, there are strong tidal currents over the shoals in the western 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 Peña, it is estimated that the current velocity is less than 1 knot. From Isla de Culebra the southward current sets toward Punta Este, Isla de Vieques, around which tidal currents are strong.

In Canal de Luis Peña, the southeastward current is deflected northward of Bahía Tarja and thence sets toward the south end of Cayo de Luis Peña; the current is weak off the entrance to Bahía de Sardinas. The northwestward current sets directly through the channel. The current velocity is about 2 knots.

WEATHER.—The Appendix lists storm warning displays and radio stations which transmit weather information. Also included are climatological tables for San Juan and Santa Isabel. The following description of general weather conditions in Puerto Rico was prepared by the Office of Climatology, U.S. Weather Bureau.

Climate.—Puerto Rico is a tropical, hilly island which lies directly in the path of the easterly trade winds throughout the year. Because of island characteristics, daily temperature ranges are relatively small, at least near the coast where there is a tempering effect from the nearby waters. The hilly terrain of the island causes rather sizable variations in temperature over relatively short distances with precipitation largely orographic in nature. The rugged terrain also causes wide local variations in wind speed and direction due to sheltering and channeling effects.

Winds.—The prevailing winds over Puerto Rico are the easterly trades, which generally blow fresh during the day. The center of the Bermuda High shifts a little north in summer and south in winter changing the direction of the winds over that island from north-northeast in winter to east in summer.

Factors which interrupt the trade wind flow are frontal and easterly wave passages. As the cold front approaches, the wind shifts to a more southerly direction, and then as the front passes there is a gradual shift through the southwest and northwest quadrants back to northeast. The easterly wave passage normally does not bring a westerly wind but is usually characterized by an east-northeast wind ahead of the wave and a change to east-southeast following passage.

Over most of the ocean area near Puerto Rico the strength of the winds increases in midsummer, with lighter winds in the spring and autumn seasons. There are also somewhat higher average winds in the northwestern parts of the area in the late autumn and winter. Mean wind speeds over the Atlantic in this area range from 9 to 10 knots during the autumn to a high of 12 to 15 knots in midsummer.

At San Juan the lowlands east of the city permit the trade winds to be felt throughout the harbor area by day. At night the trade winds generally die down and a light southerly breeze comes off the land. Except for hurricanes, heavy northerly winds are the most troublesome, piling up heavy seas and breakers in the harbor mouth.

Since the island lies in the path of tropical storms and hurricanes, occasional winds of extreme force are experienced. At San Juan, during the passage of the hurricane known locally as "San Felipe" in September 1928, the Weather Bureau's anemometer blew away after recording an extreme wind speed of 160 m.p.h This is the highest value recorded in Puerto Rico to date.

Precipitation.—The greatest part of Puerto Rico's rainfall is orographic and showery in nature. Duration of rain is usually brief and amounts vary greatly from place to place. The distribution of rainfall over the year shows only a relatively dry season and a relatively wet season. The length of the dry season varies somewhat with location on the island. In the southern portion of Puerto Rico the dry season normally lasts from about December to April, while in the northern portion it runs from about February to April. In both the north and south the wet season commences in May.

Precipitation at San Juan, averaging 60 inches annually, ranges between a low monthly average of 2.42 inches in March and a high monthly average of 6.51 inches in May.

Temperature.—Temperatures are normally steady over the tropical island of Puerto Rico. At San Juan for instance, the average annual temperature is 78° F. The coolest months, January and February, average 74.9° F., and the warmest months, August and September, average 80.5° F., a difference of only 5.6° F. The extremes of temperature at San Juan are 96° F. and 62° F.

Tropical cyclones of the North Atlantic are usually called West Indian Hurricanes, but many of these storms form, move and die hundreds of miles from the West Indies. The hurricane season generally begins in June and closes with November. See Chapter 3 for more detailed discussion of hurricanes.

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 east 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.—All foreign vessels and United States vessels engaged in foreign trade are required to take a licensed pilot when entering or leaving the harbors of Puerto Rico. Coastwise vessels, vessels owned or controlled by the United States or foreign governments, 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 will take vessels in or out day or night.

Towage.—Large tugs are available at San Juan; some of the other ports have small towboats

Quarantine.—National quarantine laws are enforced in Puerto Rico by officers of the U.S. Public Health Service. Vessels subject to quarantine inspection include all vessels from foreign ports, vessels with sickness on board,

and vessels from domestic ports where certain quarantinable diseases prevail. An outpatient clinic and detention facilities are available at San Juan; an outpatient office is at Ponce. Municipal or private medical facilities are available at all the ports.

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. Bureau of Customs. 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.

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 at San Juan, Aguirre (Bahía de Jobos), Ponce, Ensenada (Bahía de Guánica), and Mayagüez have wharves where large vessels can go alongside to load and unload cargo. Bahía de Guayanilla has finger piers with mooring dolphins for the handling of petroleum products. At the other ports, small vessels can go alongside the wharves, but large vessels must anchor offshore and be loaded and unloaded by barges.

Supplies.—All kinds of supplies are available at San Juan, Ponce, and Mayagüez. Gasoline, water, marine hardware, and groceries are available at most of the smaller ports. If necessary, supplies can be trucked from San Juan in a few hours.

Repairs.—San Juan has a 691-foot graving dock, machine shops, and foundry that can handle any ship repair. Complete salvage equipment is available. Ordinary repairs to machinery can be made at Ponce and Mayagüez.

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 Mayagüez. 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 Mayagüez 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.

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
Amarillo—Yellow
Anclaje, Ancladero—Anchorage
Arena—Sand
Arrecife—Reef
Arroyo—Small stream
Bahía—Bay
Bajo—Shoal
Banco—Bank
Barra—Bar
Blanco—White
Boca—Mouth, entrance
Boquerón—Wide mouth
Cabeza—Shoal head
Cabezo—Summit of hill
Cabo—Cape
Caleta—Cove
Canal—Channel
Caño—Creek, channel
Castillo—Castle
Cayo—Key
Cerro—Hill
Ciénaga—Marsh
Cordillera—Mountain chain
Costa—Coast
Desembarcadero—Landing
Embarcadero—Wharf, quay
Ensenada—Bay, cove
Escollo—Shelf, reef
Este—East
Estero—Creek, inlet
Estrecho—Strait
Exterior—Exterior
Farallón—Rocky islet
Golfo—Gulf
Gran, Grande—Great
Interior—Interior
Isla—Island
Isleta—Islet
Istmo—Isthmus
Lago—Lake
Laguna—Lagoon
Laja—Flat rock
Largo—Long
Mar—Sea
Medio—Middle
Meridional—Southern
Monte, Montaña—Mountain
Morro—Headland, bluff
Negro—Black
Norte—North
Nuevo—New
Occidental—Western
Oeste—West
Oriental—Eastern
Pantano—Marsh
Pasaje—Passage
Peninsula—Peninsula
Pico—Peak
Piedra—Stone, rock
Playa—Beach
Pueblo—Town
Puerto—Port, harbor
Punta—Point
Rada—Roadstead
Rincón—Inside corner
Río—River
Roca—Rock
Rojo—Red
Septentrional—Northern
Sierra—Mountain range
Sonda—Sound
Sud—South
Tierra—Land
Verde—Green
Viejo—Old

Chart 920.—**Mona Passage**, 61 miles wide between the western end of Puerto Rico and the eastern end of His-

paniola, is one of the principal entrances to the Caribbean Sea. Three small islands are located in the passage: Isla Mona and Isla Monito about midway in the southern part, and Isla Desecheo about 12 miles westward of the extremity of Puerto Rico in the northern part.

On the western side of Mona Passage, a bank extends from Cabo Engaño, the eastern extremity of Hispaniola, for 23 miles, with a least depth of 27 fathoms. 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 eastern side of the passage, an extensive bank makes off from the west coast of Puerto Rico extending up to 15 miles offshore. The west coast of Puerto Rico is described later in this chapter.

Tidal currents set generally southward and northward through Mona Passage. 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 north-northwest is generally experienced during all seasons. In summer, when the trade wind has slackened and blows more from the east and east-southeast, a strong countercurrent sets eastward off the south coast of Hispaniola. This countercurrent occasionally induces a northerly set in the passage.

A 3.5-knot current, setting approximately west-southwest, has been reported in the passage northward of Isla Mona. Observations made on the northwest edge of the bank about 13 miles westward of Punta Guanajibo, Puerto Rico, gave a velocity of about 1 knot for both southward and northward strengths.

The tidal currents also set with considerable velocity, especially near the shore south of Cabo Engaño, where they have been reported to set with a velocity of 3.5 knots during the month of May, with ebb currents setting northeastward for 3 hours and flood currents setting southwestward 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 southeast 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 901.—Isla Mona (18°05′ N., 67°54′ W.), 6 miles long east and west and 4 miles wide, lies in the middle of the southern part of Mona Passage. Temporary anchorage and landing can be made in places on the south and west sides of the island during good weather, but on many days anchorage and landing are impracticable. The attendants for the light station on Cabo Este are the only inhabitants of the island, which is a commonwealth forest preserve.

The island is composed of limestone and from eastward appears perfectly flat on top, breaking off abruptly at the water in a vertical whitish cliff about 175 feet high. On the northwestern and northeastern coasts there are extensive caves which 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 western, southern, and southeastern 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 southeast side, where it is about 1.7 miles off, and on the southwest 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 Sardinero,** on the west coast, is the best anchorage during southeast winds, and **Anclaje Isabella,** just south of Punta Oeste, is good during northeast winds. Boat landings can be made at Anclaje Sardinero and Playa Pajaro.

Currents.—In Anclaje Sardinero the tidal currents set northward and southward with a velocity of about 0.5 knot. A northerly current with a velocity of 0.5 knot has been experienced off Playa Pajaro.

Isla Mona Light (18°05.3′ N., 67°50.8′ W.), 231 feet above the water, is shown from a 59-foot black skeleton tower connected to a white dwelling on **Cabo Este,** the eastern extremity of the island. A radiobeacon is at the light; see Appendix for **storm warning displays.**

Vertical cliffs with deep water close to shore extend from Cabo Este northward and westward to **Cabo Barrionuevo,** the northwest 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 northward and southwestward.

Playa Pajaro, about 1.5 miles southward of Isla Mona Light, has a boat harbor with 3 to 8 feet of water inside the reefs. The southern and main entrance, with depths of 7 to 20 feet, is marked by a range maintained by the light attendant for use of the Coast Guard supply vessel. The landing place has 7 to 8 feet alongside, but with southerly winds a swell sets into the landing.

The southernmost point of the island is surmounted by a large balanced rock. **Punta Oeste,** the westernmost point, is a low, narrow ridge, covered with brush, which projects nearly a mile westward of the cliffs; a reef extends 0.3 mile westward of the point.

Isla Monito, 3 miles north-northwestward of Isla 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 northeastward of Isla Mona and 12 miles westward of Punta Higuero, is a 715-foot high wooded island a mile in diameter. The island is visible more than 30 miles in clear weather and is one of the best landmarks for Mona Passage and the west coast of Puerto Rico. Isla Desecheo is a forest reserve and a native-bird reserve; it is uninhabited and there are no anchorages along its shores.

Punta Higuero, the most westerly 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 southeastward. 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.

Bahía de Aguadilla, 7 miles northeastward of Punta Higuero, is exposed northward and westward, but with ordinary easterly trade winds anchorage is smooth. There are frequent rough spells during the winter when the wind is from northward.

Aguadilla is on the east shore of the bay. Radio towers south of the town, and the city hall clock tower and twin gray towers of the cathedral at the plaza are prominent. The small white shaft of Columbus Monument is about a mile south of city hall. **Storm warning displays** are made near the Fire Department; see Appendix.

Large vessels load raw sugar and molasses at the conveyor pier with mooring buoys and dolphins 1.1 miles north of Aguadilla; depths of 40 feet or more are at the outer end of the pier.

An Air Force crash boat basin, 1.8 miles north of Aguadilla, has an emergency landing pier with 6 feet alongside.

Pilotage, quarantine, customs, and immigration services for Bahía de Aguadilla are handled by reprsentatives from Mayagüez.

Charts 901, 903.—The north coast of Puerto Rico from Mona Passage to San Juan extends in an almost easterly 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 west 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 westward of San Juan.

In addition to the marine and aero lights near Punta Borinquen, the marine lights at Arecibo and San Juan, several stacks, radio towers, and towns are prominent from offshore along the north coast. All dangers will be avoided by staying a mile or more offshore.

Chart 901.—Punta Borinquen, at the northwest 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 western 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; see Appendix for **storm warning displays.** A 200-foot rock bluff begins 0.8 mile southwestward of the light and extends northeast and eastward along the north coast of Puerto Rico. A brown scar in the cliff just beneath the light is conspicuous.

A boat landing may be made at times in the sandy cove on the west side of **Punta Sardina,** 7.3 miles east of Punta Borinquen Light.

Chart 903.—Punta Peñon, 16 miles east of Punta Borinquen Light, is a slight projection with lower land between it and the foothills. A rocky islet lies westward of the point and a chain of bare rocks and a small islet extend 0.8 mile eastward of it.

Puerto Arecibo, 26 miles east of Punta Borinquen Light and 33 miles west of San Juan, is an open bight somewhat protected by the headland of **Punta Morrillos** on the east side with a 1,200-foot breakwater extending from it to **Roca Cocinera.** Only fishing vessels and small pleasure craft use the port. **Arecibo** is along the southwestern 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 western end of Punta Morrillos; see Appendix for **storm warning displays.** Radio towers and stacks are prominent around Arecibo.

Boundary lines of inland waters.—The lines established for Puerto Arecibo are described in § **82.205,** Chapter 2.

An 18-foot channel marked with buoys leads to a 550-foot bulkhead pier on the south side of the breakwater at Puerto Arecibo. Care should be taken to avoid the offshore rocks when approaching the port from westward and eastward. Gasoline can be obtained at the pier in an emergency. Fishing vessels and small craft anchor south of the pier.

Danger zones for artillery and small-arms ranges extend up to 10 miles offshore in the vicinity of **Punta Puerto Nuevo,** 42 miles east of Punta Borinquen Light; limits and regulations are given in § **204.228,** Chapter 2.

A boat landing can be made at times inside the rock islets that extend a mile west of Punta Puerto Nuevo.

Several large structures are prominent on **Punta Salinas,** a narrow projecting point 3 miles west of San Juan.

Chart 908.—Bahía de San Juan, the most important commercial harbor in Puerto Rico, is about 60 miles eastward of Punta Borinquen and 30 miles westward of Cabo San Juan. It is the only harbor on the north coast which affords protection in all weather. It is protected on the north by the relatively high land of Isla San Juan, and on the south, east, and west by the adjacent low mangrove swamps of the Puerto Rico mainland.

The bay is about 3 miles long in a southeasterly direction and varies in width from 0.6 to 1.6 miles, but the entire southwestern side is shoal. The southwest shore is divided into two large bights by **Punta Cataño,** the point which extends about 0.6 mile northeastward into the harbor.

Metropolitan **San Juan,** the capital and principal port of Puerto Rico, includes Isla San Juan on the north side of Bahía de San Juan and the communities surrounding the

bay. The principal commercial facilities are on the south side of Isla San Juan (Old San Juan) and on the north side of **Isla Grande** which projects westward from the eastern 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, 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 west side of the entrance to Bahía de San Juan, is low with cliffs 32 to 36 feet high at its northern end. **Las Cabritas** are three small islands and rocks 0.1 mile northeast 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 southern extremity of Isla de Cabras.

Isla San Juan, on the eastern side of the entrance to the harbor, is generally bold and rocky, with a ridge 100 feet high extending along its northern side. At each end of the island are large stone forts connected by a continuous high wall. **San Cristobal** is on the summit of the ridge in the easterly part and **Castillo del Morro** is on the extreme western 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 east-southeast of the light.

The white marble dome of the capitol building, a mile eastward of the light, and a white church 0.4 mile farther eastward are prominent landmarks.

Two prominent tanks are on Isla Grande and many radio towers and stacks surround Bahía de San Juan.

Boundary lines of inland waters.—The lines established for Bahía de San Juan are described in **§ 82.200,** Chapter 2.

Channels.—The entrance channel has depths of 30 to 38 feet, thence depths of 29 to 33 feet to the wharves in **Caño de San Antonio,** between Isla San Juan and Isla Grande. The controlling depth is 30 feet in the channel on the south side of Isla Grande and 30 feet in the channel leading to the Army Terminal, the Puerto Nuevo dock, and the oil piers at the south end of the harbor, although the turning basin has shoaled to 26 feet.

The entrance channel is marked by range lights and lighted buoys. The channels inside the harbor are marked by lighted and unlighted buoys and range lights.

Vessels should proceed with caution when dredging is in progress in the channels; navigation regulations are given in **§ 207.810,** Chapter 2.

Caño de Martin Peña, at the southeastern end of Bahía de San Juan, is a narrow slough that connects with lakes and lagoons which extend eastward for 7 miles. A 6-foot channel extends for 1.5 miles above the entrance to fertilizer plants supplied by barges. The fixed bridge at the entrance has a width of 100 feet and a clearance of 19 feet. The fixed bridges above the fertilizer plants have a least width of 44 feet and a clearance of 7 feet

Anchorages.—Limits and regulations of the anchorage areas in Bahía de San Juan are given in **§ 202.240,** Chapter 2. Depths of 28 to 32 feet are in the general and restricted anchorages, while depths decrease to 10 feet in the east end of the small-boat anchorage.

Dangers.—Bajo Colnas, on the west side of the entrance to Bahía 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 Sta Elena, on the east 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.

A **restricted area** for seaplane operations is in the southern part of the bay; see **§ 207.812,** Chapter 2, for limits and regulations.

Tides.—The mean range of tide is only about 1 foot; the wind causes considerable variation in the depths.

Currents.—The currents along the north shore of Puerto Rico are greatly influenced by the direction and strength of the winds. The prevailing easterly trade winds generally cause a westerly drift. In Bahía de San Juan a slight westerly flow prevails at all times. When northerly seas set into the harbor entrance, an undertow and surge may be felt as far as Caño de San Antonio.

Weather.—The prevailing winds are the easterly trades, which generally blow fresh during the day. The lowland eastward of San Juan permits the cool trades to be felt throughout the harbor. At night the trade wind generally dies down and a light southerly breeze comes off the land. Heavy northerly winds pile up heavy seas and breakers in the harbor entrance.

See Appendix for **storm warning displays.**

Routes.—From a position about 0.5 mile northward of **Punta del Morro,** the northwestern point of Isla San Juan, enter Bahía de San Juan on the lighted range bearing **188°,** then follow the buoys into the harbor. From westward, Punta Salinas 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 sharp bend inside the entrance can be difficult when the northeast trades are blowing strongly, as they may force a vessel almost broadside to the swells. Vessels outbound should avoid getting too close to Bajo Colnas; this is particularly so with long vessels in a strong northerly breeze.

Pilotage.—Vessels usually are boarded by a pilot in a motorboat at the entrance buoys. The Commonwealth Captain of the Port maintains a daytime signal station on San Cristobal; communication is by International Code signals.

Traffic signals.—The alphabet flag **N,** when displayed

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from either yardarm of the signal mast on San Cristobal, will govern entry and departure of vessels at Bahía de San Juan:

(a) When displayed from the northwestern yardarm, all incoming vessels must remain at a safe distance outside the entrance.

(b) When displayed from the southeastern yardarm, all outgoing vessels must remain at a safe distance inside the harbor entrance or at the anchorages or berths.

Towage.—Tugs up to 1,400 horsepower are available for docking, undocking, and long distance towing and salvage.

Quarantine.—Vessels subject to visitation are boarded at the dock. The Public Health Service outpatient clinic is on Fernandez Juncos Avenue, 0.3 mile west of the San Juan Yacht Club. Hospital cases are taken to the Presbyterian Hospital.

Customs.—San Juan is a port of entry and marine documents are issued. The U.S. Customhouse is located on the waterfront west of Pier 1, and is open daily, except Sundays and holidays; inspectors are on duty from 8 a.m. to 5 p.m. The office is open on Saturdays from 8 a.m. to 12 noon only for entrance and clearance of vessels. Special arrangements can be made for work outside regular hours. Goods going to the customs warehouse cannot be landed directly, but are hauled from the general cargo piers.

Immigration.—Vessels subject to inspection are boarded by immigration officers at the docks. The port hours are 6 a.m. to 6 p.m.; at other times, inspection is made only on advance request.

Harbor regulations.—The Commonwealth Captain of the Port enforces the local rules and regulations for Bahía de San Juan. His office is located on Isla Grande.

Wharves.—The principal public and private piers and bulkheads of the port are on the south side of Isla San Juan, the north and south sides of Isla Grande, and at the south end of the harbor. Depths of 5 to 30 feet are alongside. Cruise ships are berthed at piers where space is available according to size and draft.

Pier 1, 530 feet long, 30 feet alongside, covered storage, general cargo. Operator: International Shipping Agency, Inc.

Bulkhead between Piers 1–2, 150 feet long, 14 feet alongside, general cargo of small interisland vessels. Operator: Ports Authority.

Pier 2, 380 feet long, 30 feet alongside, storage only. Operator: Ports Authority.

Bulkhead between Piers 2–3, 250 feet long, 15 feet alongside, general and bulk cargo of small interisland vessels. Operator: Ports Authority.

Pier 3, 400 feet long (additional 200 feet to outer dolphins), 30 feet alongside, covered storage, general cargo. Operator: Fred Imbert, Inc. (Note: Ports Authority to convert pier for use of cruise ships).

Bulkhead between Piers 3–5, 695 feet long, 16–18 feet alongside, general and bulk cargo of small interisland vessels. Operator: Ports Authority.

Pier 5, 480 feet long, 20–30 feet alongside. Operator: Ports Authority. (Note: Pier damaged by fire in 1961—sometimes used to tie-up vessels).

Pier 6, 955 feet long, 27–30 feet alongside, covered storage, general and bulk cargo. Operator: San Juan Merchantile Corp.

Pier 7, 550 feet long, 21–30 feet alongside, covered storage, general cargo. Operator: San Juan Trading Co., Inc.

Pier 8, 590 feet long, 30 feet along west side, covered storage, bulk cargo, conveyor, 2½-ton mobile crane. Operator: Armour Fertilizer.

Pier 8, 590 feet long, 400 feet across outer end, 30 feet along east side and outer end, covered storage, general and container cargo, pipeline for fuel oil. Operator: Bull Lines.

Pier 9, 600 feet long, 350 feet across outer end, 30 feet alongside, covered storage, general and container cargo. Operator: Bull Lines.

Pier 10, 450 feet long, 26–29 feet alongside, bulk cargo, petroleum products, 15-ton mobile crane, 25-ton floating crane, 1,400 horsepower tugs, 1,500-ton dry lighters, 1,100-ton liquid lighters, pipeline for molasses. Operator: Porto Rico Lighterage Co.

Pier 11, 580 feet long, 30 feet alongside, open and covered storage; general, bulk, and container cargo. Operator: Waterman Line.

Pier 12, 260 feet long, 30 feet alongside, covered storage, general and bulk cargo. Operators: Waterman Line and Lykes Line.

Pier 13, 500 feet long, 30 feet alongside, open and covered storage, general and bulk cargo. Operator: Lykes Line.

Pier 14, 445 feet long, 30 feet alongside, open and covered storage; general, bulk, container, and trailer cargo. Operator: Bull Lines.

Fernandez Juncos Bulkhead (18°27.8′ N., 66°05.6′ W.), 900 feet long, 29–30 feet alongside. Operator: U.S. Navy.

Isla Grande Terminal (18°27.6′ N., 66°05.8′ W.), 3,000 feet long, 5–30 feet alongside, open and covered storage; general, bulk, container, and trailer cargo. Operator: Ports Authority.

San Antonio Tank Farm (18°27.7′ N., 66°06.0′ W.), 350 feet long, 25–30 feet alongside, fuel oil. Operator: U.S. Navy.

Wagner Shipyard (18°27.3′ N., 66°06.3′ W.), marine railway can haul out vessels of 1,500 tons, 200 feet in length, and 17 feet in draft; 25-ton lift, machine shop, electrical shop. Operator: Wagner Shipyard & Marina, Inc.

Tender Pier (18°26.9′ N., 66°05.5′ W.), 450 feet long, 22–30 feet alongside. Operator: U.S. Navy.

Pier 15 (18°27.0′ N., 66°05.4′ W.), 1,000 feet long, 30 feet alongside, 45-ton mobile crane, 25-ton floating crane, 2,000-ton floating drydock; graving dock—691 feet over all, 632 feet docking length with 83 feet at bottom and 96 feet at top, 25 feet over sill; machine shop, electrical shop. Operator: Puerto Rico Drydock and Marine Terminals, Inc.

Pier 16 (18°27.0′ N., 66°05.3′ W.), 600 feet long, 29 feet alongside, open and covered storage; general, bulk, and container cargo. Operator: Alcoa Steamship Co.

Puerto Nuevo Terminal (18°25.8′ N., 66°06.4′ W.), 1,000 feet long, 25–30 feet alongside, covered storage, general and bulk cargo, conveyor. Operator: Ports Authority.

Cataño Navy Fuel Pier (18°25.8′ N., 66°06.5′ W.), 490 feet long, 28 feet alongside, fuel oil. Operator: Oil companies.

Army Terminal Pier (18°25.9′ N., 66°06.6′ W.), 600 feet long, 200 feet across outer end, 30 feet alongside, covered storage, military cargo, 75-ton fixed crane, 20-ton mobile crane. Operator: U.S. Army.

Caribbean Refining Company Oil Pier (18°25.9′ N., 66°06.7 W.), 400 feet long, 30 feet alongside, petroleum products. Operator: Borinquen Refinery.

Pier and tie-up dolphins (18°26.1′ N., 66°06.6′ W.), 600 feet long, 30 feet alongside, conveyor. Operator: Nebraska Flour Mill.

Pier and tie-up dolphins (18°26.2′ N., 66°06.6′ W.), 600 feet long, 30 feet alongside, conveyor. Operator: Rice Growers Assn. of California (P.R.), Inc.

The office and operating base of the Coast Guard are on **La Puntilla,** the southwest point of Isla San Juan.

Supplies.—All kinds of supplies are available at San Juan. Water can be obtained from pipelines at all piers and at anchorage from barges. Fuel oil is available at Pier 8 and Cataña Navy Fuel Pier, and at anchorage from barges.

Repairs.—Major repairs can be made and complete salvage equipment is available; types of equipment are given under "Wharves".

Small-boat facilities.—Small boats usually anchor northwestward of La Puntilla inside the harbor entrance and at the east end of Caño de San Antonio.

The San Juan Yacht Club, at the east end of Caño de San Antonio, has a small marine railway and boat lift; gasoline and diesel fuel are available.

Docking facilities, gasoline, diesel fuel, water, and marine hardware are available at the marina which is part of the shipyard on the west side of Isla Grande.

A marine railway at Punta Cataño can haul out boats up to 125 feet in length and 10 feet in draft for repairs.

Charts 903, 904.—The north coast of Puerto Rico from San Juan to Cabo San Juan trends in an east by south 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 eastern 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 two miles or more offshore.

Chart 903.—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 depths of 2 to 3 feet is westward of the reef off Punta Cangrejos. The inlet leads under a fixed bridge with a clearance of 15 feet to a private yacht club where gasoline is available and minor repairs can be made in an emergency. The entrance to the inlet is marked by a bell buoy and private range lights. See Appendix for **storm warning displays.**

Chart 904.—**Punta Vacia Talega,** 12 miles east 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 east 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 sand bar across the entrance.

A rocky patch with a least depth of 2½ fathoms is 1.5 miles off **Punta Picúa,** 21 miles east of San Juan. The patch breaks in a moderate swell and is marked by a lighted buoy.

Sierra de Luquillo, the mountains in the northeast part of Puerto Rico, are the prominent feature in clear weather for this part of the coast. **El Yunque,** the westernmost of the three closely connected peaks 5 miles inland and 10 miles from the eastern end of the island, is the highest and most prominent.

Chart 921.—**Cabo San Juan,** the northeastern point of Puerto Rico, is a bluff hill 200 feet high. **Cabezas de San Juan,** two 100-foot clifflike heads, are at the north 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. See Appendix for **storm warning displays.**

Charts 921, 917, 904.—Beginning 1.5 miles north of Cabo San Juan, a chain of islands, islets, rocks, and reefs extends southeastward for 20 miles to Isla de Culebra. The chain is nearly steep-to on the north and south 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 northward of Cabo San Juan, lie at the northwestern end of the chain. A light is shown from a gray cylindrical tower on one of the rocks. A shoal with depths of 15 to 26 feet extends 0.9 mile northwestward of the light and a rock is awash 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 eastward of Las Cucarachas. Deep water is close to the north and west 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 southward of Los Farallones and continues about 0.4 mile westward from the northwest end of Cayo Icacos. The western 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 and has a clear depth of 40 feet. A 23-foot spot is 500 yards southeastward of the light on Las Cucarachas and another 23-foot spot is 200 yards westward of Los Farallones. A 218° course for Cabo San Juan Light will lead through the passage over a least depth of 40 feet. It is the best passage for sailing vessels entering the northwest end of Sonda de Vieques with the usual easterly trade winds.

Cayo Icacos, 1.3 miles eastward 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 southwest point of the island.

Cayo Ratónes, 250 yards eastward of Cayo Icacos, is 60 feet high; the eastern summit is a large bare ledge. A number of bare rocks are off its north side, and a reef awash is between the island and Cayo Icacos.

Cayo Lobos, 0.5 mile east-southeastward of Cayo Ratónes, is 25 feet high with several bare rocks and islets up to 75 feet high off the north side. A chain of bare rocks and islets up to 30 feet high continues southeastward for 2.2 miles to Cayo Diablo. A 300-yard wide channel with depths of 19 to 30 feet is between Cayo Ratónes and the bare rocks northwestward of Cayo Lobos. In 1962 a tourist resort was being built on Cayo Lobos.

Cayo Diablo, 5 miles southeastward of Cabo San Juan, is low with a 40-foot grassy hummock at its eastern end. White beaches are on the north and south sides.

Between Cayo Diablo and Cayo Lobita, 8 miles east-southeastward, 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 east-southeastward 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 east-southeastward of Cayo Diablo and 1.3 miles westward of Cayo Lobito, has depths of 36 to 48 feet and may be used by large vessels. A buoy marks the center of the passage, but the deepest water is eastward of it. A 28-foot shoal is 0.6 mile westward of the buoy.

Chart 914.—Cayo Lobito, 13 miles eastward of Cabo San Juan, is the westernmost of the chain of islands extending for over 3 miles northwestward of Isla de Culebra. **Cayo Tuna** and a bare ledge are close to the northwest end of the island. **Roca Columna** is a detached 75-foot bare pinnacle rock on the south end of the island.

Cayo Lobo, a mile southeastward of Cayo Lobito, is a triangular-shaped island covered with scrub grass, the highest part being at the west 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.

El Mono, 0.5 mile southeastward 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 west coast of Isla de Culebra, consist of three islets. **Cayo Yerba,** the northernmost, 66 feet high, has a smooth grassy slope on the east side, and rocky bluffs on the west side. **Cayo Ratón,** the southwesternmost and smallest, 46 feet high, is grassy on top and rocky on the sides; a low rock is close to its southeast side. **Cayo del Agua,** the southeasternmost, is low in the middle and 39 feet high at its eastern 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 westward. The passage between Cayo Ratón and Cayo del Agua should be avoided.

Cayo de Luis Peña, off the western side of Isla de Culebra and the largest island of the chain, rises to a peak in about the center with the south and north ends joined to the island by low necks. **Punta Cruz,** the southwest point of the island, has a prominent whitewashed cliff. The 0.3-mile wide passage between Cayo del Agua and Cayo de Luis Peña has depths of 30 feet or more.

Isla de Culebra, 16 miles eastward of Puerto Rico, is about 6 miles in length east and west. The island is fairly high, with broken and ragged terrain. **Monte Resaca,** a mountain about in the center, rises to 650 feet, and **Cerro Balcón,** about 1.5 miles east-southeast of it, is 551 feet high. The island is barren and brown in appearance. The northern shore is steep-to, with the 20-fathom curve extending about 1.5 miles off and nearly parallel to it.

The island is a **Naval Defensive Sea Area and Airspace Reservation.** Navigation by vessel other than those authorized by the Secretary of the Navy is prohibited within the 3-mile limit.

The principal product of the island is 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 fresh-water streams, and rain water stored in cisterns forms the principal water supply. No fresh water is available for vessels. The principal harbor is Ensenada Honda, one of the most secure in the Leeward Islands.

Punta Noroeste, the northwest point of Isla de Culebra, is at the end of a prominent projecting ridge. A reef extends 200 yards northwestward from the high bare rock close to the point.

A shoal area with several rocks extends 2.2 miles northwestward from Punta Noroeste. **Cayo Botijuela,** 2 feet high, and **Roca Lavador,** awash, are the northwesternmost rocks of the group.

Alcarraza, 1.6 miles northwestward 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 northwestward of Punta Noroeste, consist of a 20-foot rock 50 yards in diameter with a low rock close to its southwest side and another small rock 100 yards northwestward. **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 Ancón, 0.9 mile northwestward of Punta Noroeste, is a rock with 7 feet over it that breaks when there is considerable sea; a buoy is 150 yards east of the rock.

Piedra Stevens, 0.6 mile north-northwestward of Punta Noroeste, is a 30-foot rock 100 yards in diameter with a 27-foot shoal extending 100 yards southward of it. A lighted buoy is 100 yards northwestward of the rock.

La Pasa de Los Gemelos, between Los Gemelos and El Ancón on the west and Piedra Stevens on the east, is a 0.5-mile wide passage with depths of 45 feet or more; it is the safest passage northwestward 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 **north 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 0.5 mile east by north of Punta Noroeste and a 17-foot spot the same distance eastward of the point have been reported; otherwise depths of 30 feet or more are 0.4 mile off the north 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.

Bahía Flamenco, 1.8 miles southeastward of Punta Noroeste, is constricted by reefs. Buoys mark the entrance into the bay.

Cayo Matojo, 3.2 miles about east by south of Punta Noroeste, is a 20-foot high island off **Punta Resaca,** a projecting point separating Bahía de Marejada and Bahía de Oleaje.

Roca Speck, 100 yards off **Punta Manchita,** 4.8 miles southeastward of Punta Noroeste, is low and bare. **Punta Anade** is a projecting point 0.8 mile southeastward of the rock.

Cabeza de Perro, the eastern point of Isla de Culebra, is a pointed rocky bluff. A break in the reef 0.3 mile north of the point leads to a boat landing. **Pelá,** 0.5 mile southwestward of the point, is a 30-foot high cay that presents a prominent bluff facing southeastward.

Cayo Norte, 0.5 mile off the northeastern 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 western part of the island. **Cayo Sombrerito,** a 59-foot rocky islet, extends about 300 yards northward of the eastern end of the island.

Several rocky islets and islands extend up to 0.5 mile northeastward from Cayo Norte. **Cayo Ballena** and **Cayo Tiburón,** the northwesternmost group, are 10 to 20 feet high with foul ground between. **Cayos Geniqúi,** the southeasternmost group, are two connected islands; the 79-foot western island is flat and grass covered on top, the 82-foot eastern island is pointed on top.

Isla Culebrita, 0.6 mile off the east 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 west side of the island. The eastern 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 northwestward of Isla Culebrita.

The islands, islets, and reefs on the eastern and southern sides of Isla de Culebra form a protected passage and several well-protected anchorages.

Canal de Cayo Norte, between Cayo Norte and the mainland, 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 northwestward 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 Tiburón, or between Cayo Tiburón and Cayos Geniquí. The passages are at least 0.3 mile wide with depths of 30 feet or more.

Tierra á Medio, between Isla de Culebra and Isla Culebrita, is a shoal area with depths of 13 to 29 feet that obstructs the southern end of Canal de Cayo Norte. A buoy marks the southwestern side of the shoal area.

Canal de Culebrita and **Canal del Sur** are a continuation of the protected passage on the east and southeast sides 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 southwestward from Isla Culebrita, protects the inside passage from southward. The southwestern 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 southwestern part of Canal del Sur. Buoys mark the northwestern side of Cabezas Puercas and the northeastern side of Cabezas Crespas.

Anchorages.—The best anchorage is in Canal de Culebrita in 60 feet of water with the extreme western end of Cayo Botella in line with the eastern side of Cayo Sombrerito, and the southeastern extremity of Isla Culebrita bearing 067°. Vessels can anchor closer under the lee of Isla Culebrita according to draft.

Puerto del Manglar, at the southeastern end of Isla de Culebra, is a small but well-sheltered bay. The entrance is constricted to 100 yards wide by reefs, but once inside vessels can anchor in depths of 21 to 50 feet near the middle of the bay; sand and mud bottom. The sides and head of the bay are shallow.

Bahía de Almodóvar, on the southern 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 northwestward of Pelá.

Currents.—The current velocity is 1.5 knots between Cayo Norte and Cayos Geniquí and sets southward and northward, and 2 knots in Canal del Sur and sets southwestward and northeastward.

Routes.—To enter Canal de Cayo Norte from northward, steer **132°** between Cayo Norte and Isla de Culebra until 300 yards off Punta Anade, then draw in toward the

Culebra side to avoid the middle ground, heading **146°** between the buoy marking Tierra á 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 northward, steer toward Cayo Norte and, having passed 150 yards west of Cayo Tiburón, bring the western extremity of Cayo Botella in line with Cabeza de Perro and steer **186°** until Cerro Balcón on Isla de Culebra bears **240°**, then make a sharp turn and head for Cerro Balcón on **241°**, passing midway between the 23-foot spot on the north side and the 12-foot spot on the south side of the channel; continue southwesterly, swinging to get on course **146°**, passing 300 yards off Punta Anade.

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 buoys marking Cabezas Puercas until west-northwest of buoy 5, then either swing left to pass midway between buoys 1 and 5, 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 southeastern extremity of Isla de Culebra. The southern head, on which there is a depth of 23 feet, lies with Punta del Soldado in range with the southern extremity of Cayo de Luis Peña bearing 293°. A lighted buoy is on the southern side of Bajos Grampus. A buoy marks the northern edge of the innermost or western head of these shoals. A 23-foot spot lies 0.3 mile northeast of this buoy. Virgin Passage is discussed in Chapter 14.

Canal de Grampus is a channel between this western knoll and Arrecife Culebrita; it is a clear navigable channel about 0.6 mile wide, and is marked by buoys. The tidal current sets diagonally across Canal de Grampus southwestward and northeastward.

To pass southward of Bajos Grampus, keep on or southward of the line of Sail Rock and Signal Hill on St. Thomas Island until Cayos Geniqui show eastward of Cabo del Pasaje, the northeast point of Isla Culebrita. Bajos Grampus will then be cleared and the course can be shaped as desired.

Chart 913.—Ensenada Honda, on the south side of Isla de Culebra between bluff **Punta Vaca** on the east and Punta del Soldado on the west, is the most secure anchorage in the area. The harbor is about 1.5 miles in length 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 eastward of Punta del Soldado, is a 0.3-mile long shoal with a least depth of 7 feet; it is marked by buoys.

Bajo Grouper, 0.2 mile northward of Bajo Amarillo, is 0.3 mile in length with a least depth of 4 feet. A buoy marks the eastern extremity of the shoal.

Bajo Camarón, 0.2 mile southward of Punta Vaca, has a least depth of 9 feet over the 0.2-mile long shoal. A buoy is at the southern end.

Bajo Snapper, 0.3 mile westward 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 southward, bring the left tangent of Punta Vaca to bear **008°** before the southern end of Cayo de Luis Peña closes behind Punta del Soldado and steer for Punta Vaca close up to Bajo Camarón; then swing on to the entrance range bearing **296°**. When nearly up to the buoy marking the 17-foot shoal, steer in on the inner range bearing **323°** until up to buoy 8, then open the range to the westward and anchor according to draft.

From southeastward, 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 westward, when 0.5 mile south 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, on the northeast side of Ensenada Honda, is a naval reservation. The prominent house on the small hill above the wharf is used as the residence of the naval custodian. 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 west end of Ensenada Honda. Vessels calling at Culebra use Bahía de Sardinas.

Charts 914, 913, 915.—The 5.5-mile long **southwest 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 Peña.

Punta del Soldado, the southern point of Isla de Culebra, is wooded and terminates in a rocky bluff. A light is on the west side of the point.

Bahía de Sardinas, 1.5 miles northwest of Punta del Soldado, is the harbor for the towns of Culebra and Clark Village. The boat 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 Bahía 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. Avail-

able supplies include groceries and gasoline in drums. Telephone and telegraph communications are available. A motorboat carries passengers between Culebra and Fajardo; the mail is delivered by airplane.

Punta Melones, the northwestern point of Bahía 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 northwest 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 Peña and the chain of islands and reefs to the northwestward have been described previously in this chapter.

Canal de Luis Peña, between the north end of Cayo de Luis Peña 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 Peña and Isla de Culebra in depths of 30 to 79 feet. The rocky patch with depths of 42 to 53 feet, 0.6 mile westward 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 **Bahía Tamarindo,** a mile northwestward of Punta Melones. A fair anchorage in depths of 40 to 55 feet is about 0.3 mile off the northwest side of Cayo de Luis Peña.

Currents.—In Canal de Luis Peña the southeastward current is deflected northward of **Bahía Tarja,** just north of Punta Melones, and thence sets toward the south end of Cayo de Luis Peña; it is weak at the entrance to Bahía de Sardinas. The northwestward current sets directly through the passage. The current velocity is about 2 knots.

Charts 904, 917.—Sonda de Vieques extends from the east coast of Puerto Rico to Virgin Passage between the chain of islands and reefs including Isla de Culebra on the north and Isla de Vieques on the south. The sound is about 20 to 22 miles long and from 8 to 15 miles wide. The eastern part is clear with depths of 7 to 17 fathoms, except for Bajos Grampus southeastward of Isla de Culebra. The western part has numerous shoals and reefs extending as much as 8 miles off the east coast of Puerto Rico.

A **danger area** for aerial gunnery and bombing extends 9 miles south and southwesterly of Isla de Culebra; limits and regulations are given in **§ 204.230,** Chapter 2.

Explosives anchorage areas are in Sonda de Vieques north of Isla de Vieques; limits and regulations are given in **§ 202.245,** Chapter 2.

Boundary lines of inland waters.—The lines established for Sonda de Vieques are described in **§ 82.245,** Chapter 2.

Isla Palominos, 3.5 miles southeastward 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 northeastern side.

Bajo Blake, 2 miles eastward of Isla Palominos, is 0.4 mile in diameter and has a least depth of 20 feet. The south side is marked by a buoy.

Bajo Hodgkins, 7 miles southeastward of Isla Palominos, is a narrow 0.8-mile long ridge with a least depth of 28 feet; a buoy is off the eastern side of the shoal.

The area between Bajo Hodgkins and the east 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 northwestern end of Sonde de Vieques between Cabo San Juan and Isla Palominos.

Routes.—Vessels bound from San Juan to Isla de Culebra and eastward frequently enter Sonda de Vieques through Pasaje de San Juan and proceed southward of the chain of islands and reefs to gain comparatively smooth water.

A buoyed north-south route along the east coast of Puerto Rico is used by vessels with a draft of 22 feet or less. Large deep-draft vessels bound for the south coast of Puerto Rico usually enter Sonda de Vieques through Pasaje de San Juan and continue around the east coast of Isla de Vieques. Vessels from northeasterly points use Virgin Passage and pass south of Isla de Vieques to go to ports on the south coast of Puerto Rico.

Charts 904, 940.—Isla de Vieques, 6 miles off the nearest point of the east coast of Puerto Rico, forms the south side of Sonda de Vieques. It is 18 miles long east and west 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 western end and **Cerro Matias Jalobre,** 3 miles from the east end. The island is wooded in places, especially its eastern half and Monte Pirata, but some of the hills are cultivated with sugarcane to their summits.

Principal products are sugarcane, 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 Bahía de Mulas on the north coast; sugarcane is loaded on barges at Puerto Real on the south coast. When the trade wind is northward of east a heavy surf runs and landing is difficult on the open north coast.

Naval restricted areas extend 1,500 yards offshore around the western part of the island; limits and regulations are given in **§ 207.815,** Chapter 2.

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 north of the western end of Isla de Vieques and between that island and Puerto Rico. The current velocity is 1.2 knots in the passage and floods southwestward and ebbs eastward.

Punta Arenas, at the northwestern 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 west end of Isla de Vieques, southward of Punta Arenas, there is a smooth anchorage with easterly winds but exposed to the south and west.

Escollo de Arenas is a continuation northwestward of a shoal which fringes the north side of Isla de Vieques to a distance of about 1 mile and extends eastward nearly to Punta Mulas. The western edge of the shoaler part of the bank extends 3.3 miles north-northwestward 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 northward 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 southwesterly set is noted frequently north of Escolla de Arenas. The bank itself is generally indicated by the tide rips.

Punta Boca Quebrada, 1 mile southward of Punta Arenas, is a low wooded point which terminates in a dry ledge outside of a white sand beach.

A 1.2-mile causeway extends from shore at **Desembarcadero Mosquito,** 3.9 miles east of Punta Arenas. Boats land on both sides of the causeway in depths of 6 to 30 feet, but care must be taken because of the riprap.

Arrecife Mosquito, a reef awash, is 1.2 miles to the northeastward 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 west-northwestward from the reef. During ordinary weather a fairly smooth anchorage is 0.3 mile south of Arrecife Mosquito, in 40 feet, sandy bottom. Several spots with 14 to 17 feet are in the approaches to the anchorage, and vessels drawing more than 12 feet should use it only with local knowledge.

Arrecife Corona, a reef awash, is about 0.3 mile long and about 0.2 mile eastward of Arrecife Mosquito. Several shoals are around the reef, including a 9-foot spot 0.2 mile southward. **Bajo Merail,** a shoal with least depth of 6 feet, lies 0.6 mile southward of Arrecife Corona.

Caballo Blanco, a low grassy islet, is 1.8 miles northwestward of Punta Mulas. Several shoals surround the islet, the outer of which are 0.6 mile northerly and 0.2 mile southerly. **Bajo Comandante,** a shoal about 600 yards in extent and covered by 10 to 17 feet, lies about midway between Caballo Blanco and the shore. There are 24-, 26-, and 27-foot spots in the channel between Caballo Blanco and Bajo Comandante.

Bahía de Mulas, 8 miles east of Punta Arenas and 10 miles west of Punta Este, is an open bight on the north coast of Isla de Vieques. **Isabel Segunda** (P.O. Vieques), the principal town on the island, is on the southeast 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 tower on a low bluff point on the northeast side of the bay. An old Spanish brick fort and building is prominent on a hill 0.5 mile southeastward of the light. A depth of 12 feet can be taken to the 300-foot pier on the east side of the bay. Depths of 4 to 12 feet are alongside the pier.

Small vessels and schooners anchor north and south 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 northerly 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 (east coast of Puerto Rico).

The approach to Bahía de Mulas is obstructed by shoals with depths of 5 to 30 feet. Caballo Blanco and Arrecife Corona can be avoided in approaching from the northwest by staying in the white sector of Punta Mulas Light until inside the bay.

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 groceries and gasoline in drums. Telephone and telegraph communications are available. A motorboat carries passengers between Isabel Segunda and Fajardo; the mail is delivered by airplane.

Punta Cabellos Colorados, 3.1 miles eastward of Punta Mulas, is rocky and steep-to. **Puerto Negro** is a boat landing 4.8 miles east 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 westward of the entrance, is marked by **Roca Roja,** a large bare rock close-in. **Punta Goleta** is the eastern entrance point.

Roca Cucaracha, 3.4 miles west-northwestward of Punta Este Light, consists of 2 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.

Caño Hondo extends 0.6 mile eastward of Roca Cucaracha to the reefs forming Bahía Salinas. It is open northward and has depths of 18 to 42 feet. It has no sheltered anchorage except for small craft, which can anchor at its southeast end. A narrow channel with a depth of 8 feet south of an islet about 15 feet high and 250 yards from shore leads from Caño Hondo to Bahía Salinas.

Bahía Salinas, 1.6 miles westward of Punta Este, has an anchorage with depths of 12 to 24 feet. It is the best landing along the north coast eastward of Bahía 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 north by a reef 0.6 mile long, the highest part of which is awash. The entrance from eastward is between the reef and those reefs which fringe the shore. About 1.5 miles northwestward of Punta Este is a high bluff point with bare white cliffs to eastward.

Punta Este, the eastern point of the island, is moderately low and grassy, with rocky bluffs at the water. A light, 60 feet above the water, is shown from a red skeleton tower on the point.

The south coast of Isla de Vieques is irregular and in-

dented by sandy bays. **Bahía Salina del Sur,** 2 miles westward of Punta Este, is 0.5 mile in diameter and affords a boat landing with the wind northward of east. **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 southeast end, lies 0.3 mile off the western entrance point. Anchorage is in the western half of the bay in 18 to 24 feet, sheltered from winds northward of east. The clearer entrance is between Roca Alcatraz and the island off the western point of the bay. For 1 mile westward of the island, shoals with 18 feet and less extend nearly 0.5 mile from shore.

Ensenada Honda, about 6 miles westward of Punta Este, is 1.2 miles wide, and has several bare rocks and reefs awash. The bay is rough with southeasterly winds, but with the wind northward of east 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 mile east-northeastward from **Punta Conejo,** the western entrance point. A light on the east side of the point is operated only during military exercises in the vicinity. **Cayo Jalovita** and **Cayo Jalova** are small islands on the eastern side of the harbor.

Bahía de la Chiva is a shallow bight on the west 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 westward of Punta Conejo. **Bahía Tapon** is a bight northward of the reef, with depths of 2 to 3 feet.

Puerto Ferro, 9 miles westward 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. A light, 68 feet above the water, is shown from a 44-foot white octagonal tower on the summit of a rocky bluff 0.3 mile southward of the entrance.

Puerto Mosquito, about 10 miles westward of Puerto Ferro Light, is a boat harbor. Least depths in the narrow entrance are 2 to 3 feet.

Ensenada Sun Bay, 2.3 miles westward of Puerto Ferro Light, is about 0.6 mile wide. It offers anchorage in 18 to 24 feet exposed to winds from southeast to southwest. A shoal extends 200 yards westward from the eastern point of the bay and a shoal with 16 feet over it lies westward from the middle of the entrance. The depths in the southern half of the bay are 18 to 27 feet.

Puerto Real, on the south coast of Isla de Vieques 3 miles westward of Puerto Ferro Light, provides good anchorage in ordinary weather. The port is somewhat protected by **Cayo de Tierra** on the east and **Cayo Real** on the south; depths are 18 to 24 feet. Barges are loaded with sugarcane at the pier on the northeast side of the port and towed to Humacao; a depth of 10 feet is alongside the pier. The radio tower lights 0.4 mile inshore are prominent.

The principal outlying danger is a shoal covered by 13 to 17 feet, with 30 to 50 feet around it, lying 0.7 mile from shore and 0.9 to 1.3 miles west-southwestward from the south end of Cayo Real; its eastern and western ends are each marked by a buoy. A spot with 23 feet is about 0.4 mile southwestward from the southern end of Cayo Real. A shoal with 15 feet of water is 0.2 mile from shore and 0.6 mile west from the north point of Cayo Real.

Vessels can anchor in 35 feet about 550 yards westward of Cayo Real. The approach to the anchorage is between the buoy marking the east end of the principal offshore danger and a 23-foot spot nearly 0.4 mile southwestward of Cayo Real.

Punta Vaca, 3 miles westward of Puerto Real, is the southernmost point of the island. Outlying rocks are a short distance off it. Thence the coast trends westward and turns northward past **Punta Boca Quebrada** to Punta Arenas.

Charts 904, 917.—The **east coast** of Puerto Rico extends 10 miles southward from Cabo San Juan to Punta Puerca and then 22 miles southwestward 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 east coast, but extreme caution is necessary to avoid the shoals near the route. The principal ports on the east coast are Fajardo and Humacao.

Chart 921.—**Playa Canalejo,** 1.1 miles south-southeastward of Cabo San Juan Light, is a shallow indentation leading to a Coast Guard pier where landings can be made in good weather.

Punta Gorda, 1.4 miles southward of Cabo San Juan, is a conspicuous high head. A 360-foot hill, 0.4 mile west-northwest from the point, is the northern end and highest part of a high ridge which extends southwestward nearly to Playa de Fajardo.

Punta Bateria, 2.2 miles southward of Cabo San Juan, is a black rocky 70-foot cliff from which a grassy ridge makes inland.

Bahía de Fajardo, 2.5 miles southward of Cabo San Juan Light, affords good shelter for medium draft vessels. It is somewhat protected on the east and south by two islands and surrounding reefs. Motorboats carry passengers between Playa de Fajardo, Isla de Culebra, Isla de Vieques, and the Virgin Islands. Small interisland vessels trade in general cargo, building materials, and livestock. Large vessels load molasses from barges offshore.

Prominent features.—Cabo San Juan Light is the principal landmark in making the approach to Bahía de Fajardo. A hotel just south of Punta Gorda and two stacks of a sugar central and a radio tower near Fajardo are prominent.

Channel.—The principal entrance to Bahía de Fajardo is from northward through the channel marked by buoys westward of Bajo Laja, although small vessels can enter from eastward and southward with local knowledge. The north entrance has a controlling depth of 23 to 30 feet to

Buoy 5, thence 12 feet to the public pier. The controlling depth from eastward is 17 feet to Buoy 5, and from southward, 9 feet to the public pier.

Anchorages.—Large vessels anchor northeast 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 in the vicinity of the public pier.

The hurricane anchorages for large vessels are Ensenada Honda (Isla de Culebra) and Ensenada Honda, 10 miles southward of Fajardo. Small vessels can anchor south of Cayo Obispo.

Dangers.—The approaches to Bahía 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 east side of the north entrance and is marked with buoys.

Cayo Obispo and **Cayo Zancudo,** with surrounding reefs up to 0.5 mile, form the eastern side of the bay.

Arrecife Corona Carrillo and a long reef to the westward obstruct the south 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 southern entrance to the bay.

Currents.—The current velocity is 0.3 knot in a south-southeastward direction on the flood and 1 knot in a north-northwestward direction on the ebb in the channel in Bahía de Fajardo.

Pilotage.—A local pilot is available.

Towage.—Small towboats used for towing molasses barges are available.

Quarantine, customs, immigration.—A representative of the quarantine service enforces the national quarantine laws. Fajardo is a 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 southwestern side of Bahía de Fajardo. The westerly 300-foot public pier has 12 feet at the outer end and 8 feet alongside. An 80-foot bulkhead pier with 12 feet alongside for passenger motorboats is just west of the public pier.

The easterly 400-foot pier with 9 feet at the outer end is used by the sugar central to load molasses by pipeline into barges for transfer to large vessels in the anchorage area. The former limestone pier to the eastward is in ruins.

Supplies and repairs.—Water is available and gasoline 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 hardware is San Juan, 38 miles by highway from Playa de Fajardo.

Small-boat facilities.—A marina on Cayo Obispo, on the east side of Bahía de Fajardo, has facilities for small boats. Depths of 8 to 14 feet can be taken to the dock. Available supplies include gasoline and diesel fuel; water and electricity are available at the finger piers. A lift can haul out boats up to 200 tons and 125 feet in length for hull and engine repairs.

Chart 917.—Isla de Ramos, 4 miles south 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 east-southeastward of the island.

Cayo Largo, 1.5 miles eastward of Isla de Ramos, consists of a narrow 1.8-mile long ridge steep-to on all sides. The southern half is awash at low water and the sea always breaks on it; the northern half has depths of 5 to 15 feet. A black pipe tripod daybeacon is in about the center of the reef and buoys mark the western side. The velocity of the current is 0.5 knot in the channel west of Cayo Largo; it floods southward and ebbs northwestward.

Isla Piñeros, 8 miles southward of Cabo San Juan Light, is a wooded island with a prominent tower on the 249-foot hill near the middle. **Isla Cabeza de Perro,** just eastward of Isla Piñeros, has a large detached rock off the rocky bluff northeast end. A light is shown from a red skeleton tower on the east point of the island. **Pasaje Medio Mundo,** west of Isla Peñeros, 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 southward of Cabo San Juan, is a prominent bold wooded head with a high rock bluff at the shoreline.

Chart 922.—Ensenada Honda, 11 miles south 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,** 3.5 miles north of Ensenada Honda, to 2 miles westward of the entrance; limits and regulations are given in **§ 207.815,** Chapter 2.

Bahía de Puerca, a mile northeastward of Ensenada Honda, has dredged depths of 38 feet or more leading to a pier with 40 feet alongside at the head of the bay. The 1,000-foot pier consists of a series of dolphins connected by walkways; a large graving dock is inshore of the pier.

Isla Cabras, on the east side of the entrance to Ensenada Honda, has a rocky bluff on the east side and a light shown from a gray square stone tower on the southeastern end. 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 Bahía de Puerca.

Punta Cascajo, the western point at the entrance to Ensenada Honda, has rocky cliffs on the south side and a bare reef 250 yards off the southeastern side. Many houses are on the high part of the point and trees fringe the shoreline.

A dredged channel marked by buoys and a lighted range

bearing 315° leads into Ensenada Honda. The controlling depth is 30 feet on the range line, but depths of 25 to 30 feet are along the edges of the channel. Depths of 30 to 41 feet are inside the harbor. Shoals with depths less than 10 feet extend as much as 0.7 mile from the shore outside the buoyed channel. Two shoals with a least depth of 27 feet are 0.3 mile eastward of the range front light. Vessels anchor in the harbor according to draft; the holding ground is soft mud which may cause some dragging during a hurricane.

Two piers, 400 feet and 450 feet in length, with depths of 30 feet alongside, are on the northeastern side of Ensenada Honda. A landing ramp is southeastward of the easterly pier.

Chart 923.—Puerto de Humacao, 19 miles southward of Cabo San Juan, affords some shelter for medium draft vessels. The port is exposed southeastward and southward, and a heavy sea sometimes makes in with southeasterly winds. The port is used by a sugar central to receive sugarcane by barge from Isla de Vieques and to ship molasses by large vessels loaded from barges offshore.

Prominent features.—Punta Lima, 3 miles northeastward of Puerto de Humacao, is a projecting wooded hill with low land back of it. A reef 0.5 mile eastward of the point usually shows breakers on it.

Cayo Santiago, 0.7 mile southeastward of the waterfront at **Playa de Humacao,** is the most prominent feature when approaching the port. The island is low at the north end, rising to 162 feet at the southern end. The University of Puerto Rico maintains a monkey colony for experimental purposes on the island; no visitors are permitted.

El Morrillo, 1.8 miles southwestward 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 southwestward 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 eastward and southward of Cayo Batata.

Channels.—The principal entrance to Puerto de Humacao is from southward through the buoyed channel westward of **Bajo Parse** and **Bajo Evelyn**; small vessels can enter from northward. The south channel has depths of 24 to 30 feet to Buoy 6 marking Bajo Evelyn, thence 10 feet to the wharf. The north channel has depths of 6 to 10 feet to the wharf.

Anchorages.—Large vessels usually anchor inside the entrance bell buoy, 2.3 miles south of Cayo Santiago, as close inshore as possible and shift offshore as they are loaded.

Ensenada Honda, 10 miles northeastward, is the nearest hurricane anchorage.

Small vessels anchor in depths of 3 to 10 feet in the northeast part of **Puerto de Naguabo,** 2 miles northeastward of Puerto de Humacao. Good anchorage is afforded except with southeasterly or southerly winds.

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 east of Cayo Santiago is marked by a buoy and the shoals at the south entrance are marked by buoys. 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 covered 8 feet is 300 yards southeastward of the outer end of the long pier.

Pilotage.—A local pilot is available.

Towage.—Small towboats of the sugar central are available.

Quarantine, customs, immigration.—Services are handled by representatives from Fajardo.

Harbor regulations.—Local regulations are enforced by a Commonwealth Captain of the Port.

Wharves.—The sugar central 625-foot wharf at Playa de Humacao has depths of 10 to 12 feet at the outer end. It has pipelines for water, fuel oil, and molasses. The 200-foot pier, 250 yards northeastward of the sugar central wharf, is used by small boats with supplies for Cayo Santiago.

Supplies and repairs.—Some groceries are available at Playa de Humacao, but most supplies must be obtained from **Humacao,** 6 miles inland. The principal source of marine hardware is San Juan, 44 miles by highway from Playa de Humacao.

Chart 918.—Puerto Yabucoa, 23.5 miles southwestward of Cabo San Juan Light and 6 miles northeastward of Point Tuna Light, is an open bay with numerous reefs and sunken rocks with depths of less than 5 feet. **Playa de Guayanes** is at the north end of the bay which extends for 2.2 miles from rocky **Punta Guayanes** on the north to **Punta Quebrada Honda** on the south.

An 18-foot entrance channel in the north part of the bay is marked by buoys and an unlighted range bearing 286°, thence a depth of 8 feet can be taken to the unused pipeline trestle formerly used for loading molasses at Playa de Guayanes. The bay is exposed and should be used as an anchorage only with local knowledge.

Chart 924.—Punta Yeguas, 1.2 miles south 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 eastern end of Cuchilla de Panduras.

Punta Toro, the point 1.4 miles west-southwestward of Punta Yeguas, is a spur 500 feet high from **Cuchilla de Panduras,** which is 1 mile northward of the point and has elevations of 1,400 feet.

Punta Tuna Light (17°59.4′ N., 65°53.1′ W.), 110 feet above the water, is shown from a 49-foot white tower on dwelling, near the end of the point. A radiobeacon is at the light; see Appendix for **storm warning displays.** The point projects as a high cliff; a 400-foot hill 0.5 mile northward is prominent.

Arrecife Sargent, 0.5 mile southeastward of Punta Tuna, is 1.8 miles long and 0.3 mile wide at its widest point. Because it breaks the force of the southeast swell, the reef affords some protection from the southeast for ves-

sels 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 eastward of the light, has the appearance of a rowboat and black can buoy. Other parts of the steep-to reef have depths of 6 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 901, 902.—The **south coast** of Puerto Rico from Punta Tuna to Cabo Rojo extends in an almost westerly 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 eastern and western 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 insured 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.

Chart 925.—**Puerto Arroyo,** 11 miles westward of Punta Tuna Light, is an open bay exposed to southerly winds. The harbor is used only by small fishing vessels that anchor near **Arroyo** in the northeastern part of the bay.

Punta Figuras, a projecting point on the east side of Puerto Arroyo, is marked by a light. **Cerro Range,** 3.2 miles north of the light, is a distinct sharp conical hill. The stacks of several sugar centrals are also prominent.

The principal entrance channel is from southwestward; the approach is marked with buoys. 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 eastward marked by buoys in its narrowest part 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 5 to 20 feet to the private pier at Arroyo. The east passage has depths of 20 to 30 feet to the anchorage.

The best anchorage is in 23 to 30 feet a mile west-southwestward of Punta Figuras Light. The prevailing southeast 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. Bahía de Jobos, 10 miles westward, 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 eastern 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. **Arrecife Corona,** 1.4 miles westward of Punta Figuras, has a least depth of 5½ feet. **Arrecife Algarrobo,** 2.3 miles westward 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 southward of **Punta Barrancas,** a point on the west side of Puerto Arroyo 3.8 miles westward of Punta Figuras.

Local harbor regulations for Puerto Arroyo are enforced by a Commonwealth Captain of the Port.

Chart 909.—**Bahía de Jobos,** 20 miles westward of Punta Tuna Light, is a good hurricane anchorage. The harbor is formed by **Punta Pozuelo,** a projecting point on the east side, and many islands on the south and southwesterly sides. The shore and islands are low, and are covered with thick brush and mangroves. **Central Aguirre,** on the northwestern side of the bay, is one of the largest sugar centrals of Puerto Rico. The eastern part of the bay is shoal and is used only by local fishing boats.

Prominent features.—A light on the east end of **Cayos de Ratones** marks the entrance to Bahía de Jobos. The stacks at Central Aguirre, the stack back of **Puerto Jobos,** and the tank at **Salinas** show up well from offshore.

Boundary lines of inland waters.—The lines established for Bahía de Jobos are described in **§ 82.230,** Chapter 2.

Channels.—The principal entrance is from westward between **Cayo Morrillo** and Cayos de Ratones, thence through the buoyed channel to the pier at Central Aguirre; private range lights also mark the dredged cuts. The controlling depth is 28½ feet.

Boca del Infierno, a small-boat entrance into Bahía 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.

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 26 to 35 feet with grassy bottom northeastward of **Cayos de Pájaros.** The anchorage inside the bay is southward 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 southerly winds.

Dangers.—Numerous wooded islands with reefs awash and steep-to surround the south and southwesterly part of Bahía de Jobos up to 1.5 miles from the mainland. There are passages between some of the island groups, but only the principal entrance east of Cayos de Ratones should be used by large vessels and small boats without local knowledge.

Pilotage.—Vessels are boarded by a pilot in a motorboat off Cayos de Ratones.

Quarantine, customs, immigration.—A Public Health Service doctor at Central Aguirre enforces national quarantine laws. Customs and immigration are cleared by representatives from Ponce.

Wharves.—A 1,000-foot pier at Central Aguirre extends south of the main buildings; depths of 29 feet are along each side. Pipelines for water and molasses, a conveyor belt for bulk sugar, and a gantry crane for bulk loading are on the pier.

Supplies and repairs.—Supplies have to be obtained from inland towns; San Juan is 67 miles by highway. Some emergency repairs can be made by the machine shop at Central Aguirre.

Small-boat facilities.—A private yacht club is 0.3 mile northeastward of the pier at Central Aguirre. A depth of 4 feet can be taken to the pier where water and gasoline are available.

Bahía de Rincon, 26 miles westward of Punta Tuna Light, is a 5-mile wide bay used only by local fishing boats that anchor near **Playa Salinas** in the northeastern part. There is a good anchorage in depths of 25 to 28 feet in the eastern part of the bay during ordinary weather. The bay shoals to 18 feet and less within a mile of the shore in some places.

Arrecife Media Luna and **Arrecife Alfenique** obstruct the entrance to Bahía de Rincon from southward. The reefs are partly bare or awash, steep-to, and the sea breaks on them. The western 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 southern sides. Foul ground with depths of 3 to 8 feet extends northward to **Punta Petrona,** the western point of the bay.

Depths of 23 to 28 feet can be taken to anchorage in Bahía de Rincon on either side of Arrecife Media Luna; avoid the 11-foot shoal 0.4 mile westward of Cayos de Ratones. Small vessels with local knowledge also use the narrow channel north of Cayos de Ratones.

Chart 926.—The 15-mile indentation in the coast between Bahía de Rincon and Bahía Ponce is obstructed by islands and shoals up to 5 miles offshore. The only landmarks are the stacks of several sugar mills. 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 westward of Punta Tuna Light, is a small settlement near the beach where water and gasoline can be obtained. A depth of 4 feet can be taken to the landing. Groceries and some other supplies are available at **Santa Isabel,** 0.7 mile inland.

Cayo Berberia, 33 miles westward of Punta Tuna Light, is 3 miles offshore and is surrounded by a reef and shoals. The fringing reef, on which the sea breaks on the southern and eastern sides, extends up to 0.4 mile from the island. A shoal with depths of 2 to 12 feet extends for 0.2 mile north of the island and over a mile westward of it.

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 southwest end is low except for a 170-foot steep hill at the extreme southwest end. Landings can be made on the western side of the island during ordinary weather. **Isla Morrillito** is a small 31-foot flat-topped island 200 yards off the southwest 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 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 is 0.4 mile off the eastern shore. A bar with a least depth of 15 feet extends northeastward from Isla Caja de Muertos gradually curving eastward and joins the shoal area westward of Cayo Berberia. The sea rarely breaks on the bar; it is dangerous to approach.

A passage northward 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.

Cayos Frios (Chart 927), 4.3 miles north-northwestward of Isla Caja de Muertos and 0.5 mile offshore, are surrounded by a 0.4-mile long reef that is steep-to on the southern edge.

Chart 927.—Bahía de Ponce, 43 miles westward of Punta Tuna Light and 32 miles eastward of Cabo Rojo Light, is the most important commercial harbor on the south coast and one of the three leading ports of Puerto Rico. The harbor is protected from the prevailing easterly trade winds by Punta Penoncillo and Cayo Gata with their surrounding reefs, but it is exposed to the southward causing a swell at times in the anchorage. The port facilities are in the eastern part of the 3.5-mile wide bay which is surrounded by shoals and reefs; the north 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.—Isla Caja de Muertos, with the light on its summit, is the most prominent feature in the approach. The stacks of the cement factory west of Ponce, the hotel on the hill back of Ponce, and the radio towers and stacks surrounding the bay can be seen from well offshore.

Cayo Cardona, in about the middle of the entrance to Bahía de Ponce, is marked by a light shown from a white tower near the middle of the island.

Cayo Gata and several islets extend 0.3 mile westward of **Punta Carenero,** 0.3 mile southeastward of the municipal pier on **Punta Penoncillo.**

Boundary lines of inland waters.—The lines established for Bahía de Ponce are described in § **82.225,** Chapter 2.

Channels.—The principal entrance channel is eastward of Cayo Cardona where the controlling depth is 30 feet to the municipal pier and bulkhead. The channel is marked by a lighted range and buoys; do not confuse the rear range light with the flashing red radio tower lights back of it. A 0.2-mile wide channel between Cayo Cardona and Arrecife Cayito is sometimes used by small vessels with local knowledge.

Anchorages.—The usual anchorage is northeastward of Cayo Cardona in depths of 30 to 50 feet, although vessels can anchor in 30 to 40 feet northwestward of Arrecife Cayito. A small-craft anchorage is northeastward of Arrecife Cayito in depths of 18 to 28 feet; limits and regulations are given in § **202.255**, Chapter 2. A well-protected anchorage for small boats in depths of 16 to 30 feet is northeastward of the yacht club on Cayo Gata. A comfortable anchorage with little swell during ordinary weather in depths of 18 to 30 feet can be found in **Caleta de Cabullón,** the bight eastward of Cayo Gata.

Bahía de Ponce is not safe as a hurricane anchorage because it is exposed to the southward. The nearest hurricane anchorages are at Bahía de Jobos, 28 miles eastward, Bahía de Guayanilla, 8 miles westward, and Bahía de Guanica, 16 miles westward.

Dangers.—**Bajo Tasmanian,** an extensive bank on the eastern 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 westward of the bell buoy to clear the western limit of the bank.

The bank on the western side of the entrance extends almost to Cayo 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 southwestward of the island.

Bajo Cayo Cardona extends 600 yards east-southeastward from Cayo Cardona with depths of 12 to 17 feet. A bare reef on which the sea breaks extends 300 yards northeastward 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 westward and southwestward from Cayo Gata. The sea always breaks on the outer side of this reef.

Other unmarked shoals and reefs are dangerous in approaching Bahía de Ponce through any of the inshore passages. A reef with three islets extends 0.4 mile from shore to Punta Cabullón, 2.5 miles east of Cayo Cardona. The reef is steep-to and the sea breaks on the southern side. **Roca Ahogado,** a bare rock in the middle of Caleta de Cabullón, has shoal water of 4 to 18 feet extending up to 0.2 mile from it.

Arrecife Cayito, northwestward of Cayo Cardona, is 0.8 mile long in a northeasterly direction with a small patch awash near the southwest end. The reef has depths of 4 to 11 feet and is steep-to eastward and northeastward of this patch.

Escollo Hojas, 0.8 mile westward of Cayo Cardona, is about 0.3 mile in diameter and awash at it shoalest point.

Cayo Ratones, on the western side of the entrance to Bahía de Ponce and a mile offshore, is a low island with a reef that bares at low water extending a mile east-southeastward of it. **Cayo Arenas,** 0.5 mile northeastward of Cayo 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.

Storm warning displays are made from the customhouse at Playa de Ponce and the yacht club; see Appendix.

Routes.—From eastward: When 3 miles south of Isla Caja de Muertos Light steer **303°** for 8 miles until Cayo Cardona Light bears 005°, distant 2.5 miles, then head in on the lighted range bearing **015°**. From westward: When 5 miles south of Guánica Light steer **079°** for 15.4 miles to the position off the entrance of Bahía de Ponce.

Pilotage.—Vessels usually are boarded by a pilot in a motorboat at the entrance buoys.

Towage.—Vessels enter and clear the harbor under their own power. No towboats or launches are available for towing.

Quarantine.—Vessels subject to visitation are boarded at the dock. The Public Health Service has an outpatient office at Ponce; see Appendix.

Customs and immigration.—Ponce is a port of entry and marine documents are issued. The customhouse is located 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 Bahía de Ponce.

Wharves.—The municipal dock on Punta Penoncillo is administered by a board with a dock superintendent in charge. The facilities include: A finger pier 450 feet long and 125 feet wide with covered shed and a depth of 30 feet along both sides; pipelines for water, molasses, and bulk cement are on the pier. A 1,900-foot bulkhead wharf, on the northern side of Punta Penoncillo, has a depth of 30 feet alongside with a 30-foot maneuvering basin extending 250 yards northward of it; the northerly limit of the basin is marked by buoys and the red sector of the anchorage light on shore. Pipelines for water and diesel oil are on the bulkhead; transit sheds are along the wharf. A 25-ton mobile crane is available.

Supplies.—Most supplies are available at Ponce. If necessary, supplies can be brought in from San Juan by truck in a few hours. Water and diesel oil are available at the municipal dock; gasoline can be trucked in.

Repairs.—The Porto Rico Iron Works can do repairs to ships above the waterline. There is no drydock or large marine railway at the port.

Small-boat facilities.—A yacht club pier, 300 yards eastward of the municipal dock, has water and gasoline; the controlling depth to the landing is 10 feet.

A yacht club with docking facilities is on the north side of Cayo Gata. A depth of 10 feet can be taken to the landing where water and gasoline are available. The club has a small marine railway.

Charts 902, 928.—**Bahía de Tallaboa,** 27 miles eastward of Cabo Rojo Light, is an open bay somewhat protected by islands and surrounding reefs. Large vessels call here to load bulk ethylene glycol and other products of Union Carbide, Inc.

A channel marked by private buoys and a lighted range bearing **358°** leads into the bay between **Cayo Caribe** on the east and **Cayo María Langa** and **Cayo Palomas** on the west. Depths of 32 feet or more can be taken to the

loading platform and dolphins 150 yards southwestward of Cayo Río. Shoals and reefs with depths of 10 feet and less extend from the islands nearly to the buoyed channel.

Chart 928.—Bahía de Guayanilla, 25 miles eastward of Cabo Rojo Light, is the largest hurricane harbor and one of the best in Puerto Rico. The reefs and islands to the southeastward break the sea but not the wind; some dragging can be expected. The harbor, between low and wooded **Punta Guayanilla** on the east and bluff faced **Punta Verraco** on the west, is protected at its entrance by extensive reefs which extend a mile or more offshore. Large vessels call here to deliver crude oil and load petroleum products.

Prominent features.—The two processing towers with red lights on top of the Commonwealth Oil Refining Company, 1.6 miles northeastward of Punta Guayanilla, are the most prominent features in the approach. The tanks on Punta Pepillo and the two black stacks south of **Guayanilla** are conspicuous.

Cerro Toro, on the southwestern side of Punta Verraco, has a 100-foot hill with a bluff head at its western end and a gentle slope northeastward to the low part of Punta Verraco. There is a bright yellow spot in the bluffs on the southeast side. A low break separates the hill from **Punta Ventana,** 0.4 mile to the southwestward. The hill and point usually show well.

Boundary lines of inland waters.—The lines established for Bahía de Guayanilla are described in **§ 82.220,** Chapter 2.

Channels.—The entrance channel marked by buoys is between the shoals extending 0.4 mile from Cayo María Langa on the east and the shoals extending 1.4 miles from Punta Verraco on the west. The controlling depth is 36½ feet to the Commonwealth Oil Refining Company dock, thence 31 feet to the dock off Punta Pepillo. A depth of 7 feet can be taken to the pier at **Playa de Guayanilla** in the north end of the bay.

Anchorages.—The usual anchorage is 0.5 to a mile northeastward 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 near the piers in the north end of the bay.

Dangers.—Cayo María Langa is surrounded by reefs on which the sea breaks. The 30-foot curve is 0.3 mile southward and about 0.6 mile east-southeastward from the island, descending abruptly to great depths.

Arrecife Fanduco, the southwest end of the shoal that extends 0.6 mile southward of Punta Guayanilla and 0.4 mile westward of Cayo María 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 south-southwestward from **Punta Gotay,** the western end of Punta Guayanilla.

Arrecife Guayanilla and **Arrecife Unitas,** on the west side of the entrance to Bahía de Guayanilla, form the south and southeastern 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 south side, and the slope is abrupt to great depths.

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 32 feet.

Routes.—Vessels approaching in the daytime from east or west can follow the coast at a distance of 2.5 miles until the entrance to Bahía 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.—Vessels usually are boarded by a pilot in a motorboat a mile outside the entrance buoy for Bahía de Guayanilla and Bahía de Tallaboa.

Towage.—A small tug is available if necessary for Bahía de Guayanilla and Bahía de Tallaboa.

Quarantine, customs, immigration.—Services are handled by representatives from Ponce who board vessels at dock or anchorage for both Bahía de Guayanilla and Bahía de Tallaboa.

Harbor regulations.—Local regulations are enforced by a Commonwealth Captain of the Port whose office is at Playa de Guayanilla.

Wharves.—The Commonwealth Oil Refining Company dock at the end of a causeway, 0.4 mile southwestward of Punta Pepillo, has two 680-foot berths with a least depth of 36½ feet alongside. Mooring buoys are available to assist in clearing the dock and mooring dolphins. There are pipelines on the dock for water and petroleum products.

An oil company distributing plant 525-foot dock off Punta Pepillo has a depth of 31 feet at the end; depths of 12 to 18 feet are alongside the dock. Mooring buoys are available to assist in clearing the dock and mooring dolphins. Coasting vessels call here to distribute the petroleum products.

The westerly of two piers at Playa de Guayanilla in the north end of the bay is 300 feet long and has 7 feet at the outer end; the easterly pier is in ruins.

Supplies.—Water, bunker C, diesel fuel, and other petroleum products are available in quantity at the Commonwealth Oil Refining Company dock. Groceries and marine hardware can be obtained from Ponce, 12 miles by highway from Bahía de Guayanilla.

Repairs.—No repair facilities are available. Above the waterline repairs can be made at Ponce.

Chart 929.—Bahía de Guánica, 16 miles eastward 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 east and west sides. Large vessels call here to load fertilizer, sugar, and molasses.

Prominent features.—Guánica 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 east side of the entrance to Bahía de Guánica. An abandoned lighthouse tower just southeasterly of the light is prominent in the daytime.

Boundary lines of inland waters.—The line established for Bahía de Guánica is described in § **82.215**, Chapter 2.

Channels.—The buoyed entrance channel is between Bajo La Laja on the east and **Punta Brea** on the west, thence through a dredged channel marked by a lighted range, thence a continuation of a buoyed dredged channel in a northwesterly direction to the sugar mill at the west end of the bay. The controlling depth is 30 feet. A depth of 28 feet can be taken to the fertilizer plant 0.5 mile north of Guánica Light.

Anchorages.—The usual anchorage is 0.6 mile eastward of the sugar mill dock in depths of 20 to 30 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 Guánica.

Dangers.—**Cayos de Caña Gorda,** 2 miles eastward of the entrance to Bahía de Guánica, extend 0.8 mile southwestward from **Punta Criollo.** 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 eastward of the entrance, is an extensive coral reef partly bare at low water. The west end of the reef is nearly a mile southeastward from Guánica Light. Foul ground is between it, the north shore, and Cayos de Caña Gorda.

Bajo La Laja, 0.9 mile southward of Guánica 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 westward of the shoal almost to the buoyed channel.

On the western side of the entrance, a shoal with an 11-foot spot extends 0.2 mile southeastward of Punta Brea. A series of ridges with depths of 28 to 30 feet are 0.6 mile southward of the point and extend eastward to an extensive shoal on the eastern side of the approach. This shoal is 1 to 2 miles offshore and has depths of 20 to 24 feet on its northern part and 28 to 30 feet on its southern part.

A detached shoal, 0.6 mile northeastward of Punta Brea, has depths of 20 to 29 feet near the west side of the entrance channel. Other spots with depths of 26 to 28 feet are near the limits of the channel leading into the bay.

Ensenada las Pardas, an open bay north 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 south of Guánica Light, head towards the entrance lighted buoy, passing 50 yards west of it to avoid the shoal with a least depth of 20 feet on the west side of the channel and the 28-foot spots on the east side of the channel. When about 50 yards off Buoy 3, steady on the entrance range bearing **354½°** into the harbor.

Pilotage.—Vessels usually are boarded by a pilot in a motorboat 0.5 mile outside the entrance buoy. A tug from Bahía de Guayanilla is available if necessary.

Quarantine, customs, immigration.—A representative of the Public Health Service enforces the national quarantine laws; vessels subject to visitation are boarded at the dock. Customs and immigration services are handled by inspectors from Ponce.

Harbor regulations.—Local regulations are enforced by a Commonwealth Captain of the Port whose office is near Playa de Guánica.

Wharves.—A 440-foot fertilizer bulkhead wharf and conveyor, 0.5 mile northward of Guánica Light, has 28 feet alongside. The conveyor pier, 0.2 mile northward, has 28 feet alongside the mooring dolphins.

The sugar mill docks on **Punta Pera** at the west end of the bay have 30 feet alongside. Vessels go alongside the two small sugar docks on the south side of the point for loading; there are pipeline connections for water, fuel oil, and molasses, and a conveyor for bulk sugar. The Dominican Dock, extending off the east end of the point, is equipped for handling sugarcane.

Supplies.—Water is available at the sugar mill dock. Groceries and some marine hardware can be obtained at **Ensenada** and **Guánica.**

Repairs.—Some emergency repairs can be made by the machine shop of the sugar central at Ensenada.

Chart 901.—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 northwest of Punta Jorobado, and **Cerro Mariquita,** 6 miles northeastward of Cabo Rojo.

Punta Jorobado, 2 miles westward of Punta Brea, is a small projecting point with a hummock 92 feet high. **Arrecife Baul** is a reef lying 0.7 mile southeast of the point. **Cayo Terremoto,** a mile westward of Punta Jorobado, is a sandy islet 300 yards wide surronded by reefs. **Bahía Montalva,** the bay about 2.8 miles northwest 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. **Cayo Corral,** an islet 3.6 miles west of Punta Jorobado, is small and sandy, with shoals of 16 to 21 feet deep extending southeastward and southwestward.

At **Parguera,** 8.5 miles eastward 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. Water and electricity are at the berthing piers; gasoline, some groceries and a small marine railway are available.

Arrecife Margarita, 9 miles west of Punta Jorobado, is 1.5 miles south of **Punta Tocon,** and its western end is about 2 miles southeast of Cabo Rojo. Rocks awash and depths up to 28 feet are on this reef which extends nearly 4.5 miles in an east-west direction.

Cabo Rojo, the southwest point of Puerto Rico, is a low neck 1.5 miles long, at the southern end of which are two hills with yellow bluff faces. The eastern hill is 118 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 tower on dwelling on the 75-foot high western hill. **Storm warning displays** are made; see Appendix.

The **west coast** of Puerto Rico extends 26 miles northward from Cabo Rojo to Punta Higuero and then 11 miles northeastward 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 southern part the land is low near the shore with prominent high hills in the interior. Between Cabo Rojo and Bahía de Mayagüez reefs with depths of 30 feet or less extend up to 13 miles offshore; lighted buoys mark the extension of the shoal area. North of Bahía de Mayagüez 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 Bahía de Mayagüez.

Punta Aguila, 1.7 miles northwest 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 westward from the point. Water and gasoline are available at a fishing village a mile north 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 western edge, which is fairly steep-to; a buoy marks the western limit. A shoal with 22 to 28 feet extends westward from the southern part of Bajo Casabe, its western end lying about 2.7 miles west-northwestward from Punta Aguila.

Chart 932.—Bahía de Boqueron, 6 miles northward 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 Guánica. 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, north and south of **Bajo Enmedio,** the latter a shoal with depths of 5 to 17 feet which lies across the middle of the bay. A buoy marks its southern edge.

Punta Melones, the southerly point, is a bluff at the water's edge, backed by a 230-foot hill. Punta Guaniquilla, the northerly 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 north-and-south direction near the middle of the bay between Bajos Roman and Ramito. The depths east of the ridge decrease gradually from 26 to 12 feet.

Canal Norte is the channel leading into the bay between Punta Guaniquilla and the north end of Bajo Enmedio. It has 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 south 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 Bahía de Boqueron, except on the shoals where the bottom is hard.

Bajo Palo is a shoal that extends nearly 0.7 mile northward from the south shore of the bay, between 0.4 and 0.8 mile northeastward of Punta Melones. A depth of 5 feet is 0.3 mile from shore, and north of this the water deepens gradually from 8 to 13 feet at its north end. The west 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 south side of the bay, and 1.7 miles northeastward from Punta Melones. It is marked by a buoy. **Roca Velasquez,** a rock which should be avoided by all vessels, lies nearly 0.2 mile westward 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 north shore and 1 mile southeasterly from Punta Guaniquilla.

Boqueron, a small fishing settlement on the north side at the head of the bay, is principally a bathing resort for Mayagüez. Water and some groceries are available; gasoline can be trucked in.

Chart 901.—Canal Guanajibo, a buoyed passage inside the reefs between Punta Aguilla and Bahía de Mayagüez, has a least depth of 18 feet at its northern end on the ridge extending northeastward from Escollo Negro. The least depth at the southern end of the channel is 23 to 24 feet on a bank making westward from Bajo Casabe. The current velocity is about 1 knot and sets northward and southward in the channel.

Bajos Resuello, the shoals off the entrance to Bahía de Boqueron, consist of three shoals separated by channels having depths of 24 to 36 feet; the southern extremity of the shoals is westward 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 northwest shoal, 1.3 miles long, is 4.5 miles westward from Punta Guaniquilla; it has a least depth of 12 feet at its north end. The southeast shoal is 1 mile long and has depths on the coral heads of 16 to 18 feet.

Punta Carenero, the north 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 south point of Puerto Real, is low and covered with coconut trees which extend southward to **Punta Boca Prieta.** A good anchorage in 36 feet is 0.5 mile westward of Punta La Mela.

Cerro Buena Vista, an 850-foot hill 4 miles eastward of Puerto Real, is a prominent and useful landmark for many miles, especially from westward. From that direction it shows a knob at the summit, with a steep convex slope on its north side.

Puerto Real, 8 miles northward of Cabo Rojo, is a circular basin 0.7 mile in diameter used by local fishing vessels. Depths in the basin are 10 to 15 feet, except for a

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6-foot spot in the entrance and shoal water toward the eastern end. **Puerto Real,** a small fishing community, is on the north shore of the basin. Water and some groceries are available; gasoline can be trucked in from **Cabo Rojo,** 2.5 miles inland. A small marine railway can haul out boats for minor repairs.

Escollo Media Luna, a rocky patch with a least depth of 25 feet, is 12 miles northwestward 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 south end of which is 3.2 miles northwest of Punta Guaniquilla. The shoal extends 1 mile northward and 2.5 miles east-northeastward toward Punta Ostiones and, together with the shoals extending off that point, forms a ridge across Canal Guanajibo. The depths are 9 to 15 feet on the shoalest section of this ridge 3 miles west-southwestward from Punta Ostiones, and depths of 13 to 17 feet are along the center portion of the ridge.

Escollo Negro is the northern shoal on the west side of Canal Guanajibo. It is about 2.2 miles long in a northeasterly 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 Guanajibo.

Arrecife Tourmaline extends 5 miles westward from Escollo Negro, with a width of 2.7 miles, its northwest end lying 9.2 miles westward from Punta Guanajibo. On the western and southern parts of the reef are depths of 30 to 42 feet, decreasing to 18 and 24 feet on its northeast part. A 30-foot spot off the northwestern end of the reef is marked by a lighted buoy.

Punta Ostiones, 9.5 miles northward of Cabo Rojo and 1.3 miles northward of the entrance to Puerto Real, is projecting and prominent, especially as seen from southward. **Cayo Fanduca,** 0.8 mile southwestward from Punta Ostiones and about 0.5 mile from shore, consists of a few bare rocks which seldom show water. A narrow channel between it and the shore has a depth of about 7 feet, but it should not be attempted by strangers.

Chart 931.—Bahía de Mayagüez, about halfway along the 34-mile stretch of the west 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 north 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 northern part of the bay, but the southern part is shoal.

Mayagüez, the largest city on the west coast of Puerto Rico, is a mile southward 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 northward of Cabo Rojo Light, is a 165-foot flat-topped ridge on the south side of Bahía de Mayagüez. A reform school on the point shows well from southward.

Cerro Anterior, a 433-foot saddle-shaped hill 1.5 miles inshore at Mayagüez, is conspicuous, and **Pico Montuoso,** a dome-shaped peak 9 miles eastward of the bay is readily identified from westward.

The city hall clock tower and a church are conspicuous above the other buildings at Mayagüez. A fixed white light with a red sector is on top of a transit shed at the shipping terminal, but at night the white sector is difficult to identify from offshore because of background lights. Several radio towers are located near the southern shore of the bay and a stack and tanks are back of the shipping terminal.

Boundary lines of inland waters.—The lines established for Bahía de Mayagüez are described in **§ 82.210,** Chapter 2.

Channels.—The principal entrance channel is between the lighted buoys marking Manches Grandes and Manchas Interiores; the controlling depth is 30 feet to the shipping terminal. The entrance is marked by a lighted range and the approach to the terminal is marked by buoys and the white-red sector of the light on the transit shed.

A secondary channel with depths of 18 feet or more leads into the bay from northward inside of Manchas Exteriores and Manchas Interiores and west of Arrecife Algarrobo.

Anchorages.—The usual anchorage is southwestward of the shipping terminal in depths of 30 to 50 feet; the holding ground is good. The nearest hurricane anchorage is on the south coast at Bahía de Guánica, a distance of 60 miles.

Small fishing boats anchor in depths of 3 to 12 feet along the shore southward of the shipping terminal. Pleasure craft anchor in depths of 7 to 12 feet along the shore 1.2 miles southward of the terminal. Some small boats use Puerto Real, 10 miles southward of Bahía de Mayagüez, as a hurricane anchorage.

Dangers.—Escollo Rodriguez, a bank with depths of 3 to 18 feet extending northward for 2.5 miles from Punta Guanajibo, has a reef at the western end which is awash and always breaks. **Roca Blanco,** 0.7 mile northeastward of the reef, has 9 feet over it with deep water close-to.

Manches Grandes, on the south side of the principal entrance, has depths of 12 to 20 feet and extends southward to Escollo Rodriguez.

Manchas Interiores and **Manchas Exteriores** with depths of 12 to 18 feet extend in a northwestern direction for 2 miles on the north side of the principal entrance. The western side of the shoals are steep-to, but broken ground on the eastern side extends to within a mile of the shore; some spots have depths of 18 feet.

Arrecife Algarrobo, a mile northwestward of the terminal, has a few heads which show at low water; the sea frequently breaks on the reef.

Bajo Mondongo, 500 yards southwestward of the terminal, is a small shoal partly awash. A sunken wharf is off **Punta Algarrobito,** 0.4 mile southward of the terminal.

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 northward

and southward across the entrance to Bahía de Mayagüez.

Storm warning displays are shown from the customhouse at Mayagüez; see Appendix.

Routes.—From southward: When abeam of Arrecife Tourmaline lighted buoy 8, steer **060°** for about 8 miles then head in on the lighted range bearing **109°** and anchor according to draft. If proceeding to the shipping terminal, leave the range when Manches Grande lighted buoy 2 bears about 252° and steer **088°** on the white-red sector of the terminal light.

From northward: When Punta Higuero Light bears 120°, distant 2.3 miles, steer **153°** for about 10.1 miles and enter on the lighted range.

Pilotage.—Vessels usually are boarded by a pilot in a motorboat a mile outside the entrance buoys.

Quarantine.—A representative of the quarantine service enforces the national laws. The nearest Public Health Service facilities are at Ponce and San Juan.

Customs and immigration.—Mayagüez is a port of entry and marine documents are issued. The customhouse is located in Mayagüez near the range rear light. The deputy collector of customs and his inspectors act as immigration officers.

Harbor regulations.—A Commonwealth Captain of the Port with an office near the customhouse enforces the local rules and regulations for Bahía de Mayagüez.

Wharves.—The Port Authority Terminal, located in the northern part of the bay, is administered by a public service corporation with a manager at the terminal. It is the only place in Bahía de Mayagüez where vessels can dock.

The 2,500-foot bulkhead wharf has a depth of 30 feet alongside. There is a 20-foot apron at the southeastern end of the bulkhead in front of the transit shed and pipelines for water, fuel oil, and molasses. Tractors, trailers, finger-lift tows, and conveyor belts are available for handling cargo. There are storage tanks for molasses and fuel oil close to the terminal.

Supplies.—Most supplies are available at Mayagüez. 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 Mayagüez can do repairs to vessels above the waterline.

Small-boat facilities.—A small-boat pier with 10 feet at the end is 1.2 miles southeastward of the shipping terminal. Water, gasoline, and electricity are available; diesel fuel can be trucked in.

Chart 901.—Bahía de Añasco, 4.5 miles northwestward of Bahía de Mayagüez, is somewhat foul in the northern 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 eastward, 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.

Mona Passage and the west coast of Puerto Rico northward of Punta Higuero have been described previously in this chapter.

14. VIRGIN ISLANDS

The United States Virgin Islands, separated from the easternmost island of the Puerto Rico group by 8-mile-wide Virgin Passage, include the islands of St. Thomas, St. John, and St. Croix and about 40 small islets or keys. The islands were purchased from Denmark in 1917, and United States citizenship was 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 appointed by the President of the United States. The capital is Charlotte Amalie, on the island of St. Thomas.

The **British Virgin Islands** are north and east of the United States group. The United States-Great Britain boundary extends southeastward between Hans Lollik and Little Tobago Islands, thence through the narrows between St. John and Tortola Islands, and thence southward through Flanagan Passage between Flanagan and Norman Islands.

Prominent features.—Making the Virgin Islands from the north, 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 northward but rises to an elevation of about 1,800 feet. Immediately westward 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 northward 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 south.

Boundary lines of inland waters.—Specific lines are described in **Part 82,** Chapter 2.

Control over movement of vessels.—See **Part 124,** Chapter 2, for regulations requiring advance notice of vessel's time of arrival to Captain of the Port.

Routes.—From Charlotte Amalie to Straits of Florida, proceed through Virgin Passage and thence as direct as safe navigation permits along the north coasts of Puerto Rico and Hispaniola, and then along the north 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 westward 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 tide 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 southeastward and northwestward. 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 northwestward to westward.

WEATHER.—The Appendix lists storm warning displays and radio stations that transmit weather information. Also included is a climatological table for St. Croix Island. The following description of general weather conditions in the Virgin Islands was prepared by the Office of Climatology, U.S. Weather Bureau.

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 easterly direction, or between north-northeast and south-southeast. 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 4 p.m. 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 easterly waves which may reach the area in these or other months. See Chapter 3 for information about hurricanes.

Pilotage.—Vessels of and above 100 gross register tons

must engage or pay for the services of an Insular Government pilot in order to enter, leave, or shift berth in a U.S. Virgin Islands port. Vessels of less tonnage and vessels of the United States or foreign governments are exempt from pilotage unless a pilot is actually employed. Pilots will take vessels in or out day or night.

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. An outpatient clinic is at Charlotte Amalie, St. Thomas Island.

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 from 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.

Immigration.—The United States immigration laws apply in the U.S. Virgin Islands. Passports and visas are required.

Wharves.—Charlotte Amalie, St. Thomas Island, and Frederiksted, St. Croix Island, have wharves where large vessels can go alongside to load and unload cargo. Vessels drawing less than 13 feet can go alongside the wharf at Christiansted, St. Croix Island. At other places only small boats go alongside the wharves.

Supplies.—Fuel oil, limited quantities of water, groceries, and marine hardware are available at Charlotte Amalie. Limited supplies can be obtained at Christiansted and Frederiksted. Some supplies for small boats are available at other places.

Repairs.—There are no facilities at any of the ports for major repairs. Machine shops at Charlotte Amalie, Christiansted, and Frederiksted can make minor 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, Christiansted, and Frederiksted. Small interisland vessels operate from U.S. Virgin Island ports to the British Virgin Islands, Puerto Rico, and other West Indies ports.

Telephone and cable services are available on the islands of St. Thomas, St. John, and St. Croix. Radio communications, including ships at sea, are available through commercial systems.

Currency.—The monetary unit is the United States dollar.

Standard time.—The United States Virgin Islands use Atlantic standard time, which is 4 hours slow of Greenwich mean time.

Chart 920.—Most of the Virgin Islands are situated on the southern side of **Virgin Bank** which extends in an east and east-northeasterly direction for 86 miles from the eastern end of Puerto Rico. For about 50 miles the bank trends eastward, averaging 25 miles in width, and then swings slightly east-northeastward, increasing in width to 32 miles. It terminates close beyond the southeastern 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 northern side of the island group, westward 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. Eastward of this line, the depths gradually decrease until soundings of 6 fathoms are found about 0.8 mile off the western end of Anegada Island. On the southerly side of the island group, the depths differ considerably from those on the northern side. The southerly 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 northward of Tortola Island and 15 miles westward of Anegada Island, are two patches with depths of 12 to 20 fathoms on the northern bank and a least depth of 10 fathoms on the southern bank. **Turtle Head,** a coral reef covered 6 fathoms, is about 10 miles northward of Jost Van Dyke Island and 13 miles northwestward of Tortola Island. **Barracouta Banks,** about 8 miles northwestward of Jost Van Dyke, consist of several patches covered by 11 to 20 fathoms. **Kingfish Banks,** about 5 miles north-northeastward of Jost Van Dyke Island, are 2 coral patches with 8 fathoms over them.

Chart 904.—Virgin Passage is 8 miles wide between Savana Island and Isla Culebrita, with depths of from 11 to 17 fathoms in the southern part and up to 27 fathoms in the northern part. It is clear except for Bajo Grampus on the southwestern side and Sail Rock on the southeastern side.

Tidal currents.—In the middle of the passage the current velocity is about 0.5 knot and sets southward and northward. On the eastern side of the passage near Savana Island the velocity increases to about 2 knots.

Chart 905.—Sail Rock, on the easterly side of Virgin Passage about 7.6 miles east-southeastward of Isla Culebrita, 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 westward of the islet. A light, 125 feet above the water, is shown from the summit on a gray stone foundation.

St. Thomas Island, commercially the most important of the U.S. Virgin Islands, is 34 miles east of Puerto Rico. It is 12 miles long and from 1 to 3 miles in width. 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 westward, is 1,550 feet high. Lights are shown from towers on the summit of each.

The western half of St. Thomas presents the appearance of a steep ridge sloping precipitously to the north and the south, 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, while the lower ones are for the most part dome shaped. The country is almost entirely wooded, the region west of Perseverance Bay presenting a forestlike appearance of a thick growth of trees, shrubs, and vines.

The eastern end of St. Thomas has the appearance of two main ridges, separated by a large basin, which slope to the northward and southward 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 west-southwestward from the western end of St. Thomas, is nearly a mile in length and 0.5 mile in width. The island is covered with a dense growth of vines, small trees, and underbrush. The entire northwest 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 northwest extremity of the island. The southeastern 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 east side of the island. Just north of **Virgin Point,** the southwestern extremity of the island, the cliffs are of a crushed rock and sandstone formation and from offshore appear as red cliffs. Detached rocks extend 200 yards southward of Virgin Point. **Domkirk Rock,** a crag with twin steeple-shaped pinnacles which resemble a cathedral, is 100 yards southeast 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 northeastern point.

The currents in the vicinity of the northeastern 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 southeastward 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 west end of the island of St. Thomas by a sandspit. A 50-foot hill is near the northeast point and a 21-foot bluff is at the southern 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 southwest point of Little St. Thomas. Small boats stay in the small gravel cove south 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 northward.

Big Current Hole is a passage separating West Cay from Little St. Thomas. There are rocks awash extending easterly from West Cay; the outer one, **Drum Rock,** 2 feet high, constricts the channel, and strong currents and heavy tide rips render the passage difficult. Small boats using this passage, when passing through from southward, head for Drum Rock and leave it close-to on the port hand.

West Cay, 0.2 mile northwestward 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 eastern side of the cay is gravel. Landing may be made in the bight on the southern side.

Salt Cay, 242 feet high and 0.6 mile northwestward of Little St. Thomas, is generally rocky and rugged, particularly on the north coast where cliffs rise precipitously to 100 and 150 feet high. Many rocks awash are close-to on the southwest, west, and east 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 northwestward of Salt Cay, rises abruptly from the sea to 278 feet high, with cliffs 100 feet high on the north shore.

Cockroach Island, 3.3 miles north-northwestward 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 north 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 east-northeastward from Cockroach Island, is 46 feet high, bold, and steep-to, with sharp pinnacle rocks on top.

Dutchcap Passage, just southward 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 southward of Savana Island, so as to avoid the strength of the inshore current.

The **north 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 eastern half of the island are open to the prevailing easterly 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 west end of St. Thomas Island. Small-boat landings can be made during calm weather.

Santa Maria Bay, 2.5 miles eastward 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 northern side of St. Thomas about 4 miles from the western end. A 22-foot channel is between St. Thomas and Inner Brass Island, and **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 eastern side. There are detached rocks and rocks awash within that area. Northwestward of the southern tip is a fine sand beach with a fringing coral reef. There are several breaks in the reef through which small-boat landings can be made. A well-sheltered anchorage for local boats is off the southwestern side of the island.

The eastern shore of Outer Brass Island is bold and precipitous with rocky cliffs rising vertically from the water. The western shore is rocky and slopes up uniformly. **Cave Cove,** in about the middle of the western shore, has a large cave opening into it. The northern extremity of the island is sharp and jagged. A 15-foot spot lies 330 yards west of northern point.

Landings may be made on St. Thomas Island through breaks in the fringing coral reef in **Caret Bay** and **Neltjeberg Bay** southwestward and southward of Inner Brass Island. **Hull Bay,** southeastward 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 westward of Inner Brass Island, are a group of bare rocks and rocks awash. **Ornen Rock,** with 6 feet over it, is a mile eastward of Inner Brass Island.

Magens Bay is the only important bight on the north shore of St. Thomas. It is 1.6 miles in length and 0.6 mile wide. Its eastern side is formed by a long, narrow tongue of land, which terminates to the northwestward at **Picara Point,** nearly midway between Hans Lollik and the Brass Islands. However, it is open to the northwestward, and consequently exposed to the rollers. It is safe only for small vessels. In entering care must be taken to avoid Ornen Rock.

The depth in Magens Bay varies from 5 to 12 fathoms, but in the southern portion there is 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 west 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 northeastward of Picara Point. The western side of the island is precipitous and rocky, except in a bay on the west side which has a gravel beach. **Camp Bay,** on the southeast face, is protected by outlying reefs, through which small boats make the beach. **Hansa Rock,** close inshore at the south point, is 19 feet high. **Hans Lollik Rock,** awash and on which the sea always breaks, is over 0.3 mile east-southeastward of the southern point of Hans Lollik Island.

Little Hans Lollik Island is 0.2 mile northward 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 eastern shore of the island, is 25 feet high.

Pelican Cay, 200 yards northward of Little Hans Lollik Island, is a 20-foot grassy islet. Between the two are several rocks awash, and a reef over which the sea breaks is close northeastward of Little Hans Lollik Island. With the exception of these dangers, the channels on either side of the Hans Lollik group are clear.

Chart 938.—Mandal Bay, 3 miles eastward of Picara Point, is shoal, with a sandy beach at its head. **Mandal Point,** just eastward of the bay, is 277 feet high, with cliffs 100 to 120 feet high at the water's edge. A reef which generally breaks is close northeastward. A 23-foot spot is 0.3 mile eastward from Mandal Point.

Coki Point, 1.9 miles east-southeast of Mandal Point, is 47 feet high. It forms the northern shore of **Water Bay.** A conspicuous 235-foot cone-shaped hill is just south of Water Bay. **Turtleback Rock,** 2 feet high, is off the entrance to Water Bay 0.3 mile southeastward of Coki Point. **Cabes Point** is a low rocky hook 1 mile southeast of Coki Point. **Shark Island,** 32 feet high, is about 0.3 mile east-southeastward of Cabes Point. Foul ground encircles the island with several visible rocks 125 yards off the northeastern end.

Redhook Bay, at the eastern end of St. Thomas Island, consists of a southern arm called **Muller Bay** and the western arm, **Vessup Bay.** A small L-wharf with 9 feet at its end on the north side of Redhook Bay is used by ferry boats to St. John Island. Gasoline, water, and some groceries can be obtained at a nearby pier; a small marine railway is available and repairs can be made to small boats. A National Park Service L-pier with 6 feet alongside is on the southern side of Vessup Bay.

Cabrita Point, the eastern 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 east-southeast of Cabrita Point.

Pillsbury Sound is the body of water between St. Thomas, St. John and the cays which bound the sound on the northern side, forming an excellent roadstead about 2 miles in extent east and west and 1.5 miles north and south. This area is quite secure against rollers and all winds except from the southward which blow only in the hurricane months. However, the current attains a velocity of 2 knots.

The depths in the sound are somewhat irregular, varying from 48 to 100 feet. All the main passages leading to it are deeper than the mean depth of the sound itself.

Thatch Cay, at the northwestern end of Pillsbury Sound, is 1.6 miles long. The island is in the form of a ridge, 482 feet high near the eastern end. **Bull Point** and **Mother East Point** are prominent projecting points on the north side. **Lee Point** is the western point and **Grouper Point** the eastern point of the island. **Grass Cay,** 0.5 mile eastward of Thatch Cay, is 0.8 mile long. The north shore consists of rocky cliffs in places 150 feet in height. A

narrow rocky ledge, 12 feet at its eastern end, is close to shore near the west end, and a rock awash is 150 yards westward of the same point.

Mingo Cay, eastward of Grass Cay, is 186 feet high. Between Mingo and Grass Cays there is a narrow shoal passage with a bare rock 15 feet high close to the middle. **Lovango Cay** is eastward of Mingo Cay, and separated from it by a shoal passage 300 yards wide; the tidal current is strong in the 15-foot boat channel. Several houses are in the bight along the south shore between **Murder Rock** and the southwestern point. **Blunder Rocks**, 250 yards eastward of Lovango Cay, are 4 feet high. **Congo Cay**, a narrow pointed cay northward of Lovango Cay, is separated from it by a channel with depths of 14 feet. **Carval Rock** is 0.3 mile eastward of Congo Cay. There are several smaller rocks between it and the cay.

Two Brothers are two 10-foot high small barren rocks lying in the middle of Pillsbury Sound. A ledge extends off their northeastern 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 northeastward of Two Brothers, 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 western 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 rocky in less than 60 feet. In this channel, with the northeastward current running against the wind, there is a race which appears 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 steamers, the only dangers being a small rock awash nearly 200 yards westward from the west end of Grass Cay, which is easily seen. Sailing vessels generally use this passage in leaving the sound. It may be entered from the northward even on the ebb, provided the trades have not too much of a southerly slant.

Leeward Passage, between Thatch Cay and the northern side of St. Thomas, is about 0.4 mile wide, with depths of 70 feet or more.

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 southeastward for 2 miles from the eastern end of St. Thomas. The islands are rugged, with cliffs fronting much of the shores. **Dog Rocks**, 9 feet high, are the most easterly danger of the group close off the easterly 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 0.3 mile from the shores of the islands.

Dog Island Cut, between Dog Island and **Little St. James Island**, has depths of 7 to 21 feet and 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 18 to 30 feet, but caution is necessary to avoid **Welk Rocks** in the eastern approach and **The Stragglers**, on the western side.

St. James Bay, between Great St. James Island and the eastern end of St. Thomas Island, provides secure anchorage in depths of 23 to 50 feet, except in hurricanes. **Cow Rock**, 9 feet high, is the western one of a group of rocks in the southern approach to the bay. **Calf Rock**, 3 feet high, is close eastward of the same reef.

Current Hole, at the northern end of St. James Bay, provides a passage from the south 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 23 feet can be carried through the 100-yard wide channel east of the rock. The current velocity is 3 knots or more through Current Hole and sets southward and northward. Sailing vessels using the passage should await a northward current and a steady breeze in order to stem the current.

The **south 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 southeastern 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 west-southwestward 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 south-southeast of the rock.

Capella Islands, of which the westernmost is **Buck Island**, lie 1.7 miles southwestward 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 easterly end. A shallow ledge extends 100 yards off the western end, and off the northern side the depth is 30 feet. At the head of the southwest bight is a small wharf and boat landing.

Between Capella Island and St. Thomas Island the currents are weak.

Chart 905.—Frenchcap Cay is about 3.6 miles southeastward 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 933.—St. Thomas Harbor, in about the middle of the south 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 south, it is well protected by the

high hills surrounding the other sides, and provides safe anchorage except during a hurricane. The harbor is used as a fueling station for some trans-Atlantic shipping.

Charlotte Amalie, along the north shore of St. Thomas Harbor, is the most important city and capital of the U.S. Virgin Islands. During the winter months 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 southern side of **Long Bay,** the eastern part of St. Thomas Harbor. The principal imports include foodstuffs, textiles, clothing, building materials, machinery, and petroleum products. **Exports** include rum, bay rum, bauxite, and sundry articles.

Prominent features.—Muhlenfels Point Light (18°19.3′ N., 64°55.4′ W.), 121 feet above the water, is shown from a red cylindrical tower on the east side of the entrance to St. Thomas Harbor.

Hassel Island, on the western side of the harbor entrance, is indented by shallow coves and has several high wooded hills. **Cowell Point** is the southern end of a ridge sloping up to **Cowell Battery,** the highest point on the island.

Signal Hill, about a mile northwestward of St. Thomas Harbor, is the second highest peak on the island with a lighted tower on top. From it the main ridge extends east-southeastward, passing less than 0.5 mile northward of Charlotte Amalie. The town is built around the three spurs that extend southward from the ridge. **Frenchman Hill** is the western spur. **Berg Hill** in the center, has a square white building on its southern slope near the top. On **Government Hill,** the eastern spur, stands **Blackbeard Castle,** a remarkable 47-foot stone tower.

To the eastward 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, southwestward 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 southern end consists of brown rocky 100-foot cliffs. A water tower is on a 203-foot hill 0.2 mile northeastward of the point, and a square tower is on 256-foot **Providence Hill,** 0.8 mile northward of the point.

Red Point, a mile northwestward of Water Island, is a rugged red cliff at the southern end of a peninsula with a 218-foot flat-topped crest that has an aero light on the summit.

Boundary lines of inland waters.—The lines established for St. Thomas Harbor are given in § **82.235,** Chapter 2.

Channels.—The 33-foot entrance channel is westward of Muhlenfels Point and close eastward of Scorpion Rock, thence a 30-foot channel to the West Indian Dock. The entrance channel is marked by a lighted range and buoys. Depths of 12 to 15 feet can be taken to the waterfront at Charlotte Amalie.

East Gregerie Channel, between Hassel Island and Water Island, has depths of 30 to 50 feet for a 350-yard center width. **Haulover Cut,** between Hassel Island and St. Thomas Island, has a least depth of 11 feet at the southwestern entrance to the narrow passage. A daybeacon is on the eastern side of the passage.

West Gregerie Channel, between Water Island and St. Thomas Island, has depths of 30 to 60 feet for a 250-yard center width to the junction with East Gregerie Channel north of Water Island.

Anchorages.—Limits and regulations of the anchorage areas in St. Thomas Harbor are given in § **202.250,** Chapter 2. Depths are as follows: 64 to 72 feet in the deep water anchorage 0.9 mile west of Water Island; 45 to 59 feet in the outer harbor anchorage south of Hassel Island; 18 to 39 feet in the inner harbor anchorage; 10 to 50 feet in the exposives anchorage in East Gregerie Channel; and 3 to 20 feet in the small craft anchorage south of the Charlotte Amalie waterfront and in Long Bay.

Krum Bay, northwestward of Water Island, has a 42-foot entrance channel, shoaling to 18 feet near the head. The bay affords excellent anchorage for small vessels during a hurricane. An overhead power cable with a clearance of 63 feet crosses the narrow part of the bay.

Lindbergh Bay, close westward 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, a mile southeastward of Muhlenfels Point, is a small 24-foot islet covered with a low underbrush. Several bare rocks and rocks awash lie up to 125 yards south of the islet; a reef partly awash extends northeastward from the islet to the shore.

Triangle is a group of dangerous rocks between Green Cay and Muhlenfels Point. The southwestern and outer rock group dries in places, while the northerly group is partly awash and frequently breaks. A detached coral rock covered by 16 feet and marked by a bell buoy is nearly 0.7 mile south-southeastward of Muhlenfels Point Light. **Barrel of Beef,** 2 feet high, is the easterly foul area of the group.

Point Knoll, a coral head covered by 3 feet, extends 175 yards southwestward from Muhlenfels Point Light. **Rohde Bank,** 0.2 mile northwestward of Muhlenfels Point Light, 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 23 feet surrounded by depths of 24 to 27 feet.

Rupert Rock, 0.5 mile northward of Muhlenfels Point Light 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 westward from 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 westward of the south end of Water Island, consist of three reefs with rocks bare or awash and depths of 2 to 17 feet. A buoy is on the southwest side.

A rocky ledge extends 0.3 mile southward of Red Point. A steep-to rock at the outer end has a least depth of 2 feet over it.

Sandy Point Rock, an elongated shoal extending 300 yards northwestward from the northerly end of Water Island, has a least depth of 3 feet and is marked by a lighted buoy.

Tides and currents.—The tide in St. Thomas Harbor is chiefly diurnal; the mean range is about 0.5 foot and the daily range is less than 1 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 easterly wind.

Storm warning displays are made at several places in St. Thomas Harbor; see Appendix.

Routes.—From westward: pass 0.5 mile or more off the south end of Water Island, then steer for Muhlenfels Point Light until on the entrance range, and then proceed into the harbor on bearing 344°. The prominent white catchment area on the west side of Berg Hill helps in picking up the range in the daytime. From southward: pass a mile or more westward of Buck Island and enter on the range. From eastward: set a course to pass about midway between Buck Island and St. Thomas Island and enter on the range.

Pilotage.—Vessels are boarded by a pilot in a motorboat 1 to 2 miles southward of Hassel Island.

Reporting station.—All approaching vessels are reported to the harbormaster from the station on Cowell Battery on the south end of Hassel Island. Vessels should not proceed into the narrow entrance channel until previous arrangements have been made with the harbormaster.

Towage.—Small launches are at the West Indian Dock. A 660-horsepower tug is available upon advance request to the Insular Government.

Quarantine.—Vessels subject to visitation are boarded at the West Indian Dock or at the waterfront at Charlotte Amalie. The Public Health Service maintains an outpatient clinic in the Post Office Building. Seamen requiring emergency hospital attention are taken to the municipal hospital.

Customs.—Charlotte Amalie is a port of entry and marine documents are issued. Vessels are boarded at anchorage or at the docks. The customs office is in the Post Office Building.

Immigration.—Vessels subject to inspection are boarded by immigration officers at the docks.

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 east of the waterfront at Charlotte Amalie.

Wharves.—The West Indian Dock, along the south side of Long Bay, is the only deepwater terminal. The 2,234-foot bulkhead wharf has depths of 27 to 30 feet alongside. Buoys mark the limit of a maneuvering area north of the dock which is 300 feet wide near the easterly end and 900 feet wide off the western end. Open and covered storage is available. There are two 8-ton electric gantry cranes for handling bulk cargo and bauxite, and a 25-ton swing crane.

The waterfront of Charlotte Amalie, is a concrete bulkhead wharf with depths of 7 to 15 feet alongside. It is used by small sailing vessels and motor launches trading with the nearby islands.

A 300-foot finger pier extending from the point east of the waterfront is used by vessels assigned to the Coast Guard station on the point.

The piers in **Little Krum Bay,** northwestward of Water Island, are used by public vessels.

Supplies.—Groceries and some marine hardware are available at Charlotte Amalie. When available, water can be delivered from pipelines at the West Indian Dock or at anchorage from a barge. Fuel and diesel oil are on hand for bunkers at the West Indian Dock.

Repairs.—Some repairs can be made to vessels at the West Indian Dock, which has a machine shop and welding equipment. A marine railway on the north end of Hassel Island can handle vessels up to 125 feet in length and 9 feet in draft for general repairs. The nearest drydocks for large vessels are at San Juan and the Panama Canal.

Small-boat facilities.—A yacht club on the east side of Long Bay has berthing finger piers with water, electricity, and telephone service. Gasoline, diesel fuel, marine hardware, and some groceries are available. Depths of 10 to 12 feet are alongside the piers.

Chart 905.—Saba Island, 202 feet high and triangular in shape, is 2.4 miles west of Flamingo Point. The northern part of the island is low, but the southern part has precipitous red cliffs 150 feet high along the south shore. Two small lagoons surrounded by mangroves are near the north end. A landing can be made on the sand beach along the northwest shore. About 150 yards east 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 southward of the western end of the island.

Turtledove Cay, 50 feet high, 100 yards northward of Saba Island, is connected with Saba Island by a reef bare at low water. About 0.1 mile westward 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 southwestward of Saba Island, comprises a group of rocks bare and awash; the highest rock bares 2 feet. **Flat Cays,** 0.8 mile northeastward from Saba Island and 1.3 miles southwestward from Red Point, consist of 2 small islets, 32 and 11 feet high, respectively. About 300 yards eastward of the southern 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 east-southeastward and west-northwestward with velocities up to 1 knot.

Southwest Road, between Flat Cays and Perseverance Bay, affords an excellent anchorage with the wind as far southward as east-southeast.

Vessels may anchor as convenient after entering through any of the channels between the islands and shoals southward. Sailing vessels should enter from the eastward between Water Island and Porpoise Rocks, favoring Water Island, and pass between Flat Cays and the shoal south of Red Point.

Range Cay, an islet 21 feet high, lies close to the shore 0.7 mile northwestward of Red Point. **Black Point,** 1.2 miles northwestward of Red Point, terminates in rocky cliffs 40 to 50 feet high.

Perseverance Bay, between Black Point and **Lucas Point** to the westward, 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 eastward of St. Thomas Island, is 8 miles long, and up to 4 miles wide. Its eastern 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 southward, forming a deep bight which terminates at Ram Head, the southern point of the island. The central and western 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 and brush, and some patches of grass.

Most of the population of St. John Island is located in two small settlements, Cruz Bay at the west end and Coral Bay at the east end. Tourism is the principal commerce; foodstuffs and building material are brought into Cruz Bay by small interisland vessels.

The Government administration is at Cruz Bay where a person is designated to act as customs and immigration inspector. Some groceries, gasoline, diesel fuel, and water can be obtained at the settlement. Small motorboats carry passengers and mail between St. Thomas Island and St. John Island. Land transportation is mostly by taxi or by small sightseeing buses. Telephone and radio-telephone services are available.

Chart 938.—Moravian Point, on the end of a peninsula southward of Cruz Bay, is the westernmost part of St. John Island. **Mingo Rock,** which is awash and breaks, is 175 yards west-southwest of Moravian Point. A group of 4 rocks awash, with surrounding depths of 17 to 30 feet, is about 0.1 mile west-southwest of Mingo Rock.

Steven Cay, 0.4 mile west of Moravian Point, is 28 feet high. A 31-foot rock is just south of **May Point,** the southern extremity of Steven Cay. **Skipper Jacob Rock** is 0.1 mile east of the south end of Steven Cay.

Cruz Bay, on the west side of St. John Island, is a small cove used by small interisland vessels bringing supplies and tourists to the island. Depths of 10 to 12 feet can be taken to the public pier. 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 southeastward of Battery Point; a depth of 6 feet can be taken to the 80-foot pier and bulkhead. See Appendix for **storm warning displays.**

Caneel Bay, 0.8 mile northeastward of Cruz Bay, is the site of the Caneel Bay Plantation resort development. A motorboat provides transportation to St. Thomas Island from a small pier in the bay.

Durloe Cays are three islets westward of Hawksnest Point. **Henley Cay,** the largest, is 70 feet high and about 300 yards wide. **Ramgoat Cay,** 310 yards northeast of Henley, is 30 feet high, and **Rata Cay,** the smallest, is 0.2 mile west-northwestward of Henley Cay.

Hawksnest Point, a projecting point forming the western shore of Hawksnest Bay, is wooded. In the northern part is a circular hill 130 feet high. Off the extreme point is **Hawksnest Rock,** bare and 25 feet high. **Hawksnest Bay,** eastward of the point, is small and of no commercial importance. Off its southern shore are numerous rocks.

Perkins Cay is an islet close to the eastern point of Hawksnest Bay. **Trunk Cay,** a grass-covered islet 48 feet high, is about 0.5 mile east of Perkins Cay. **Trunk Bay,** between the two cays, is used extensively by skin-divers. The limits of an anchorage area in the bay are marked by private buoys.

Johnson Reef, a coral formation 0.4 mile northeastward of Perkins Cay, is 500 yards long and over 0.1 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 southeast. The reef is marked by a buoy on its northerly end.

Cinnamon Cay, 32 feet high and covered with tall grass and cactus, is about 0.7 mile east of Trunk Cay. **America Point** is 2 miles east 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 east.

Francis Bay, southward of Mary Point, is somewhat protected to the northward by Whistling Cay, and affords good anchorage in 50 feet, sandy bottom.

Whistling Cay, the 202-foot islet 300 yards west of Mary Point, is covered with trees. Its north shore is precipitous, with cliffs 130 feet high. A gravel beach is along the southeast 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 905.—Mary Peninsula is a remarkable headland in the form of a ridge, 578 feet high. This ridge is connected with St. John by a low divide, separating Francis Bay from Mary Creek. **Mary Point,** the western end of

the peninsula, has bluffs 135 feet high. The north 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 western entrance to the passage between the northern coast of St. John and the southwestern coast of Tortola. This passage leads into Flanagan Passage and Sir Francis Drake Channel. Tidal currents in The Narrows and the passage eastward attain velocities of from 2 to 4 knots.

Leinster Bay is a double indentation between Mary Peninsula on the west and **Leinster Point,** 48 feet high, on the east; it is about 0.8 mile in length. **Mary Creek,** the western part of this bight, makes well in behind the high land to northward. The eastern part, **Waterman Bay,** is partially protected by **Waterlemon Cay,** 30 feet high, 250 yards westward 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, southwestward of Waterlemon Cay, is faced by a conspicuous landslide.

Threadneedle Point, 0.5 mile eastward of Leinster Point, is precipitous, with cliffs up to 70 feet high. From Threadneedle Point the coast trends in a general east-southeasterly direction for 3.5 miles to **East End Point,** the eastern extremity of the island. **Haulover Bay,** 3 miles southeastward of Leinster Bay, offers the best anchorage of the small bights along the north coast.

Privateer Point, 0.4 mile south of East End Point, is a projecting point 164 feet high, separating **East End Bay** from **Privateer Bay,** 2 small bights open to the southeastward. **Red Point,** a remarkable headland westward of Privateer Bay, is the southern end of a high ridge.

Flanagan Island, 127 feet high, lies 0.7 mile southeast of Privateer Point. A rock off the west side is 45 feet high.

Flanagan Passage, the westernmost of the passages leading into Sir Francis Drake Channel from southward, 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 eastward, haul close around the western side of Norman Island, inside Santa Monica Rock, which may be done at a distance of 300 yards. From westward, line up the Indians and Mount Bellevue, the highest hill on the eastern end of Tortola, and enter westward of Santa Monica Rock on bearing about 016°.

Coral Bay, the large bay extending northward into St. John between Red Point and Ram Head, is open to the southeastward. 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. See Appendix for **storm warning displays.**

Currents.—The current velocity is about 0.7 knot and sets southwestward and northeastward 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 southwestern extremity of East End Peninsula. **Turner Point** is the knob at the end of the peninsula separating Round Bay and Hurricane Hole. **Fortberg Hill,** north of Harbor Point, is nearly circular in shape, 426 feet high, covered with trees, and very prominent. **Lagoon Point,** the southern entrance point of Coral Harbor, is fringed by a coral reef 200 yards wide and bare at low water. **Sabbat Point,** 0.5 mile southward of Lagoon Point, is the end of a long high rock forming the buttress of **Sabbat Hill,** 101 feet high.

Ram Head, the southern point of St. John, is a bold headland, with two conspicuous hills. The eastern side of the head has rocky cliffs 100 to 150 feet in height. 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 southward of Leduck Island. The shoal consists of 3 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 southward. There are no towns in Coral Bay. The community is scattered among several points along the shore.

Round Bay, the northeastern 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 northeastern part of the bay. The best anchorage in Round Bay is off Moor Point.

Hurricane Hole, the northern arm of Coral Bay, is 0.6 mile wide at the entrance westward 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 western side of Hurricane Hole.

Coral Harbor, the northwestern 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.

The south 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 northwestward 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 westward of Lameshur Bay consists of 150-foot white cliffs which are very prominent.

Chart 938.—Reef Bay, 2.7 miles westward 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 westward of Ram Head, affords good shelter for small vessels. The depth is 24 feet in the entrance, decreasing to less than 10 feet in the middle of the bay.

Chart 905.—St. Croix Island, 32 miles southerly of St. Thomas and St. John Islands and 50 miles southeastward 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 northern side is somewhat mountainous, particularly in the western part. **Mount Eagle,** 1,165 feet high and about 5 miles from the western end, is the highest point on the island. Southward from the mountains the land is composed of fertile undulating valleys. The southern side is nearly straight and generally low.

Water commerce with St. Croix Island is handled through two ports, Christiansted on the north coast, and Frederiksted on the west coast. Tourism accounts for a good part of the commerce while the raising of sugarcane and the manufacturing of sugar and rum are the principal industries. Some cattle are raised for export to nearby islands.

Tides and currents.—The tides are chiefly diurnal and are small, the mean range being about 0.5 foot and the diurnal range less than a foot. There is usually a slight westerly current between St. Croix Island and St. Thomas Island. No perceptible current has been observed at Christiansted Harbor, but a moderate westward flow is reported outside Fort Louise Augusta Light.

Coast and Geodetic Survey parties have reported that off East Point tidal currents of about 1 knot velocity set northwestward and southeastward in calm weather. Close to East Point strong currents set north and south. Trade winds increase the northwestward flow and decrease the southeastward flow. A very strong westward current setting around East Point and through Buck Island Channel was noted when the trade wind was blowing. A strong northwestward current was noted off Southwest Cape.

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 southwestward blow across the island, with much rain. Northers, with the accompanying heavy ground swell, do not appear to reach the island.

See Appendix for **storm warning displays.**

Pilotage.—At both Christiansted and Frederiksted vessels are boarded by a pilot in a motorboat off the entrance.

Quarantine, customs, immigration.—Both Christiansted and Frederiksted are ports of entry. Vessels are boarded at the docks by representatives of these services as required. Both places have municipal hospitals.

Harbor regulations.—Local rules and regulations for the ports of St. Croix Island are enforced by a harbormaster whose office is on the waterfront at Christiansted.

Supplies and repairs.—At Christiansted and Frederiksted groceries, some marine hardware, and a limited amount of water are available; gasoline and diesel fuel can be obtained from trucks or barrels. Facilities for repairs are limited.

Hams Bluff, the northwestern 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 tower.

From Hams Bluff the north 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 eastward to **Salt River,** the shore consists of low rocky cliffs.

Salt River Point is 1.7 miles eastward of Baron Bluff. Westward 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.

White Horse, 400 yards northward 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 southeastward 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 935.—Christiansted Harbor, on the north coast of St. Croix Island 10 miles east of Hams Bluff and 7.7 miles west of East Point, is a port of call for vessels drawing up to 14 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 southeastern part of the harbor. Most of the harbor is shoal.

Christiansted, on the south 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, cattle, and scrap iron.

Prominent features.—Fort Louise Augusta, on the east side of the harbor entrance, is an old battery on a projecting point. A light, 65 feet above the water, is shown from a white skeleton tower near the fort. The structure and a daybeacon form a day range for entering the harbor. The radio tower adjacent to the 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 north end of the cay.

Boundary lines of inland waters.—The lines established for Christiansted Harbor are described in **§ 82.240,** Chapter 2.

Channels.—The entrance is northward of Fort Louise Augusta through a crooked channel marked by buoys and ranges, thence east and south of Protestant Cay to Kings Wharf. The controlling depth is 15 feet.

A 15-foot passage over the southern portion of Scotch Bank is used by small vessels coming from eastward. A 13-foot channel eastward of Round Reef is sometimes used by schooners and small boats with local knowledge.

Anchorages.—Vessels anchor northeastward of Protestant Cay in depths of 9 to 30 feet according to draft. Small boats anchor in Gallows Bay and along the east side of the harbor. 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 northeastward from Fort Louise Augusta, is on the east 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 northwesterly side of the harbor. Shoal water extends eastward from the reef to the channel marked with buoys.

Round Reef, westward of Fort Louise Augusta, is circular in shape 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.

Routes.—Approaching Christiansted Harbor from northeastward, give Buck Island a berth of 2 miles or more to avoid the bar north of it. From westward all dangers will be avoided by staying a mile or more off the north coast. The entrance is marked by a light and daybeacon range bearing **164°** and buoys mark the entrance channel into the harbor.

Strangers are advised to take a pilot and should not attempt to enter at night without one.

Wharves.—**Kings Wharf,** the 600-foot bulkhead stone quay westward of the fort, has depths of 5 to 16 feet alongside. Vessels up to 13-foot draft and schooners load and unload cargo alongside the stone quay, and at a small pier at the west end.

Small-boat facilities.—A marine railway, 250 yards southeastward of the fort, can haul out boats up to 60 feet in length and 20 tons in weight for minor repairs.

In 1962 a marina was under construction on the east side of Gallows Bay. When completed it will have the following facilities: marine hardware; marine railway that can haul out boats up to 100 feet in length, 200 tons in weight, and 12 feet in draft; 10-foot deep repair basin; machine shop; gasoline, diesel fuel, and water at the outer end of 200-foot T-pier with a depth of 12 feet at outer 60-foot face; electricity and water at berthing slips.

Chart 905.—Beyond Fort Louise Augusta, the north coast trends easterly for 7.3 miles to East Point, the easterly end of the island. The coast is fringed by coral reefs, behind which in several places small vessels may find protection.

Punnett Point, 1.4 miles east of Fort Louise Augusta, forms the eastern side of **Punnett Bay,** a semicircular cove 0.2 mile wide. Northeastward of Punnett Point, at a distance of about 0.4 mile, is **Green Cay,** an islet 55 feet high. Southward to the beach and between Green Cay and Pull Point, the area has depths of only 6 to 18 feet, with numerous coral heads.

Pull Point, 2.3 miles east-northeastward of Fort Louise Augusta, is a small projecting point, terminating in cliffs 35 feet high. **Chenay Bay** is the bight westward of the point.

Buck Island, 340 feet high, is 4.3 miles east-northeastward of Fort Louise Augusta and about 1.5 miles off St. Croix. The island is on the southern edge of a coral bank which extends westward about 0.8 mile, then sweeps around a mile north of the island. This forms **Buck Island Bar,** 1.5 miles in length. Shoals extend about 1.8 miles eastward of Buck Island. The island lies on the route from eastward to Christiansted Harbor. A light, 360 feet above the water, is shown from a red skeleton tower on the summit of the island.

Diedrichs Point, the southern extremity of Buck Island, is low. Several spots with 13, 17, and 20 feet lie from 1 mile east of the island to 1.7 miles east-southeast of it. **Buck Island Channel** lies between Buck Island and the adjacent reefs and St. Croix. Moderate-draft vessels may approach it from either northward or eastward. **Channel Rock,** awash, lies 1.8 miles westward of East Point.

The north 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 eastward of Pull Point. The opening in the end of the reef can be entered by steering **180°** with Coakley Mill directly ahead.

Pow Point, 1.5 miles eastward of Pull Point, is rocky with a 130-foot hill 250 yards inland. **Tague Point,** 1.1 miles eastward of Pow Point, is sharp and rocky with a 155-foot hill 0.2 mile south-southwestward. **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 northeastward of Tague Point.

Cottongarden Point, a prominent rocky point with a 55-foot knoll, is 1.6 miles eastward of Tague Point and opposite the eastern end of the long reef paralleling the coast. **Cramer Park,** a public beach and park operated by the Insular Government, is westward of the point.

East Point, the eastern extremity of St. Croix, is a bluff. A 225-foot hill is 100 yards west-northwest, and **Morne Rond,** 380 feet high, is a conspicuous round hill near the point.

Lang Bank, an extensive bank from 3 to 5 miles in

extent, stretches 9 miles northeastward from the east end of St. Croix Island. Along its edge is a wall-sided narrow coral ledge which, commencing about 3 miles eastward of Buck Island, sweeps around in a convex form for about 14 miles, terminating 2 miles southward from East Point. Its northern part is from half a mile to 1 mile broad, with depths of 5½ to 10 fathoms. The southern portion is about 100 to 600 yards broad, 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 south coast of St. Croix Island trends west-southwestward 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 eastward 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 aero light on the southwestern part of the island are prominent.

Point Cudejarre, a sharp point with a 25-foot bluff and a 120-foot hill north-northwest, is 0.3 mile southwest of East Point. **Grass Point,** 3 miles west-southwest of East Point, is a long narrow point marked by a 43-foot knob.

Mount Fancy, about 4.7 miles westward of East Point, is a conspicuous double hill, 245 feet high, which forms the east 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 east tangent of Milord Point in line with Sight Mill; when about 100 yards off the point haul around to **064°**, pass west of a 7-foot shoal 200 yards east 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 west-southwestward of East Point. **Canegarden Bay,** 1.2 miles wide, forms an irregular crescent to the west of Vagthus Point. **Limetree Bay,** 1 mile wide, is a semi-circle indentation west of Canegarden Bay. Good anchorage is in the center of the bay in 12 to 18 feet.

Krause Point, 12.3 miles west-southwest of East Point, is a point covered by mangrove. One of the best small-craft anchorages is found south of Krause Point. **Long Reef,** lying to the southward, affords protection from the sea. The anchorage can be approached through an opening in the reef with local knowledge.

Krause Lagoon, northward of the point, is an extensive mangrove swamp with areas of shoal water.

Chart 937.—Long Point, 3.6 miles eastward of Southwest Cape, is a low projecting point covered with grass. Westward of the point is **Long Point Bay,** which is shoal. **Southwest Shoal,** 1.2 miles southward of Long Point, has only 6 feet of water over it, and eastward to Krause Point the outlying reefs are the most dangerous along the south coast. They generally break, but as several shoal spots are southward, the area should be approached with caution.

Southwest Anchorage, between Long Point and Southwest Cape, offers temporary anchorage in 7 fathoms 2 miles offshore. Small vessels can anchor in 4 fathoms a mile from shore.

Southwest Cape, the southwestern extremity of St. Croix Island, is a low point projecting 1.2 miles in a southwesterly direction. The point is covered by low bushes and trees. A coral reef extends southward, with a least depth of 9 feet, at a distance of 0.8 mile from the shore. A buoy marks the southwest extremity of this shoal. The 5-fathom curve is 1.6 miles southward of Long Point and nearly a mile south of Southwest Cape, but westward of the point it is only 200 yards off. The 100-fathom curve lies nearly 2.5 miles southwest 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 western extremity of the island, is 0.5 mile north-northwest of Southwest Cape.

The west coast of St. Croix Island trends north-northeastward from Southwest Cape for 2.4 miles to Frederiksted, thence northwestward for 2 miles, and then curves northeastward for 2 miles to Hams Bluff. The coast consists mostly of sand beach with the land back of it sloping gently upward in the southern part and the hills gradually working westward to the shore in the northern 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 west coast of St. Croix Island 2.4 miles northward of Southwest Cape and 3.7 miles southward of Hams Bluff, is a port of call for cruise ships and cargo vessels. Large vessels can dock at the long pier in the 4-mile wide open roadsted. The principal imports include foodstuffs, building materials, petroleum products, and clothing. Exports include sugar, rum, and scrap iron.

Prominent features.—Frederiksted Harbor Light (17°43.0′ N., 64°53.1′ W.), 42 feet above the water, is shown from a red skeleton tower on a small wharf at the northerly part of the waterfront. **Fort Frederik** is 125 yards northeastward of the light.

Anchorages.—Vessels anchor in depths of 30 to 60 feet northwestward and southwestward of the long pier according to draft. Small boats anchor near the waterfront.

Routes.—From southward, the shoals south 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.

Wharves.—A 1,600-foot pier extends from the water-

front at Frederiksted. A 160-foot loading platform and mooring dolphins with depths of 35 to 40 feet alongside are at the outer end. A landing craft spur is on the south side of the inshore end of the pier. A small-boat stone landing pier with loading crane is on the north side of the long pier.

Mooring facilities and pipelines for vessels unloading petroleum products and molasses extend 300 yards offshore 0.5 mile south of the long pier. Depths of 12 to 15 feet are at the outer end of the pipelines.

Chart 905.—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 H.O. Publication 22, Sailing Directions, The West Indies, Volume II, published by the U.S. Navy Hydrographic Office, and West Indies Pilot, Volume II, published by the British Admiralty.

Little Tobago Island, 3.5 miles northeast of Hans Lollik Island, is nearly 0.5 mile in length and 279 feet high. It is steep-to except on its southeast side. **Tobago Island,** 1 mile northeast of Little Tobago Island, is 0.8 mile in extent and about 538 feet in height. A small rock, awash and steep-to, is about 100 yards off the northern point. The southeastern side of the island is fringed with coral, but elsewhere the coastal cliffs are steep-to. A few rocks lie close off the northwestern point.

Watson Rock, steep-to and 89 feet high, is about 0.3 mile westward of the southwestern point of Tobago Island. **King Rock,** 0.6 mile south of the southwest point, is awash and steep-to. It is near the southern end of a bank, over which are general depths of 6 to 9 fathoms, extending about 0.7 mile southward of Tobago Island.

Mercurius Rock, 0.8 mile east of the northern end of Tobago Island and the only danger between that island and Jost Van Dyke Island, is small and steep-to. It is covered by 7 feet. When using the passage between Tobago and Jost Van Dyke Islands, the eastern side should be favored.

Jost Van Dyke Island, about 2 miles east of Tobago, is 3.5 miles long, lofty, rugged, and steep-to. Near the middle of the northern part a summit rises to 1,070 feet. **Great Harbor** and **Little Harbor,** on the southern 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 northeastern end of Jost Van Dyke Island, is 367 feet high. **Green Cay,** 108 feet high, is a small islet close east of Little Jost Van Dyke Island. **Sandy Cay,** nearly 1 mile south of Green Cay, is 66 feet high at its eastern end. It is surrounded by shoal water, and foul ground extends 200 yards from the eastern and western 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 western extremity, is about 2 miles northeastward of Mary Point, St. John. The highest summit in the Virgin Islands is 1,780-foot **Mount Sage** in the western part of the island; rugged hills rise somewhat abruptly from the shores on all sides.

Great Thatch Island, about 0.6 mile north of Mary Point from which it is separated by The Narrows, is 1.7 miles in length, and near its center rises to a peak 613 feet high. The eastern point is bold and steep-to. **Thatch Island Cut,** the channel between Great Thatch Island and the West End, is deep. Sailing vessels should not attempt Thatch Island Cut from the northward except with a southward 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 eastward attain velocities of from 2 to 4 knots.

Little Thatch Islet, 0.4 mile southward of The West End, is about 0.5 mile long. **Frenchman Cay,** about 0.3 mile eastward of Little Thatch Island, is 400 feet high. **Sopers Hole** is a deep little basin, 1 mile in length and about 0.3 mile in width, between Frenchman Cay and Little Thatch Island, on the south, and the western end of Tortola, on the northern side. At the eastern end of Sopers Hole the muddy bottom is the best holding ground. There is a small pier on the north 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 southward may enter Sopers Hole by the passage between Frenchman Cay and Little Thatch Island, or by that between the latter island and the western end of Tortola. These passages are not difficult, but the western 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 southward current, which will shoot a vessel into it. A vessel coming from the eastward will find the passage eastward of Little Thatch Island the best, as she will have a leading wind, can luff up closer under the western end of Frenchman Cay, which is steep-to, and shoot into Sopers Hole with either a southward or northward current. When leaving, pass out to the northward through Thatch Island Cut, or, if bound into Sir Francis Drake Channel, round the western end of Little Thatch Island at a distance of somewhat more than 200 yards and haul to the wind. With the eastward 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 westward tidal current has a similar velocity. There is no danger on either shore. A vessel must be prepared to meet the gusts and baffling winds which rush out from the valleys of Tortola.

On the northwestern side of Tortola there are numerous small bays or bights, of which Canegarden Bay, the largest, is the only one on the northern 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 mile northward of the southern entrance point.

H.O. Chart 0137.—Road Harbor, on the southern side of Tortola 6 miles east of its western end, is the only port of entry in the British Virgin Islands for all vessels. Sopers Hole at the west end of Tortola, is a limited port of entry. The harbor is exposed southeastward, but the other sides are surrounded by high hills with their spurs reaching the shores.

Road Town, on the western 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.—Burt Point, marked by a light, is on the west side of the entrance to Road Harbor. A hotel on the point, the customhouse at Road Town, and the Commissioner's House midway between the point and the town are 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 light off Burt Point and Lark Bank. The controlling depth is 36 feet to the anchorage area, but only 7½ feet to the dock.

Anchorages.—Vessels anchor in depths of 24 to 74 feet, uneven bottom, inside Scotch Bank and Lark Bank, according to draft.

Careening Cove, in the lee of the dry reef off Burt Point, is small but well sheltered, with depths of 4 to 5 feet.

Dangers.—Although depths of 36 to 48 feet can be taken to the anchorage area in Road Harbor, irregular bottom and coral patches with depths of 13 to 36 feet surround the entrance for a distance of 1.5 miles.

Denmark Banks, 0.5 mile southeastward of Burt Point, have two rocky patches with a least depth of 13 feet. **Lark Bank,** 0.4 mile eastward of Burt Point, has a least depth of 15 feet over a coral head. **Scotch Bank,** 0.8 mile eastward of Burt Point, has a least depth of 12 feet.

Harbor Spit, 0.4 mile northward of Burt Point, is an extension of the shoal water in the northwestern part of the harbor. Depths on the spit are 7 to 17 feet, but a rocky patch on it has depths less than 6 feet. **Harbor Rock,** 250 yards southeastward from the end of the spit, has a least depth of 21 feet.

Tides.—The tides in Road Harbor are chiefly diurnal and the range is small.

Pilotage.—Reliable mariners are available to bring ships into the harbor.

Wharves.—An 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 southward has depths of 7 feet alongside. Small sloops are used for lighterage when necessary.

Supplies.—A limited amount of groceries and water are available. Gasoline and diesel fuel can be obtained from offshore pipelines on the northeastern side of Road Harbor.

Repairs.—A small marine railway in Careening Cove can haul out boats about 40 feet in length, and 6 feet in draft. Another marine railway in **Bauger Bay,** on the northeastern side of Road Harbor, can haul out small boats of 6-foot draft for repairs.

Communications.—Passenger service is maintained between Road Harbor and St. Thomas. Radiotelephone communications are available.

Chart 905.—Guana Island, 810 feet high and 1.7 miles long, is about 0.3 mile northward of Tortola. The passage between these islands has a depth of about 29 feet in the fairway. On the western 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 Island, a mile east 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 east of Great Camanoe Island, from which it is separated by a narrow channel with many shoals and rocks.

Little Camanoe and **Marina Cay** are southwest and southeast, respectively, of the southern end of Great Camanoe Island. They are all connected to the northern side of Beef Island by a shoal bank on which are several rocks and reefs. The channel north of Beef Island is quite open and easily navigated by large yachts. **Shallow Rock** is a 3-foot shoal off the western point of **Trellis Bay** on the north 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.

Beef Island, about 2.4 miles in length and 660 feet high in its eastern part, is separated from the eastern end of Tortola by a narrow shoal channel which should be used only with local knowledge. **The Bluff,** its southern extremity, is a good landmark for vessels bound to Road Harbor. During strong northeasterly winds excellent anchorage will be found in the lee of Beef Island, about 0.7 mile westward of The Bluff. **Buck Island,** 1.1 miles southwest of Beef Island and close off the southeastern side of Tortola, is 170 feet high at its southeastern end.

Sir Francis Drake Channel is a passage bounded on the northwest by Tortola and the islands off its eastern end, and on the southeast 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 Islets.

Eastward of Buck Island the depths are regular, about 13 to 14 fathoms, but westward of that island the bottom is very irregular, especially in the approach to Road Harbor. In the southern portion of the western part, the general depths are 17 to 27 fathoms, but there are several coral patches with depths of 4 to 10 fathoms. Anchorage

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is found anywhere in this channel eastward 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 northeastward flow.

Flanagan Passage, the westernmost of the passages leading into Sir Francis Drake Channel from the southward, 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 eastward of Flanagan Island, is about 2.3 miles long and 440 feet high near its southwestern extremity. Foul ground is close off its northeastern and southwestern ends. **Ringdove Rock,** covered by 2 fathoms, is about 300 yards westward of the northwestern point of Norman Island. **Santa Monica Rock,** 0.7 mile northwest of Norman Island, is a small patch 1¾ fathoms deep.

Pelican Islet, 180 feet high, is about 0.5 mile north of Ringdove Rock. About 200 yards westward of it are the **Indians,** four remarkable small pinnacle rocks, 50 feet high. A 6½ fathom shoal lies 0.7 mile north-northwest of Pelican Islet.

The Bight, a small inlet in the western 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 the northwestward, 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 western side of Treasure Point.

Peter Island, northeast of Norman Island, is in the form of an elbow, 440 feet high at its western part. **Carrot Rock,** 84 feet high, lies about 0.3 mile off the southern end of the island, and **Carrot Shoal,** covered by about 11 feet, is about 0.4 mile southwest of the rock. Some 6-fathom patches lie within 0.5 mile of the northern side of the island.

Great Harbor, a small bight on the northern 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 westward 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 aboard.

Dead Chest, nearly 0.5 mile off the northeastern end of Peter Island, is an islet 200 feet high; a group of rocks extends about 0.2 mile southward from its eastern end. A 33-foot patch lies about 0.7 mile northwestward of the islet.

Blonde Rock, 12 feet deep, is about 0.6 mile east-northeastward 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 eastern side of the passage.

Salt Island, about 2 miles northeast of Peter Island, rises to a height of 380 feet in its northern part. A rock awash lies close off its northeastern 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,** northeast of Salt Island, is 1.7 miles in length and 530 feet high at its southern end. **Dry Rocks** are 300 yards off the northeastern side of Cooper Island, and **Carval Rock,** 110 feet high and steep-to, is 0.8 mile east-northeastward of **Markoe Point,** the southern point of Cooper Island.

Ginger Island, about 1 mile eastward of Cooper Island, is 500 feet high and steep-to at its northeastern and southeastern ends. A light is shown on the northeastern extremity of the island. Some rocks lie close off its western end. The passage between Ginger and Cooper Islands may be taken by steamers, but sailing vessels may meet trouble.

Round Rock, 220 feet high, is the southernmost of a chain of islets and rocks extending south-southwestward from the southwestern 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 southward. It is the best for vessels coming from southward. The passage is about 0.7 mile wide and easily located from its position in relation to Fallen Jerusalem, 1.2 miles to the northeastward. 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 southeast and northwest tidal currents attain a velocity of about 1 knot.

H.O. Chart 3904.—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 eastward and south-southwestward. The eastern peninsula consists of irregular rugged hills which terminate at **Pajaros Point** in an astounding pinnacle rock 120 feet high. The southwestern 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 west side of the southwestern peninsula consists of immense granite blocks which lie scattered about on the shore. **Colison Point** is the northwestern extremity of the peninsula. The islets and rocks to the southward as far as Round Rock, 2 miles distant, are also of granite; the largest, about 140 feet high, nearly 0.5 mile from the southern end of the island, is named **Fallen Jerusalem** because of its resemblance to a town in ruins.

Several islets are in the northern part of Sir Francis Drake Channel. **Great Dog,** the southeasternmost, is 270 feet high and steep-to at its western end; rocks fringe its northern and southern sides. **George Dog,** the northern-

most, is 250 feet high and has some detached rocks about 0.2 mile north of it. **Cockroach Rock** lies about 0.2 mile westward of it. **West Dog,** the westernmost, is 150 feet high, with its western side bold and steep-to.

Tow Rock, 1.2 miles west-northwest 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 northeast of George Dog and 1 mile westward of **Mountain Point,** the northwestern extremity of Virgin Gorda, are a cluster of three small islets. The northern 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 western side of Virgin Gorda, are two excellent anchorages for vessels of any draft. The northern is situated in the bight between Mountain and Colison Points, and is partially protected to the northwestward by Dog Islets. It seldom, however, blows hard to the westward of north, and the only thing to be prepared for is the ground swell in the winter months, at which season 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 southern 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 westward with more ease than from the northern 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 west of Colison Point, and **Burrow Rock,** with 1½ fathoms, is 1 mile south of Colison Point. The anchorages may be approached from either north or south as the passages are clear except between West Dog and Scrub Island, where Tow Rock lies. On the northern side of Virgin Gorda are several small slightly wooded islets and cays.

H.O. Chart 0569.—Mosquito Island, about 0.6 mile long and 290 feet high, the highest of the islets off the northern side of Virgin Gorda, is 1 mile east-northeastward of Mountain Point. The channel separating it from **Anguilla Point,** on Virgin Gorda, is shoal and only 175 yards wide. The northeastern end is fringed by a reef, and a chain of small detached rocks extends 300 yards north-northeastward. **Mosquito Rock,** the outermost, is 24 feet high.

Colquhoun Reef, which dries in patches, extends nearly 0.6 mile southeastward from Mosquito Rock, and is steep-to on its northeastern side. On the southwestern side there is a small sandy islet, about 2 feet high and sparsely covered with course grass. **Prickly Pear Island,** the largest of the islets off the northern side of Virgin Gorda, is about 0.8 mile east of Mosquito Island. It is 1 mile in length and 237 feet high. **Asbestos Point,** its eastern end, is 0.2 mile from the nearest part of a small peninsula of the eastern 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 westward of Cactus Point, the northwestern end of Prickly Pear Island, is steep-to on its northern side; the sea breaks on it even with a slight swell.

Gorda Sound is an excellent and roomy harbor between Virgin Gorda on the south and Mosquito Island, Colquhoun Reef, and Prickly Pear Island on the north. 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 western 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 southeast of Colquhoun Reef, has a least depth of 30 feet. **Creek Shoal,** off the southern 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 southern 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 southeastern corner of Gorda Sound.

The tide in Gorda Sound is chiefly diurnal. The tidal currents at the entrance are seldom more than 0.5 knot, but the inward current sets toward Prickly Pear Island. Between Mosquito Island and Anguilla Point, the eastgoing current has a velocity of from 1 to 1.5 knots.

Routes.—Steamers coming from the eastward 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 northern extremity of Necker Island bears 279°, distant 6.8 miles. Then alter course to pass at least 0.5 mile northward 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 northward it is better to pass westward of Anegada and approach with Virgin Peak on a bearing between 132° and 155°.

Sailing vessels can follow the direction for steamers, but if coming from the northward and passing eastward 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 east of Prickly Pear Island, is 172 feet high and 0.3 mile long. Its northern

side is foul for 300 yards off, from which a barrier reef extends to Pajaros Point. Outside this foul ground there are two detached patches with depths less than 3 fathoms, one about 0.6 mile east-northeastward and the other about 0.5 mile eastward of the eastern 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 eastward 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 northward of Prickly Pear and Eustatia Islands and those southward 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 eastward and westward with a velocity of about 0.5 knot.

Necker Island, 0.7 mile north of Eustatia Island, is nearly 0.5 mile in extent and 107 feet high at its northern part. The northeastern side is fairly bold and steep-to, with depths of 6 to 10 fathoms within 300 yards. The southeastern and western 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 southward of Necker Island.

The Invisibles, about 0.8 mile eastward of Necker Island, are three small rocky heads with only 4 to 5 feet of water on them. They do not always break. Between them and the reefs on the eastern side of Necker Island there are depths of 5 to 8 fathoms, but greater depths are a short distance off the eastern end. The rocks are not easy to see, and therefore care should be exercised when approaching from eastward.

H.O. Chart 3904.—Anegada, the northeasternmost island of the Virgin Group, lies with **East Point,** its southeastern end, about 12 miles north-northeastward of Pajaros Point. Anegada is 9 miles in length, about 30 feet high, and covered wtih brushwood except at a few places cleared for cultivation. Numerous salt-water lagoons are in the westerly interior. The principal settlement is on the southern 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 northern side by a narrow barrier reef which is about 0.1 mile off at **Soldier Point,** the northerly point, and 1.5 miles eastward at East Point. Thence **Horse Shoe Reef,** a most dangerous reef upon which many vessels have been lost, extends southeastward for nearly 8 miles. From its southeastern end detached coral heads and shoal ledges extend 4.5 miles southwestward, 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 westward of the elbow of Horse Shoe Reef.

The edge of the bank is 2.5 miles eastward 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 southern end lies 5.5 miles east-northeast of Pajaros Point. A detached 5-fathom patch is 0.7 mile southward of the reefs.

Robert Reef, 3.5 miles westward of Herman Reefs, is a small rocky patch with 4½ fathoms on it. Another small rocky head, with 3¾ fathoms, is 1.1 miles north-northeastward of this reef. **Hawks Bill Bank,** about 2 miles north-northwestward of Robert Reef, is a small rocky ledge with 2¾ to 5½ fathoms.

The reef skirting the northern side of Anegada terminates about 300 yards off **West End,** but the southern 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 west 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 south of the island. The bank westward of Anegada is chiefly fine sand, and in good weather vessels may anchor on it in safety, taking care to avoid the dangers.

APPENDIX

COAST AND GEODETIC SURVEY.—United States Coast Pilots, Tide Tables, Tidal Current Tables, and Tidal Current Charts: For sale by U.S. Coast and Geodetic Survey, Washington 25, D.C., and its district offices and sales agencies which are listed semiannually in the Notice to Mariners.

United States Coast Pilots:

1, Atlantic Coast, Eastport to Cape Cod, 1960.
2, Atlantic Coast, Cape Cod to Sandy Hook, 1960.
3, Atlantic Coast, Sandy Hook to Cape Henry, 1961.
4, Atlantic Coast, Cape Henry to Key West, 1959.
5, Atlantic Coast—Gulf of Mexico, Puerto Rico, and Virgin Islands, 1962.
7, Pacific Coast—California, Oregon, Washington and Hawaii, 1959.
8, Pacific Coast, Alaska—Dixon Entrance to Cape Spencer, 1962.
9, Alaska, Cape Spencer to Arctic Ocean, 1954.
Distances Between United States Ports, Third (1961) Edition.

A Coast Pilot for which a supplement has been issued should not be used except with reference to the latest issue of its supplement. Supplements may be obtained from the U.S. Coast and Geodetic Survey, Washington 25, D.C., or any of its district offices.

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.

Tidal Current Tables:

Atlantic Coast, North America.
Pacific Coast, North America and Asia.

Tidal Current Charts:

Boston Harbor (1949).
Narragansett Bay to Nantucket Sound (1955).
Long Island Sound and Block Island Sound (1954).
New York Harbor (1956).
Delaware Bay and River (1960).
San Francisco Bay (1947).
Puget Sound, Northern Part (1952).
Puget Sound, Southern Part (1961).

District Offices.—Tampa District, 19th and Grant Streets, Tampa 5, Fla. The district includes South Carolina, Georgia, Florida (east and south of Apalachicola River), Puerto Rico, and the Virgin Islands. The office does not sell charts, coast pilots, or other publications.

New Orleans District, 315 Customhouse, 423 Canal Street, New Orleans 16, La. The district includes Florida (west of Apalachicola River), Alabama, Mississippi, Louisiana, Arkansas, and the coastal areas of Texas.

Coast and Geodetic Survey Sales Agents.—Agents marked with an asterisk (*) also handle certain U.S. Navy Hydrographic Office publications, and those marked with a dagger (†) also handle certain U.S. Coast Guard publications.

Florida:

Anna Maria Island: †Dobbe's Island Hardware & Marine Supply.
Apalachicola: C. W. Randolph, Agent Standard Oil Co. Bulk Plant.
Boca Grande: Millers Marina.
Bradenton: †Turner's Marine Supply, 9th Ave. and 13th St.
Carrabelle: Gulf Oil Products, Marine St.
Chokoloskee: Chokoloskee Small Boat Dock.
Clearwater Beach: †Clearwater Marine Sales, No. 2 Marina Bldg.
Dania: De Padro Yacht Basin.
Daytona Beach: Daytona Marine Supplies and Sales, Div. of Southern Aero, 645 So. Beach St.
Delray Beach: *Marineway Corp., 777 Palm Trail.
Flamingo: Everglades Park Co., Inc.
Fort Lauderdale: Bahia Mar Marine, Inc., Bahia Mar Yachting Center; *†Herold Boat Co., 1112 E. Las Olas Blvd.; Lauderdale Marina, Inc., 1900 SE. 15th St.; Phillips Petroleum Co., Pier 66; †Vogel's Marine Supply Co., 601 S. Andrews Ave.
Fort Myers: †Fort Myers Yacht Basin; Parker's Book Store.
Fort Myers Beach: Snug Harbor Tackle Shop, Snug Harbor.
Fort Pierce: Horton's, Inc.
Hialeah: R. & H. Marine Service, 33 E. 2d St.
Homestead: Don's Bait and Tackle, 30711 S. Federal Hwy.; Maxson Marine Mart, Inc., 1460 N. Federal Hwy.
Islamorada: The Four Winds, Overseas Highway at Ocean Lane.
Jacksonville: Outboard, Inc., 1344 University Blvd.; †The H. & W. B. Drew Co., 22–30 W. Bay St.; *†The Nautical Supply Co., 213 E. Bay St.
Key West: Capt. Red's, 517 Fleming St.
Lantana: Lake Worth Marine Inc., 808 N. Dixie.
Marathon: Thomas Marina, Inc.; Ye Ole Feshin' Hole.
Melbourne: Melbourne Marina, Inc., 42 Front St.
Merritt Island: Banana River Marine Service, Banana River Drive.

Miami: *†Florida Precision Instrument Co., 1221 Biscayne Blvd.; *†Hopkins-Carter Hardware Co., Miami Ave. & SE. 2d St.; *L. B. Harvey, Marine Instruments, 252 SW. 6th St.; Phillips Hardware Co., 490 NW., South River Dr.; †Santana Marine Service, Dinner Key.

Naples: M & M Marina, 1312 Fifth Ave., South.

New Smyrna Beach: Dan's Boathouse, Inc., City Yacht Basin.

Orlando: Florida Marine & Equipment Co., 1104–06 North Mills St.; Ransom Downes Outboard Service, 1118 So. Orange Ave.

Palatka: Oliver & Garrett Co.

Panama City: Harby Marina, Inc., Highway 98 at Watson Bayou.

Pensacola: *†McKenzie-Oerting Supply Co., 601 S. Palafox St.

Pompano Beach: *Lighthouse Marine Center, 2507 N. Ocean Blvd.; Sea Chest of Pompano Beach, Inc., 12 N. Riverside Dr.

Punta Gorda: *Van Dyke Blueprint Service, 124 Herald Court.

St. Petersburg: St. Petersburg Shipbuilding and Supply Co., 200 7th Ave. South. Modern Marine Inc., 15015 Madeira Way.

Sarasota: H. & F. Marine Sales and Service, Inc., 1149 10th St.; Hansen Cris Craft Sales, 1201 N. Tamiami Trail; †Tucker's Sporting Goods, Sportman's Corner.

South Miami: †Johnson-Kirby, Inc., 5966 S. Dixie Hwy.

Stuart: Ideal Sport Shop, 245 Osceola Ave.

Tallahassee: John S. Beazley, 1903 N. Monroe St.

Tampa: *†Poston Marine Hardware & Supply Co., Inc., 1012 E. Cass St., Tampa Marine Supply Co., Inc., 202 N. 13th St.

Tarpon Springs: Leist Engineering Co., P.O. Box 83.

Tavernier: Roberts Bait Supply, P.O. Box 374.

Titusville: Correct Craft Marina, Inc.

Vero Beach: †Vero Marine Center, 12 Royal Palm Blvd.

West Palm Beach: *Hopkins Marine Hardware Co., 207 6th St.

Alabama:

Dauphin Island: Ship & Shore Sport Supplies.

Mobile: *†Mobile Ship Chandlery Co., corner Dauphin, Commerce and Front Sts.

Mississippi:

Biloxi: Bel-Bru Marine Mart, 1600 E. Howard.

Pascagoula: *Nelson Office Supply, 104 S. Pascagoula St.

Louisiana:

Morgan City: Shannon Hardware Co., Ltd.

New Orleans: Coast and Geodetic Survey District Office, 314 Customhouse, 423 Canal St.; *†Baker, Lyman & Co., 308 Magazine St.; New Orleans Map Co., 134 Chartres St.

Texas:

Corpus Christi: L. K. Gunderland & Son, 1920 N. Water St.

Galveston: *†R. H. John, Inc., 515 21st St.

Houston: *†Texas Nautical Co., Cotton Exchange Bldg.

Port Arthur: †Nielsen's Stationery & Gift Shop, 532 5th St.

Puerto Rico:

San Juan: Fred Imbert, Inc., Ochoa Bldg., P.O. Box 4424.

Virgin Islands:

St. Thomas: *James E. Simmons, Charlotte Amalie.

PUBLICATIONS.—A résumé of the U.S. Government publications of navigational value is included for the ready reference of the mariner. In addition to the agents located in the principal seaports handling sales publications, certain libraries have been designated by the Congress of the United States to receive the publications as issued for public review.

Nautical Charts.—United States coastal waters (Chart No. 1, a pamphlet, is Nautical Chart Symbols and Abbreviations): Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Mississippi River (Cairo, Ill., to Gulf of Mexico): Published and for sale by Mississippi River Commission, Vicksburg, Miss.

Mississippi River (Cairo, Ill., to Minneapolis, Minn.) and Illinois Waterway (Mississippi River to Lake Michigan): Published and for sale by U.S. Army Engineer District, Chicago, Ill.

Great Lakes, Lake Champlain, New York State Canals, and the St. Lawrence River-St. Regis to Cornwall, Canada: Published and for sale by U.S. Lake Survey, Detroit, Mich.

Foreign countries: Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Coast Pilots.—Coasts of the United States and Possessions: Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Great Lakes (Great Lakes Pilot): Published and for sale by U.S. Lake Survey, Detroit, Mich.

Foreign countries (Sailing Directions): Published by U.S. Navy Hydrographic Office: for sale by H.O. and its sales agents.

Tide and Tidal Current Tables, and Tidal Current Charts.—Published by U.S. Coast and Geodetic Survey; for sale by C&GS 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, Part I (Atlantic Coast), and Part II (Pacific Coast)—U.S. Navy Hydrographic Office; Weekly Notice to Mariners, Great Lakes—Commander, Ninth Coast Guard District, Cleveland, Ohio.

Light Lists.—United States and Possessions: Published by the Coast Guard; for sale by the Superintendent of Documents and his sales agents.

Foreign countries: Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Radio.—Radio Navigational Aids (H.O. Pub. No. 117), Radio Weather Aids (H.O. Pub. No. 118), Weather Station Index (H.O. Pub. No. 119), and International Code of Signals, Vol. II—Radio (H.O. Pub. No. 104): Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Miscellaneous.—American Nautical Almanac and American Ephemeris and Nautical Almanac: Published by

United States Naval Observatory; for sale by Superintendent of Documents and his sales agents.

American Practical Navigator (Bowditch) (H.O. Publication No. 9), and International Code of Signals, Volume I—Visual (H.O. Publication No. 103): Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Rules of the Road, International—Inland (C.G.–169). Rules of the Road, Western Rivers (CG–184). Rules of the Road, Great Lakes (C.G.–172): Published by and free on application to the U.S. Coast Guard.

Port Series of the United States: Part I (port administration and services) published by Maritime Administration, U.S. Department of Commerce; Part II (port conditions and facilities) published by Corps of Engineers, U.S. Army. Both parts are for sale by the Superintendent of Documents.

CORPS OF ENGINEERS, U.S. ARMY.—Jacksonville District Office: 575 Riverside Ave., Jacksonville 1, Fla. The district includes the coastal waters and tributaries of Florida eastward of St. Marks, and Puerto Rico and the Virgin Islands.

San Juan Area Office: Stop 7½, Fernandez Juncos Ave., San Juan, P.R.

Mobile District Office: 2301 Airport Blvd., Mobile 7, Ala. The district includes the coastal waters and tributaries of Florida westward of St. Marks; Alabama, Mississippi, and Louisiana to and including Pearl River.

New Orleans District Office: Foot of Prytania St., New Orleans, 9, La. The district includes the coastal waters and tributaries of Louisiana westward of Pearl River, and the Mississippi River to Vicksburg, Miss.

Galveston District Office: 606 Santa Fe Bldg., Galveston, Tex. The district includes the coastal waters and tributaries of Texas.

COAST GUARD.—Commander, Seventh Coast Guard District, 150 Southeast Third Avenue, Miami 32, Fla.

The district includes South Carolina, Georgia, Florida to the Apalachicola River Entrance; and Puerto Rico and the United States Virgin Islands.

Commander, Greater Antilles Section: Coast Guard Base, San Juan, P.R.

Key West Captain of the Port Office: Coast Guard Base, Key West, Fla.

Tampa Captain of the Port Office: 406 Federal Bldg., Tampa 2, Fla.

San Juan Captain of the Port Office: Coast Guard Base, San Juan, P.R.

Commander, Eighth Coast Guard District, 332 Customhouse, New Orleans 16, La.

The district includes Florida westward of the Apalachicola River Entrance; Alabama, Mississippi, Louisiana, and Texas.

Mobile Captain of the Port Office: Federal Bldg., Mobile, Ala.

New Orleans Captain of the Port Office: Customhouse, New Orleans 16, La.

Sabine Captain of the Port Office: Port Arthur, Tex.

Galveston Captain of the Port Office: General Delivery.

Houston Captain of the Port Office: Galena Park, Tex.

Corpus Christi Captain of the Port Office: Federal Bldg., Corpus Christi, Tex.

Port Isabel Captain of the Port Office: General Delivery.

Lifeboat stations.—The lifeboat stations operated by the Coast Guard in the area covered by this Coast Pilot are:

Santa Rosa, Fla. (No. 212) 30°19.1′ N., 87°15.3′ W. About 2.5 miles east of west end of Santa Rosa Island.

Grand Isle, La. (No. 214) 29°13.8′ N., 89°59.9′ W. About 3 miles southwest of Barataria Pass, in center of Grand Isle.

New Canal, La. (No. 215) 30°01.6′ N., 90°06.8′ W. East side of New Canal entrance, on Lake Pontchartrain.

Sabine, Tex. (No. 216) 29°43.7′ N., 93°52.3′ W. West side of Sabine Pass, about 5.6 miles north-northwest of Sabine Pass East Jetty Light.

Galveston, Tex. (No. 217) 29°20.0′ N., 94°46.2′ W. East side of Galveston Channel, about 4 miles west of Galveston Jetty Light.

Freeport, Tex. (No. 219) 28°56.5′ N., 95°18.2′ W. Northeast side of Freeport Harbor entrance.

Port O'Connor, Tex. (No. 220) 28°23.8′ N., 94°24.7′ W. North end of Matagorda Island, on Saluria Bayou.

Port Aransas, Tex. (No. 221) 27°50.2′ N., 97°03.5′ W. Northeast end of Mustang Island at east end of Corpus Christi Channel.

Port Isabel, Tex. (No. 222) 26°04.3′ N., 97°09.8′ W. South end of Padre Island, at Brazos Santiago Light.

CUSTOMS DISTRICTS.—The first port listed in each district is the headquarters port. An asterisk (*) precedes the names of ports authorized to issue marine documents.

Florida District: The area includes Florida, the north bank of St. Marys River, and the city of St. Marys, Georgia.

Ports of entry: *Tampa, *Apalachicola, Boca Grande, Carrabelle, *Key West, Panama City, *Pensacola, Port St. Joe, St. Petersburg.

Mobile District: The area includes Alabama and Mississippi south of 31° N.

Ports of entry: *Mobile, *Gulfport, Pascagoula.

New Orleans District: The area includes Louisiana except the parishes of Cameron and Calcasieu, and Mississippi north of 31° N.

Ports of entry: *New Orleans, *Baton Rouge, *Morgan City.

Sabine District: The area includes the easterly part of Texas from Sabine Pass westward to Neches River, and the parishes of Cameron and Calcasieu in Louisiana.

Ports of entry: *Port Arthur, *Beaumont, *Lake Charles, Orange, Sabine.

Galveston District: The area includes Texas east of 97° W., except the area in the Sabine District; also

portions of Texas in the counties of Dallas, Aransas, and Refugio west of 97° W., and the counties of Tarrant, San Patricio, and Nueces.

Ports of entry: *Galveston, including Port Bolivar and Texas City; *Houston, Freeport, *Corpus Christi.

Laredo District: The area includes Texas west of 97° W., and east of the Pecos River, except the area in the Galveston District.

Port of entry: *Brownsville.

Puerto Rico District: The district area includes the Territory of Puerto Rico.

Ports of entry: *San Juan, Aguadilla, Fajardo, Guanica, Humacao, Jobos, *Mayaguez, *Ponce.

Virgin Islands: The area includes the U.S. Virgin Islands.

Ports of entry: *Charlotte Amalie, Coral Bay, Cruz Bay, Christiansted, Frederiksted.

PUBLIC HEALTH SERVICE.—Quarantine stations where supervision of quarantine and medical examination of aliens are performed:

Florida:

Tampa: U.S. Quarantine Station, P.O. Box 1438, Tampa 1, Fla.

Louisiana:

New Orleans: U.S. Quarantine Station, 3819 Patterson Road, Algiers, New Orleans 14, La.

Texas:

Galveston: U.S. Quarantine Station, 45th St. and Avenue N., Galveston, Tex.

Puerto Rico:

San Juan: U.S. Quarantine Station, P.O. Box 3788, San Juan 18, P.R.

Other ports where quarantine services are performed are: Key West, Fla., Mobile, Ala.; Houston, Tex., Port Arthur, Tex., Brownsville, Tex.; St. Thomas, V.I.

Hospitals:

New Orleans: 210 State St., New Orleans 18, La.

Galveston: 45th St. and Avenue N., Galveston 1, Tex.

Outpatient clinics:

Tampa: P.O. Box 1438, Davis Island, Tampa 1, Fla.

Mobile: U.S. Court and Customhouse, St. Joseph and St. Louis Sts., Mobile 16, Ala.

Houston: 216 Appraisers Stores Bldg., 7300 Wingate Ave., Houston 11, Tex.

Port Arthur: 211 Post Office and Customhouse, 5th and Austin Ave., Port Arthur, Tex.

San Juan: P.O. Box 3788, San Juan 18, P.R

Charlotte Amalie: Post Office and Customhouse Bldg., Charlotte Amalie, V.I.

Outpatient offices:

Apalachicola, Fla., 17½ Avenue E; Baton Rouge, La., 225 Wabash Ave.; Biloxi, Miss., 423 Lameuse St.; Brownville, Tex., 108 Medical Arts Center; Chattahoochee, Fla., 401 High St.; Corpus Christi, Tex., 2512 Medical Center, 2400 Morgan Ave.; Gulfport, Miss., 309 Gulf National Bank Bldg.; Key West, Fla., 420 Simonton St.; Morgan City, La., 1122 8th St.; Panama City, Fla., 456 Grace Ave.; Pensacola, Fla., 1003 N. 12th St.; Ponce, P.R., 82 Salud St.; Port St. Joe, Fla., The Medical Clinic, 324 Williams Ave.

IMMIGRATION and NATURALIZATION.—Offices of these services are in the following places:

Florida:

Key West: 105 New U.S. Post Office Bldg.

Fort Myers: Room 214, U.S. Post Office Bldg.

Tampa: Room 203, Florida Bldg., 404 E. Jackson St.

Pensacola: U.S. Post Office Bldg.

Alabama:

Mobile: 457 U.S. Court & Custom House Bldg.

Mississippi:

Gulfport: Paulk Bldg., 11th & 32d Sts.

Louisiana:

New Orleans: Federal Bldg., 701 Loyola Ave.

Baton Rouge: Room 838 Commerce Bldg.

Lake Charles, Federal Office Bldg., 931 Moss St.

Texas:

Port Arthur: U.S. Post Office & Customhouse Bldg.

Houston: Federal Office Bldg.

Galveston: U.S. Post Office Bldg.

Corpus Christi: Federal Courts Bldg.

Port Isabel.

Brownsville: Gateway International Bridge.

Puerto Rico:

San Juan: 804 Ponce de Leon Ave., Santurce.

Virgin Islands:

Charlotte Amalie, St. Thomas: Federal District Court Bldg.

Christiansted, St. Croix: U.S. Post Office Bldg.

FEDERAL COMMUNICATIONS COMMISSION.—Distric field offices:

Tampa: Spradlin Bldg., Tampa, Fla.

Mobile: U.S. Court and Custom House, Mobile, Ala.

New Orleans: Federal Office Bldg., New Orleans, La.

Houston: U.S. Appraisers Bldg., Houston, Tex.

Beaumont: U.S. Post Office Bldg., Beaumont, Tex.

Puerto Rico: Federal Bldg., San Juan, P.R.

WEATHER BUREAU.—Offices: In the area covered by this Coast Pilot, the Weather Bureau operates marine centers from which personnel will visit ships to compare barometers and other weather instruments, and at other Weather Bureau offices barometers may be brought in for comparison with standards, as follows:

Marine centers:

Mobile: 516 U.S. Court & Custom House, Mobile, Ala.

New Orleans: 317 U.S. Post Office Bldg., New Orleans 12, La.

Houston: 1002 Federal Office Bldg., Houston 14, Tex.

San Juan, P.R.: Airport Station, Isla Verde International Airport, San Juan, P.R.

Comparison offices:

Tampa: Airport Station, Tampa International Airport, Tampa, Fla.

Fort Myers: Airport Station, Fort Myers, Fla.

Pensacola: U.S. Post Office Bldg., Pensacola, Fla.

Lake Charles: Airport Station, Lake Charles Air Force Base, Lake Charles, La.
Galveston: U.S. Post Office Bldg., Galveston, Tex.
Port Arthur: Airport Station, Jefferson County Airport, Port Arthur, Tex.
Corpus Christi: Airport Station, Cliff Maus Field, Corpus Christi, Tex.
Brownsville: Airport Station, International Airport, Brownsville, Tex.

Radiotelephone broadcasts by Coast Guard.—Scheduled marine information broadcasts of notices to mariners, hydrographic information, storm warnings, small-craft warnings, advisories, and other important marine information are broadcast by radiotelephone at the scheduled times and indicated frequencies preceded by an initial call on 2182 kc. Safety and emergency broadcasts are made on 2182 kc. upon receipt.

NMA, Miami, Fla. 2670 kc. 1150 and 2350 e.s.t.
NOF, St. Petersburg, Fla. 2670 kc. 1120 and 2320 e.s.t.
NMG, New Orleans, La. 2670 kc. 0550, 1150, 1750, and 2350 c.s.t.
NOY, Galveston, Tex. 2670 kc. 0520, 1120, 1720, and 2320 c.s.t.
NMR, San Juan, P.R. 2670 kc. 1100 and 2300 A.s.t.

Radiotelegraph broadcasts by Coast Guard.—Scheduled marine information broadcasts of notices to mariners, hydrographic information, storm warrings, advisories, and other important marine information are broadcast by radiotelegraph at the scheduled times and indicated frequencies, preceded by an initial call on 500 kc. Emergency broadcasts are made on 500 kc. upon receipt and repeated during the last 15 seconds of the first silent period after receipt. Emergency broadcasts are preceded by the Urgent Signal (XXX).

NMA, Miami, Fla., 440 kc. 1100 and 2000 e.s.t.
NMG, New Orleans, La., 428 kc. 1120 and 1820 c.s.t.
NOY, Galveston, Tex. (Emergency broadcasts on 500 kc. only)
NMR, San Juan, P.R. 466 kc. 1220 and 2020, A.s.t.

Weather broadcasts by commercial radio stations.—Taped or direct broadcasts of forecasts and storm warnings are made by commercial radio stations in the areas covered by this Coast Pilot. These usually are put on the air at least twice daily; broadcast times are published in local newspaper radio program schedules, and in the Coastal Warning Facilities Charts issued annually by the U.S. Weather Bureau. The charts are on sale, 10 cents each, by Superintendent of Documents, Washington 25, D.C.

Storm warning stations.—Weather Bureau listings of the display stations in the area covered by this Coast Pilot follows: DN indicates day and night displays; D indicates daytime displays only, and W indicates no display, posted warnings only:

Florida:

D Grassy Key, Bonefish Harbor; 24°46.0′, 80°56.7′.
D Marathon, Leonard's Sports Goods; 24°43.7′, 81°01.8′.
D Marathon, Overseas Boat Rental; 24°42.5′, 81°06.7′.
D Marathon; 24°42.5′, 81°06.3′.
D Key Colony Beach; 24°43.4′, 81°01.1′.
D Sombrero Key Light; 24°37.6′, 81°06.7′.
D American Shoals Light; 24°31.5′, 81°31.2′.
D Key West, Sands Marine Station; 24°33.8′, 81°48.0′.
DN Key West, Lumley & Roberts Hdwe Co.; 24°33.6′, 81°48.1′.
D Key West, Eisner Yacht Basin; 24°33.5′, 81°47.3′.
D Key West, U.S. Navy Station; 24°33.1′, 81°48.4′.
D Flamingo No. 2; 25°08.5′, 80°55.5′.
D Everglades; 25°51.4′, 81°23.3′.
D Naples; 26°08.0′, 81°47.6′.
D Fort Myers Beach; 26°27.4′, 81°57.3′.
D Punta Rassa; 26°29.2′, 82°00.8′.
DN Fort Myers; 26°38.8′. 81°52.3′.
D Port Boca Grande; 26°43.2′, 82°15.6′.
DN Punta Gorda; 26°56.1′, 82°03.2′.
DN Venice, Jetty; 27°06.7′, 82°27.9′.
D Sarasota; 27°20.0′, 82°32.7′.
D Cortez; 27°28.1′, 82°41.3′.
D Bradenton; 27°29.9′, 82°34.4′.
D St. Petersburg Beach; 27°41.1′, 82°44.2′.
DN St. Petersburg, O'Neill's Boat Marina; 27°42.4′, 82°40.9′.
DN St. Petersburg; 27°46.3′, 82°37.9′.
DN St. Petersburg, South Pasadena Marina; 27°45.3′ 82°44.2′.
D Ruskin Marina; 27°43.7′, 82°28.6′.
D Gulfport; 27°44.3′, 82°41.7′.
DN Johns Pass; 27°47.0′, 82°47.0′.
DN Pinellas Park; 27°50.3′, 82°42.9′.
D Davis Island Yacht Club; 27°54.4′, 82°27.1′.
D Clearwater; 27°57.9′, 82°48.3′.
D Clearwater Beach Marina; 27°58.6′, 82°49.5′.
DN Dunedin; 28°00.7′, 82°47.6′.
D Tarpon Springs; 28°09.3′, 82°45.7′.
D Port Richey; 28°16.3′, 82°43.5′.
DN Cedar Keys; 29°08.1′ 83°02.1′.
W St. Marks; 30°07.0′, 84°12.0′.
DN Carrabelle; 29°50.9′, 84°39.8′.
DN Port St. Joe; 29°48.7′ 85°18.2′.
D Apalachicola: 29°43.6′, 84°59.0′.
DN Panama City; 30°10.1′, 85°41.6′.
D Destin, Kelly's Boat Service; 30°23.7′, 86°30.7′.
D Valparaiso; 30°30.3′, 86°29.4′.
D Fort Walton Beach Yacht Club; 30°25.5′, 86°35.5′.
DN Pensacola; 30°24.2′, 87°12.9′.
D Pensacola Yacht Club; 30°23.8′, 87°14.4′.

Alabama:

DN Gulf Shores; 30°16.7′, 87°41.0′.
D Mobile Point Range Rear Light; 30°13.5′, 88°01.5′.
DN Mobile; 30°41.0′, 88°02.5′.
D Bayou la Batre; 30°23.5′, 88°16.0′.

Mississippi:

DN Pascagoula; 30°22.2′, 88°33.9′.
DN Biloxi; 30°23.5′, 88°53.1′.
DN Gulfport; 30°22.0′, 89°05.5′.
D Pass Christian; 30°18.8′, 89°15.0′.
DN Bay St. Louis; 30°18.4′, 89°19.7′.

Louisiana:

DN Pilottown; 29°11.0′, 89°15.5′.
D Burrwood; 28°58.0′, 89°23.0′.
DN Chef Menteur, Intracoastal Waterway; 30°03.8′, 89°47.6′.
DN New Orleans, Inner Harbor Canal Locks; 29°58.0′, 90°01.6′.
D New Canal Light; 30°01.6′, 90°06.7′.
D Grand Isle Lifeboat Station; 29°13.8′, 89°59.9′.
DN Morgan City; 29°41.8′, 91°12.7′.
D Cameron; 29°46.7′, 93°20.5′.

Texas:

D Orange; 30°05.5′, 93°43.8′.
DN Port Arthur; 29°52.0′, 93°56.0′.
DN Sabine Lifeboat Station; 29°43.7′, 93°52.3′.
DN Galveston Lifeboat Station; 29°20.0′, 94°46.0′.
D Texas City; 29°22.5′, 94°53.6′.
D Houston Yacht Club; 29°37.1′, 95°00.1′.
DN Kemah; 29°32.9′, 95°01.0′.
D Freeport; 28°56.9′, 95°20.8′.
D Freeport Lifeboat Station; 28°56.5′, 95°18.1′.
DN Matagorda; 28°41.0′, 95°58.4′.
DN Palacios; 28°41.9′, 96°13.0′.
D Port O'Conner Lifeboat Station; 28°23.9′, 96°24.4′.
DN Port Lavaca; 28°37.8′, 96°37.2′.
D Rockport; 28°01.2′, 97°03.0′.
D Aransas Pass; 27°53.9′, 97°08.4′.
DN Port Aransas Lifeboat Station; 27°50.3′, 97°03.5′.
D Corpus Christi, T-head; 27°47.7′, 97°23.3′.
D Corpus Christi, Padre Island Toll House; 27°39.8′, 97°16.4′.
D Corpus Christi, Padre Island Causeway; 27°38.1′ 97°14.4′.
D Yarborough Pass; 27°12.2′, 97°22.5′.
D Port Mansfield; 26°33.4′, 97°25.6′.
D Port Isabel Lifeboat Station; 26°04.0′, 97°10.0′.
D Port Brownsville; 25°57.1′, 97°23.7′.

Puerto Rico:

D Isla Mona Light; 18°05.3′, 67°50.8′.
D Aguadilla City; 18°26.0′, 67°09.3′.
D Punta Borinquen Light; 18°30.0′, 67°09.0′.
D Arecibo Light; 18°29.0′, 66°42.0′.
D Fort San Cristobal; 18°28.2′, 66°06.7′.
D San Juan, Coast Guard Base; 18°27.7′, 66°07.0′.
D San Juan, Club Nautico; 18°27.7′, 66°05.3′.
D Cangrejos Yacht Club; 18°27.5′, 65°59.5′.
D Cabo San Juan Light; 18°23.0′, 65°37.1′.
D Punta Tuna Light; 17°59.4′, 65°53.1′.
D Ponce Yacht and Fishing Club; 17°58.0′, 66°37.1′.
D Playa de Ponce; 17°58.9′, 66°37.2′.
D Cabo Rojo Light; 17°56.1′, 67°11.6′.
D Mayagüez; 18°12.5′, 67°09.0′.

Virgin Islands:

D St. Thomas, Hassel Island; 18°19.6′, 64°56.0′.
D St. Thomas (Harbormaster Office); 18°20.5′, 64°55.8′.
D St. Thomas, Bluebeard Castle; 18°20.5′, 64°55.5′.
D Cruz Bay, St. Johns; 18°20.0′, 64°47.9′.
D Coral Bay, St. Johns; 18°21.0′, 64°43.0′.
D Johns Folly, St. Johns; 18°19.2′, 64°42.2′.
D Fort Christiansted; 17°44.9′, 64°42.1′.
D Christiansted (Harbormaster Office); 17°44.9′, 64°42.2′.
D Frederiksted (inner end of pier); 17°43.0′, 64°53.1′.
D Frederiksted (Fort Frederik); 17°43.0′, 64°53.0′.
D Ham Bluff Light; 17°46.3′, 64°52.5′.

LEGAL HOLIDAYS.—The following are the legal holidays in the area covered by this Coast Pilot:

Jan. 1, New Year's Day.—All States, Puerto Rico, and Virgin Islands.
Jan. 6, Three Kings' Day (Epiphany)—Puerto Rico.
Jan. 8, Battle of New Orleans—Louisiana.
Jan. 11, De Hostos' Birthday—Puerto Rico.
Arbor Day—Florida (3d Friday in January).
Jan. 19, Robert E. Lee's Birthday—All Gulf coast States.
Jan. 30, Franklin D. Roosevelt Day—Virgin Islands.
Feb. 12, Lincoln's Birthday—Virgin Islands.
Mardi Gras (Shrove Tuesday)—Alabama, Florida, and Louisiana.
Feb. 22, George Washington's Birthday—All States, Puerto Rico, and Virgin Islands.
Mar. 2, Texas Independence Day—Texas.
Mar. 22, Emancipation Day—Puerto Rico.
Mar. 31, Transfer Day—Virgin Islands.
Holy Thursday—Virgin Islands.
Good Friday—Florida, Louisiana, Puerto Rico, and Virgin Islands.
Easter Monday—Virgin Islands.
Apr. 13, Thomas Jefferson's Birthday—Alabama.
Apr. 16, Jose de Diego's Birthday—Puerto Rico.
Apr. 21, San Jacinto Day—Texas.
Apr. 26, Confederate Memorial Day—Alabama, Florida, and Mississippi.
Whit Monday—Virgin Islands.
May 30, Memorial Day—Louisiana, Puerto Rico, and Virgin Islands.
June 3, Jefferson Davis' Birthday—Gulf coast States.
June 22, Organic Act Day—Virgin Islands.
July 4, Independence Day—All States, Puerto Rico, and Virgin Islands.
July 17, Munoz Rivera's Birthday—Puerto Rico.
July 25, Constitution Day—Puerto Rico, and Virgin Islands.
July 27, Barbosas Birthday—Puerto Rico.
Aug. 30, Huey P. Long's Birthday—Louisiana.
Labor Day—All States, Puerto Rico and Virgin Islands.

Oct. 12, Columbus Day—Alabama, Florida, Louisiana, Texas, and Puerto Rico.

Nov. 1, All Saints Day—Louisiana and Virgin Islands.

Nov. 11, Veterans Day—All States, Puerto Rico and Virgin Islands.

Nov. 19, Discovery Day—Puerto Rico.

Thanksgiving Day—All States, Puerto Rico, and Virgin Islands.

Dec. 25, Christmas Day—All States, Puerto Rico, and Virgin Islands.

CLIMATOLOGICAL TABLES

These tables were compiled from U. S. Weather Bureau data.

Sky cover is expressed in a range of 0 for no clouds to 10 for complete sky cover. The number of clear days is based on average cloudiness of 0 to 3, partly cloudy days on 4 to 7, and cloudy days on 8 to 10.

Heavy fog includes data referred to at various times in the past as "Dense" or "Thick." The upper visibility limit for heavy fog is 1/4 mile.

(a) means length of record in years.
* means less than one-half.
T means trace, an amount too small to measure.

KEY WEST, FLORIDA (International Airport) 24°33'N., 81°45'W.; Elevation (ground) 5 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7:00 a.m. EST	1:00 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				9	9		13	13	13	13	8	1	13	3	9	9	9	9	13	13	13	13
Jan.	75.8	65.8	70.8	85	49	1.54	4.43	0.0	84	69	10.9	NE	62 N	69	4.6	12	14	5	6	0	1	*
Feb.	76.8	66.3	71.6	85	47	1.64	1.88	0.0	82	67	10.8	SE	55 WNW	76	4.2	13	11	4	5	0	1	*
Mar.	79.0	68.4	73.7	87	55	1.57	1.78	0.0	80	66	11.2	SE	41 SW	73	4.4	15	11	5	6	0	2	0
Apr.	82.3	71.7	77.0	88	55	2.40	3.15	0.0	78	64	11.3	ENE	42 NNW	77	4.5	12	14	4	5	0	2	0
May	85.0	74.5	79.8	91	66	2.82	8.89	0.0	77	65	9.4	ESE	44 E	71	4.8	11	13	7	7	0	4	0
June	87.7	77.4	82.6	94	68	4.01	4.00	0.0	78	67	8.7	ESE	42 S	63	6.2	5	15	10	11	0	8	0
July	89.1	78.3	83.7	95	69	4.24	2.78	0.0	77	66	9.0	ESE	45 ESE	66	6.2	4	18	9	14	0	13	0
Aug.	89.3	78.4	83.9	95	68	4.67	3.23	0.0	78	66	8.0	ESE	49 S	69	6.1	3	18	10	15	0	13	0
Sep.	88.0	77.4	82.7	94	70	6.05	4.05	0.0	80	69	9.1	ESE	106 NW	60	6.2	3	18	9	15	0	9	*
Oct.	84.2	74.7	79.5	92	60	6.78	3.65	0.0	83	69	9.9	ENE	56 NNE	66	5.9	7	13	11	13	0	5	*
Nov.	79.1	70.0	74.6	88	49	2.02	7.73	0.0	84	69	10.5	ESE	66 NW	70	4.6	11	13	6	7	0	1	*
Dec.	76.6	66.9	71.8	85	46	1.78	4.60	0.0	84	70	10.8	ENE	41 N	67	4.9	12	12	7	8	0	1	0
Year	82.7	72.5	77.6	95	46	39.52	8.89	0.0	80	67	10.0	ESE	106 NW	70	5.2	108	170	87	113	0	57	1

FORT MYERS, FLORIDA (Page Field), 26°35'N., 81°52'W.; Elevation (ground) 13 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7:00 a.m. EST	1:00 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				2	2		22	22	1	1	16	10			13	20	20	20	21	21	17	18
Jan.	75.2	53.9	64.6	80	34	1.52	2.25	0.0	85	60	7.2	E			4.4	12	11	8	5	0	1	5
Feb.	76.6	54.6	65.6	88	43	1.94	2.14	0.0	85	58	7.8	E			4.7	11	11	6	5	0	2	4
Mar.	79.6	57.5	68.6	90	40	2.18	4.91	0.0	90	54	8.2	SW			4.8	12	11	8	6	0	2	3
Apr.	84.1	61.8	73.0	90	50	2.37	3.82	0.0	88	52	7.7	E			4.9	10	13	7	6	0	4	2
May	87.7	66.1	76.9	94	61	4.29	3.22	0.0	84	48	6.8	E			4.9	10	14	7	9	0	9	1
June	90.0	71.2	80.6	95	65	9.20	6.67	0.0	80	54	6.3	E			6.1	5	15	10	14	0	15	*
July	90.5	73.4	82.0	96	71	8.72	3.58	0.0	80	55	5.8	ESE			6.6	2	16	13	19	0	25	*
Aug.	91.0	74.0	82.5	95	72	7.81	4.19	0.0	82	58	5.8	E			6.3	3	16	12	18	0	21	*
Sep.	89.5	73.1	81.3	94	70	8.59	6.02	0.0	87	55	6.8	E			6.3	4	14	12	16	0	14	*
Oct.	85.0	67.5	76.3	93	55	4.15	10.85	0.0	86	52	7.3	NE			5.2	11	12	8	9	0	5	*
Nov.	79.1	59.3	69.2	89	51	1.21	2.13	0.0	84	52	7.0	NE			4.5	12	12	6	4	0	1	2
Dec.	76.0	55.1	65.6	86	33	1.29	2.35	0.0	88	53	7.1	NE			4.8	11	12	8	5	0	1	4
Year	83.7	64.0	73.9	96	33	53.27	10.85	0.0	85	54	7.0	E			5.3	104	156	105	118	0	100	21

TAMPA, FLORIDA (International Airport), 27° 58'N., 82°32'W.; Elevation (ground) 19 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7:00 a.m. EST	1:00 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				15	15		15	15	15	15	15	12		15	15	15	15	15	15	15	15	15
Jan.	70.8	52.1	61.5	84	27	1.99	3.29	T	88	57	7.5	N		69	5.1	11	11	9	6	0	1	7
Feb.	72.3	53.4	62.9	87	24	2.50	2.80	T	88	55	8.1	E		69	5.2	10	10	8	7	0	1	3
Mar.	75.4	56.6	66.0	91	34	3.12	5.20	0.0	86	54	8.4	S		70	5.3	10	11	10	8	0	3	3
Apr.	81.1	61.8	71.5	93	42	2.51	3.70	0.0	85	51	8.3	ENE		71	5.3	10	11	9	7	0	4	1
May	86.0	67.0	76.5	96	54	3.29	3.45	0.0	84	52	7.6	E		76	5.0	11	12	8	6	0	6	1
June	88.9	71.9	80.4	98	62	7.77	4.31	0.0	85	57	7.1	E		67	5.9	6	14	10	12	0	14	*
July	89.5	73.8	81.7	97	64	8.11	12.11	0.0	88	62	6.3	E		60	6.7	2	17	12	18	0	23	*
Aug.	90.1	73.9	82.0	97	67	8.06	5.37	0.0	90	63	6.3	ENE		59	6.6	3	16	12	17	0	20	*
Sep.	88.3	72.6	80.5	96	59	6.45	4.67	0.0	92	61	7.2	ENE		61	6.5	5	13	12	15	0	13	*
Oct.	83.4	65.8	74.6	94	42	3.14	2.18	0.0	89	57	7.5	NNE		65	5.2	11	11	9	8	0	4	1
Nov.	76.2	57.2	66.7	90	29	1.04	3.56	0.0	88	56	7.6	NNE		68	4.9	12	10	8	5	0	2	3
Dec.	72.1	53.2	62.7	85	26	1.96	2.93	0.0	87	57	7.7	N		63	5.5	9	11	11	6	0	1	5
Year	81.2	63.3	72.3	98	24	49.94	12.11	T	88	57	7.5	E		66	5.6	100	146	119	113	0	91	26

APALACHICOLA, FLORIDA (Post Office Building), 29°44'N., 85°59'W.; Elevation (ground) 13 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7:00 a.m. EST	1:00 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				32	32		32	32	25	21	28	22	29	28	28	32	32	32	32	32	32	32
Jan.	62.2	48.1	55.2	79	18	3.61	3.77	T	87	69	7.4	N	42 E	60	5.3	11	8	12	8	0	1	6
Feb.	64.0	49.7	56.9	80	21	3.94	3.74	T	86	67	7.7	N	35 SE	62	5.4	10	7	11	8	*	2	4
Mar.	67.8	54.0	60.9	82	26	4.92	8.17	0.0	85	66	8.0	SE	47 E	62	5.5	11	8	12	8	0	4	5
Apr.	74.2	60.8	67.5	90	37	4.28	7.55	0.0	85	66	7.7	SE	44 SE	72	4.7	12	9	9	6	0	4	2
May	81.1	67.6	74.4	96	50	2.83	7.07	0.0	83	65	6.9	SE	41 SE	78	4.4	14	10	7	6	0	5	1
June	86.2	73.5	79.9	101	62	5.47	5.34	0.0	84	68	6.4	SW	41 NE	70	5.2	10	12	8	10	0	10	*
July	87.4	75.1	81.3	102	66	7.56	5.86	0.0	85	72	5.8	W	55 N	64	6.0	7	13	11	15	0	17	0
Aug.	87.3	75.2	81.3	99	66	7.48	5.67	0.0	87	70	6.0	SW	51 NE	63	5.8	8	12	11	14	0	16	0
Sep.	84.7	73.0	78.9	96	52	7.65	11.71	0.0	88	71	7.3	NE	58 E	63	5.5	10	9	11	12	0	10	*
Oct.	78.2	63.8	71.0	93	39	2.55	5.63	0.0	86	64	7.3	NE	49 NW	75	3.8	17	7	7	6	0	2	1
Nov.	69.0	53.7	61.4	87	24	2.45	5.84	0.0	85	64	7.2	N	41 SE	67	4.5	14	8	8	6	0	1	2
Dec.	63.7	48.9	56.3	82	23	3.29	4.15	T	87	70	7.1	N	36 SE	55	5.6	10	8	13	8	0	1	4
Year	75.5	62.0	68.8	102	18	56.03	11.71	T	86	68	7.0	N	58 E	66	5.1	134	112	119	106	*	73	24

PENSACOLA, FLORIDA (Post Office Building), 30° 25'N., 87° 13'W.; Elevation (ground) 13 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	12:00 M. CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				22	22		22	22	12	12	14	14	22	22					22	22	22	
Jan.	61.1	46.9	54.0	79	14	4.55	4.46	T	86	64	7.0	N	30 NW	56					9	0	2	
Feb.	63.1	48.8	56.0	79	13	3.93	9.16	0.1	83	59	7.1	SE	36 SE	57					9	*	2	
Mar.	66.9	53.4	60.2	88	24	6.00	7.22	0.1	83	57	7.7	SE	43 NW	61					11	*	4	
Apr.	73.2	60.8	67.0	91	34	4.90	5.30	T	83	58	7.5	SE	36 NW	70					7	0	4	
May	79.8	67.7	73.8	100	47	4.36	4.53	0.0	82	58	6.6	W	35 NW	75					7	0	5	
June	85.5	73.7	79.6	100	59	5.17	5.64	0.0	83	59	6.2	W	29 SW	71					9	0	10	
July	86.9	75.0	81.0	101	64	7.59	7.85	0.0	85	64	5.8	W	30 SE	66					14	0	14	
Aug.	87.4	74.9	81.2	103	63	7.43	7.37	0.0	87	60	5.6	W	50 W	71					12	0	12	
Sep.	84.6	72.0	78.3	95	50	5.78	8.51	0.0	87	62	6.8	E	79 SE	67					11	0	6	
Oct.	77.7	62.8	70.3	93	39	3.88	4.27	0.0	85	53	6.4	N	28 NW	76					5	0	2	
Nov.	68.0	52.4	60.2	83	22	3.84	5.40	0.0	83	56	6.7	N	30 SW	64					7	0	2	
Dec.	62.4	47.7	55.1	78	20	4.17	3.64	T	84	61	7.0	NE	31 SE	53					11	0	2	
Year	74.7	61.3	68.0	103	13	61.60	9.16	0.2	84	59	6.7	W	79 SE	66					112	*	65	

MOBILE, ALABAMA (Bates Field), 30° 41.0'N., 88° 14.5'W.; Elevation (ground) 211 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				20	20		20	20	20	20	13	12			13	13	13	13	20	20	20	20
Jan.	62.2	43.2	52.7	84	14	5.02	3.44	0.2	86	62	10.1	N			6.5	7	8	16	10	*	2	5
Feb.	64.7	45.2	55.0	82	11	4.81	5.00	0.1	86	60	10.2	N			6.6	7	7	14	11	*	2	5
Mar.	69.1	49.9	59.5	90	21	7.62	6.52	0.1	85	57	10.3	S			5.9	10	7	14	11	*	6	3
Apr.	76.3	57.0	66.7	92	36	5.10	13.36	0.0	87	55	9.6	S			5.6	9	9	12	8	0	6	4
May	82.8	64.0	73.4	100	43	4.64	4.33	0.0	87	55	8.3	S			5.7	9	12	10	8	0	8	2
June	88.5	70.6	79.6	102	56	6.09	7.38	0.0	88	58	7.4	S			5.8	7	14	9	12	0	12	*
July	89.4	72.0	80.7	104	60	8.97	3.92	0.0	90	64	6.6	S			6.8	3	15	13	18	0	20	1
Aug.	89.7	71.9	80.8	102	59	6.31	4.45	0.0	91	60	6.7	NE			5.6	8	15	8	13	0	15	1
Sep.	86.6	68.7	77.7	98	47	5.78	5.79	0.0	90	61	7.9	NE			5.7	9	10	11	10	0	8	2
Oct.	79.4	58.8	69.1	93	32	3.75	2.25	0.0	87	53	8.1	N			4.3	16	7	8	6	0	3	2
Nov.	69.0	48.3	58.7	85	22	4.07	3.11	0.0	84	55	9.3	N			5.0	12	8	10	8	0	2	3
Dec.	63.0	43.9	53.5	80	18	5.41	5.28	T	86	62	9.6	N			6.1	9	7	15	11	0	2	5
Year	76.7	57.8	67.3	104	11	67.57	13.36	0.4	87	59	8.7	N			5.8	105	119	141	125	*	85	32

NEW ORLEANS, LOUISIANA (Post Office Building), 29°57'N., 90°04'W.; Elevation (ground) 9.3 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				47	47		47	47	38	36	46		47	46	46	46	46	46	46	46	46	46
Jan.	63.5	48.3	55.9	83	17	4.78	4.67	T	85	67	6.5		36 NE	49	6.0	9	8	14	10	0	2	4
Feb.	66.6	50.4	58.5	85	20	4.18	6.11	0.1	85	64	6.6		38 E	51	6.0	7	9	12	9	*	2	2
Mar.	71.1	54.8	63.0	90	28	6.56	10.93	T	83	60	6.8		37 NW	57	5.8	9	9	13	9	0	4	2
Apr.	77.7	61.8	69.8	91	41	5.45	14.01	0.0	84	59	6.5		30 SE	65	5.3	10	11	9	7	0	5	1
May	83.8	68.4	76.1	97	50	5.43	9.08	0.0	83	59	5.8		37 SE	69	5.1	10	13	8	9	0	6	*
June	89.4	74.4	81.9	102	62	5.57	6.64	0.0	83	60	5.1		35 NE	67	5.3	7	16	7	12	0	11	*
July	90.3	75.8	83.1	100	66	7.09	5.49	0.0	84	63	4.9		32 NW	61	6.1	5	16	10	15	0	16	*
Aug.	90.5	76.2	83.4	100	65	6.41	5.30	0.0	85	63	4.9		36 SE	63	5.8	6	16	9	14	0	15	*
Sep.	87.2	73.4	80.3	99	54	5.82	10.75	0.0	85	62	5.8		85 SE	64	5.1	10	12	8	10	0	7	*
Oct.	80.1	65.4	72.8	93	40	3.66	13.68	0.0	82	59	6.0		27 SE	72	4.0	15	9	7	7	0	2	1
Nov.	70.1	54.8	62.5	89	31	4.01	7.77	0.0	82	60	6.3		24 NW	62	4.8	13	8	9	7	0	2	2
Dec.	64.7	49.5	57.1	84	19	4.58	4.83	T	85	66	6.3		27 SW	48	5.9	9	8	14	10	0	2	3
Year	77.9	62.8	70.4	102	17	63.54	14.01	0.1	84	62	6.0		85 SE	61	5.4	110	135	120	119	*	74	15

PORT ARTHUR, TEXAS (Jefferson County Airport), 29°58'N., 94°01'W.; Elevation (ground) 16 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				8	8		8	8	7	7	8	8	8	8	8	8	8	8	8	8	8	8
Jan.	61.7	44.0	52.9	78	23	5.12	4.92	T	87	69	10.7	N	43 S	42	6.9	6	8	17	9	0	2	7
Feb.	65.1	46.8	56.0	83	25	4.19	3.74	0.9	89	66	11.6	S	49 SW	47	6.5	7	6	15	10	*	3	7
Mar.	69.8	50.8	60.3	85	30	4.00	4.21	T	86	61	11.5	S	43 NW	53	6.4	8	8	15	8	0	3	6
Apr.	76.8	58.9	67.9	93	41	3.94	2.65	0.0	90	63	11.4	S	49 NW	51	6.6	6	8	16	8	0	5	3
May	83.1	65.6	74.4	95	46	4.40	7.18	0.0	90	61	10.0	SSE	44 SW	66	5.9	6	14	11	6	0	5	1
June	88.8	71.4	80.1	100	59	4.78	10.20	0.0	91	60	8.8	S	63 NW	71	5.5	7	16	7	8	0	8	*
July	90.7	72.6	81.7	99	67	6.80	3.96	0.0	93	64	7.6	S	39 SE	62	6.1	5	16	10	12	0	14	*
Aug.	91.3	72.2	81.8	99	62	5.14	7.08	0.0	93	65	7.1	S	39 SW	60	6.0	6	15	10	12	0	12	*
Sep.	87.5	68.3	77.9	96	53	4.88	5.26	0.0	92	63	8.7	NE	43 SE	61	5.5	8	12	10	9	0	6	1
Oct.	81.4	59.5	70.5	92	35	2.93	5.35	0.0	91	60	8.9	N	56 NW	63	5.0	11	11	9	8	0	3	3
Nov.	70.0	48.6	59.3	84	27	3.56	7.26	0.0	87	61	10.1	N	49 SW	52	5.8	10	6	14	8	0	3	6
Dec.	63.7	44.4	54.1	80	24	5.47	6.24	0.0	88	65	10.1	N	60 S	48	6.1	10	6	15	10	0	3	7
Year	77.5	58.6	68.1	100	23	55.21	10.20	0.9	90	63	9.7	S	63 NW	58	6.0	90	126	149	108	*	67	41

GALVESTON, TEXAS (Municipal Airport), 29°16'N., 94°52'W.; Elevation (ground) 5 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				11	11		11	11	11	11	11	11			11	11	11	11	11	11	11	11
Jan.	60.4	48.2	54.3	76	22	4.34	2.77	T	84	73	11.3	SSE			6.6	7	8	16	8	0	2	6
Feb.	63.5	51.1	57.3	81	18	3.14	8.53	0.2	86	74	12.1	SE			6.4	7	6	15	9	*	3	6
Mar.	67.8	55.7	61.8	83	33	3.26	3.77	0.0	83	71	11.4	SE			6.5	7	9	15	7	0	2	7
Apr.	74.6	63.5	69.1	91	45	3.40	2.84	0.0	85	72	11.5	SE			6.3	8	8	14	7	0	4	4
May	81.4	70.4	75.9	90	52	3.49	3.47	0.0	84	70	11.2	SSE			5.6	8	13	10	5	0	4	*
June	87.0	76.5	81.8	95	60	3.35	11.34	0.0	82	69	10.8	S			4.8	11	14	5	6	0	5	*
July	88.7	77.9	83.3	95	69	4.71	6.83	0.0	82	69	9.8	S			5.5	8	15	8	8	0	9	*
Aug.	89.1	78.2	83.7	97	70	3.62	3.44	0.0	82	68	9.2	S			5.4	10	13	8	9	0	9	0
Sep.	86.2	74.6	80.4	93	64	5.82	8.44	0.0	82	68	9.6	ESE			4.8	12	10	8	9	0	6	0
Oct.	79.9	67.6	73.8	92	45	3.84	3.05	0.0	80	64	9.9	SE			4.3	14	9	8	6	0	3	*
Nov.	69.9	56.9	63.4	82	29	4.19	5.72	0.0	82	68	11.3	N			5.8	10	7	13	7	0	3	3
Dec.	63.0	50.0	56.5	76	29	4.82	2.44	0.0	82	70	10.9	N			6.2	9	6	16	9	0	2	6
Year	76.0	64.2	70.1	97	18	47.98	11.34	0.2	83	70	10.8	S			5.7	111	118	136	90	*	52	32

HOUSTON, TEXAS (Federal Office Building), 29°46'N., 95°22'W.; Elevation (ground) 41 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				24	24		23	23	19	19	23	23	23	23	23	23	23	23	24	24	23	23
Jan.	61.9	45.7	53.8	82	10	3.98	3.19	0.2	86	65	9.3	N	43 NW	46	6.6	8	7	16	10	*	2	3
Feb.	65.8	49.5	57.7	90	14	2.81	3.89	0.1	88	65	9.7	SE	46 SE	45	6.7	6	7	15	10	*	3	2
Mar.	71.1	54.0	62.6	96	21	3.10	3.65	0.0	85	58	10.2	SE	41 NW	51	6.4	8	8	15	9	0	2	2
Apr.	78.0	61.0	69.5	92	39	3.40	3.76	0.0	89	60	10.4	SE	50 SE	54	6.4	7	8	15	8	0	5	1
May	84.5	67.3	75.9	95	46	4.84	5.45	0.0	92	60	9.3	SE	44 NW	63	6.2	6	12	13	8	0	6	1
June	89.9	73.6	81.8	99	57	4.08	8.28	0.0	91	59	8.4	S	41 SE	70	5.5	7	15	8	8	0	7	*
July	92.3	75.2	83.8	105	68	4.45	6.92	0.0	92	58	7.2	S	63 NW	69	5.9	6	16	9	10	0	11	0
Aug.	92.9	75.4	84.2	103	63	3.09	9.06	0.0	93	58	7.2	S	44 NE	68	5.7	7	15	9	9	0	9	*
Sep.	88.6	71.4	80.0	99	45	3.65	5.19	0.0	90	60	7.6	SE	57 E	64	5.4	9	11	10	9	0	5	*
Oct.	82.1	63.1	72.6	97	37	3.39	7.63	0.0	89	56	8.1	SE	61 E	67	4.7	12	10	9	7	0	3	2
Nov.	71.0	52.8	61.9	89	28	3.95	10.83	0.0	86	57	9.0	SE	33 N	57	5.6	10	8	12	8	0	2	2
Dec.	64.2	47.4	55.8	83	20	4.63	3.38	T	86	64	8.9	SE	35 S	48	6.2	9	6	16	10	0	2	3
Year	78.5	61.4	70.0	105	10	45.37	10.83	0.3	89	60	8.8	SE	63 NW	59	5.9	95	123	147	106	*	57	16

CORPUS CHRISTI, TEXAS (International Airport), 27°46'N., 97°30'W.; Elevation (ground) 43 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				21	21		19	22	20	20	19	13	19	19	19	19	19	19	22	22	22	19
Jan.	66.3	47.4	56.9	86	18	1.39	6.38	0.1	88	67	10.3	SSE	51 NE	48	6.6	7	7	17	8	*	1	5
Feb.	69.8	50.8	60.3	98	18	1.44	2.99	T	89	67	11.0	SSE	42 SE	52	6.6	7	6	15	8	0	2	5
Mar.	74.5	56.0	65.3	94	28	1.63	2.67	T	86	63	11.9	SSE	49 S	57	6.7	6	8	17	6	0	2	3
Apr.	80.1	63.3	71.7	102	39	1.74	7.19	0.0	90	64	12.1	SE	43 SE	60	6.5	6	10	14	5	0	3	2
May	85.5	69.3	77.4	98	50	3.41	2.83	0.0	92	65	11.2	SE	56 NW	67	6.1	7	13	11	6	0	5	1
June	90.2	74.1	82.2	100	61	2.88	3.89	0.0	92	63	10.6	SE	37 SE	77	5.0	11	13	6	5	0	3	*
July	92.5	75.0	83.8	104	68	2.26	3.73	0.0	93	58	10.1	SSE	35 S	85	4.7	11	14	6	4	0	4	*
Aug.	92.9	75.0	84.0	102	65	2.08	5.52	0.0	93	57	9.5	SSE	61 N	82	4.5	13	12	6	5	0	4	*
Sep.	89.3	72.1	80.7	102	50	4.70	7.68	0.0	91	62	8.6	SE	55 NW	72	4.9	12	10	8	8	0	5	*
Oct.	84.0	65.0	74.5	98	40	2.46	7.25	0.0	89	60	8.4	SE	40 N	72	4.4	14	9	8	7	0	3	1
Nov.	74.9	54.9	64.9	95	29	1.74	3.44	T	85	60	9.6	SSE	40 N	58	5.9	9	8	13	6	0	1	3
Dec.	68.4	49.1	58.8	88	24	2.27	3.86	0.0	87	63	9.5	SSE	41 NW	51	6.2	9	7	15	7	0	1	5
Year	80.7	62.7	71.7	104	13	28.00	7.68	0.1	90	62	10.3	SSE	61 N	66	5.7	112	117	136	75	*	34	25

BROWNSVILLE, TEXAS (R.G.V. International Airport), 25°54'N., 97°26'W.; Elevation (ground) 16 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 6:00 a.m. CST	Noon CST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				24	24		22	22	22	22	19	12	19	19	19	19	19	19	19	19	19	19
Jan.	69.6	51.4	60.5	87	23	1.43	2.95	T	89	66	10.4	SSE	40 S	46	6.6	7	8	16	7	0	1	4
Feb.	73.4	54.4	63.9	94	22	1.18	4.98	T	90	65	10.9	SSE	39 N	49	6.5	7	6	15	7	0	1	5
Mar.	77.1	58.9	68.0	99	32	1.11	1.85	T	89	62	11.8	SSE	41 S	49	6.7	6	9	16	5	0	1	3
Apr.	82.1	65.3	73.7	100	45	1.59	3.69	0.0	90	60	12.3	SE	45 SE	53	6.6	5	11	14	4	0	2	2
May	87.3	70.5	78.9	100	53	3.09	4.00	0.0	91	60	12.0	SE	50 SE	66	5.8	7	15	9	4	0	3	1
June	90.9	74.2	82.6	101	49	3.05	8.18	0.0	91	59	11.1	SE	45 E	73	5.2	7	17	6	5	0	2	*
July	92.5	75.1	83.8	103	68	1.97	3.62	0.0	93	55	10.2	SE	32 E	81	4.7	11	15	5	4	0	2	0
Aug.	93.4	74.8	84.1	100	66	2.45	4.39	0.0	92	56	9.3	SE	50 NW	76	4.9	11	14	6	7	0	4	0
Sep.	90.2	72.5	81.4	104	55	5.13	5.76	0.0	92	61	8.4	SE	35 SE	67	5.2	9	14	7	10	0	4	*
Oct.	85.6	66.4	76.0	95	43	2.91	6.67	0.0	91	61	8.5	SE	41 NE	68	4.7	12	12	7	6	0	2	1
Nov.	77.3	58.2	67.8	94	34	1.55	3.64	0.0	87	61	9.6	SSE	36 NW	52	6.0	8	9	13	7	0	1	2
Dec.	71.7	53.0	62.4	88	29	2.16	5.69	0.0	89	64	9.6	NNW	39 NW	47	6.5	7	8	16	6	0	*	5
Year	82.6	64.6	73.6	104	22	27.62	8.18	0.0	90	61	10.3	SE	50 SE	61	5.8	97	138	130	72	0	23	23

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SAN JUAN, PUERTO RICO (Stop 4, Ponce De Leon Ave.), 18°28'N., 66°06'W.; Elevation (ground) 47 feet. WB-1961

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 8:00 a.m. AST	2:00 p.m. AST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				63	63		63	63	6	6	6	6	6	6	6	6	6	6	63	63	63	63
Jan.	79.6	70.2	74.9	90	63	4.69	4.52	0.0	87	66	7.7	ENE	27 E	69	5.1	11	15	5	20	0	*	0
Feb.	79.7	70.0	74.9	91	62	2.67	4.84	0.0	84	62	8.1	ENE	25 ENE	72	5.1	8	16	4	14	0	*	0
Mar.	80.6	70.6	75.6	96	63	2.42	5.26	0.0	83	60	7.9	ENE	26 SE	71	4.9	8	20	3	14	0	*	0
Apr.	81.5	71.7	76.6	93	65	3.80	6.72	0.0	81	64	7.3	ENE	25 NE	63	6.0	4	17	9	14	0	2	0
May	83.5	73.8	78.7	94	66	6.51	5.37	0.0	81	66	7.0	ENE	25 N	62	6.8	2	17	12	16	0	5	0
June	84.0	75.0	79.5	93	66	5.16	6.47	0.0	82	67	7.3	ENE	28 NE	54	7.1	2	13	15	17	0	6	0
July	84.2	75.7	80.0	92	70	6.02	4.05	0.0	81	67	8.3	ENE	30 SE	62	6.3	3	18	10	19	0	7	0
Aug.	85.0	76.0	80.5	94	68	6.26	9.83	0.0	82	66	7.8	ENE	70 NE	63	6.2	4	17	10	20	0	7	0
Sep.	85.5	75.4	80.5	94	69	6.00	8.50	0.0	83	67	6.5	ENE	29 SE	52	6.5	1	19	10	18	0	10	0
Oct.	85.3	74.8	80.1	94	68	5.27	3.87	0.0	85	67	5.8	ENE	31 NE	62	6.8	2	16	13	18	0	8	0
Nov.	83.2	73.5	78.4	93	65	6.37	8.06	0.0	87	67	6.2	ENE	30 NE	62	6.0	4	18	8	19	0	3	0
Dec.	81.1	71.8	76.5	90	62	4.83	10.55	0.0	87	68	7.1	ENE	30 NE	58	5.9	5	17	9	20	0	1	0
Year	82.8	73.2	78.0	96	62	60.00	10.55	0.0	84	66	7.3	ENE	70 NE	63	6.1	54	20.3	108	208	0	49	0

SANTA ISABEL, PUERTO RICO (Santa Isabel Airport), 17°58' N., 66°24' W.; Elevation (ground) 28 feet. WB-1952

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 2:30 a.m. AST	2:30 p.m. AST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)	7	7	7	7	7	7	7	7	7	7	7	7	.....		7	7	7	7	7	7	7	7
Jan.	84.3	65.9	75.1	89	59	0.49	0.91	0.0	82	58	6.0	ENE	.....		4.2	14	14	3	4	0	0	0
Feb.	83.3	65.3	74.3	88	57	0.33	0.54	0.0	84	61	5.5	NE	.....		5.0	12	14	3	5	0	0	0
Mar.	84.2	66.1	75.2	89	58	0.30	0.44	0.0	82	61	7.0	ESE	.....		4.6	14	14	3	3	0	0	0
Apr.	85.1	68.4	76.8	90	62	1.18	1.66	0.0	83	65	6.3	SE	.....		5.3	10	13	7	7	0	1	0
May	86.6	71.3	79.0	89	60	2.90	1.70	0.0	74	57	5.8	SE	.....		6.6	3	17	11	11	0	5	0
June	88.0	72.6	80.3	94	67	2.45	1.94	0.0	85	66	6.4	SE	.....		6.5	4	16	10	8	0	7	0
July	88.9	72.9	80.9	96	67	3.15	3.97	0.0	84	66	6.5	SE	.....		6.2	7	13	11	9	0	8	0
Aug.	89.1	72.9	81.0	95	68	4.22	2.85	0.0	86	66	6.0	E	.....		5.3	9	15	7	10	0	12	0
Sep.	87.6	72.4	80.0	93	68	6.66	6.62	0.0	87	69	5.0	E	.....		6.5	5	13	11	13	0	15	0
Oct.	87.9	71.7	79.8	91	67	6.16	4.02	0.0	89	70	4.6	N	.....		6.3	7	14	10	12	0	15	0
Nov.	86.9	69.9	78.4	91	63	2.72	5.17	0.0	89	65	4.5	NE	.....		5.1	9	15	6	9	0	8	0
Dec.	84.5	66.8	75.7	88	59	0.99	1.98	0.0	68	63	4.6	NE	.....		4.9	13	13	5	6	0	1	0
Year	86.4	68.0	77.2	96	57	31.55	6.62	0.0	83	64	5.7	SE	.....		5.5	107	171	87	97	0	72	0

ST. CROIX, VIRGIN ISLANDS, U. S. A. (Alexander Hamilton Field), 17°42' N., 64°48' W; Elevation (ground) 53 feet. WB-1952

Month	Air temperature (°F.)					Precipitation (inches)			Humidity (percent)		Wind (knots)			Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days						
	Normal			Extreme												Sunrise to sunset						
	Daily maximum	Daily minimum	Monthly	Record highest	Record lowest	Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	2:30 a.m. AST	2:30 p.m. AST	Mean speed	Prevailing direction	Maximum speed and direction			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)	5	5	5	5	5	5	5	5	5	5	5		.....		5	5	5	5	5	5	5	5
Jan.	82.3	69.4	75.9	88	64	3.13	2.88	0.0	81	66	11.1	ENE	.....		5.7	4	21	6	20	0	0	0
Feb.	82.6	69.2	75.9	88	62	2.91	3.95	0.0	84	64	10.5	ENE	.....		5.8	5	18	5	13	0	0	0
Mar.	83.9	69.8	76.9	88	62	2.18	3.42	0.0	83	62	10.9	ENE	.....		5.6	5	21	5	13	0	1	0
Apr.	84.9	72.0	78.5	89	65	2.87	1.24	0.0	85	66	10.9	ENE	.....		6.1	4	18	8	14	0	1	0
May	86.3	74.3	80.3	90	68	5.31	2.84	0.0	87	70	10.3	ESE	.....		7.1	1	15	15	17	0	3	0
June	87.5	75.5	81.5	91	70	2.74	1.78	0.0	85	69	11.3	ESE	.....		6.9	1	18	11	15	0	5	0
July	88.0	75.6	81.8	95	69	3.25	2.00	0.0	85	69	11.3	ENE	.....		6.9	2	17	12	18	0	4	0
Aug.	88.7	75.5	82.1	92	70	4.69	2.19	0.0	87	69	10.8	ENE	.....		6.2	2	21	8	19	0	6	0
Sep.	87.6	74.3	81.0	92	68	7.82	5.39	0.0	88	73	9.4	ENE	.....		7.0	2	15	13	18	0	9	0
Oct.	87.3	74.1	80.7	90	67	6.05	2.35	0.0	90	73	8.2	ESE	.....		6.7	2	17	12	18	0	8	0
Nov.	85.3	72.9	79.1	89	64	3.63	2.89	0.0	89	72	8.4	ENE	.....		6.1	3	19	8	18	0	4	0
Dec.	83.9	71.0	77.4	87	63	2.03	1.16	0.0	86	68	9.7	ENE	.....		5.8	5	18	8	18	0	1	0
Year	85.7	72.8	79.3	95	62	46.61	5.39	0.0	86	68	10.3	ENE	.....		6.3	36	218	111	201	0	42	0

HOURS OF OPERATION OF FOG SIGNALS
(U.S. Coast Guard)

Light station	11 Calendar Years - 1950 thru 1960														Pre - 1950		
	Average													Max. 1 yr.	Ave.	For yrs.	Max. 1 yr.
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year				
Egmont Key, Fla. 27°36.0'N., 82°45.6'W.	50	24	30	16	2	4	6	4	6	5	12	34	193	366	166	37	593
South Pass West Jetty, La. 28°59.4'N., 89°08.4'W.	130	134	142	63	24	5	1	2	3	2	16	61	583	991	647	7	1051
Southwest Pass Entrance, La. 28°54.4'N., 89°25.6'W.	113	109	109	43	7	2	2	1	2	2	14	48	452	940	506	17	843
Head of Passes West Jetty, La. 29°08.9'N., 89°15.1'W.	146	119	145	38	15	5	6	5	6	10	32	77	654	959	573	41	968
Cubits Gap, La. 29°11.5'N., 89°15.8'W.	156	139	139	82	25	4	4	3	6	15	35	80	688	964	670	41	1031
New Canal, La. 30°01.6'N., 90°06.8'W.	37	20	16	7	2	1	1	1	0	7	19	32	143	281	248	41	604
Point Au Fer Reef, La. 29°22.3'N., 91°23.1'W.	96	74	62	27	2	8	4	5	8	16	29	67	398	1017	280	30	561
Sabine Pass East Jetty, Tex. 29°38.7'N., 93°49.4'W.	119	96	95	67	13	5	8	7	15	43	78	121	667	1117	698	17	1112
Galveston Jetty, Tex. 29°19.7'N., 94°41.5'W.	99	59	60	35	3	3	2	5	5	6	27	67	371	509	516	24	829

MEAN SURFACE WATER TEMPERATURES AND SALINITIES

Station	Years	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Mean	
		Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo
Key West, Fla..... 24° 33.2'N. 81° 48.5'W.	31	71.1	35.9	72.3	36.0	74.7	36.4	78.5	36.7	82.3	37.0	85.3	36.6	86.7	36.6	87.0	36.6	85.4	36.2	81.5	35.8	76.1	36.3	72.2	36.2	79.4	36.4
St. Petersburg, Fla ..... 27° 46.0'N. 82° 37.0'W.	15	62.7	26.5	65.0	26.5	68.4	26.5	73.6	26.3	80.0	27.5	84.2	28.8	85.8	28.1	85.5	25.4	83.9	23.3	78.1	23.7	70.5	25.6	63.8	26.4	75.1	26.2
Cedar Keys, Fla..... 29° 08.0'N. 83° 01.9' W.	21	58.5	26.9	61.4	26.4	65.7	25.2	72.8	24.7	79.2	26.0	83.9	27.5	85.2	27.1	85.2	26.0	82.8	25.8	75.3	26.1	66.9	27.5	59.9	27.1	73.1	26.4
Pensacola, Fla..... 30° 24.2'N. 87° 12.8' W.	38	56.1	17.9	58.3	16.5	62.9	13.3	70.4	11.0	77.5	14.4	83.2	17.0	85.1	17.0	85.3	16.5	82.0	19.6	74.2	21.3	64.6	23.0	57.5	20.8	71.4	17.4
Grand Isle, La ..... 29° 10.0'N. 89° 55.0' W.	13	61.6	30.3	61.7	27.7	64.2	27.2	69.3	25.4	77.0	23.0	82.7	24.1	84.7	26.7	84.9	27.8	82.5	28.1	77.1	30.1	69.9	32.7	64.5	31.9	73.3	27.9
Eugene Island, La..... 29° 22.4'N. 91° 23.1' W.	18	53.5	3.9	54.8	2.2	60.6	2.5	67.9	2.1	76.3	2.1	83.1	2.0	84.9	2.4	85.2	4.3	82.3	8.4	74.2	8.5	63.1	6.8	54.8	5.4	70.1	4.2
Galveston, Tex..... 29° 18.6'N. 94° 47.6' W.	40	56.2	22.7	58.2	22.0	62.8	22.0	70.5	22.0	78.3	20.5	84.0	21.7	86.4	25.8	86.7	29.7	83.3	26.8	76.2	25.1	65.8	25.0	58.9	24.3	72.3	24.0
Rockport, Tex..... 28° 01.4'N. 97° 02.8' W.	7	62.1	28.0	62.2	27.2	67.7	26.7	74.3	28.0	80.8	28.4	86.2	30.3	87.4	34.5	87.4	37.1	84.3	31.4	78.1	27.7	68.1	27.8	62.5	26.1	75.1	29.4
Port Isabel, Tex ..... 26° 03.6'N. 97° 12.9' W.	18	61.6	33.2	63.7	33.5	68.0	33.1	74.2	34.0	80.5	34.5	84.5	35.3	85.4	37.1	85.6	37.1	84.2	34.0	78.8	32.1	69.9	33.5	63.6	33.8	75.0	34.3
Isla Maguey, Puerto Rico 17° 58.3'N. 67° 02.7' W.	5	81.2	35.5	80.7	35.9	81.8	36.2	83.2	36.4	84.0	36.0	84.5	36.2	84.5	36.0	85.4	35.8	85.9	35.3	84.7	35.1	83.6	35.0	81.4	35.4	83.4	35.7

For sea water temperature and salinity data in greater detail, see Coast and Geodetic Survey Publication 31-1, Surface Water Temperature and Salinity, Atlantic Coast, North and South America.

TRANS-GULF DISTANCES FOR DEEP-DRAFT VESSELS
KEY WEST, FLA., TO PORT BROWNSVILLE, TEX.

March 22, 1958

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Tampa, Fla., is 809 nautical miles from Corpus Christi, Tex.

	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°45.5'N., 82°37.9'W.	Port Tampa, Fla. 27°51.7'N., 82°33.2'W.	Tampa, Fla. 27°55.4'N., 82°26.9'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°41.5'N., 88°02.2'W.	Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	Gulfport, Miss. 30°21.4'N., 89°05.6'W.	New Orleans, La. (S. Pass) 29°57.0'N., 90°03.7'W.	New Orleans, La. (SW. Pass) 29°57.0'N., 90°03.7'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°04.0'N., 93°43.3'W.	Beaumont, Tex. 30°04.6'N., 94°05.2'W.	Galveston, Tex. 29°18.5'N., 94°48.1'W.	Texas City, Tex. 29°22.7'N., 94°53.2'W.	Houston, Tex. 29°45.0'N., 95°17.4'W.	Freeport, Tex. 28°56.3'N., 95°20.4'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.
Key West, Fla. 24°33.7'N., 81°48.5'W.	73																									
Port Boca Grande, Fla. 26°43.2'N., 82°15.3'W.	150	223																								
St. Petersburg, Fla. 27°45.5'N., 82°37.9'W.	219	292	99																							
Port Tampa, Fla. 27°51.7'N., 82°33.2'W.	228	301	108	8																						
Tampa, Fla. 27°55.4'N., 82°26.9'W.	232	305	112	18	18																					
Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	369	442	281	240	249	253																				
Panama City, Fla. 30°08.2'N., 85°37.6'W.	381	454	294	252	261	266	42																			
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	431	504	357	318	327	331	120	100																		
Mobile, Ala. 30°41.5'N., 88°02.2'W.	471	544	408	370	379	383	181	162	86																	
Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	468	541	409	372	381	385	186	166	90	71																
Gulfport, Miss. 30°21.4'N., 89°05.6'W.	485	558	429	394	403	407	209	191	115	96	51															
New Orleans, La. (S. Pass) 29°57.0'N., 90°03.7'W.	524	597	489	460	469	473	306	292	230	220	194	203														
New Orleans, La. (SW. Pass) 29°57.0'N., 90°03.7'W.	540	613	509	482	491	495	330	317	255	244	218	228	0													
Lake Charles, La. 30°13.1'N., 93°15.5'W.	675	748	658	635	644	648	488	474	412	402	376	385	374	361												
Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	676	749	660	636	645	649	489	476	414	403	377	387	376	362	81											
Orange, Tex. 30°04.0'N., 93°43.3'W.	697	770	680	657	666	670	509	496	434	424	398	407	396	383	102	20										
Beaumont, Tex. 30°04.6'N., 94°05.2'W.	703	776	686	663	672	676	515	502	440	430	404	413	402	389	108	26	26									
Galveston, Tex. 29°18.5'N., 94°48.1'W.	702	775	692	668	678	682	521	508	446	436	410	419	408	395	120	76	96	102								
Texas City, Tex. 29°22.7'N., 94°53.2'W.	706	779	696	673	682	686	525	512	450	440	414	423	412	399	124	80	100	106	9							
Houston, Tex. 29°45.0'N., 95°17.4'W.	745	818	735	711	720	724	564	551	489	478	452	462	450	437	163	118	139	145	48	50						
Freeport, Tex. 28°56.3'N., 95°20.4'W.	719	792	713	687	696	700	542	529	467	456	431	440	429	416	155	108	129	135	56	60	98					
La Quinta, Tex. 27°52.6'N., 97°15.7'W.	802	875	813	791	800	804	652	639	577	567	541	550	539	526	282	235	255	261	182	186	225	140				
Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	807	880	818	796	805	809	658	645	583	572	546	555	544	531	287	240	260	266	188	192	230	146	15			
Port Isabel, Tex. 26°03.6'N., 97°12.8'W.	783	856	807	800	809	813	678	665	603	593	567	576	566	552	350	301	322	328	251	255	294	210	130	135		
Port Brownsville, Tex. 25°57.1'N., 97°24.0'W.	794	867	818	811	820	824	690	676	614	604	578	587	577	563	362	312	333	339	262	266	305	222	141	146	13	

All tabular distances are via STRAITS OF FLORIDA, 24°25.0'N., 83°00.0'W. 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, 18 miles from Tampa Bay distances, 7 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.

March 22, 1958

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Flamingo is 231 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°51.5'N., 81°23.4'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°45.5'N., 82°37.9'W.	Tampa 27°55.4'N., 82°26.9'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.
42*																				
65*	29																			
73*	38	35																		
67*	31	32	17																	
116*	81	82	67	50																
140*	105	106	91	74	39															
136	143	144	129	112	81	45														
144	152	153	139	122	90	54	53													
166	180	181	166	149	117	82	72	32												
182	195	196	181	164	133	97	92	48	15											
210	220	221	207	190	158	122	121	77	40	26										
216	228	229	214	197	165	130	127	83	48	34	22									
230	242	243	228	211	179	143	140	96	62	48	36	18								
229	245	246	231	214	183	147	137	98	65	51	40	32	48							
243	261	262	247	230	199	163	152	108	81	67	56	49	65	19						
302	311	312	298	281	249	213	208	164	139	125	115	118	132	79	68					
376	390	391	376	359	327	292	284	240	217	203	191	194	208	157	146	90				
394	407	408	393	376	345	309	302	257	232	218	208	211	225	174	164	109	52			
412	424	425	410	393	362	326	318	274	249	235	225	228	242	191	181	126	69	25		

Each distance is by shortest coastwise and/or inside route with depths equal to or greater than the shallower of the two ports concerned. An asterisk (*) indicates the Hawk Channel route to or from Key West; all other distances to or from Key West are by way of Northwest Channel.

DISTANCES BY GULF INTRACOASTAL WATERWAY
APALACHICOLA, FLA., TO PORT BROWNSVILLE, TEX.

June 16, 1962

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Mobile, Ala., is 398 nautical miles from Beaumont, Tex.

	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°24.0'W.
Port St. Joe, Fla. 29°49.1'N., 85°18.8'W.	27																											
Panama City, Fla. 30°08.2'N., 85°37.6'W.	51	36																										
Fort Walton Beach, Fla. 30°24.0'N., 86°36.7'W.	112	98	62																									
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	150	135	99	37																								
Mobile, Ala. 30°41.5'N., 88°02.2'W.	214	200	164	102	73																							
Pascagoula, Miss. 30°21.9'N., 88°33.8'W.	222	208	171	110	81	58																						
Biloxi, Miss. 30°23.5'N., 88°52.0'W.	238	224	188	126	97	74	32																					
Gulfport, Miss. 30°21.4'N., 89°05.6'W.	248	233	197	136	106	84	41	28																				
New Orleans, La. 29°57.0'N., 90°03.7'W.	302	288	252	190	161	138	96	83	66																			
Houma, La. 29°35.9'N., 90°42.6'W.	356	341	305	243	214	191	149	136	120	53																		
Morgan City, La. 29°41.3'N., 91°12.7'W.	388	374	338	276	247	224	182	169	152	86	33																	
Lake Charles, La. 30°13.1'N., 93°15.5'W.	525	510	474	412	383	361	318	305	289	222	169	136																
Orange, Tex. 30°04.0'N., 93°43.3'W.	537	523	487	425	396	373	331	318	302	235	182	149	32															
Beaumont, Tex. 30°04.6'N., 94°05.2'W.	562	547	511	450	421	398	355	342	326	260	206	174	57	26														
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													
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												
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											
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										
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									
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								
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							
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						
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					
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				
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			
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		
Port Brownsville, Tex. 25°57.1'N., 97°24.0'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

June 16, 1962

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 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°42.2'W.	Frederiksted, St. Croix, V.I. 17°42.9'N., 64°53.4'W.
San Juan, P.R. 18°27.6'N., 66°06.6'W.																			
Fajardo, P.R. 18°20.2'N., 65°37.8'W.	40																		
Ensenada Honda, P.R. 18°13.8'N., 65°37.4'W.	52	14																	
Humacao, P.R. 18°09.9'N., 65°44.6'W.	59	21	11																
Bahia de Jobos, P.R. 17°57.0'N., 66°13.3'W.	103	65	56	48															
Ponce, P.R. 17°58.2'N., 66°37.3'W.	152*	83	74	65	31														
Bahia de Tallaboa, P.R. 17°58.9'N., 66°44.6'W.	145*	88	79	71	36	13													
Bahia de Guayanilla, P.R. 17°59.5'N., 66°46.4'W.	145*	89	80	72	37	14	5												
Bahia de Guanica, P.R. 17°57.5'N., 66°54.5'W.	138*	99	90	82	47	22	16	15											
Mayaguez, P.R. 18°13.2'N., 67°09.7'W.	92	121	133	131	96	74	67	67	60										
Bahia de Aguadilla, P.R. 18°26.0'N., 67°09.6'W.	74	103	115	123	105	83	76	77	70	23									
Puerto Arecibo, P.R. 18°28.9'N., 66°42.1'W.	43	72	84	92	140	118	112	112	105	58	40								
Ensenada Honda, Culebra 18°18.0'N., 65°17.0'W.	59	25	25	31	76	93	98	99	109	141	123	92							
Isabel Segunda, Vieques 18°09.2'N., 65°26.7'W.	55	18	12	17	62	79	85	86	96	136	118	87	15						
Charlotte Amalie, St. Thomas 18°20.0'N., 64°55.5'W.	80	46	44	50	93	110	116	117	126	161	144	112	24	33					
Cruz Bay, St. John, V.I. 18°20.0'N., 64°47.8'W.	82	53	51	57	99	116	121	122	132	164	146	115	31	40	11				
Road Town, Tortola, B.V.I. 18°25.3'N., 64°37.1'W.	94	66	65	71	113	131	136	137	147	175	157	126	47	55	24	15			
Christiansted, St. Croix, V.I. 17°45.0'N., 64°42.2'W.	103	68	69	68	101	119	124	125	135	184	166	135	48	54	38	37	42		
Frederiksted, St. Croix, V.I. 17°42.9'N., 64°53.4'W.	96	61	60	58	89	106	111	112	122	171	159	128	42	46	38	39	46	19	

* Via Mona Passage

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	

BEAUFORT SCALE OF WIND FORCE

Beaufort Number	Miles per Hour	Knots	Wind Effects Observed at Sea	Terms Used In U.S.W.B. Forecasts
0	Less than 1	Less than 1	Sea like a mirror	
1	1- 3	1- 3	Ripples with the appearance of scales formed, but without foam crests	Light
2	4- 7	4- 6	Small wavelets, short but pronounced; crests appear glassy, do not break	
3	8-12	7-10	Large wavelets with crests beginning to break; foam appears glassy. Perhaps scattered white horses (white foam crests).	Gentle
4	13-18	11-16	Small waves, becoming longer; fairly frequent white horses	Moderate
5	19-24	17-21	Moderate waves of a pronounced long form; many white horses, possibly some spray.	Fresh
6	25-31	22-27	Large waves begin to form; white foam crests more extensive everywhere; probably some spray.	Strong
7	32-38	28-33	Sea heaps up; some white foam from breaking waves blows in streaks along the direction of the wind.	
8	39-46	34-40	Moderately high waves. Edges of crests begin to break into spindrift. Well-marked streaks of foam blow along direction of wind.	Gale
9	47-54	41-47	High waves. Dense streaks of foam along direction of wind. Spray may affect visibility.	
10	55-63	48-55	Very high waves with long overhanging crests; great patches of foam blown in dense white streaks along direction of wind. Sea surface takes on a white appearance. Visibility affected.	Whole gale
11	64-72	56-63	Exceptionally high waves; sea completely covered with long white patches of foam lying along direction of wind; edges of wave crests everywhere blown into froth. Visibility affected.	
12 or more	73 or more	64 or more	Air filled with foam and spray; sea completely white with driving spray. Visibility very seriously affected.	Hurricane

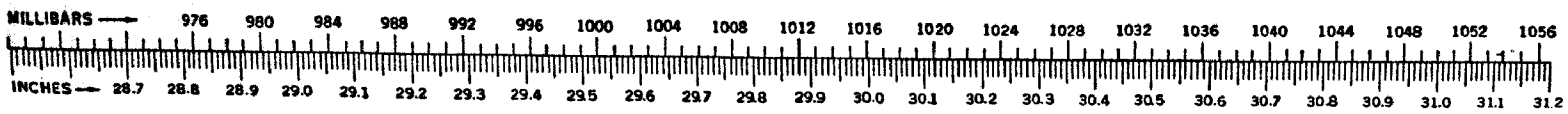

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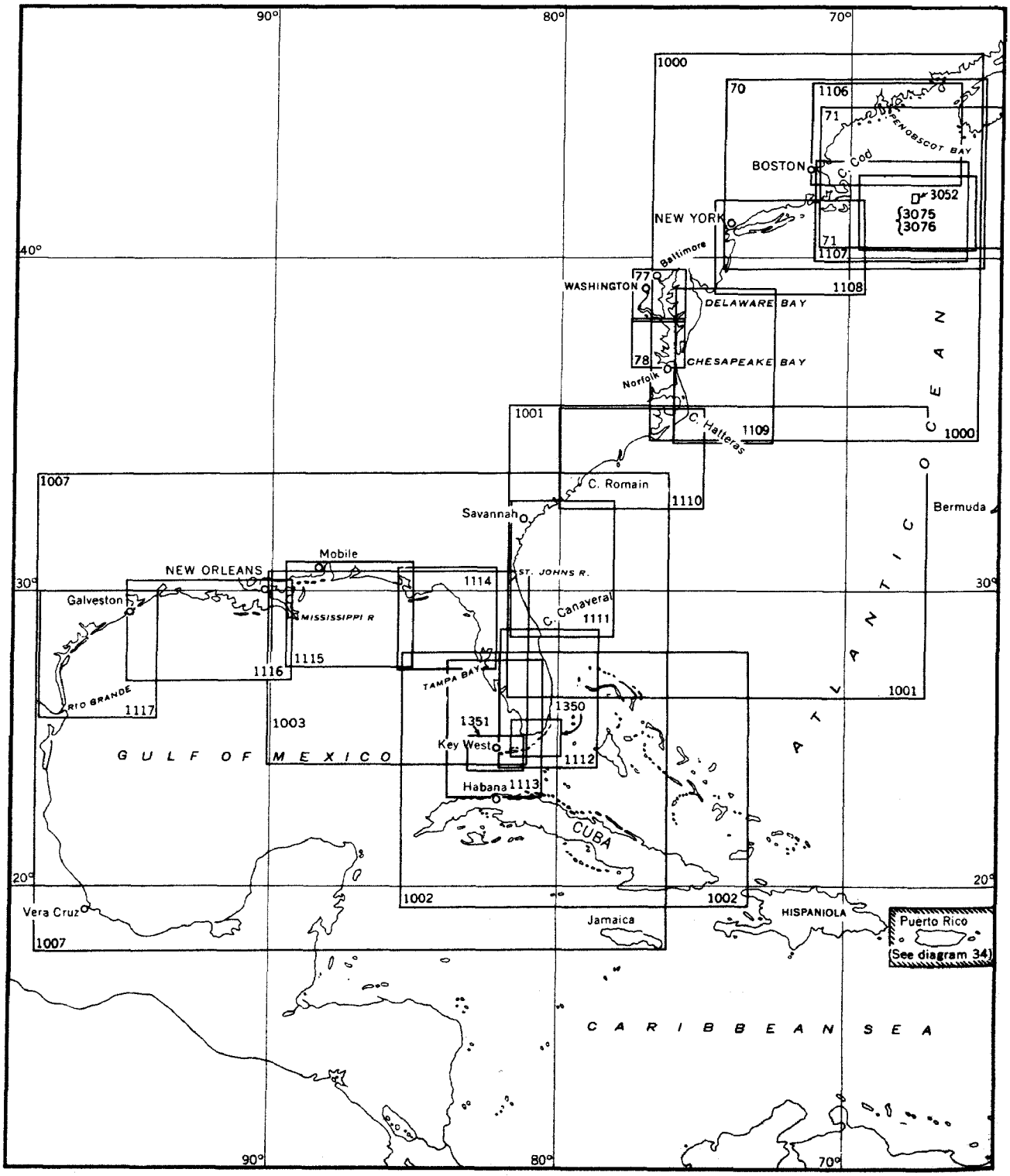
Diagram No. 1

February 1961

SAILING AND GENERAL CHARTS - ATLANTIC AND GULF COASTS



SAILING AND GENERAL CHARTS—ATLANTIC AND GULF COASTS

No.	Price	TITLE	Scale	Paper Size (inches)
		SAILING CHARTS		
70	$1.00	West Quoddy Head to New York	1:675,000	36X46
†1000	1.00	Cape Sable to Cape Hatteras	1:1,200,000	35X43
†1001	1.00	Cape Hatteras to Straits of Florida	1:1,207,256	36X48
†1002	1.00	Straits of Florida and approaches	1:1,210,765	35X43
†1003	1.00	Gulf Coast—Key West to the Mississippi River	1:868,399	36X44
†1007	1.00	Gulf of Mexico	1:2,161,530	35X43
		GENERAL CHARTS		
†71	1.00	Gulf of Maine and Georges Bank	1:500,000	36X44
77	.75	Chesapeake Bay—northern part	1:197,250	34X37
78	.75	Chesapeake Bay—southern part	1:200,000	33X34
†1106	1.00	Bay of Fundy to Cape Cod	1:378,838	36X46
†1107	1.00	Georges Bank and Nantucket Shoals	1:400,000	34X48
†1108	1.00	Approaches to New York, Nantucket Shoals to Five Fathom Bank	1:400,000	34X48
†1109	1.00	Cape May to Cape Hatteras	1:416,944	33X52
†1110	1.00	Cape Hatteras to Charleston	1:432,720	34X46
†1111	1.00	Charleston Light to Cape Canaveral	1:449,659	33X45
†1112	1.00	Cape Canaveral to Key West	1:466,940	31X47
1113	1.00	Habana to Tampa Bay	1:470,940	31X45
1114	.75	Tampa Bay to Cape San Blas	1:456,394	30X34
†1115	1.00	Cape St. George to Mississippi Passes	1:456,394	35X41
1116	1.00	Mississippi River to Galveston	1:458,596	36X49
1117	1.00	Galveston to Rio Grande	1:460,732	36X44
1350	.75	Florida Keys—Fowey Rocks to American Shoal	1:180,000	35X39
1351	.75	Florida Keys—Sombrero Key to Dry Tortugas	1:180,000	30X48
		SPECIAL CHARTS		
3052	.75	Georges Bank—Georges Shoal, approaches to Texas Tower No. 2	1:20,000	26X42
{3075	1.00	Georges Bank—eastern part	1:220,000	36X46
{3076		Georges Bank—western part	1:220,000	

†Includes Loran Lines of Position

Numbers in brackets represent charts printed back to back.

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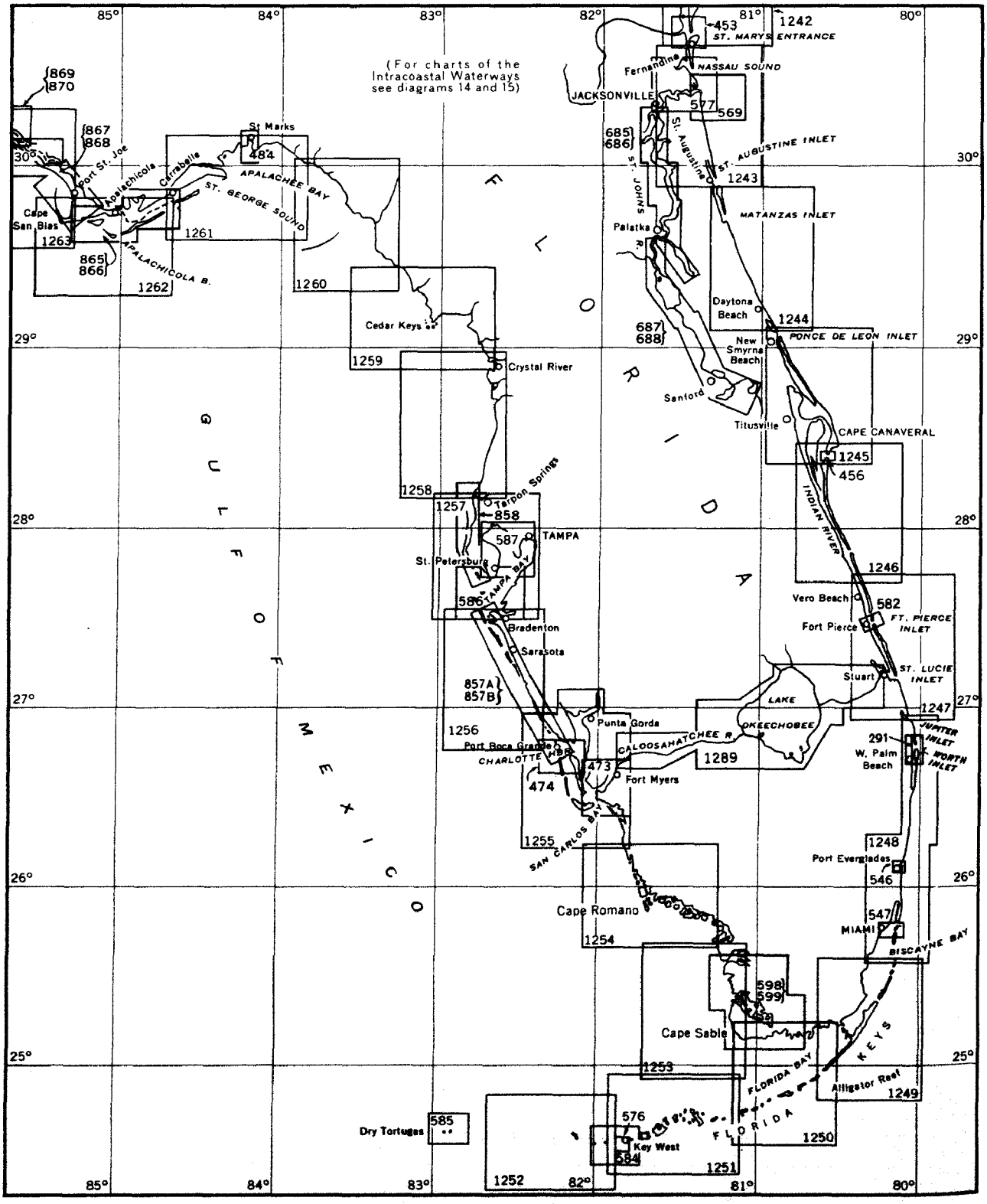
Diagram No. 10

February 1962

COAST AND HARBOR CHARTS - ATLANTIC AND GULF COASTS

JACKSONVILLE TO CAPE SAN BLAS, FLORIDA

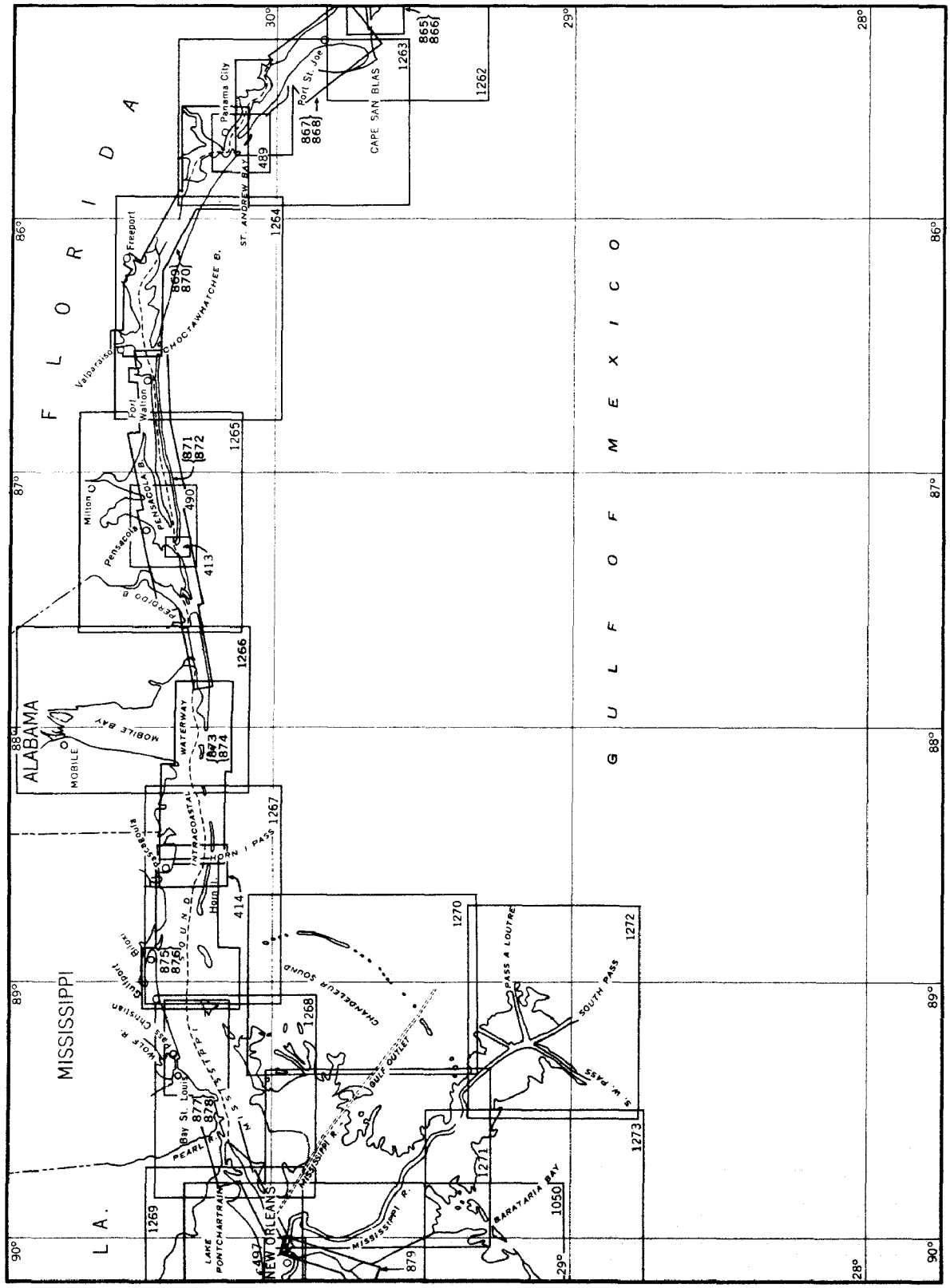


COAST AND HARBOR CHARTS—ATLANTIC AND GULF COAST
JACKSONVILLE TO CAPE SAN BLAS, FLORIDA

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1243	$1.00	Amelia Island to St. Augustine	Florida	1:80,000	34X47
1244	1.00	St. Augustine Light to Ponce de Leon Inlet Light	"	1:80,000	34X47
1245	1.00	Ponce de Leon Inlet to Cape Canaveral	"	1:80,000	36X45
1246	1.00	Cape Canaveral to Bethel Shoal	"	1:80,000	35X45
1247	1.00	Bethel Shoal to Jupiter Inlet	"	1:80,000	34X48
1248	1.00	Jupiter Inlet to Fowey Rocks	"	1:80,000	35X42
1249	1.00	Fowey Rocks to Alligator Reef	"	1:80,000	35X47
1250	1.00	Florida Keys—Alligator Reef to Sombrero Key	"	1:80,000	35X43
1251	1.00	Florida Keys—Sombrero Key to Sand Key	"	1:80,000	35X44
1252	1.00	Sand Key to Rebecca Shoal	"	1:80,000	34X43
1253	1.00	East Cape to Mormon Key	"	1:80,000	35X44
1254	1.00	Chatham River to Clam Pass	"	1:80,000	34X44
		Naples Bay		1:30,000	
1255	1.00	Estero Bay to Lemon Bay, including Charlotte Harbor	"	1:80,000	34X44
1256	1.00	Lemon Bay to Passage Key Inlet	"	1:80,000	34X46
1257	1.00	Tampa Bay and St. Josephs Sound	"	1:80,000	34X43
1258	1.00	Anclote Keys to Crystal River	"	1:80,000	35X48
1259	1.00	Crystal River to Horseshoe Point	"	1:80,000	33X47
1260	1.00	Horseshoe Point to Rock Islands	"	1:80,000	35X44
		Horseshoe Beach	"	1:20,000	
1261	1.00	Apalachee Bay	"	1:80,000	35X45
1262	1.00	Apalachicola Bay to Cape San Blas	"	1:80,000	34X44
1289	1.00	Okeechobee Waterway, including Lake Okeechobee	"	1:80,000	35X48
		Port Mayaca		1:20,000	
		HARBOR CHARTS			
291	.75	Lake Worth Inlet and Palm Beach	Florida	1:10,000	27X41
453	1.00	Fernandina Harbor to Kings Bay	Georgia & Florida	1:20,000	37X43
456	.25	Canaveral Harbor	Florida	1:10,000	21X29
473	.75	San Carlos Bay and Caloosahatchee River	"	1:40,000	30X37
474	.50	Main Entrance to Charlotte Harbor	"	1:40,000	26X31
484	.25	St. Marks River and approaches	"	1:15,000	25X30
546	.75	Port Everglades	"	1:5,000	35X39
547	.75	Miami Harbor	"	1:10,000	29X47
569	.75	Approaches to St. Johns River	"	1:40,000	35X41
		St. Johns River Entrance		1:10,000	
576	.75	Key West Harbor	"	1:10,000	36X38
577	1.00	Nassau Sound to Jacksonville	"	1:40,000	35X40
582	.25	Fort Pierce Harbor	"	1:10,000	19X29
584	1.00	Key West Harbor and approaches	"	1:30,000	36X44
585	.75	Dry Tortugas	"	1:30,000	30X36
		Tortugas Harbor		1:10,000	
586	1.00	Tampa Bay—southern part	"	1:40,000	34X44
587	.75	Tampa Bay—northern part	"	1:40,000	35X37
		St. Petersburg		1:20,000	
		Tampa		1:20,000	
598	.75	Everglades National Park—Whitewater Bay	"	1:50,000	29X42
599		Everglades National Park—Shark River to Lostmans River		1:50,000	
685	.75	St. Johns River—Jacksonville to Racy Pt.	"	1:40,000	36X36
686		St. Johns River—Racy Pt. to Crescent Lake	"	1:40,000	
687	.75	St. Johns River—Dunns Creek to Lake Dexter	"	1:40,000	36X38
688		St. Johns River—Lake Dexter to Lake Harney	"	1:40,000	
		INTRACOASTAL WATERWAY CHARTS (GULF COAST)			
857A	.50	Charlotte Harbor to Tampa Bay—southern part	"	1:40,000	Folio
		Venice		1:20,000	
857B		Charlotte Harbor to Tampa Bay—northern part	"	1:40,000	
		Sarasota		1:10,000	
858	.50	Tampa Bay to Anclote Anchorage	Florida	1:40,000	26X42
865	.50	St. George Sound to Apalachicola Bay	"	1:40,000	26X38
866		Apalachicola Bay to Lake Wimico	"	1:40,000	
867	.50	Lake Wimico to Overstreet and St. Joseph Bay Entrance	"	1:40,000	26X38
868		Overstreet to St. Andrew Bay	"	1:40,000	

Numbers in brackets represent charts printed back to back.

Diagram No. 11
October 1962



COAST AND HARBOR CHARTS - GULF COAST
CAPE SAN BLAS, FLA. TO NEW ORLEANS, LA.

COAST AND HARBOR CHARTS—GULF COAST

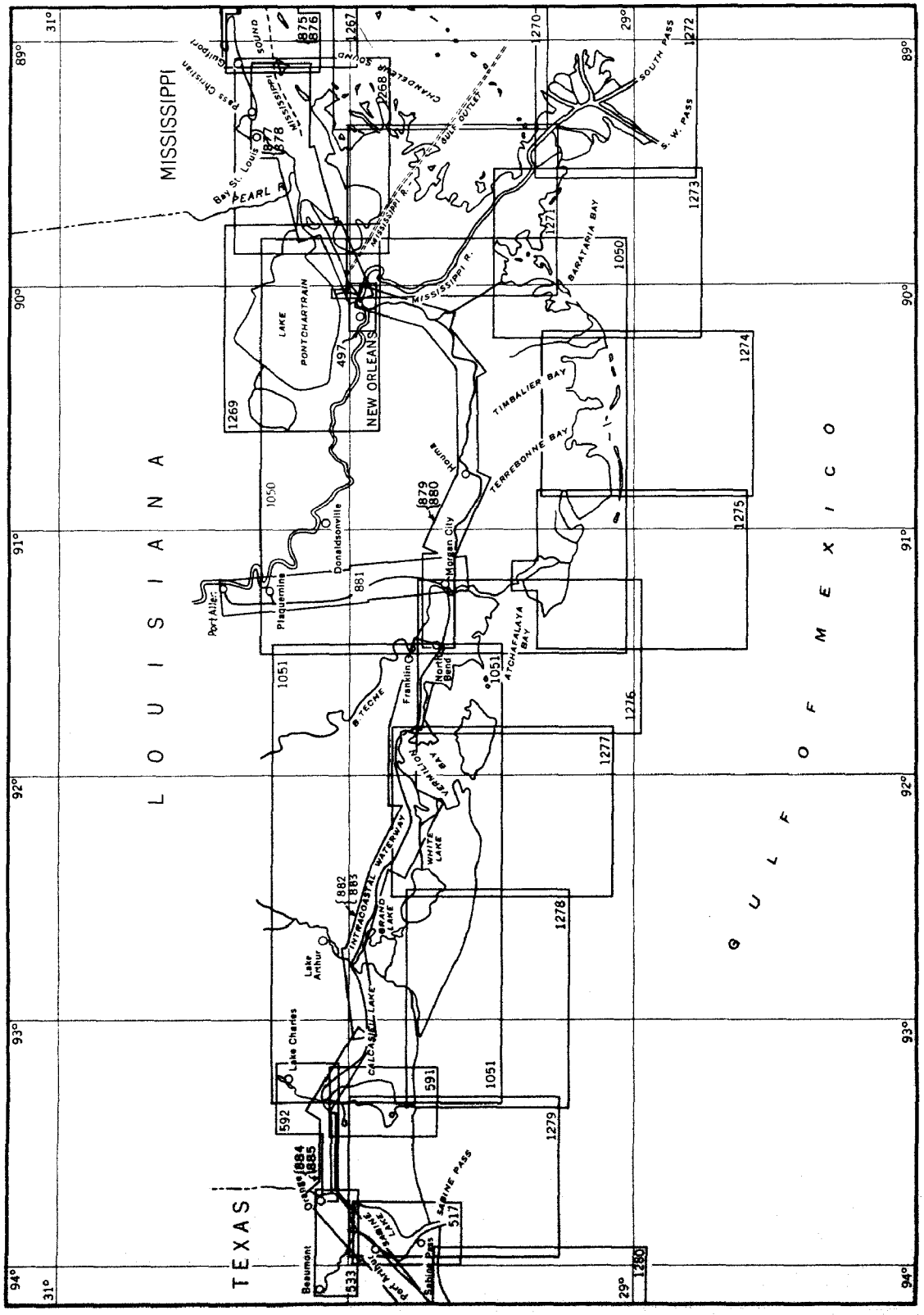
CAPE SAN BLAS, FLA. TO NEW ORLEANS, LA.

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1263	$1.00	St. Joseph and St. Andrew Bays	Florida	1:80,000	34X45
1264	1.00	Choctawhatchee Bay	"	1:80,000	33X44
1265	1.00	Pensacola Bay and approaches	"	1:80,000	33X44
1266	1.00	Mobile Bay	Alabama	1:80,000	34X46
		Mobile Ship Channel	"	1:25,000	
1267	1.00	Mississippi Sound and approaches—Dauphin I. to Cat I.	Ala. & Miss.	1:80,000	31X43
1268	1.00	Lake Borgne and approaches—Cat I. to Point aux Herbes	Miss. & La.	1:80,000	32X41
1269	1.00	Lakes Pontchartrain and Maurepas	Louisiana	1:80,000	32X43
1270	1.00	Chandeleur and Breton Sounds	"	1:80,000	36X44
1271	1.00	Mississippi River—Venice to New Orleans	"	1:80,000	36X44
1272	1.00	Mississippi River Delta	"	1:80,000	35X43
		Southwest Pass	"	1:40,000	
		South Pass	"	1:40,000	
1273	1.00	Barataria Bay and approaches	"	1:80,000	35X44
		HARBOR CHARTS			
413	.75	Pensacola Bay Entrance	Florida	1:10,000	29X39
414	1.00	Pascagoula Harbor	Mississippi	1:20,000	35X48
489	.75	St. Andrew Bay	Florida	1:25,000	36X38
490	1.00	Pensacola Bay	"	1:30,000	35X43
497	1.00	New Orleans Harbor - Chalmette Slip to Southport	Louisiana	1:15,000	35X43
		INTRACOASTAL WATERWAY CHARTS			
{867	.50	Lake Wimico to Overstreet and St. Joseph Bay Entrance	Florida	1:40,000	26X38
{868		Overstreet to St. Andrew Bay	"	1:40,000	
{869	.50	St. Andrew Bay to West Bay Creek	"	1:40,000	26X38
{870		West Bay Creek to Choctawatchee Bay Entrance	"	1:40,000	
{871	.50	Choctawhatchee Bay Entrance to Pensacola	"	1:40,000	26X38
{872		Pensacola to Bon Secour Bay	Fla. & Ala.	1:40,000	
{873	.50	Bon Secour Bay to Pass aux Herons Chan. & Mobile Bay Entr.	Alabama	1:40,000	26X38
{874		Mississippi Sound—Pass aux Herons Chan. to Pascagoula Chan.	Ala. & Miss.	1:40,000	
{875	.50	Mississippi Sound—Pascagoula Channel to Biloxi	Mississippi	1:40,000	26X38
{876		Mississippi Sound—Biloxi to Gulfport	"	1:40,000	
{877	.50	Mississippi Sound—Gulfport to Grand Island Pass	"	1:40,000	26X38
{878		Grand Island Pass to New Orleans	Miss. & La.	1:40,000	

Numbers in brackets represent charts printed back to back.

Diagram No. 12

October 1962



COAST AND HARBOR CHARTS - GULF COAST

NEW ORLEANS, LA. TO SABINE PASS, TEXAS

COAST AND HARBOR CHARTS—GULF COAST

NEW ORLEANS, LA. TO SABINE PASS, TEXAS

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1268	$1.00	Lake Borgne and approaches—Cat I. to Point aux Herbes	Miss. & La.	1:80,000	32X41
1269	1.00	Lakes Pontchartrain and Maurepas	Louisiana	1:80,000	32X43
1270	1.00	Chandeleur and Breton Sounds	"	1:80,000	36X44
1271	1.00	Mississippi River—Venice to New Orleans	"	1:80,000	36X44
1272	1.00	Mississippi River Delta	"	1:80,000	35X43
		Southwest Pass		1:40,000	
		South Pass		1:40,000	
1273	1.00	Barataria Bay and approaches	"	1:80,000	35X44
1274	1.00	Timbalier and Terrebonne Bays	"	1:80,000	35X44
1275	1.00	Isles Dernieres to Point au Fer	"	1:80,000	35X44
1276	1.00	Point au Fer to Marsh Island	"	1:80,000	34X46
1277	1.00	Vermilion Bay and approaches	"	1:80,000	35X46
1278	1.00	Rollover Bayou to Calcasieu Pass	"	1:80,000	35X45
1279	1.00	Calcasieu Pass to Sabine Pass	La. & Texas	1:80,000	34X44
		INTRACOASTAL WATERWAY CHARTS			
875	.50	Mississippi Sound—Pascagoula Channel to Biloxi	Mississippi	1:40,000	26X38
876		Mississippi Sound—Biloxi to Gulfport	"	1:40,000	
877	.50	Mississippi Sound—Gulfport to Grand Island Pass	"	1:40,000	26X38
878		Grand Island Pass to New Orleans	Miss. & La.	1:40,000	
879	.50	New Orleans to Houma	Louisiana	1:40,000	26X38
880		Houma to North Bend	"	1:40,000	
881	.50	Morgan City to Port Allen	"	1:50,000	26X38
882	.50	North Bend to Vermilion River	"	1:40,000	26X38
883		Vermilion River to Creole Ferry	"	1:40,000	26X38
884	.50	Creole Ferry to Port Arthur	La. & Texas	1:40,000	26X38
885		Port Arthur to Galveston	Texas	1:40,000	
1050	.75	New Orleans to Calcasieu River—east section	Louisiana	1:175,000	35X40
1051	.75	New Orleans to Calcasieu River—west section	"	1:175,000	26X44
		HARBOR CHARTS			
497	1.00	New Orleans Harbor—Chalmette Slip to Southport	Louisiana	1:15,000	35X43
517	.75	Sabine Pass and Lake	La. & Texas	1:40,000	27X46
533	.50	Sabine and Neches Rivers	Texas	1:40,000	19X44
591	.75	Calcasieu Lake	Louisiana	1:40,000	29X44
592	.75	Lake Charles to Sabine River	"	1:40,000	29X35

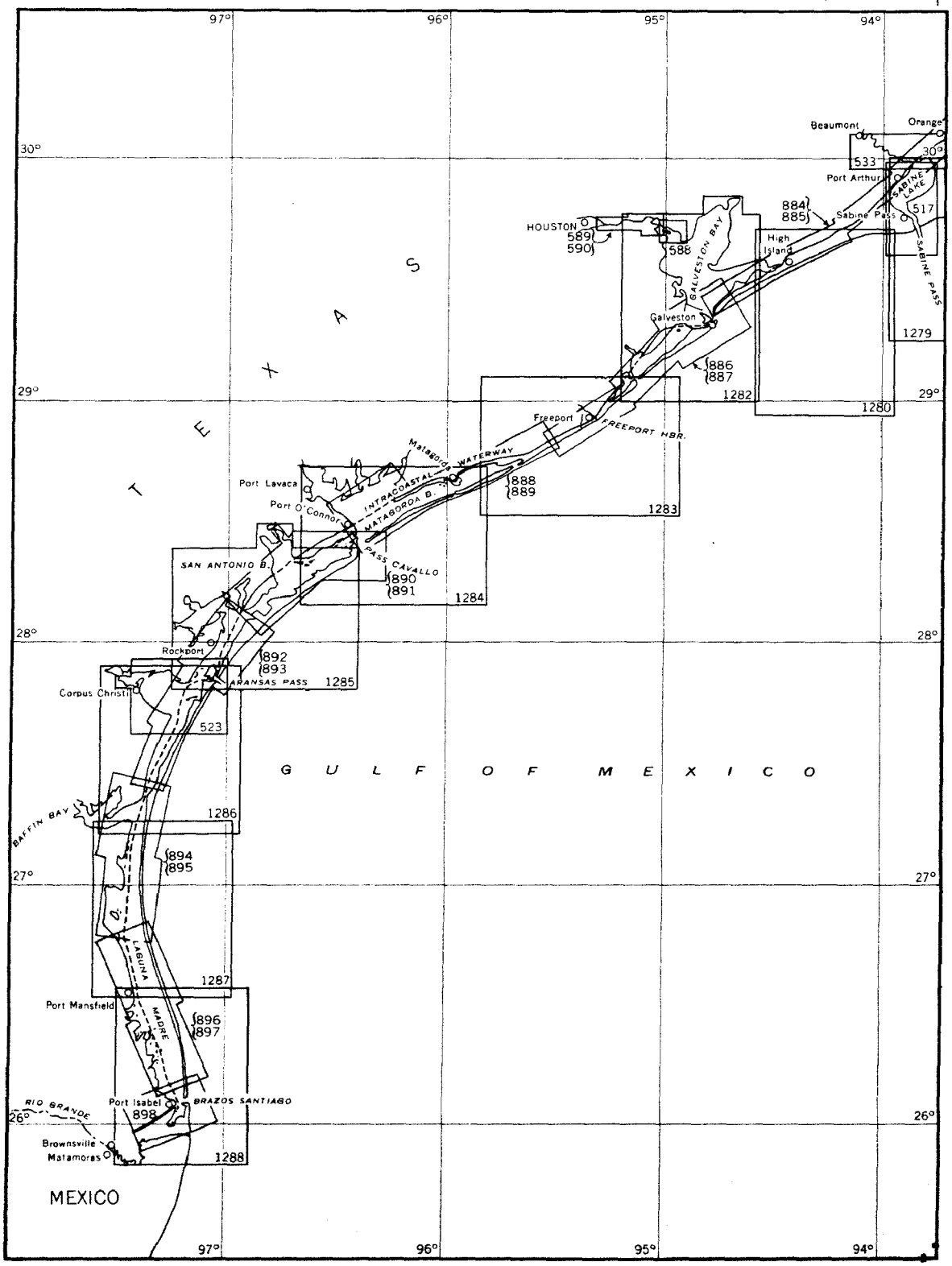
Numbers in brackets represent charts printed back to back.

COAST AND HARBOR CHARTS - GULF COAST

SABINE PASS, TEXAS TO THE RIO GRANDE

Diagram No. 13

May 1961



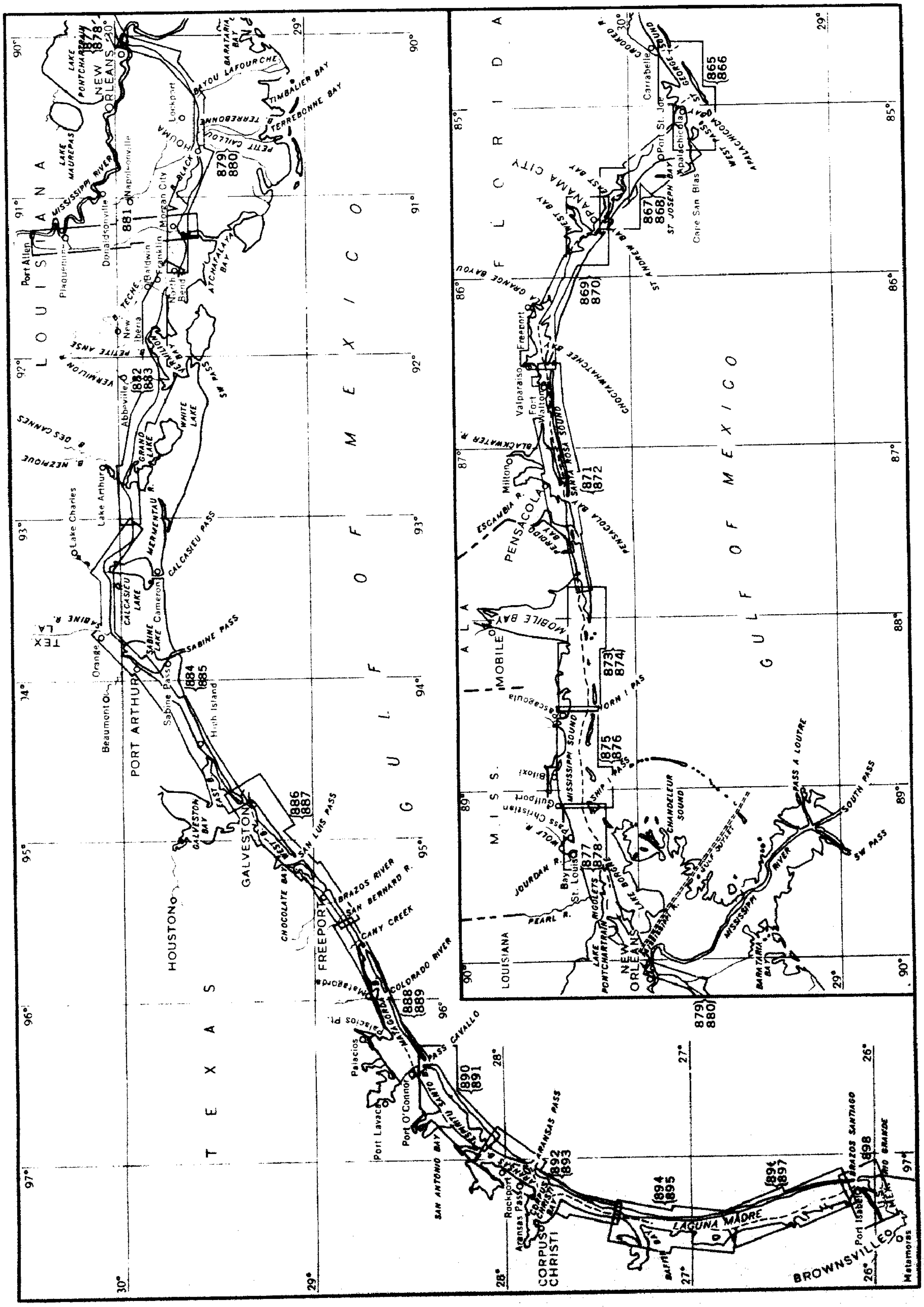
COAST AND HARBOR CHARTS—GULF COAST

SABINE PASS, TEXAS TO THE RIO GRANDE

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1280	$1.00	Sabine Bank to East Bay, including Heald Bank	Texas	1:80,000	33 X 44
1282	1.00	Galveston Bay and approaches	"	1:80,000	33 X 45
1283	1.00	San Luis Pass to East Matagorda Bay	"	1:80,000	34 X 46
1284	1.00	Matagorda Bay and approaches	"	1:80,000	34 X 44
1285	1.00	Matagorda Light to Aransas Pass	"	1:80,000	35 X 44
1286	1.00	Aransas Pass to Baffin Bay	"	1:80,000	34 X 42
1287	1.00	Northern part of Laguna Madre	"	1:80,000	34 X 43
1288	1.00	Southern part of Laguna Madre	"	1:80,000	34 X 43
		HARBOR CHARTS			
517	.75	Sabine Pass and Lake	La. & Texas	1:40,000	27 X 46
523	1.00	Corpus Christi Bay	Texas	1:40,000	35 X 46
		Corpus Christi		1:20,000	
533	.50	Sabine and Neches Rivers	"	1:40,000	19 X 44
588	.75	Houston Ship Channel—Atkinson I. to Alexander I.	"	1:10,000	32 X 43
{589	1.00	Houston Ship Channel—Alexander I. to Carpenter Bayou	"	1:10,000	35 X 46
{590		Houston Ship Channel—Carpenter Bayou to Houston	"	1:10,000	
		INTRACOASTAL WATERWAY CHARTS			
{884	.50	Creole Ferry to Port Arthur	La. & Texas	1:40,000	26 X 38
{885		Port Arthur to Galveston	Texas	1:40,000	
{886	.50	Galveston Bay to West Bay, including Galveston Bay Entrance	"	1:40,000	26 X 38
{887		West Bay to Cedar Lakes, including Freeport Harbor	"	1:40,000	
{888	.50	Matagorda Bay-Cedar Lakes to Oyster Lake	"	1:40,000	26 X 38
{889		Matagorda Bay-Oyster Lake to Port O'Connor	"	1:40,000	
{890	.50	Port O'Connor to San Antonio Bay, including Pass Cavallo	"	1:40,000	26 X 38
{891		San Antonio Bay to Aransas Bay	"	1:40,000	
{892	.50	Aransas Bay to Aransas Pass	"	1:40,000	26 X 38
{893		Aransas Pass to Dagger Hill	"	1:40,000	
{894	.50	Laguna Madre-Dagger Hill to Potrero Grande	"	1:40,000	26 X 38
{895		Laguna Madre-Potrero Grande to Rincon de San Jose	"	1:40,000	
{896	.50	Laguna Madre-Rincon de San Jose to Chubby Island	"	1:40,000	26 X 38
{897		Laguna Madre-Chubby Island to Stover Point	"	1:40,000	
898	.50	Stover Point to Port Brownsville, including Brazos Santiago	"	1:40,000	26 X 38

Numbers in brackets represent charts printed back to back.

Diagram No. 15
October 1962



CHARTS OF THE GULF INTRACOASTAL WATERWAY
CARRABELLE, FLA. TO BROWNSVILLE, TEXAS

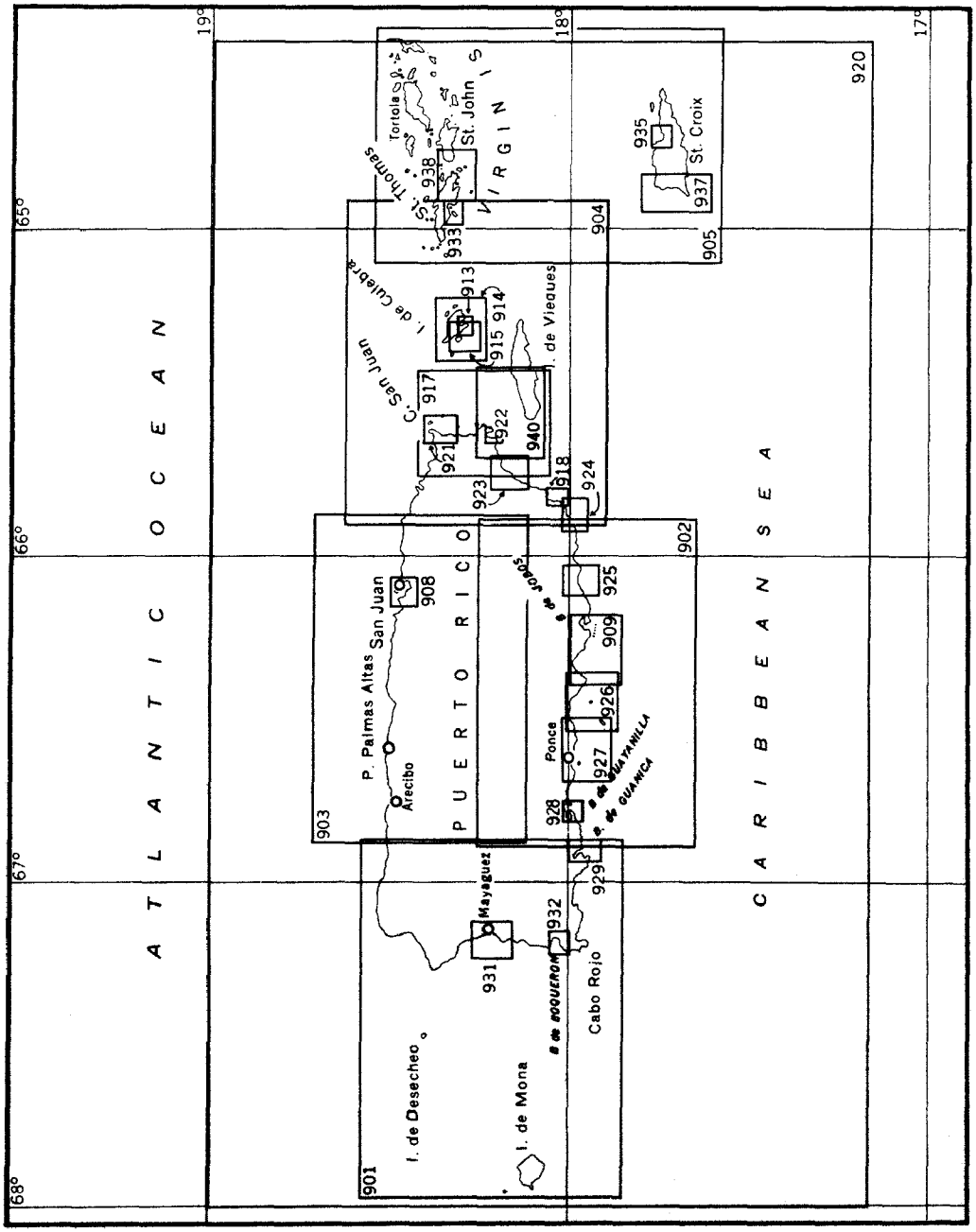
CHARTS COVERING THE GULF INTRACOASTAL WATERWAY (INSIDE ROUTE)
CARRABELLE, FLA. TO BROWNSVILLE, TEXAS

No.	Price	TITLE	State	Scale	Paper size (inches)
		The following series of Gulf Intracoastal Waterway (Inside Route) Charts shows the route in strips of varying widths.			
865	$0.50	St. George Sound to Apalachicola Bay	Florida	1:40,000	26X38
866		Apalachicola Bay to Lake Wimico	"	1:40,000	
867	.50	Lake Wimico to Overstreet and St. Joseph Bay Entrance	"	1:40,000	26X38
868		Overstreet to St. Andrew Bay	"	1:40,000	
869	.50	St. Andrew Bay to West Bay Creek	"	1:40,000	26X38
870		West Bay Creek to Choctawhatchee Bay Entrance	"	1:40,000	
871	.50	Choctawhatchee Bay Entrance to Pensacola	"	1:40,000	26X38
872		Pensacola to Bon Secour Bay	Fla. & Ala.	1:40,000	
873	.50	Bon Secour Bay to Pass aux Herons Chan. & Mobile Bay Entr.	Alabama	1:40,000	26X38
874		Mississippi Sound—Pass aux Herons Chan. to Pascagoula Chan.	Ala. & Miss.	1:40,000	
875	.50	Mississippi Sound—Pascagoula Channel to Biloxi	Mississippi	1:40,000	26X38
876		Mississippi Sound—Biloxi to Gulfport	"	1:40,000	
877	.50	MississippiSound—Gulfport to Grand Island Pass	"	1:40,000	26X38
878		Grand Island Pass to New Orleans	Miss. & La.	1:40,000	
879	.50	New Orleans to Houma	Louisiana	1:40,000	26X38
880		Houma to North Bend	"	1:40,000	
881	.50	Morgan City to Port Allen	"	1:50,000	26X38
882	.50	North Bend to Vermilion River	"	1:40,000	26X38
883		Vermilion River to Creole Ferry	"	1:40,000	
884	.50	Creole Ferry to Port Arthur	La. & Texas	1:40,000	26X38
885		Port Arthur to Galveston Bay	Texas	1:40,000	
886	.50	Galveston Bay to West Bay, including Galveston Bay Entrance	"	1:40,000	26X38
887		West Bay to Cedar Lakes, including Freeport Harbor	"	1:40,000	
888	.50	Matagorda Bay—Cedar Lakes to Oyster Lake	"	1:40,000	26X38
889		Matagorda Bay—Oyster Lake to Port O'Connor	"	1:40,000	
890	.50	Port O'Connor to San Antonio Bay, including Pass Cavallo	"	1:40,000	26X38
891		San Antonio Bay to Aransas Bay	"	1:40,000	
892	.50	Aransas Bay to Aransas Pass	"	1:40,000	26X38
893		Aransas Pass to Dagger Hill	"	1:40,000	
894	.50	Laguna Madre—Dagger Hill to Potrero Grande	"	1:40,000	26X38
895		Laguna Madre—Potrero Grande to Rincon de San Jose	"	1:40,000	
896	.50	Laguna Madre—Rincon de San Jose to Chubby Island	"	1:40,000	26X38
897		Laguna Madre—Chubby Island to Stover Point	"	1:40,000	
898	.50	Stover Point to Port Brownsville including Brazos Santiago	"	1:40,000	26X38

Numbers in brackets represent charts printed back to back.

Diagram No. 34

May 1957



CHARTS OF PUERTO RICO AND THE VIRGIN ISLANDS

CHARTS OF PUERTO RICO AND THE VIRGIN ISLANDS

No.	Price	TITLE	Island	Scale	Paper size (inches)
		GENERAL CHART			
920	$0.75	Puerto Rico and Virgin Islands	West Indies	1:326,856	28X48
		COAST CHARTS			
901	1.00	West Coast of Puerto Rico	Puerto Rico	1:100,000	35X48
902	1.00	South Coast of Puerto Rico—Guánica Light to Point Tuna Light	"	1:100,000	33X45
903	1.00	North Coast of Puerto Rico—Punta Peñon to Punta Vacia Talega	"	1:100,000	33X44
		Puerto Arecibo		1:20,000	
		Puerto Palmas Altas		1:10,000	
904	1.00	Virgin Passage and Sonda de Vieques	West Indies	1:100,000	33X44
905	1.00	Virgin Islands—Virgin Gorda to St. Thomas and St. Croix	"	1:100,000	34X46
		HARBOR CHARTS			
908	1.00	Bahía de San Juan	Puerto Rico	1:10,000	35X41
909	1.00	**Bahía de Jobos and Bahía de Rincon**	"	1:20,000	32X48
913	.75	Ensenada Honda	Culebra	1:6,500	34X40
914	1.00	Isla de Culebra and approaches	"	1:20,000	34X44
915	.75	Ensenada Honda to Canal de Luis Pena	"	1:10,000	28X39
917	1.00	Pasaje San Juan to Puerto Humacao and western part of Isla de Vieques	Puerto Rico	1:40,000	36X44
918	.25	Port Yabucoa	"	1:10,000	21X22
921	1.00	Bahía de Fajardo	"	1:10,000	34X44
922	.50	Ensenada Honda	"	1:10,000	27X27
923	.25	Punta Lima to Cayo Batata	"	1:20,000	24X26
924	.25	Port Maunabo	"	1:20,000	22X22
925	.25	Port Arroyo	"	1:20,000	22X30
926	.75	Point Petrona to Muertos Island	"	1:20,000	35X40
927	1.00	Bahía de Ponce and approaches	"	1:20,000	35X41
928	.75	Bahía de Guayanilla	"	1:10,000	36X39
929	.75	Bahía de Guánica	"	1:10,000	33X38
931	.75	Bahía de Mayaguez and approaches	"	1:15,000	33X37
932	.50	Bahía de Boqueron	"	1:10,000	26X26
933	.50	Harbor of St. Thomas	St. Thomas	1:10,000	28X36
935	.50	Christiansted Harbor	St. Croix	1:10,000	30X33
937	.75	Frederiksted Road	St. Croix	1:20,000	26X39
938	1.00	Pillsbury Sound	Virgin Islands	1:15,000	35X47
940	1.00	Pasaje de Vieques and Radas Roosevelt	West Indies	1:25,000	35X46

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.10 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

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