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United States Coast Pilot 1

Atlantic Coast Eastport to Cape Cod

ELEVENTH EDITION-NOVEMBER 1974

Corrected through:

Local Notices to Mariners issued by Coast Guard District Commanders, September 18, 1974.

Weekly Notice to Mariners published by Defense Mapping Agency Hydrographic Center, No. 45, November 9, 1974.

Next edition, about November 1975.

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Robert M. White, Administrator

National Ocean
Survey
Allen L. Powell, Director

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LIMITS OF UNITED STATES COAST PILOTS

Atlantic Coast

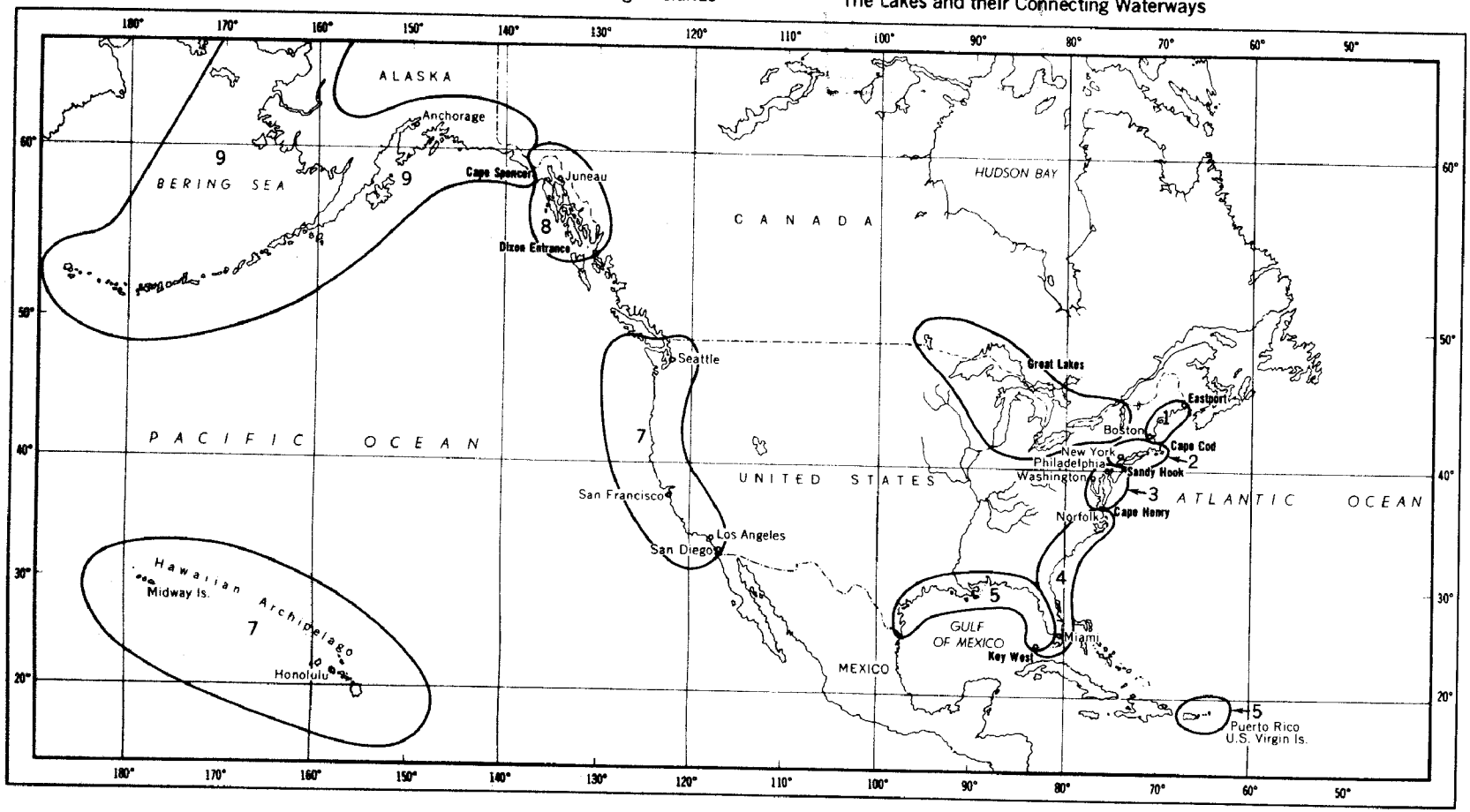
1 Eastport to Cape Cod
2 Cape Cod to Sandy Hook
3 Sandy Hook to Cape Henry
4 Cape Henry to Key West
5 Gulf of Mexico, Puerto Rico, and Virgin Islands

Pacific Coast

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

Great Lakes Pilot

The Lakes and their Connecting Waterways



Preface

United States Coast Pilots are published by the National Ocean Survey pursuant to the Act of 6 August 1947 (33 USC 883a and b), and to the Act of 2 July 1958 (PL 85-480; 72 Stat. 279). The functions of the former Coast and Geodetic Survey are now carried out by the National Ocean Survey in accordance with Reorganization Plan No. 4 of 1970.

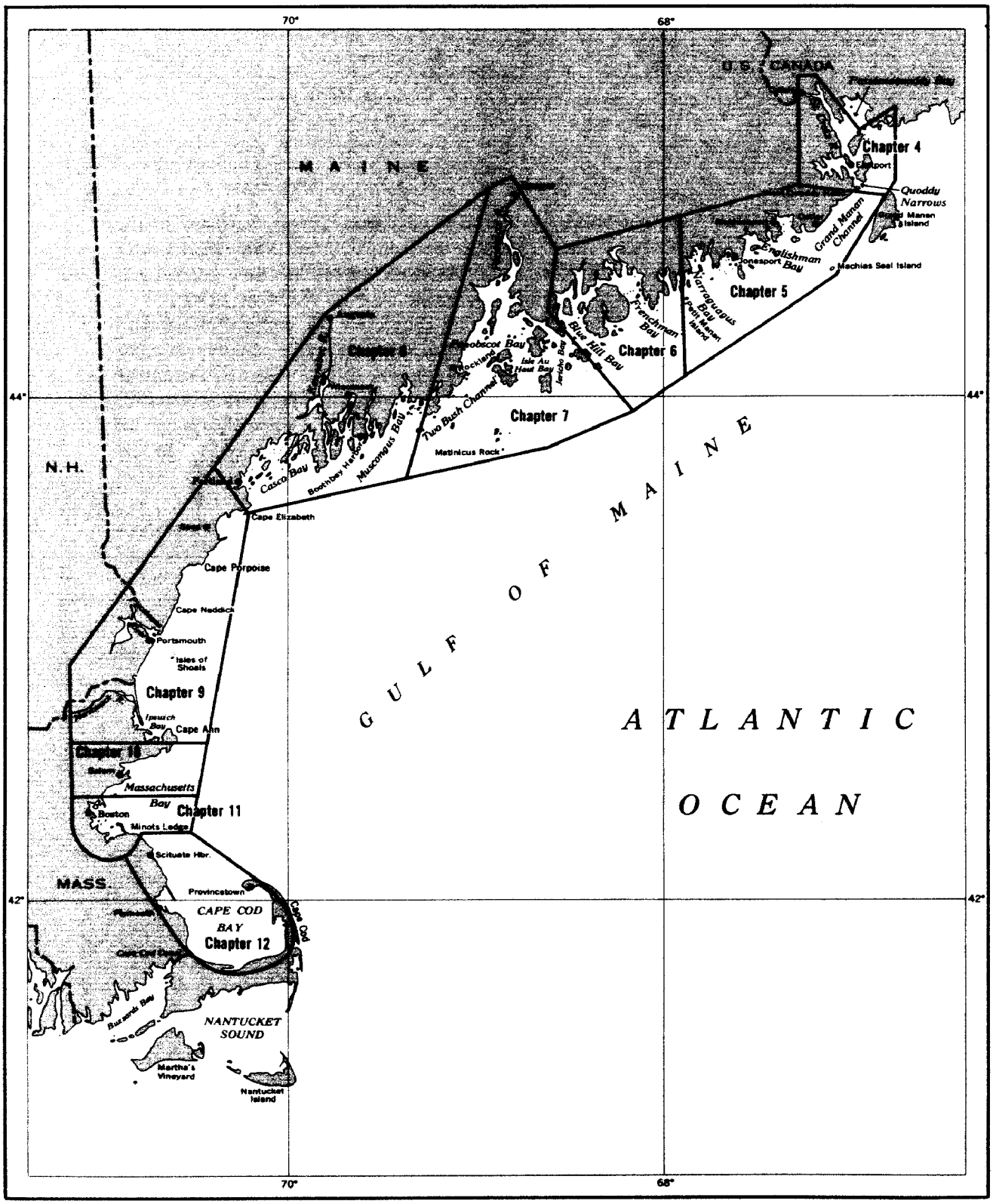
Coast Pilots supplement the navigational information shown on the nautical charts and are based upon field inspections conducted by the National Ocean Survey, information published in Notices to Mariners, and reports from NOAA survey vessels, other Government agencies, State and local governments, maritime and pilotage associations, port authorities, mariners, and others. The field inspections are made by the National Ocean Survey about every 5 years to check reported information and to update published information. In the intervening years, updated editions are published to include information reported to the National Ocean Survey.

Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod, Eleventh (November 1974) Edition is an updated edition and supersedes the Tenth (1973) Edition. It includes the April-October 1970 field observations of Lieutenant Clarence W. Tignor, NOAA, and other information reported to the National Ocean Survey. The tables which follow the appendix are usually revised about every 5 years.

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

Mariners and others are urged to report promptly to the National Ocean Survey errors, omissions, or any conditions found to differ from or to be additional to those published in the Coast Pilot or shown on the charts in order that they may be fully investigated and proper corrections made. A Coast Pilot Report form is included in the back of this book and a Marine Information Report form is published in the Weekly Notice to Mariners for your convenience. These reports and/or suggestions for increasing the usefulness of the Coast Pilot should be sent to Director, National Ocean Survey, Attention C324, Rockville, Maryland 20852.

The information published in this book has been computerized and printed by an automatic photocomposition process. The magnetic tape will be revised each year, and an updated edition of Coast Pilot 1 will be published annually.



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1. GENERAL INFORMATION

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

When new editions of Coast Pilots are published, they will be printed annually by an automatic photocomposition process, thus eliminating the yearly supplements. Coast Pilots 1, 2, 3 4, and 5 have been computerized and are now published on an annual basis.

Cumulative supplements, containing changes reported since dates of editions, will continue to be published early each year for the other Coast Pilots until they are due for new editions. Eventually all Coast Pilots will be computerized and new editions will be printed on an annual basis.

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

The **Great Lakes Pilot** is published annually by the National Ocean Survey and contains similar information for the Great Lakes. Supplements are issued monthly during the navigation season (May to October, inclusive).

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

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.

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

In general, the Coast Pilots give the project depths for deep-draft ship channels maintained by the Corps of Engineers. The latest controlling depths are usually shown on the charts and published in the Notices to Mariners. For other channels, the latest controlling depths available at the time of publication are given.

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

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

In many ships an appreciable correction must be applied to shoal soundings recorded by echo sounders due to the horizontal distance between the transducers. This separation correction, which is the amount by which recorded depths therefore exceed true depths, increases with decreasing depths to a maximum equal to half the distance apart of the transducers; at this maximum the

transducers are aground. Ships whose transducers are more than 6 feet apart should construct a table of true and recorded depths using the Traverse Tables. (Refer to discussion of echo soundings elsewhere in chapter 1.)

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

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

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

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

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

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

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

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

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

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

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

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

NOTICES TO MARINERS

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

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

Notice to Mariners, published weekly by the Defense Mapping Agency Hydrographic Center, is prepared jointly with NOS and the Coast Guard. These notices contain selected items from the Local Notices to Mariners and other reported marine information required by oceangoing vessels operating in both **foreign** and **domestic** waters, except the Great Lakes. Special items covering a variety of subjects and generally not discussed in the Coast Pilot or shown on nautical charts are published annually in Notice to Mariners 1. These items are important to the mariner and should be read for future reference. The weekly notices may be obtained by operators of oceangoing vessels, without cost, by making application to Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390.

Notice to Mariners, relating to the **Great Lakes** and tributary waters west of Montreal, is published weekly by the U.S. Coast Guard. These notices contain selected items from the Local Notices to Mariners and other reported marine information, and are intended primarily for use in correcting Great Lakes charts and related publications. Application for these free notices should be made to Commander, 9th Coast Guard District, Federal Building, Cleveland, Ohio, 44199.

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

Marine Broadcast Notices to Mariners are made by the Coast Guard through Coast Guard, Navy, and some commercial radio stations to report defi-

ciencies and important changes in aids to navigation. (See Radio Warnings and Weather, this chapter.)

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

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

U.S. GOVERNMENT AGENCIES PROVIDING MARITIME SERVICES

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

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

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

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

National Ocean Survey (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.-The National Ocean Survey, established by joining the former Coast and Geodetic Survey with elements of the U.S. Lake Survey, provides charts and related publications for the safe navigation of marine and air commerce, and provides basic data for engineering and scientific purposes and for other commercial and industrial needs. The principal marine facilities of NOS are located in the Washington, D.C. area (headquarters); in Norfolk, Va. (Atlantic Marine Center); in Detroit, Mich. (Lake Survey Center); and in Seattle, Wash. (Pacific Marine Center). NOAA ships are based at the marine centers. These offices maintain files of charts and other publications which are available for the use of the mariner, who are invited to avail themselves of the facilities afforded. (See appendix for addresses.)

The distribution center for NOS charts and publications is at 6501 Lafayette Ave., Riverdale, Md. 20840. Orders mailed to headquarters should be accompanied by a check or money order made payable to National Ocean Survey, Department of Commerce.

Sales agents for Charts, Coast Pilots, Tide Tables, Tidal Current Tables, Tidal Current Diagrams, and Tidal Current Charts of the National Ocean Survey are located in many U.S. ports and in some foreign ports. A list of authorized sales agents and chart catalogs may be had free upon request from National Ocean Survey, Distribution Division (C44), 6501 Lafayette Ave., Riverdale, Md. 20840.

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

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

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

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

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

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

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

The Coast Guard operates the **Automated Mutual-assistance Vessel Rescue System (AMVER).** It is an international maritime mutual assistance program which provides important aid to the development and coordination of search and rescue (SAR) efforts in many offshore areas of the world. Merchant ships of all nations making offshore passages are encouraged to voluntarily send sailing reports and periodic position reports to the AMVER Center at Coast Guard New York via selected radio stations. Information from these reports is entered into an electronic computer which generates and maintains dead reckoning positions for the vessels. Characteristics of vessels which are valuable for determining SAR capability are also entered into the computer from available sources of information.

Information concerning the predicted location and SAR characteristics of each vessel known to be within an area of interest, called a Surface Picture (SURPIC), is made available upon request to recognized SAR agencies or vessels needing assistance regardless of nationality for use during emergencies.

Instructions guiding participation in the AMVER System are available in the following 13 languages: Danish, Dutch, English, French, German, Greek, Italian, Japanese, Norwegian, Portuguese, Russian, Spanish, and Swedish. They are available from: Commander, Eastern Area, U.S. Coast Guard, Governors Island, N.Y. 10004; Commander, Western Area, U.S. Coast Guard, 630 Sansome Street, San Francisco, Calif. 94126; and at U.S. Coast Guard District Offices, Marine Inspection Offices, and Captain of the Port Offices in major U.S. ports.

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

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

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

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

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

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

Fishtraps.-The Corps of Engineers has general supervision of location, construction, and manner of maintenance of all traps, weirs, pounds, or other fishing structures in the navigable waters of the United States. Construction permits issued by the Engineers specify the lights and signals required for the safety of navigation.

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

Environmental Protection Agency (EPA).-The ocean dumping permit program of the Environmental Protection Agency provides that except when authorized by permit, the dumping of any material into the ocean is prohibited after April 23, 1973, by the "Marine Protection, Research, and Sanctuaries Act of 1972, Public Law 92-532."

Ocean dumping permits for dredged spoil will be issued by the Corps of Engineers, and all other ocean dumping permits will be issued by the Environmental Protection Agency.

The regulations to implement this law were published in the Federal Register on April 5, 1973.

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

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

Everyone who writes EPA will be sent information about a final application for a permit as soon as possible. This final application is expected to include questions about the description of the process or activity giving rise to the production of the dumping material; information on past activities of applicant or others with respect to the

disposal of the type of material involved; and a description about available alternative means of disposal of the material with explanations about why an alternative is thought by the applicant to be inappropriate.

Federal Communications Commission.-The Federal Communications Commission controls non-Government radio communications in the United States 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 U.S. ports. (See appendix for addresses.) Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington, D.C. 20554, or from any of the field offices.

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

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

Defense Mapping Agency Hydrographic Center (DMAHC), Department of Defense.-The Defense Mapping Agency Hydrographic Center provides accurate charts and related information for foreign waters. Publications include Sailing Directions (pilots), Light Lists, Table of Distances, Radio Navigational Aids, International Code of Signals, American Practical Navigator (Bowditch), and the Notice to Mariners published weekly.

Public Health Service, Department of Health, Education, and Welfare.-The Public Health Service administers hospitalization and outpatient treatment to legal beneficiaries of the government administers foreign quarantine procedures at U.S. ports of entry, and conducts medical examinations of aliens.

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

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

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

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

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

U.S. merchant seamen are entitled to **medical relief** obtainable through the Public Health Service. A U.S. 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 contract physician's offices of the Public Health Service are located at the addresses given in the appendix. Free **medical advice** is furnished to seamen by radio through the cooperation of Governmental and commercial radio stations whose operators receive and relay messages from ships at sea to Public Health Service stations and then radio the medical advice back to the ships. (See appendix for list of radio stations that provide this service.

National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.-The National Weather Service, formerly the Weather Bureau, makes forecasts and gives warnings of approaching storms over land and ocean areas to navigation, commerce, agriculture, and the general public. Other warnings cover cold waves, frost, forest-fire hazard, tornadoes, and floods. Meteorological information is collected and transmitted at 1-hour, 3-hour, and 6-hour intervals from

land stations, ships at sea, and aircraft. These reports form a basis for the forecasting service, and for research basic to improvement of NWS.

National Weather Service offices are in many ports and other places in the United States and possessions. Stations in the area of concern to this Coast Pilot, where the public may compare barometers against NWS barometers and discuss weather information with service officials, are listed in the appendix. NWS and the Coast Guard share in the operation of certain weather ships in the North Atlantic and North Pacific Oceans.

The collection of **marine meteorological observations** from ships at sea is conducted on a purely voluntary and cooperative basis. NWS supplies shipmasters with blank forms, printed instructions, and such other materials that are 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. Warnings are issued whenever winds, weather, sea conditions, storm surge, or other conditions are expected that will be a hazard to marine operations. These warnings are given wide distribution by commercial radio and television, Coast Guard radio, daily newspapers, and by visual warning displays. Storm information is also broadcast over National Bureau of Standards Time and Frequency Radio Stations WWV, Ft. Collins, Colo., and WWVH, Kauai, Hawaii. (See Time Signals this chapter.) During the hurricane season, June through November, ships are asked to be especially watchful for signs of hurricanes and report by radio immediately. Satellite weather pictures are also used to locate hurricanes; these pictures are especially useful in areas of the ocean infrequently crossed by ships. Special reports are obtained from weather reconnaissance planes dispatched to keep track of hurricanes. Coastal radar reports are extremely valuable in defining the size and intensity of hurricanes when they are within about 200 miles of the station.

A **hurricane watch** is an announcement by the NWS to the public and all other interests via press, radio, and television whenever a tropical storm or hurricane becomes a threat to a coastal area. The "hurricane watch" announcement is not a warning; it indicates that the hurricane is near enough that everyone in the "watch" area should listen for subsequent advisories and be ready to take precautionary action in case hurricane warnings are issued.

NWS, along with the Coast Guard, State and local governments, and private interests, cooperate in operating a **coastal warning display system** to warn pleasure boatmen, and other marine interests lacking radio-receiving equipment, of impending hazardous weather and sea conditions on coastal and inland waters. There are about 500 of these flag or light display stations. The storm warning display stations are listed on NOS charts and included on the Marine Weather Services Charts published periodically by NWS.

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

DISTRESS SIGNALS AND COMMUNICATION PROCEDURES

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

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

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

(3) The International Flag Code Signal of NC.

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

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

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

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

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

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

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

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

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

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

Radiotelephone distress communications include the following actions:

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

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

the words THIS IS (spoken once);

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

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

the distress signal MAYDAY:

The call sign and name of the vessel in distress;

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

the nature of the distress;

the kind of assistance desired;

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

present seaworthiness of vessel;

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

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

your listening frequency and schedule;

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

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

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

the words THIS IS;

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

The words RECEIVED MAYDAY.

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

the word MAYDAY;

the call sign and name of distressed vessel;

the words THIS IS;

the call sign and name of your vessel;

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

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

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

believes that silence is essential may request silence by the following procedure: -the word SEELONCE, followed by the word DISTRESS, and its own call sign.

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

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

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

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

In these cases, the transmission shall consist of:

the radiotelephone alarm signal (if available);

the words MAYDAY RELAY (spoken three times);

the words THIS IS;

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

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

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

the distress signal MAYDAY;

the call TO ALL STATIONS, spoken three times;

the words THIS IS;

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

the time;

the name and call sign of the vessel in distress;

the words SEELONCE FEENEE (French for silence finished).

DISTRESS ASSISTANCE AND COORDINATION PROCEDURES

Surface ship procedures for assisting distressed surface vessels.

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

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

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

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

(i) identity;

(ii) position;

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

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

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

(i) 500 kHz (radiotelegraphy) and/or

(ii) 2182 kHz (radiotelephony).

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

(f) Operate radar continuously;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(a) Circling the surface craft at least once.

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

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

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

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

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

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

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

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

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

(c) A message from a SAR aircraft.

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

4. An aircraft in distress will use any means at its disposal to attract attention, make known its position, and obtain help, including some of the signals prescribed by the International Regulations for Preventing Collisions at Sea.

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

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

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

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

(b) By day, make black smoke.

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

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

(a) Wind direction and force.

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

(c) Other pertinent weather information.

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

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

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

11. It should be borne in mind that military aircraft are often fitted with ejection seat mechanisms. Normally, their aircrew will use their ejection seats, rather than ditch. Should such an aircraft ditch, rather than the aircrew bail out, and it becomes necessary to remove them from their

ejection seats while still in the aircraft, care should be taken to avoid triggering off the seat mechanisms. The activating handles are invariably indicated by red and or black/yellow coloring.

12. A survivor from an aircraft casualty who is recovered may be able to give information which will assist in the rescue of other survivors. Masters are therefore asked to put the following questions to survivors and to communicate the answers to a Coast Radio Station. They should also give the position of the rescuing ship and the time when the survivors were recovered.

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

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

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

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

(e) How many ditched with the aircraft?

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

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

(h) What flotation gear had they?

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

(j) What caused the emergency?

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

When requesting helicopter assistance:

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

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

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

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

Preparations prior to the arrival of the helicopter:

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

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

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

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

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

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

Hoist operations:

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

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

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

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

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

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

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

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

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

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

(11) Place the patient in basket, sitting with his hands clear of the sides, or in the litter, as

described above. Signal the helicopter hoist operator when ready for the hoist. Patient should signal by a nodding of the head if he is able.

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

(13) When patient is strapped into the stretcher, signal the helicopter to lower the cable, attach cable to stretcher sling (bridle), then signal the hoist operator when the patient is ready to hoist. Steady the stretcher so it will not swing or turn.

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

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

Preparations for being towed by Coast Guard:

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

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

(3) Have material ready for chafing gear.

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

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

RADIO WARNINGS AND WEATHER

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

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

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

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

Urgent and safety radiotelephone broadcasts of important Notice to Mariners items, storm warnings, and other vital marine information are transmitted upon receipt, and urgent broadcasts are repeated 15 minutes later; additional broadcasts are made at the discretion of the originator. **Urgent** broadcasts are preceded by the urgent signal PAN. **Both the urgent signal and message are transmitted on 2182 kHz. Safety** broadcasts are preceded by the safety signal SECURITY. **The safety signal is given on 2182 kHz, and the message is given on 2670 kHz.** At the discretion of the originator, urgent and safety broadcasts may also be made on VHF channel 16 (156.80 MHz).

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

Commercial radiotelephone coast stations.-Broadcasts of coastal weather and warnings are made by some commercial radiotelephone coast stations (marine operators) on the normal transmitting frequencies of the stations. Vessels with suitable receivers and desiring this service may

determine the frequencies and schedules of these broadcasts from their local stations or from the series of Marine Weather Services Charts published by NWS.

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

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

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

TIME SIGNALS.-The U.S. 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 beginning of the dashes indicates 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.

Time corrections (DUT1=UT1−UTC) will be transmitted in standard Morse Code (15 wpm) during each minute between seconds 56 and 59. The code will give the letter "A" for add and one digit to designate a positive DUT1 and the letter "S" with a digit to designate a negative correction.

The **U.S. Naval Observatory**, Washington, D.C., makes time signal broadcasts for the Atlantic area from Navy Radio Station **NSS**, Annapolis, Md., as follows: frequencies-88, 5870, 8090, 12135, 16180, 20225, and 25590 kHz; hours of transmission-0455-0500, 1055-1100, 1655-1700, and 2255-2300 Greenwich Mean Time, except that on Tuesday the frequency 185 kHz replaces 88 kHz from 1655-1700 and frequencies 20225 and 25590 kHz are used only from 1655-1700 and 2255-2300.

WWV-WWVH BROADCASTS.-The **National Bureau of Standards** broadcasts time signals continuously, day and night, from its radio stations **WWV**, near Fort Collins, Colo. (40°40′49″N., 105°02′27″W.), and **WWVH**, Kauai, Hawaii (21°59′26″N., 159°46′00″W.,) on radio frequencies of 2.5, 5, 10, 15, and 20 MHz, and also 25 MHz from Fort Collins only. Services include standard time signals and time intervals, time corrections, standard radio frequencies, standard audio frequencies, standard musical pitch, a slow time code, propagation forecasts, geophysical alerts, and storm warnings.

Time Announcements .-Once per minute voice announcements are made from WWV and WWVH. The two stations are distinguished by a female voice from WWVH and a male voice from WWV. The WWVH announcement occurs first, at 15 seconds before the minute, while the WWV announcement occurs at 7.5 seconds before the minute. Greenwich Mean Time (sometimes referred to as UT) is used in these announcements. The actual time scale is known as Coordinated Universal Time (UTC).

Time Corrections .-The UTC time scale operates on atomic frequency, but by means of resets is made to approximate the astronomical UT1 scale. It may disagree from UT1 by as much as 0.7 second before resets in steps of exactly 1 second are made. Resets are required about once per year and will usually be made on December 31 or June 30. For those who need astronomical time more accurately than 0.7 second, a correction to UTC is encoded by the use of double ticks after the start of each minute. The 1st through the 7th seconds ticks will indicate a "plus" correction, and from the 9th through the 15th a "minus" correction (the 8th is not used). The correction is determined by counting the number of doubled ticks. For example, if the 1st, 2nd, and 3rd ticks are doubled, the correction is "plus" 0.3 sec. If the 9th, 10th, 11th, and 12th ticks are doubled, the correction is "minus" 0.4 second.

Standard time intervals.-An audio pluse (5 cycles of 1000 Hz on WWV and 6 cycles of 1200 Hz on WWVH), resembling the ticking of a clock, occurs each second of the minute except on the 29th and 59th second. Each of these 5 millisecond second pulses occur within a 40 millisecond period wherein all other modulation (voice or tone) is removed from the carrier. These pulses begin 10 milliseconds after the modulation interruption. A long pulse (0.8 second) marks the beginning of each minute.

Standard frequencies.-All carrier and audio frequencies occur at their nominal values according to the International System of Units (SI) (not offset as in the past). For periods of 45-second duration, either 500 Hz or 600 Hz audio tones are broadcast in alternate minutes during most of each hour. A 440 Hz tone, the musical pitch A above middle C, is broadcast once per hour near the

beginning of the hour. Diagram of detailed tone broadcast schedules follows the appendix.

Slow time code.-A modified IRIG H time code occurs continuously on a 100 Hz subcarrier. The format is 1 pulse per second with a 1-minute time frame. It gives day of the year, hours, and minutes in binary coded decimal form.

Propagation forecasts.-These occur in voice during the 15th minute of each hour from WWV. They are short-term forecasts of propagation conditions along North Atlantic paths such as Washington, D.C., to London, England, along with a description of current geomagnetic activity, and are provided by the Telecommunications Services Center, Office of Telecommunications , Boulder, Colo. 80302.

Geophysical alerts.-These occur in voice during the 19th minute of each hour from WWV and the 46th minute from WWVH. They point out outstanding events which are in process, followed by a summary of selected solar and geophysical events in the past 24 hours. They are provided by the Space Environment Laboratory, National Oceanic and Atmospheric Administration, Boulder, Colorado, 80302.

Storm information.-These will cover the waters of the Atlantic from WWV and the Pacific from WWVH and are given at the 8th, 10th and 12th minute of each hour from WWV and at the 47th, 49th, and 51st minute of each hour from WWVH. Times of issue are 0500, 1100, 1600, and 2300 UT from WWV, and 0000, 0600, 1200, and 1800 UT from WWVH. They are prepared by the National Weather Service, Forecast Offices at Washington, D.C., and Honolulu, Hawaii.

"Silent" Periods .-These are periods with no tone modulation during which the carrier, seconds ticks, minute time announcements, and 100 Hz modified IRIG H time code continue. They occur during the 16th through the 20th minute on WWVH and the 46th through the 50th minute on WWV.

Special Publication 236 describes in detail the standard frequency and time service of the National Bureau of Standards. Single copies may be obtained upon request from the National Bureau of Standards, Boulder, Colo. 80302. Quantities may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 at 45 cents per copy.

NAUTICAL CHARTS

Reporting chart deficiencies.- Users are requested to report all significant observed discrepancies in and desirable additions to NOS nautical charts, including depth information in privately maintained channels and basins; obstructions, wrecks, and other dangers; new landmarks or the nonexistence or relocation of charted ones; uncharted fixed private aids to navigation; and deletions or additions of small-craft facilities. All such reports should be sent to The Director (C321), National Ocean Survey, Rockville, Md. 20852.

Chart symbols and abbreviations.- The standard symbols and abbreviations approved for use on all regular nautical charts published by the Defense Mapping Agency Hydrographic Center and the U.S. National Ocean Survey are contained in **Chart No. 1,** United States of America **Nautical Chart Symbols and Abbreviations.** The publication is available at all Defense Mapping Agency Hydrographic Center and NOS sales agents.

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

The tidal datum for depths on NOS 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.

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

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

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

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

The **date of a chart** is of vital importance to the navigator. When charted information becomes ob-

solete, further use of the chart for navigation may be dangerous. Announcements of new editions of nautical charts are usually published in notices to mariners. A quarterly list of the latest editions is distributed to sales agents; free copies may be obtained from the sales agents or by writing to Distribution Division (C44), National Ocean Survey, 6501 Lafayette Ave., Riverdale, Md. 20840.

NOTE: Effective July 1, 1974, the National Ocean Survey and the Defense Mapping Agency Hydrographic Center adopted a uniform **U.S. Nautical Chart Numbering System.** Prefix C&GS and suffix SC, for charts published by the National Ocean Survey, and prefix N.O. for charts published by the Defense Mapping Agency Hydrographic Center, are not used in the new numbering system. The Coast Pilot reflects the new numbers followed by the former C&GS and/or N.O. numbers in parentheses as appropriate. However, until further notice, users of National Ocean Survey charts are requested to order by the former numbers from NOS and/or its authorized sales agents. Any changes in chart ordering procedures will be announced in the Weekly Notice to Mariners and Local Notices to Mariners.

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

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

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

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

General charts, scales 1:100,000 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.

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

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

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

The charted clearances of overhead cables are for the lowest wires at normal high water unless otherwise stated. **Vessels with masts, stacks, booms, or antennas should allow sufficient clearance under power cables to avoid arcing.**

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

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

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

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

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

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

Dumping grounds are areas established by federal regulation (Part 205, Title 33, Code of Federal Regulations) in which dumping of dredged material and other nonbuoyant objects is prohibited or in which such dumping is allowed with the permission of and under the supervision of the Corps of Engineers.

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

Fish havens are established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by dumping assorted junk ranging from old trolley cars and barges to scrap building material in areas which may be of very small extent or may stretch a considerable distance along a depth curve; old automobile bodies are a commonly used material. The Corps of Engineers must issue a permit, specifying the location and depth over the reef, before such a reef may be built. However, the reefbuilders' adherence to permit specifications can be checked only with a wire drag. Fish havens are outlined and labeled on the charts, but soundings and depth curves are usually retained and blue tinting is seldom used. Navigators should be cautious about passing over fish havens or anchoring in their vicinity.

Fish trap areas are areas established by the Corps of Engineers in which traps may be built and maintained according to established regulations. The areas and regulations are in Part 206, Title 33, Code of Federal Regulations. The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fish trap areas and a cautionary note are usually charted. Navigators should avoid these areas.

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

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

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

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

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

AIDS TO NAVIGATION

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

Radio messages should be prefixed "Coast Guard" and transmitted directly to any U.S. Government shore radio station for relay to the Coast Guard District Commander. If the radio call sign of the nearest U.S. Government radio shore

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

Lights.-The visibility of lights is given in the Light Lists and on the charts. The Light Lists give both the nominal range and geographic range, whereas the charts show only the shorter range (charts with edition or revision dates prior to July 1969 may not conform to this policy). **Nominal range** is the luminous range (a function of light intensity) in clear weather (meteorological visibility 10 miles), and **geographic range** is the maximum distance at which a light can be seen with perfect visibility (without regard to light intensity) with the observer's eye 15 feet above sea level. The actual luminous range for meteorological visibilities other than 10 miles may be determined graphically. (See the Light List.) Geographic range is a function of only the curvature of the earth and is determined solely from the heights above sea level of the light and the observer's eye; therefore, to determine the actual geographic range for a height of eye other than 15 feet, the geographic range from the Light List or chart must be corrected by a distance corresponding to the height difference, the distance correction being determined from a table of "distances of visibility for various heights above sea level" (see Light List or Coast Pilot table following appendix.) The maximum distances at which lights can be seen may at times be increased by abnormal atmospheric refraction and may be greatly decreased by unfavorable weather conditions, such as fog, rain, haze, or smoke. All except the most powerful lights are easily obscured by such conditions. In some conditions of the atmosphere white lights may have a reddish hue. During weather conditions which tend to reduce visibility, colored lights are more quickly lost to sight than are white lights. Navigational lights should be used with caution because of the following conditions that may exist:

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

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

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

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

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

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

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

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

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

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

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

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

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

Lights and clearance gages on bridges.-The Coast Guard regulates marine obstruction lights and clearance gages on bridges across navigable waters. Where installed, clearance gages are generally vertical numerical scales, reading from top to bottom, and show the actual vertical

clearance between the existing water level and the lowest point of the bridge over the channel; the gages are normally on the right-hand pier or abutment of the bridge, on both the upstream and downstream sides.

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

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

A complete description of bridge lighting is contained in Coast Guard Publication 208. Bridges and their lighting, construction, maintenance, and operation are set forth in the Code of Federal Regulations, Title 33, Parts 68 and 114-117. Aircraft obstruction lights, prescribed by the Federal Aviation Administration, may operate at certain bridges. Drawbridge operation regulations are published in chapter 2 of the Coast Pilots.

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

Sound travels through the air in a variable manner, even without the effects of wind; 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.

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

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

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

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

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

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

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

The buoy symbol is used to indicate the approximate position of the buoy body and the sinker which secures the buoy to the seabed. The approximate position is used because of practical limitations in positioning and maintaining buoys and their sinkers in precise geographical locations. These limitations include, but are not limited to, inherent imprecisions in position fixing methods, prevailing atmospheric and sea conditions, the slope of and the material making up the seabed, the fact that buoys are moored to sinkers by varying lengths of chain, and the fact that buoy body

and/or sinker positions are not under continuous surveillance but are normally checked only during periodic maintenance visits which often occur more than a year apart. The position of the buoy body can be expected to shift inside and outside the charting symbol due to the forces of nature. The mariner is also cautioned that buoys are liable to be carried away, shifted, capsized, sunk, etc. Lighted buoys may be extinguished or sound signals may not function as the result of ice, running ice or other natural causes, collisions, or other accidents.

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

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

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

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

Temporary changes in aids are not included on the charts.

Radiobeacons.-A map showing the locations and operating details of marine radiobeacons is given in each Light List. This publication describes the procedure to follow in using radiobeacons to calibrate radio direction-finders as well as listing 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.

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

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

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

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

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

The sign of the correction (bearings read clockwise from 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, 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 defintely 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. Instructions, tables, and charts of the Loran System are published by the Defense Mapping Agency Hydrographic Center. NOS shows Loran lines on general charts of the U.S. coasts.

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

Loran position determinations on or near the baseline extensions are subject to geometric errors exceeding 2 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.

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

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

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

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

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

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

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

Improvements have been made in the quick determination and reporting of earthquake epicenters, but no method has yet been perfected for determining whether a sea wave will result from a given earthquake. The Honolulu Observatory of the National Oceanic and Atmospheric Adminis-

tration is headquarters of a warning system which has field reporting stations (seismic and tidal) in most countries around the Pacific. When a warning is broadcast, waterfront areas should be vacated for higher ground, and ships in the vicinity of land should head for the deep water of the open sea.

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

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

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

SPECIAL SIGNALS FOR CERTAIN VESSELS

Special signals for surveying vessels.-Pilot Rules for Inland Waters, §80.33, state that by day a surveying vessel of the National Ocean Survey (NOS), 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 NOS 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 collision of vessels.

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

(d) A vessel of the NOS, 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 not less than 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, or a vessel engaged in replenishment at sea, or in the launching or recovery of aircraft 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 prescribed in Rule 2(a) (i) and (ii), or Rule 7(a) (i), three lights in a vertical line one over the other so that the upper and lower lights shall be the same distance from, and not less than 6 feet above or below, the middle light. 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 color, and the middle one diamond in shape and white.

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

Warning signals for Coast Guard vessels while handling or servicing aids to navigation:

Inland waters (Inland Rules):

DAY, two orange and white vertically striped balls in a vertical line not less than 3 feet nor more than 6 feet apart displayed from the yardarm.

NIGHT, two red lights in a vertical line not less than 3 feet nor more than 6 feet apart.

Vessels, with or without tows, passing Coast Guard vessels displaying this signal shall reduce speed sufficiently to insure the safety of both vessels, and when passing within 200 feet of the Coast Guard vessel displaying this signal, their speed shall not exceed 5 miles per hour.

High seas (International Rules):

DAY, three shapes each not less than 2 feet in diameter in a vertical line not less than 6 feet apart, the highest and lowest being red globular shapes and the middle being a white diamond shape.

NIGHT, three lights in a vertical line not less than 6 feet apart, the highest and lowest being red and the middle being white in color.

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

All vessels towing sweeps are to show: **By day,** a black ball at the fore truck and a black ball at the fore yard on the side or sides on which it is dangerous to pass; there may be thus two or three black balls displayed; **By night,** all around green lights instead of the black balls, and in a similar manner.

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

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

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

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

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

Submarine marker buoys consist of 2 spheres 3 feet in diameter with connecting structure, painted international orange. The buoy has a wire cable to the submarine, to act as a downhaul line for a rescue chamber. The buoy may be accompanied by an oil slick release to attract attention. A submarine on the bottom in distress may release this buoy. If sighted, such a buoy should be investigated and reported immediately to U.S. Navy authorities.

The submarine may transmit the International Distress Signal (SOS) on its sonar gear independently or in additional to the red signal. Submarine also may use these other means of attracting attention: release of dye marker or air bubble; ejection of oil; pounding on hull; ejection of lifejackets and other floating objects; ejection of emergency transmitter buoy, which sends the CW coded signal "SOS SUB SUNK SOS" on 121.50 MHz.

Special signals for deep-draft ships in narrow channel.-The following "Recommendation on Additional Signals for Deep-Draught Ships in Narrow Channels" was adopted by the Inter-Governmental Maritime Consultative Organization (IMCO) on November 26, 1968:

"A power-driven vessel under way in a narrow channel which, owing to its draught, can navigate only inside such channel, may carry in addition to the lights prescribed in Rule 2(a) (i), (ii), (v) and Rule 10(a) of the International Regulations for Preventing Collisions at Seas and during the same circumstances as prescribed in the Regulations for these lights, three red lights in a vertical line one over the other so that the upper and lower lights shall be the same distance from and not less than 6 feet (1.83 meters) above or below the middle light. They shall be carried where they can best be seen and visible all around the horizon at a distance of at least 2 miles. By day such a vessel may carry, where it can best be seen, a black cylinder of not

less than two feet (0.61 meters) in diameter and a height of not less than 3.5 feet (1.07 meters)."

The recommendation is not mandatory but may be used on an optional basis. Familiarity with the signals is necessary as it may be encountered in use by U.S. and/or foreign flag vessels throughout the world. The night signal recommended above is similar to the U.S. Pilot Rules provisions for vessels engaged in underwater construction and related operations, but confusion between these vastly different situations is considered unlikely.

NAVIGATION RESTRICTIONS AND REQUIREMENTS

Traffic separation schemes.-To increase the safety of navigation, particularly in areas of high shipping density, routes incorporating traffic separation have, with the approval of the Inter-Governmental Maritime Consultative Organization (IMCO), been established in certain areas of the world. In the interest of safe navigation, it is recommended that through traffic should use such routes, as far as circumstances permit, by day and by night and in all weather conditions. The routes which are intended for use by all vessels are **not mandatory,** and do not give any special rights to vessels using them.

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

(1) The International Regulations for Preventing Collisions at Sea and the Inland Rules of the Road, as appropriate, must be observed at all times.

(2) Ships navigating in lanes should keep to starboard of the separation line or separation (buffer) zone.

(3) Ships entering or leaving traffic lanes should normally do so at the ends of the lanes. When necessary to enter or leave lanes from the sides, ships should do so at as small an angle as practicable.

(4) Ships navigating in lanes should insure, as far as possible, that their courses conform with the axis of the lanes.

(5) Ships should avoid crossing traffic lanes.

(6) When necessary to cross traffic lanes, ships should, as far as practicable, do so at right angles.

(7) Other than by crossing ships, the separation (buffer) zone should not be crossed except in cases of emergency to avoid immediate danger.

(8) The arrows printed in the tracks shown on charts are intended only to give the general direction of traffic, and ships need not set their courses strictly along the arrows; the full width of each lane should be considered as available for navigation.

When approved or established, traffic separation scheme details are announced in Notice to Mariners, and later depicted on appropriate charts and included in Coast Pilots and Sailing Directions.

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

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

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

The Federal Water Pollution Control Act, as amended, prohibits the discharge of harmful quantities of oil into the navigable waters of the United States, the contiguous zone, or onto adjoining shorelines. Discharges that do occur must be reported to the Coast Guard by the most rapid available means. If the spiller or other industry organization, or State or local government, does not clean up the spill, the Federal Government may. The spiller will be liable for the cleanup costs. A harmful discharge of oil has been defined as one which causes a film or sheen upon or discoloration of the surface of the water, violates applicable State water quality standards, or causes a sludge or emulsion to be deposited beneath the surface of the water. (For regulations pertaining to this Act, see the Code of Federal Regulations, Title 33, Part 153.

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

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

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

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

Use of Radar while underway in low visibility.-Failure on the part of a vessel equipped with radar to make use of it while underway in low visibility has been held by a court to be directly contributory to a collision in which the vessel was involved. Rule 29 of the International Rules of the Road and Article 29 of the Inland Rules of the Road are applicable. This decision places an additional responsibility on vessels which are equipped and manned to use radar, to do so while underway during periods of reduced visibility without in any way relieving commanding officers of the responsibility of carrying out normal precautionary measures.

Recommendations on the use of radar during restricted visibility are included within the Annex of the International Rules of the Road.

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.

Narrow channels.—Sailing vessels and power-driven vessels of less than 65 feet in length shall not hamper the safe passage of larger steam vessels which can navigate only inside that channel.

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

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

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

Mariners are reminded that the use of bridge-to-bridge voice communications in no way alters the obligation to comply with the provisions of the RULES OF THE ROAD.

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 1. The sections are from Part 26, Vessel Bridge-to-Bridge Radiotelephone Regulations; Part 82, Boundary Lines of Inland Waters; Part 110, Anchorage Regulations; Part 117, Drawbridge Operation Regulations; Part 124, Control over Movement of Vessels; Part 204, Danger Zone Regulations; Part 205, Dumping Grounds Regulations; and Part 207, Navigation Regulations.

PART 26–VESSEL BRIDGE-TO-BRIDGE RADIOTELEPHONE REGULATIONS:

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

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

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

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

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

§26.02 Definitions. For the purpose of this part and interpreting the Act–

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

"Act" means the "Vessel Bridge-to-Bridge Radiotelephone Act", 33 U.S.C.A. sections 1201-1203;

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

"Navigable waters of the United States inside the lines established pursuant to section 2 of the Act of February 19, 1895 (28 Stat. 672), as amended." means those waters governed by the Navigation Rules for Harbors, Rivers, and Inland waters (33 U.S.C. sec. 151 et seq.), the Navigation Rules for Great Lakes and their Connecting and Tributary Waters (33 U.S.C. sec. 241 et seq.), and the Navigation Rules for Red River of the North and Rivers emptying into Gulf of Mexico and Tributaries (33 U.S.C. sec. 301 et seq.);

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

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

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

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

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

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

(4) Every dredge and floating plant engaged in or near a channel or fairway in operations likely to restrict or affect navigation of other vessels:

Provided, That an unmanned or intermittently manned floating plant under the control of a dredge need not be required to have separate radiotelephone capability: Shall have a radiotelephone capable of operation from its navigational bridge, or in the case of a dredge, from its main control station, and capable of transmitting and receiving on the frequency or frequencies within the 156–162 Mega-Hertz band using the classes of emissions designated by the Federal Communications Commission, after consultation with other cognizant agencies, for the exchange of navigational information.

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

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

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

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

Note: The Federal Communications Commission has designated the frequency 156.65 MHz for the use of bridge-to-bridge radiotelephone stations.

§26.05 Use of radiotelephone. Section 5 of the Act states–(a) The radiotelephone required by this Act is for the exclusive use of the master or person in charge of the vessel, or the person designated by the master or person in charge of the

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

§26.06 Maintenance of radiotelephone; failure of radiotelephone. Section 6 of the Act states-(a) Whenever radiotelephone capability is required by this Act, a vessel's radiotelephone equipment shall be maintained in effective operating condition. If the radiotelephone equipment carried aboard a vessel ceases to operate, the master shall exercise due diligence to restore it or cause it to be restored to effective operating condition at the earliest practicable time. The failure of a vessel's radiotelephone equipment shall not, in itself, constitute a violation of this Act, nor shall it obligate the master of any vessel to moor or anchor his vessel; however, the loss of radiotelephone capability shall be given consideration in the navigation of the vessel.

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

§26.08 Exemption procedures. (a) Any person may petition for an exemption from any provision of the Act or this part:

(b) Each petition must be submitted in writing to U.S. Coast Guard (M), 400 Seventh Street SW., Washington, DC 20590, and must state-

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

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

§26.09 List of exemptions.

(a) All vessels navigating on those waters governed by the navigation rules for Great Lakes and their connecting and tributary waters (33 U.S.C. 241 et seq.) are exempt from the requirements of the Vessel Bridge-to-Bridge Radiotelephone Act and this part until January 1, 1975.

§26.10 Penalties Section 9 of the Act states-(a) Whoever, being the master or person in charge of a vessel subject to the Act, fails to enforce or comply with the Act or the regulations hereunder; or whoever, being designated by the master or person in charge of a vessel subject to the Act to pilot or direct the movement of a vessel fails to enforce or comply with the Act or the regulations hereunder-is liable to a civil penalty of not more than $500 to be assessed by the Secretary.

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

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

PART 82-BOUNDARY LINES OF INLAND WATERS:

§82.1 General basis and purpose of boundary lines. Under 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.

§82.5 All harbors on the coast of Maine, New Hampshire, and Massachusetts between West Quoddy Head, Maine, and Cape Ann Light, Mass. A line drawn from Sail Rock Lighted Whistle Buoy 1 to the southeasternmost extremity of Long Point, Maine, to the southeasternmost extremity of Western Head; thence to the southeasternmost extremity of Old Man; thence to the southernmost extremity of Double Shot Islands; thence to Libby Island Light; thence to Moose Peak Light; thence to the eastern extremity of Little Pond Head. A line drawn from the southern extremity of Pond Point, Great Wass Island, to the southernmost point of Crumple Island; thence to Petit Manan Light; thence to Mount Desert Light; thence to Martinicus Rock Light; thence to Monhegan Island Light; thence to Seguin Light; thence to Portland Lightship; thence to Boon Island Light; thence to Cape Ann Lighted Whistle Buoy 2.

§82.10 Massachusetts Bay. A line drawn from Cape Ann Lighted Whistle Buoy 2 to Boston Lightship; thence to Cape Cod Light.

PART 110-ANCHORAGE REGULATIONS:

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

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

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

Subpart A-Special Anchorage Areas:

§110.2 Sheepscot River, Wiscasset, Maine. The area comprises that portion of the waterway beginning at a point, about 1,100 feet southerly from the westerly end of the highway bridge between Wiscasset and Davis Island, at latitude 43°59′56″, longitude 69°39′52″; thence 205° to latitude 43°59′42″, longitude 69°40′00″; thence 338° to latitude 43°59′52″, longitude 69°40′05″; and thence 64° to the point of beginning.

Note: The area will be principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction and at the discretion of the local Harbor Master.

§110.3 Kennebec River at Randolph, Maine. The area comprises that portion of the waterway beginning at a point on the shoreline 450 feet upstream from the east end of the Gardiner-Randolph Highway bridge at latitude 44°13′54″ longitude 69°46′06″, thence extending 213° to the upstream end of the east bridge pier at latitude 44°13′49″, longitude 69°46′11″, thence extending along the shoreward side of the pier to its downstream end at latitude 44°13′47″, longitude 69°46′10″, thence 113° to a point on the shoreline 350 feet downstream from the east end of the bridge at latitude 44°13′46″, longitude 69°46′05″, thence along the shore to the point of beginning.

Note: The area is principally for use by yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area. All anchoring in the area shall be under the supervision of the local harbor master or such authority as may be designated by authorities of the Town of Randolph, Maine.

§110.3a Kennebec River at Gardiner, Maine. (a) The area comprises that portion of the waterway on the westerly side of the river beginning at a point on the shoreline at latitude 44°10′20.5″, longitude 69°45′32″; thence due east to a point at latitude 44°10′20.5″, longitude 69°45′26″; thence northeasterly to a point at latitude 44°10′25″, longitude 69°45′23″; thence northerly to a point at latitude 44°10′33″, longitude 69°45′22″; thence due west to a point on the shoreline at latitude 44°10′33″, longitude 69°45′24″; and thence generally southwesterly along the shoreline to the point of beginning.

(b) The following requirements shall govern this special anchorage area:

(1) The area will be principally for use by yachts and other recreational craft.

(2) Temporary floats or buoys for marking anchors will be allowed, but fixed piles or stakes are prohibited. All moorings shall be so placed that no vessel when anchored shall at any time extend beyond the limits of the area.

(3) The anchoring of vessels and the placing of the temporary moorings shall be under the jurisdiction and at the discretion of the local harbor master, Gardiner, Maine.

§110.4 Kennebec River at Augusta, Maine. The area comprises that portion of the waterway on the east side of the river beginning at a point on the east shore at the east end of the north side of the highway bridge at mile 43.8, thence southwesterly along the north side of the bridge, to a point within 30 feet of the east limit of the project channel, thence northerly along a line 30 feet easterly of and parallel to the east limit of the channel to Kennebec Bridge at mile 44.1, thence easterly along the south side of the bridge to the shore, thence along the shore to the point of beginning.

Note: The area is reserved for yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed in the area. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend into the channel. All anchoring in the area shall be under the supervision of the local harbor master or such other authority as may be designated by the authorities of the City of Augusta, Maine.

§110.5 Casco Bay, Maine. (a) Beal's Cove, west side of Orr Island, Harpswell. The entire cove as defined by the shoreline and a line across the entrance bearing 215° and tangent to the shore on the north side.

(a-1) Merriconeag Sound, Harpswell. The area comprises that portion of the Sound beginning at a point on the shoreline about 1,000 feet northeasterly from the southwesterly extremity of Orr's Island at latitude 43°45′09″, longitude 69°59′14″, thence extending 290° to a point at latitude 43°45′10″, longitude 69°59′20″, thence extending 20° to a point at latitude 43°45′34″, longitude 69°59′05″, thence extending 110° to a point on the shoreline at latitude 43°45′33″, longitude 69°58′58″, thence along the shoreline to the point of beginning.

Note: The area is principally for use by yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area. Fixed mooring piles or stakes are prohibited. All anchoring in the area shall be under the supervision of the local harbor master or such authority as may be designated by authorities of the Town of Harpswell, Maine.

(b) Harpswell Harbor, east side of Harpswell Neck, Harpswell. The entire area lying westerly of a line bearing 8° from the eastern extremity of Stover's Point to the point of land at the northerly end of the harbor, said point of land bearing approximately 275° from the observatory on Orr Island.

(c) Basin Cove, west side of Harpswell Neck, Harpswell. All of the area lying northeasterly of a line bearing 350° from the northwest corner of the entrance to the cove.

(c-1) Basin Point, Potts Harbor, east side of Basin Point.- The water area east of Basin Point enclosed by a line beginning at the southernmost extremity of Basin Point at latitude 43°44′17″N., longitude 70°02′36″W.; thence easterly to latitude 43°44′17″N., longitude 70°02′19″W.; thence north northeasterly to a point on the shoreline at latitude 43°44′43″N., longitude 70°02′05″W.; thence following the shoreline to the point of beginning.

(d) Mussel Cove and adjacent waters at Falmouth Foreside, Falmouth. All of the waters enclosed by a line beginning at the Dock House (F.S.) located at latitude 43°44′22″N., longitude 70°11′41″W.; thence 123°, 200 yards; thence 204°, 1,760 yards; thence 220°, 1,950 yards to Prince Point; thence along the shoreline to the point of beginning.

(e) Harraseeket River. That portion of the Harraseeket River within the mean low water lines, between Stockbridge Point and Weston Point, excluding therefrom a thoroughfare, 100 feet wide, the center line of which follows the natural channel.

Note: This area is reserved for yachts and other small recreational craft. Fore and aft moorings will be allowed in this area. Temporary floats or buoys for marking anchors or moorings in place will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel when anchored shall at any time extend into the thoroughfare. All anchoring in the area shall be under the supervision of the local harbor master or such other authority as may be designated by the authorities of the Town of Freeport, Maine.

§110.6 Portland Harbor, Portland, Maine (between Little Diamond Island and Great Diamond Island). Beginning at the southeasterly corner of the wharf, at the most southerly point of Great Diamond Island at latitude 43°40′13″, longitude 70°12′00″; thence extending southwesterly to the northeasterly corner of the wharf on the easterly side of Little Diamond Island at latitude 43°40′03″, longitude 70°12′15″; thence extending along the northerly side of the wharf to its shoreward end at latitude 43°40′03″, longitude 70°12′17″; thence extending along the shoreline of Little Diamond Island to latitude 43°40′11″, longitude 70°12′20″; thence extending northeasterly to the shoreline of the southerly side of Great Diamond Island at latitude 43°40′21″, longitude 70°12′06″; thence extending along the shoreline of Great Diamond Island to the shoreward end of a wharf at latitude 43°40′15″, longitude 70°12′02″; thence extending along the southwesterly side of the wharf to the point of beginning.

Note: The area is principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. Fixed mooring piles or stakes are prohibited. The anchoring of vessels and placing of temporary moorings will be under the jurisdiction, and at the discretion of the local Harbor Master. All moorings shall be so placed that no moored vessels will extend beyond the limit of the area.

§110.10 Portsmouth Harbor, N.H., north of Newcastle Island. Southeasterly of a line bearing 74°30′ from the northeasterly extremity of Goat Island; southerly of a line bearing 89°30′ and passing through a point 100 feet due north of the northern extremity of Salamander Point, southwesterly of a line bearing 300° from Portsmouth Harbor Light; northwesterly of a line bearing 215°30′ from the southwest corner of Frisbee Wharf; and northerly of the shore line and of the breakwater between Newcastle Island and Goat Island.

§110.15 Newburyport Harbor, Mass. Eastward of a line bearing due north from the northeast corner of the American Yacht Club property to a point 237° and about 900 feet from South Pier; southward of a line bearing 70° to a point 212° and 310 feet from South Pier, thence 90° to a point 180° and about 600 feet from North Pier; westward of a line bearing 180° from North Pier to the shore line.

§110.20 Parker River, Newbury, Mass., 1½ miles above mouth. That portion of the river extending 3,800 feet downstream from the highway bridge on Route 1A; excluding therefrom a clear approach to the bridge 100 feet wide following generally the deepest water.

§110.22 Plum Island Sound off Great Neck, Mass. The waters of Plum Island Sound within the quadrant of a circle bounded by radii 2,600 feet long, bearing due north and 90°, respectively, from latitude 42°42′18″, longitude 70°48′12″, and the included arc.

§110.25 Beverly and Salem Harbors, Mass. (a) Beverly Harbor, north of Salem Neck. Southwest of a line bearing 315° from a point due north of and 60 yards from the northerly corner of the Salem Willows Municipal Pier, south of a line bearing 90° from Monument Bar Beacon; east of a line bearing 180° from Monument Bar Beacon; north of a line bearing 278° from the northerly end of the Salem Willows Yacht Club house; and northwest of a line extending from the northerly end of the Salem Willows Yacht Club house to the starting point due north of and 60 yards from the northerly corner of the Salem Willows Municipal Pier.

(b) Bass River. All of the area upstream of the highway bridge (Popes Bridge) outside of the dredged channel.

(c) Salem Harbor. That part of the harbor lying southwesterly of a line bearing 116° from the eastern extremity of Long Point to a point 20° from the beacon southeast of Pickering Point; thence bearing 160° to a point 47° from the aforesaid beacon; thence bearing 99° to the shore; excluding therefrom the dredged channel and basin to the Dion Boat Yard.

§110.26 Marblehead Harbor, Marblehead, Mass. The area comprises that portion of the harbor lying between the extreme low water line and southwestward of a line bearing 336° from Marblehead Neck Light to a point on Peach Point at latitude 42°31′03″, longitude 70°50′30″.

Note: The area is principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors are allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so that no vessel, when anchored, shall at any time extend beyond the limits of the area. The anchoring of vessels and the placing of temporary moorings are under the jurisdiction and at the direction of the local harbormaster.

§110.30 Boston Harbor, Mass., and adjacent waters. (a) Lynn Harbor. North of a line bearing 244° from the tower of the Metropolitan District Building, extending from the shore to a point 100 feet from the east limit of the channel; east of a line bearing 358°, extending thence to a point 100 feet east of the northeast corner of the turning basin; south of a line bearing 88°, extending thence to the shore; and south and west of the shore line to its intersection with the south boundary.

(b) Vicinity of Pleasant Park Yacht Club, Winthrop. Southerly of a line bearing 276° from a point on the west side of Pleasant Street, Winthrop, 360 feet from the southwest corner of its intersection with Main Street; westerly of a line bearing 186° from a point on the south side of Main Street 140 feet from the southwest corner of its intersection with Pleasant Street; northerly of a line bearing 256° from a point on the west side of Pleasant Street 550 feet from the southwest corner of its intersection with Main Street; and easterly of a line bearing 182° from a point on the south side of Main Street 640 feet from the southwest corner of its intersection with Pleasant Street.

(c) Mystic River, east side of Chelsea Bridge North. Northerly of the northerly fender pier of Chelsea Bridge North; easterly of Chelsea Bridge North; southerly of the shore line; and westerly of a line bearing 7° from the easterly end of the aforesaid fender pier.

(d) Mystic River, west side of Chelsea Bridge North. Northerly of the northerly fender pier of Chelsea Bridge North and a line extending from the westerly end of the shoreward face of the aforesaid fender pier to the southeasterly corner of the wharf projecting from the Naval Hospital grounds; easterly of the aforesaid wharf; southerly of the shore of the Naval Hospital grounds; and westerly of Chelsea Bridge North.

(e) Vicinity of South Boston Yacht Club, South Boston. Northerly of a line bearing 96° from the stack of the heating plant of the Boston Housing Authority in South Boston; easterly of a line bearing 5° from the west shaft of the tunnel of the Boston Main Drainage Pumping Station; southerly of the shore line; and westerly of a line bearing 158° from the northeast corner of the iron fence marking the east boundary of the South Boston Yacht Club property.

(f) Dorchester Bay, in vicinity of Savin Hill Yacht Club. Northerly of a line bearing 64° from the stack of the old power plant of the Boston Elevated Railway on Freeport Street in Dorchester; westerly of a line bearing 163° from the stack of the Boston Main Drainage Pumping Station of the Cow Pasture in Dorchester; and southerly and easterly of the shore line.

(g) Dorchester Bay, in vicinity of Dorchester Yacht Club. Eastward of a line bearing 21° from the stack located a short distance northwestward of the Dorchester Yacht Club; southward of a line bearing 294° from the southerly channel pier of the highway bridge; westward of the highway bridge and the shore line; and northward of the shore line.

(h) Quincy Bay, in vicinity of Wollaston and Squantum Yacht Clubs. Northwesterly of a line bearing 36°30′ from a point on the shore 2,600 feet easterly of the east side of the Wollaston Yacht Club landing; southwesterly of a line bearing 129°15′ from the water tank in Squantum; and southeasterly and northeasterly of the shore line.

(i) Quincy Bay, in vicinity of Merrymount Yacht Club. South of a line starting from a point bearing 246°, 3,510 yards, from the stack of the pumping station on Nut Island, and extending thence 306° to the shore; west of a line bearing 190° from the aforesaid point to the shore; and north and east of the shore line.

(j) Weymouth Fore River, in vicinity of Quincy Yacht Club. Southwesterly of a line bearing 119° from the outer end of the wharf at Nut Island; northwesterly of a line bearing 199°30′ from Pig Rock Light to the eastern end of Raccoon Island; northerly of Raccoon Island and of a line from its western extremity bearing 245° from Beacon 2A; and easterly of the shore of Houghs Neck.

(k) Weymouth Fore River, in vicinity of Wessagusett Yacht Club. Southwesterly of a line bearing 117° from channel light "4"; southeasterly of a line 150 feet from the parallel to the meandering easterly limit of the dredged channel; easterly of a line bearing 188° from the eastern extremity of Rock Island Head; and northwesterly of the shore line.

(l) Weymouth Back River, in vicinity of Eastern Neck. The cove on the north side of the river lying northerly of a line bearing 264°30′ from the southwesterly corner of the American Agricultural Chemical Company's wharf (Bradley's Wharf) to the shore of Eastern Neck, about 2,200 feet distant.

§110.31 Hull Bay and Allerton Harbor at Hull, Mass. (a) Area No. 1 in Allerton Harbor. That area north of Hog Island beginning at latitude 42°18′15″, longitude 70°53′46″; thence due east to latitude 42°18′15″, longitude 70°53′29.5″; thence due south to latitude 42°18′07.5″, longitude 70°53′29.5″; thence due west to latitude 42°18′07.5″, longitude 70°53′46″; thence due north to the point of beginning.

(b) Area No. 2 in Hull Bay. That area south of Hog Island beginning at latitude 42°17′50.5″, longitude 70°54′07″; thence due east to latitude 42°17′50.5″, longitude 70°53′29.5″; thence due south to latitude 42°17′30″, longitude 70°53′29.5″; thence due west to latitude 42°17′30″, longitude 70°54′07″; thence due north to the point of beginning.

(c) Area No. 3 in Hull Bay. That area north of Bumkin Island beginning at latitude 42°17′22″, longitude 70°54′07″; thence due east to latitude 42°17′22″, longitude 70°53′17.5″; thence due south to latitude 42°17′01″, longitude 70°53′17.5″; thence due west to latitude 42°17′01″, longitude 70°54′07″; thence due north to the point of beginning.

Note: The areas will be principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. Fixed mooring piles or stakes are prohibited. The anchoring of vessels and the placing of temporary moorings is under the jurisdiction, and at the discretion, of the local Harbor Master, Hull, Mass.

§110.32 Hingham Harbor, Hingham, Mass. (a) Area 1. Beginning at latitude 42°15′39″, longitude 70°53′24″; thence to latitude 42°15′53.5″, longitude 70°53′32″; thence to latitude 42°15′56″, longitude 70°53′23″; thence to latitude 42°15′42″, longitude 70°53′15″; thence to point of beginning.

(b) Area 2. Beginning at latitude 42°15′30″, longitude 70°53′02.5″; thence to latitude 42°15′30″, longitude 70°53′13.5″; thence to latitude 42°15′27.5″, longitude 70°53′18″; thence to latitude 42°15′28.5″, longitude 70°53′31″; thence to latitude 42°15′35″, longitude 70°53′34″; thence to latitude 42°15′36″, longitude 70°53′36.5″; thence to latitude 42°15′41″, longitude 70°53′34.5″; thence to latitude 42°15′31″, longitude 70°53′28″; thence to latitude 42°15′31.5″, longitude 70°53′03″; thence to point of beginning.

(c) Area 3. Beginning at latitude 42°15′33″, longitude 70°53′01.5″; thence to latitude 42°15′33.5″, longitude 70°53′19″; thence to latitude 42°15′35.5″, longitude 70°53′02″; thence to point of beginning.

(d) Area 4. Beginning at latitude 42°14′47″, longitude 70°53′09.5″; thence to latitude 42°14′48.5″, longitude 70°53′11.5″; thence to latitude 42°14′54″, longitude 70°53′08″; thence to latitude 42°14′56.5″, longitude 70°52′58.5″; thence to point of beginning.

(e) Area 5. Beginning at latitude 42°14′48″, longitude 70°52′57″; thence to latitude 42°14′48.5″, longitude 70°53′02″; thence to latitude 42°14′58″, longitude 70°52′51″; thence to latitude 42°14′53.5″, longitude 70°52′50″; thence to point of beginning.

Note: The areas will be principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed in the areas but fixed piles or stakes may not be placed. The anchoring of vessels and the placing of moorings will be under the jurisdiction of the local Harbor Master.

§110.35 Plymouth Harbor, Mass. Southeasterly of a line bearing 39° from Splitting Knife front range light; southwesterly of a line bearing 123° from a point on the Southeast face of the State Pier, 40 feet from the northeast corner (intersection of the northeast and southeast faces produced) of said pier; westerly of a line bearing 356° from the northeast corner of the Pilgrim Yacht Club wharf; and northeasterly of the shore line.

§110.37 Sesuit Harbor, Dennis, Mass. All the waters of Sesuit Harbor southerly of a line extending between the outer end of the jetties on each side of the entrance to the Harbor.

Note: The area will be principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. Fixed mooring piles or stakes will be prohibited. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction and at the discretion of the local Harbor Master.

Subpart B–Anchorage Grounds:

§110.130 Rockland Harbor, Maine. (a) The anchorage grounds–(1) Anchorage A. Beginning at a point bearing 158°, 1,075 yards, from Rockland Breakwater Light; thence 255°, 2,000 yards, to a point bearing 225° from Rockland Breakwater Light; thence 345°, 700 yards, to a point bearing

244° from Rockland Breakwater Light; thence 75°, 1,200 yards, to a point bearing 222° from Rockland Breakwater Light; and thence 120°, 1,000 yards, to the point of beginning.

(2) Anchorage B. Beginning at a point bearing 273°, 400 yards, from Rockland Breakwater Light; thence 273°, 700 yards, to a point bearing 273° from Rockland Breakwater Light; thence 349°, 850 yards, to a point bearing 305° from Rockland Breakwater Light; thence 89°, 700 yards, to a point bearing 328° from Rockland Breakwater Light; and thence 169°, 900 yards, to the point of beginning.

(3) Anchorage C. Beginning at a point bearing 244°, 1,715 yards, from Rockland Breakwater Light; thence 260°, 490 yards, to a point bearing 248° from Rockland Breakwater Light; thence 350°, 580 yards, to a point bearing 263° from Rockland Breakwater Light; thence 83°, 480 yards, to a point bearing 263° from Rockland Breakwater Light; and thence 169°, 550 yards, to the point of beginning.

(b) The regulations. (1) Anchorages A and B are general anchorages reserved for merchant vessels over 100 feet in length. Anchorage C is reserved for small commercial and pleasure craft.

(2) A distance of approximately 500 yards shall be left between Anchorages A and B for vessels entering or departing from the Port of Rockland. Any vessel not anchoring in these areas shall be ready to move on short notice when ordered to do so by the Captain of the Port.

(3) All other vessels within the Rockland Harbor area are prohibited from anchoring within 300 yards or operating within 100 feet of any navy yard, ship-building plant, power plant, oil terminal, marine terminal, munitions plant, military or naval arsenal or depot, warehouse, or freight pier without permission from the Captain of the Port, Rockland, Maine, or his authorized representative.

§110.131 Kennebec River in vicinity of Bath, Maine. (a) The anchorage grounds. Vessels may anchor only within the following limits:

(1) Northward of a line bearing 54° true and extending from a point on Passmore's wharf in prolongation with the north side of Commerce Street, Bath, Maine, to a point on the shore in Woolwich, approximately 1,200 feet north of the Maine Central Railroad wharf.

(2) Southward of a line drawn from the derrick on the Bath Iron Works wharf to Sassanoa Point in Woolwich.

(b) The regulations. (1) Vessels in the north anchorage shall be so anchored as to leave a clear fairway of 150 feet channelward of the established harbor lines at Bath, and a clear fairway 200 feet from the east or Woolwich shore, for the passage of steamers, tows, rafts, and other watercraft.

(2) The launching of vessels into the waters between the anchorages or the bringing up of such vessels by their anchors will be permitted: Provided, That the vessels so launched shall be removed therefrom within 12 hours from the time of anchorage.

§110.132 Portland Harbor, Maine. (a) The anchorage grounds-(1) Anchorage A (general). Beginning at the eastern corner of Grand Trunk Railway Company pier No. 3; thence approximately 90°, 1,700 yards, to Brooklyn Ledge Buoy 16; thence 330°, 350 yards; thence 25°, 780 yards; thence 303°, 750 yards; thence 254°, 560 yards; thence 186°, 750 yards; and thence to the point of beginning.

(2) Anchorage B (general and quarantine). Beginning at Brooklyn Ledge Buoy 16; thence 58° to Little Diamond Island; thence along the southwestern shore to the pier on the southern end of Little Diamond Island; thence 143°, 1,200 yards; thence 270° to House Island Light; thence along the western shore of House Island to Fort Scammel Point Light; and thence 329°, 1,620 yards, to the point of beginning.

(3) Anchorage C. Bounded on the northwest by House Island; on the north by a line running 90° from House Island Light to Peak Island; on the east by the western shore of Peak Island, by a line running 198° from the westernmost point on Peak Island to Cushing Island, and by the shore of Cushing Island to its westernmost point; and on the southwest by a line running from the westernmost point on Cushing Island to Fort Scammel Point Light.

(4) Anchorage D. Southerly and westerly of a line beginning at Lighthouse Channel Buoy 1; thence 35° to Anchorage Buoy E; and thence 145° to the mainland.

(b) The regulations. (1) Anchorage B is intended for general purposes, but especially for use by oil tankers and other large deep-draft ships entering harbor at night and intending to proceed to the dock allotted at daylight the following morning or as soon as practicable. This area is also to be used for quarantine anchorage. Vessels must be so anchored in this area as to leave at all times an open usable channel at least 100 feet wide for passage of ferry and other boats between Portland, Peak Island, and Bay Points. Any vessels anchored in this area shall be ready to move on short notice when ordered to do so by the Captain of the Port.

(2) Anchorage C is intended for use only by small vessels and for temporary anchorage.

(3) Anchorage D is for use only by small yachts and pleasure craft and small light-draft coastwise freighters.

§110.134 Boston Harbor, Mass. (a) The anchorage grounds-(1) Bird Island Anchorage. Beginning at a point bearing 93°, 1,400 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 81°, 1,600 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 102°, 3,100 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 109°, 3,050 yards, from the aerial beacon on top of the Boston Custom House tower; and thence to the point of beginning.

(2) President Roads Anchorage-(i) 40-foot anchorage. Beginning at a point bearing 237°, 522 yards from Deer Island Light; thence to a point bearing 254°, 2,280 yards from Deer Island Light; thence to a point bearing 261°, 2,290 yards from Deer Island Light; thence to a point bearing 278°, 2,438 yards from Deer Island Light; thence to a point bearing 319°, 933 yards from Deer Island Light; thence to a point bearing 319°, 666 yards from Deer Island Light; and thence to point of beginning.

(ii) 35-foot anchorage. Beginning at a point bearing 256°, 2,603 yards from Deer Island Light; thence to a point bearing 258°30′, 3,315 yards from Deer Island Light; thence to a point bearing 264°, 3,967 yards from Deer Island Light; thence to a point bearing 261°, 2,290 yards from Deer Island Light; and thence to point of beginning.

(3) Long Island Anchorage. East of Long Island, bounded as follows: Beginning at the southwesternmost point of Gallups Island; thence 270° to Long Island; thence southerly along the eastern shore line of Long Island to Bass Point; thence to the northernmost point of Rainsford Island; thence to Georges Island Gong Buoy 6; and thence to the point of beginning.

(4) Castle Island Anchorage. Bounded on the north by Castle Island and adjacent land; on the east by a line between Castle Rocks Fog Signal Light and Old Harbor Shoal Buoy 2; on the southeast by a line between Old Harbor Shoal Buoy 2 and Old Harbor Buoy 4; and on the west by a line running due north from Old Harbor Buoy 4 to the shore line at City Point.

(5) Explosives anchorage. In the lower harbor, bounded on the northeast by a line between the northeast end of Peddocks Island and the northeast end of Rainsford Island; on the northwest by Rainsford Island; on the southwest by a line between the western extremity of Rainsford Island and the westernmost point of Peddocks Island; and on the southeast by Peddocks Island.

(b) The regulations. (1) The Captain of the Port may authorize the use of the President Roads Anchorage as an explosives anchorage when he finds that the interests of commerce will be promoted and that safety will not be prejudiced thereby. Vessels anchored in this area shall move promptly upon notification by the Captian of the Port.

(2) In the Long Island Anchorage vessels shall anchor in the position designated by the Captain of the Port.

(3) Floats or buoys for marking anchors or moorings in place will be allowed in all areas. Fixed mooring piles or stakes are prohibited.

PART 117-DRAWBRIDGE OPERATION REGULATIONS:

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

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

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

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

(d) As used in this part, the term "long blast" means a distinct blast of a whistle, horn, siren, or other efficient sound producing device, of approximately three (3) seconds' duration. The term "blast" or "short blast" means a distinct blast of one (1) second's duration, or where specified, a distinct stroke of a bell.

(e) The Commandant may require the owner or operator to install and operate a radiotelephone station or stations of appropriate characteristics on a drawbridge when he finds that for navigation or safety it is essential that in addition to the use of sound or visual signals prescribed a supplemental means be available by which vessels may communicate to confirm requests for opening of the draw as well as exchange information with the drawtender concerning the condition of the draw or governing its operation.

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

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

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

(4) Radiotelephone communications pursuant to this section supplement the sound and visual signals prescribed elsewhere in this part of the operation of drawbridges in general or for specific bridges and do not alter any obligation with respect to their use. The provisions of this section are not intended to restrict the voluntary installation and operation of radiotelephone stations on drawbridges.

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

(b) Delegation to District Commanders. The Commandant further delegates pursuant to 49 CFR 1.4(g) to District Commanders authority to place in effect the provisions of paragraph (a) of this section with respect to drawbridges in their respective Coast Guard Districts for periods of time determined to be necessary but in no event to exceed 15 calendar days. For a specific drawbridge the District Commander having jurisdiction may suspend any drawbridge operation regulations applicable thereto and if necessary establish other operational requirements without prior notice and public procedures thereon for such actions. Where practicable, notice of the District Commander's actions taken pursuant to this section shall be disseminated in Notices to Mariners, or otherwise, for the information of all concerned.

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

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

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

reasonableness of the time and date (if requested), and the overall effect on navigation.

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

§117.2 Machias River, Maine; East Machias Highway bridge between Machiasport and East Machias, Maine. (a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 7:00 a.m. and 5:00 p.m. (local time) throughout the year.

(b) At times other than those specified in paragraph (a) of this section, the draw need not be opened for the passage of vessels, except on advance notice to the drawtender to be given between the hours of 7:00 a.m. and 5:00 p.m. when the drawtender is on duty.

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

§117.2a Narraguagus River, Maine; Maine State Highway Commission bridge across Narraguagus River, Milbridge, Maine. (a) The owner of or agency controlling the drawbridge will not be required to keep a drawtender in constant attendance.

(b) Whenever a vessel desires an opening of the drawspan at least a 24-hour advance notice of the time the opening is required shall be given in person, in writing, or by telephone to the Maine State Highway Commission, Division Office, Ellsworth, Maine.

(c) Upon receipt of such 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 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 it can be easily read at any time, a copy of the regulations in this section, together with a notice stating exactly how the representative stated in paragraph (b) of this section may be reached.

§117.3 Taunton River, Maine; Maine State Highway Commission highway bridge between Hancock and Sullivan. (a) The owner of or agency controlling this bridge will not be required to keep draw tenders in constant attendance.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw, at least 48 hours' 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, except as provided in paragraph (c) of this section. Advance notice as required by this paragraph shall be given either in person, by telephone, or otherwise to the Maine State Highway Commission, Augusta, Maine, or Ellsworth, Maine, or to such person or persons as may be designated an authorized representative.

(c) In case of emergency, the draw shall be opened promptly upon notification. For this purpose the owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be readily reached by telephone or otherwise at any hour of the day or night.

(d) Upon receipt of such 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.

(e) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in such manner that it can be easily read at any time, a copy of the regulations in this section, together with a notice stating exactly how the draw tender may be reached in an emergency and how the authorized representative may be reached by telephone or otherwise.

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

§117.5 Townsend Gut, Maine; bridge (highway) of town of Southport. (a) That the draw of the bridge shall be opened promptly upon reasonable signal for the passage of boats except when there are vehicles, animals, or foot passengers on the bridge; but in no case shall the delay in opening the bridge from this cause exceed five minutes: provided, That the signal may be given by three distinct blasts of whistle, horn, or conch, or by shouting with the voice.

(b) All boats desiring to pass through the draw shall be allowed to do so freely and without interference at a speed not exceeding 5 knots per hour.

§117.5a Sheepscot River, Maine; Maine State Highway Commission bridge, mile 14 and Maine Central railroad bridge, mile 15. From June 1 through September 30 the draw of each bridge shall open on signal if at least 4 hours' notice has been given to the owner of the bridge to be opened. From October 1 through May 31 the draw of each bridge shall open on signal if at least 24 hours' notice has been given to the owner of the bridge to be opened.

§117.6 Back River, Maine; highway bridge between Hodgdon and Barter Islands in the town of Boothbay, Maine. (a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 8:00 a.m. and 5:00 p.m. (local time) during the months of June to October, inclusive. At other hours during these months the draw

need not be opened for the passage of vessels except on previous notice in person, by telephone, or in writing to the drawtender. Such previous notice to be received during the hours the drawtender is on duty.

(b) From November to May, inclusive, the draw need not be opened for the passage of vessels any hour of the day or night except on a 24-hour advance notice to the drawtender of the bridge over Townsend Gut between Southport and Boothbay Harbor, Maine, or to the Maine State Highway Commission, Augusta, Maine.

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

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

§117.8 Kennebec River, highway and railroad bridge, between Bath and Woolwich. (a) The draw shall be opened promptly on signal provided that:

(1) From February 15 through April 14 and November 16 through December 15 at least 4 hours' advance notice has been given.

(2) From April 15 through June 15 and October 1 through November 15 at least 4 hours' advance notice has been given from 7 p.m. to 3 a.m.

(3) From December 16 through February 14 at least 24 hours' advance notice has been given.

(b) Signals:

(1) Sound signals. Sound signals shall be used if weather conditions will permit sound signals to be heard by the drawtender or by the vessel operator. A long blast shall be of approximately 3 seconds duration and a short blast shall be of approximatley 1 second duration. These blasts may be made by a whistle, horn, or by other similar device producing sound that can be clearly heard, or by a bell. In appropriate circumstances, shouting through a megaphone may be employed instead of sounding these signals.

(i) Signal to request opening of draw. One long blast followed by one short blast.

(ii) Acknowledging signal by the drawtenders. (a) When the draw will be opened immediately. One long blast followed by one short blast.

(b) When the draw cannot be opened immediately or is open and must be closed immediatley. Four or more short blasts, shall be sounded in rapid succession, repeated at regular intervals until acknowledged by the same signal from the vessel. As soon as the draw can be opened the drawtender shall sound the opening signal and open the draw for any vessels waiting to pass.

(2) Visual signals. These signals shall be use if weather conditons may be prevent sound signals from being heard or if sound producing devices are not properly functioning. Sound signals may be used in conjunction with visual signals.

(i) Signal to request opening of draw. A white flag of sufficient size to be readily visible by day or a white light of sufficient intensity to be readily visible by night, raised and lowered vertically in full sight of the drawtender repeated until acknowledged by the drawtender. Mechanical devices which produce essentially the same signal using fixed and/or flashing lights are permitted.

(ii) Acknowledging signal by the drawtender. (a) When the draw will be opened immediately. Same as signal to request opening.

(b) When the draw cannot be opened immediately or is open and must be closed immediately. A red flag of sufficient size to be readily visible by day or a red light of sufficient intensity to be readily visible by night, swung back and forth horizontally in full sight of the vessel, repeated until acknowledged by the vessel with the same signal. Mechanical devices which produce essentially the same signal using fixed and/or flashing lights are permitted. As soon as the draw can be opened, the drawtender shall give the opening signal and open the draw for any vessels waiting to pass.

(c) Unnecessary delays prohibited. Trains, vehicles, or pedestrians shall not stop or be stopped on a drawbridge so as to delay its opening, nor shall vessels be navigated so as to hinder or delay the closure of the draw. All passages across or through a drawbridge shall be prompt to prevent delay to either land or water traffic. Passage through a draw shall be made at no greater speed than that required to maintain reasonable control of a vessel as to minimize damage to the bridge, fenders, and/or vessel in case of collision.

(d) Posting of special operation regulations. The owners of or agencies controlling the drawbridge shall keep conspicuously posted both upstream and downstream of the drawbridge, on the bridge or elsewhere, in such a manner that they can easily be read at any time, from an approaching vessel, a brief statement of the special operation regulations pertaining to that bridge. Information as to whom and how notice should be given when passage through the draw is desired shall also be posted.

§117.10 Kennebec River, Maine; Maine State Highway Commission bridges between Richmond and Dresden and between Gardiner and Randolph. (a) The owner of or agency controlling these bridges shall provide the necessary draw tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draws for the passage of vessels.

(b) The draw of each bridge shall, upon receiving the prescribed call signal, be opened promptly at any time, day or night, for the passage of any

vessel or other watercraft not able to pass under the closed bridge: Provided, That the draw shall not be required to be opened between 9:00 p.m. and 5:00 a.m. except when advance notice of the time an opening is desired is given to the draw tender in person or by telephone or letter. The owner of or agency controlling the bridges shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any time between 5:00 a.m. and 9:00 p.m. Notices stating exactly how the draw tender may be reached shall be posted in the same manner as the copies of the regulations posted in accordance with paragraph (e) of this section.

(c) Sound and visual signals: Both sound and visual signals shall be given together under any weather conditions and whether sound signals can or cannot be heard.

(1) Call signal for opening of draw. Three blasts, and a flag by day or a lighted lantern by night swung in circles at arm's length from the bridge or pilot house of the vessel. The call signal shall be given when the vessel is within a reasonable distance of the bridge, and shall be repeated at intervals until acknowledged.

(2) Acknowledging signals when draw can be opened immediately. Three blasts, and a flag by day or a lighted lantern at night raised and lowered in vertical plane a number of times.

(3) Acknowledging signals when draw cannot be opened immediately. Five blasts, and a flag by day or a lighted lantern at night swung to and fro horizontally a number of times.

Note: As used in this paragraph, the term "blasts" means distinct blasts of a whistle, horn, or megaphone, or loud and distinct stroke of a bell.

(d) Vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

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

§117.15 Presumpscot River, Portland, Maine; bridge (highway) at Martins Point, Portland, Maine. (a) That on week days between April 1 and November 30 the draw shall be opened promptly upon signal between the hours of 7 a.m. and 6 p.m. Between December 1 and March 31 and on holidays and Sundays throughout the year the draw shall be opened only upon timely previous notice in person or in writing or by telephone to the draw tender.

(b) That the signal for opening the draw shall be five blasts of steam whistle on steam vessels or towboats, and five blasts from a horn on sailing or gasoline-driven vessels.

(c) That boats and tows shall approach and pass through the draw at a speed no higher than that required for good steerageway.

§117.20 Back Cove, Portland, Maine; Canadian National Railway bridge. (a) The draw of the bridge shall be opened promptly on signal for the passage of vessels that cannot pass the closed draw between 8:00 a.m. and 12:00 midnight (local time) from June 1 to October 1. At all times other than those specified above, the draw will be opened on a twelve hour advance notice given to the General Agent of Grand Trunk Railway, 1 India Street, Portland, Maine. The owner of or agency controlling the bridge shall provide arrangements whereby the General Agent may be conveniently reached by telephone or otherwise, and shall keep conspicuously posted on both the upstream and downstream side of the bridge in a position where it can be read easily at any time, a copy of the regulations of this section together with a notice stating how the agent may be reached at any time.

(b) The signal for opening the draw promptly when required shall be three short blasts of a whistle or horn.

§117.25 Fore River, Portland Harbor, Maine; bridge (highway), known as "Portland Bridge." (a) The owner of or agency controlling the 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 the drawbridge and desires to pass through the draw, three distinct blasts of a whistle, horn, or megaphone shall be sounded from the vessel when within reasonable hearing distance of the bridge.

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

(c) When weather conditions prevent hearing the sound signals when a vessel approaches the 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 draw tender shall reply by raising and lowering in a 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 to be closed immediately, the draw tender shall reply by swinging to and fro horizontally a number of times a lighted lantern at night and a flag by day.

(d) When two or more vessels are approaching the drawbridge 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 draw tender shall reply as prescribed and in turn to the signal of each vessel.

(e) The draw shall be opened with the least possible delay at all hours upon receiving the prescribed signal for the passage of any vessel or vessels or other water craft not able to pass underneath it.

(f) When a bridge tender is about to close a draw, he shall sound two distinct blasts of a whistle, horn, or megaphone, or two loud and distinct strokes of a bell.

(g) Wagons and other vehicles shall not be stopped on a drawbridge for the purpose of delaying its opening, nor shall water craft 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 delay to either land or water traffic.

(h) The owners of or agency controlling the drawbridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. The gages shall be so placed on the ends of the drawspan fender that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream, and the said gages shall be illuminated at night.

(i) Vessels which can pass under the drawbridge with a clearance of 2 feet or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw and if he finds that there would have been a clearance of 2 feet or more had the draw remained closed, he will report the matter immediately to the District Commander giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

§117.28 Kennebunk River, Maine Dock Square Highway Bridge between Kennebunk and Kennebunkport, Maine. (a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 7:00 a.m. and 5:00 p.m. (local time) on all days of the year.

(b) At times other than those specified in paragraph (a) of this section, the draw need not be opened for the passage of vessels except on advance notice to the drawtender to be given between the hours of 7:00 a.m. and 5:00 p.m. when the drawtender is on duty.

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

§117.35 Piscataqua River, Maine and N.H. (a) Bridge (highway) between Portsmouth, N.H., and Kittery, Maine. (1) The draw shall, upon the signals prescribed in subparagraphs (2) and (3) of this paragraph being given, be opened promptly at all hours for the passage of any vessel or vessels or other watercraft not able to pass underneath it.

(2) The signal for opening the draw shall be four blasts of a whistle or horn.

(3) Upon receiving the prescribed signal from an approaching vessel or watercraft, the draw tender, in case the draw can be opened immediately, shall promptly reply by an answering signal of three blasts of a whistle or horn. If, for any reason, the draw cannot be opened promptly when the prescribed signal is given, the draw tender shall so indicate by sounding five blasts of a whistle or horn, repeated at intervals until answered in like manner by the approaching vessel.

(4) There shall be provided, and kept in good legible condition, two board gages, painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. The gages shall be so placed on the piers at the ends of the drawspan, that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream.

(5) Pedestrians and vehicles shall not be stopped on the bridge 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 delay to either land or water traffic.

(b) Bridge (combined highway and railroad) between Portsmouth, N.H., and Kittery, Maine. (1) The corporation or persons owning or controlling this 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.

(2) If the weather conditions are good and sound signals can be heard when a vessel approaches this drawbridge and desires to pass through the draw, two long and two short distinct blasts of a whistle, horn, or megaphone shall be sounded from the vessel when within reasonable hearing distance of the bridge.

(i) When the draw of the bridge can be opened immediately, the draw tender shall reply by two long distinct blasts of a whistle, siren, horn, or megaphone or by two loud and distinct strokes of a bell.

(ii) When the draw of the bridge cannot be opened immediately or when the bridge is open and is to be closed immediately, the draw tender shall reply by five short distinct blasts of a whistle, siren, horn, or megaphone or by five loud and

distinct strokes of a bell, repeated at intervals until answered in like manner from the approaching vessel.

(3) When weather conditions prevent hearing the sound signals when a vessel approaches this 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.

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

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

(4) When two or more vessels are approaching this 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 draw tender shall reply as prescribed and in turn to the signal of each vessel.

(5) The draw shall be opened with the least possible delay at all hours upon receiving the prescribed signal for the passage of any vessel or vessels or other watercraft not able to pass underneath it: Provided, That the drawspan shall not be opened when a train is approaching so closely that it cannot safely be stopped before reaching the railroad signal block in which the drawspan of the bridge is located.

(6) When the draw tender is about to close the draw, he shall sound one distinct blast of a whistle, siren, horn or megaphone, or one loud and distinct stroke of a bell.

(7) Trains and vehicles shall not be stopped or pedestrians loiter on this drawbridge for the purpose of delaying its opening, nor shall watercraft or vessels be so manipulated as to hinder or delay the operation of the drawspan, but all passage over, through, or under it shall be prompt, to prevent delay to either land or water traffic.

(8) The owners of this bridge shall provide and keep in good legible condition two suitable gages approved by the Commandant, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. These gages shall be so placed on the piers at the ends of the drawspan that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream.

§117.40 Bellamy River, N.H.; bridge (highway) between Cedar Point and Dover Point, N.H. (a) The owner of or agency controlling the bridge will not be required to keep draw tenders in constant attendance at the bridge.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw between the hours of 6:00 a.m. and 10:00 p.m., from April 1 to October 31, at least 4 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner or agency controlling the bridge: Provided, That in an emergency the draw will be opened as soon as possible after notification. At all other hours during the period April 1 to October 31 and at all times during the period November 1 to March 31, the draw will be opened only in an emergency. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any hour of the day or night.

(c) Upon receipt of such 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 owner of or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where it can easily be read at anytime, 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) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw. All passage over the draw or through the draw opening shall be in a manner to expedite both land and water traffic.

(f) The operating machinery of the draw shall be maintained in servicable condition, and the draw opened and closed at least once each quarter to make certain that the machinery is in proper order for satisfactory operation.

§117.48 Little Harbor, N.H.; bridge (highway) between Rye and New Castle, N.H. (a) The owner or agency controlling the bridge will not be required to keep draw tenders in constant attendance at the bridge.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw between the hours of 6:00 a.m. and 10:00 p.m., from April 1 to October 31, at least 4 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner or agency controlling the bridge: Provided, That in an emergency the draw will be opened as soon as possible after notification. At all other hours during the period April 1 to October 31 and at all times during the period November 1 to March 31, the draw will be opened only in an emergency. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any hour of the day or night.

(c) Upon receipt of such notice, the authorized representative of the owner 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 owner or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where is can easily be read at any time, a copy of the regulations of this section, together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) Automobiles, trucks, vehicles, vessels, or other watercraft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw. All passage over the draw or through the draw opening shall be in a manner to expedite both land and water traffic.

(f) The operating machinery of the draw shall be maintained in a servicable condition, and the draw opened and closed at least once each quarter to make certain that the machinery is in proper order for satisfactory operation.

§117.50 Hampton River, N.H.; bridge (highway) between Seabrook and Hampton Beaches, N.H. (a) The owner of or the agency controlling the drawbridge shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draw.

(b) The draw shall be operated as prescribed in paragraphs (c) and (d) of this section and shall be opened promptly when the signal prescribed in paragraph (i) of this section for the opening of the draw is received.

(c) On all week days between April 1 and October 31, both dates inclusive, the draw shall be opened promptly for the passage of vessels during the daylight portions of the periods beginning 3 hours before and ending 3 hours after each high water. For the purpose of this section, daylight is construed to begin 30 minutes before sunrise and to end 30 minutes after sunset, and high water shall be deemed to occur 30 minutes later than the time of high water for Portland, Me., as given in the tide tables for the United States published by the Department of Commerce, United States Coast and Geodetic Survey.

(d) At times other than those specified in paragraph (c) of this section, the draw shall be opened only upon at least 3 hours' previous notice given in person or in writing or by telephone to the representative of the owner or agency controlling the bridge except that in case of emergency the draw shall be opened promptly upon such notice. For this purpose the owner shall install and maintain at the bridge a telephone and shall keep conspicuously posted on both the upstream and downstream sides of the bridge 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 this section may be reached.

(e) The owners of the bridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the closed drawspan at all stages of the tide. The gages shall be so placed on the bridge that they will be plainly visible to the operator of a vessel approaching the bridge either up or down stream.

(f) Vessels which can pass under the bridge with a clearance of 1 foot or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw and if he finds that there would have been a clearance of 1 foot or more had the draw remained closed, he will report the matter immediately to the District Commander, giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

(g) Pilots or masters of vessels are prohibited from signaling for or serving notice of passage unless it is necessary for the draw to be opened for the passage of the vessel. If notice or signal is given and the passage not effected at the proper time, report shall be made to the District Commander, by the draw tender.

(h) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw, but all passage over the drawspan or through the draw opening shall be in a manner so as to expedite both land and water traffic.

(i) Signals-(1) Call signals for opening of draw-(i) Sound signal. Three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell sounded within a reasonable hearing distance of the bridge.

(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 operator-(i) Sound signals. Draw to be opened immediately: Same as call signal. Draw cannot be opened immediately, or if open must be closed immediately: Two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. Draw to be opened immediately: A white flag by day or a green light at night swung up and down vertically a number of times in full sight of the vessel. Draw cannot be opened immediately or if open must be closed immediately: A red flag by day, a red light by night swung to and fro horizontally in full sight of the vessel, to be repeated until acknowledged by the vessel.

(3) Acknowledging signals by the vessel. Vessels or other water craft having signaled for the opening of the 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 by night.

§117.55 Merrimack River, Mass. (a) Massachusetts Department of Public Works highway bridge and Boston and Maine Railroad bridge between Newburyport and Salisbury. (1) Between 6:00 a.m. and 10:00 p.m. from May to October, inclusive, and between 8:00 a.m., and 5:00 p.m. from November to April, inclusive, the draw of each of these bridges shall, upon receipt of the signal prescribed in subparagraph (5) of this paragraph or upon verbal request at the bridge, be opened promptly for the passage of any vessel or other watercraft not able to pass under the closed draw.

(2) At all other times, the draw shall be opened within a reasonable time after notice to the draw tender in person, by letter, or by telephone. For this purpose the owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be reached readily by telephone or otherwise at any hour of the day or night, and shall keep conspicuously posted on both the upstream and downstream sides of the bridge in a position where it can be read easily at any time, a copy of the regulations in this paragraph together with a notice stating exactly how the draw tender may be reached at all times by telephone or otherwise.

(3) The draw shall not be opened if there is a train, car, or other vehicle passing over the draw, or if a train or car is approaching so closely that it cannot be stopped safely before reaching the draw, but the draw shall be opened as soon as it can be cleared, and no person, vehicle, car, or train shall be permitted to begin to cross the draw after it has been signaled to open except as provided in this paragraph.

(4) When the draw shall have been opened for 10 minutes it may be closed for the crossing of trains, cars, vehicles, or individuals if there be any waiting to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary for the said trains, cars, vehicles, or individuals to cross, it shall again be opened promptly for the passage of any vessel or other watercraft desiring to pass. The length of time that the draw has been open shall be computed from the time it is fully opened, and the length of time that the draw has been closed shall be computed from the time it ceases to move in closing.

(5) When a vessel or other watercraft intends to pass through the draw of either bridge, the master or pilot thereof shall, on approaching within signaling distance, signify his intention to pass through the draw by sounding two long blasts followed immediately by two short blasts. If the draw can be opened immediately, the draw tender shall reply by three long blasts. If a delay in opening the draw is permitted by the regulations in this paragraph and it is not to be opened immediately, the draw tender shall reply by two long blasts.

(6) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be navigated so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either land or water traffic.

(7) The owner of or agency controlling each bridge shall maintain in good and efficient order the draw and the machinery and appliances for operating the same and for assisting vessels while passing through the draw, shall provide such draw tenders as may be necessary to open and close the draw promptly, and shall provide and maintain in good order on the bridge piers or fenders such fixtures as may be necessary to vessels in mooring or making fast while waiting for the draw to open.

(8) This paragraph shall not apply to vessels owned or leased by the United States, nor to vessels employed for police or fire protection by any town or municipality touching on the Merrimack River. All such United States and municipal vessels shall be passed without delay through the draw of either bridge during the periods specified in subparagraph (1) of this paragraph upon signaling by four long blasts, and at all other times as soon as possible after notice to draw tender in person or by telephone.

(b) Essex County highway bridge between Deer Island and Salisbury and drawbridges upstream therefrom. (1) The owner of or agencies controlling these bridges will not be required to keep draw tenders in constant attendance.

(2) Whenever a vessel unable to pass under a closed bridge desires to pass through the draw, at least two hours' 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: Provided, That all vessels owned or leased by the United States, and all vessels employed for police or fire protection by any town or municipality touching on the Merrimack River, shall be passed through the draw as soon as possible after notice to the authorized representative in person or by telephone.

(3) Upon receipt of such advance 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.

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

(5) 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.

§117.60 Plum Island River, Mass.; bridge (highway). (a) The owner of or the agency controlling the drawbridge shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draw.

(b) On every calendar day between April 1 and November 30, both dates inclusive, the draw shall be opened promptly for the passage of vessels during the daylight portions of the periods beginning 2 hours before and ending 2 hours after each high tide. For the purpose of this section, daylight is construed to begin 30 minutes before sunrise and to end 30 minutes after sunset, and high tide shall be deemed to occur 30 minutes later than the time of high tide for Portland, Maine, as given in the tide tables for the United States published by the Department of Commerce, United States Coast and Geodetic Survey.

(c) Persons requiring the opening of the draw at times other than those specified in paragraph (b) of this section shall, except in an emergency, give at least 3 hours' notice of the time at which such opening will be required. Said notice may be given in person, in writing, or by telephone to the draw tender while in attendance at the bridge or to a designated representative of the owner or agency controlling the bridge. Upon receipt of such notice said owner or agency shall cause a suitable 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 opened promptly for the passage of vessels.

(d) The owner of or agency controlling the bridge shall install and maintain at the bridge a telephone and shall keep conspicuously posted on both the upstream and downstream sides of the bridge 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 this section may be reached.

(e) The owners of the bridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the closed drawspan at all stages of the tide. The gages shall be so placed on the bridge that they will be plainly visible to the operator of a vessel approaching the bridge either up or down stream.

(f) Vessels which can pass under the bridge with a clearance of 1 foot or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw, and if he finds that there would have been a clearance of 1 foot or more had the draw remained closed, he will report the matter immediately to the District Commander, giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

(g) Pilots or masters of vessels are prohibited from signaling for or serving notice of passage unless it is necessary for the draw to be opened for the passage of the vessel. If notice or signal is given and the passage not effected at the proper time, report shall be made to the District Commander, by the draw tender.

(h) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw, but all passage over the drawspan or through the draw opening shall be in a manner so as to expedite both land and water traffic.

(i) Signals-(1) Call signals for opening draw. (i) Sound signal. Three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell sounded within a reasonable hearing distance of the bridge.

(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 operator-(i) Sound signals. Draw to be opened immediately: Same as call signal. Draw cannot be opened immediately, or if open must be closed immediately: Two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. Draw to be opened immediately: A white flag by day or a green light at night swung up and down vertically a number of times in full sight of the vessel. Draw cannot be opened immediately or if open must be closed immediately: A red flag by day, a red light by night swung to and fro horizontally in full sight of the vessel, to be repeated until acknowledged by the vessel.

(3) Acknowledging signals by the vessel. Vessels or other water craft having signaled for the opening of the draw and having received a signal that the draw cannot be opened immediately, or if opened 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 by night.

§117.64 Manchester Harbor, Mass.; Boston and Maine Railroad Bridge at Manchester. (a) The draw shall be opened promptly on signal for the passage of vessels from 9:00 a.m. to 1:00 p.m. and from 2:00 p.m. to 6:00 p.m. (local time) each day of the week from April 1 to November 1, inclusive.

(b) At times other than those specified in paragraph (a) of this section, advance notice of at least 2 hours is required for opening the draw between the hours of 6:45 a.m. and 3:45 p.m., and 5 hours for opening at times other than specified above. The notice is to be given to the Chief Dispatcher, Boston and Maine Railroad, Boston, Massachusetts.

(c) 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 easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the representative in paragraph (b) of this section may be reached.

§117.65 Danvers River, Mass.; bridges (highway and railroad). (a) The corporations or persons owning or controlling the bridge shall provide the same with the necessary tenders and proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) The draw of each of the bridges shall, upon the signal prescribed in paragraphs (d) and (e) of this section being given, be opened promptly for the passage of vessels from 8:00 a.m. to 12:00 midnight each day of the year.

(c) Between 12:00 midnight and 8:00 a.m. each day of the year, the bridges shall be opened on advanced notice in person, or in writing, or by telephone to the draw tenders, either at the bridges during the time the operators are on duty or at the residences thereafter, except that in case of emergency, the draw shall be opened promptly upon notification. For this purpose, the bridge owners shall install and maintain telephones at the bridges and provide arrangements whereby the draw tenders can be reached by telephone or otherwise at any hour of the day or night, and notice of such arrangements shall be conspicuously posted on the bridges.

(d) If weather conditions are good and sound signals can be heard when a vessel approaches a drawbridge and desired to pass through the draw, the person in charge of said vessel shall cause to be sounded, within reasonable hearing distance of the bridge, three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell.

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

(2) When the draw of the bridge cannot be opened immediately, the draw tender shall reply by two long distinct blasts of a whistle, horn, or megaphone, or by two loud and distinct strokes of a bell.

(e) When weather conditions prevent hearing the sound signals, signals shall be made from the vessel by swinging in circles at arm's length a flag.

(1) When the draw of the bridge can be opened immediately, the draw tender shall reply by raising and lowering in vertical plane a number of times a flag.

(2) When the draw of the bridge cannot be opened immediately, the draw tender shall reply by swinging to and fro horizontally a number of times a flag.

(f) The draw shall be opened with the least possible delay upon receiving the prescribed signals: 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.

(g) 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 delay to either land or water traffic.

§117.75 Boston Harbor, Mass., and adjacent waters; bridges. (a) The regulations in this section shall govern the operation of all drawbridges across Boston Harbor, Massachusetts, including the following waters in and adjacent thereto:

(1) Chelsea River.
(2) Mystic River.
(3) Malden River (excluding the Massachusetts Department of Public Works highway bridge at Medford Street, Malden).
(4) Little Mystic Channel.
(5) Charles River.
(6) Fort Point Channel (excluding therefrom the portion of Fort Point Channel lying above the easterly side of the highway bridge at Dorchester Avenue).
(7) Reserved Channel.
(8) Neponset River.
(9) Weymouth Fore River.
(10) Weymouth Back River.

(b) The owners of or agencies controlling the bridges shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draws for the passage of vessels and for assisting vessels while passing through the draws. They shall also provide and maintain in good order on the bridge piers or fenders such fixtures as may be necessary to vessels in mooring or making fast while waiting for the draws to open.

(c) Except as otherwise provided in paragraphs (g) to (l) of this section, the draw of each bridge shall, upon oral request or upon receiving the prescribed call signal, be opened promptly for the passage of any vessel or other watercraft not able to pass under the closed bridge: Provided, That the draw shall not be opened when a train or vehicle is approaching so closely that it cannot safely be stopped before reaching the draw: Provided

further, That when any draw shall have been open for 10 minutes or longer it may be closed to permit any waiting trains, vehicles, or persons to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary it shall again be opened promptly for the passage of vessels or other watercraft if there be any such desiring to pass.

Note: The length of time a draw has been open shall be computed from the time that the draw begins to move in opening, and the length of time that a draw has been closed shall be computed from the time that the draw ceases to move in closing.

(d) Signals-(1) Call signal for opening of draw. Two long blasts followed immediately by two short blasts, sounded within signaling distance of the bridge: Provided, That the call signal for the City of Boston bridge across Chelsea River connecting Meridian Street, East Boston, and Pearl Street, Chelsea, shall be two long blasts followed immediately by two short blasts and one long blast: Provided further, That the call signal for those bridges across Mystic River, Charles River, and Fort Point Channel referred to in paragraphs (g), (h), and (i) of this section, to be given by vessels entitled to passage during closed periods under the provisions of paragraphs (f) to (i), inclusive, of this section, shall be four long blasts.

(2) Acknowledging signals-(i) When draw can be opened immediately. Three long blasts.

(ii) When draw cannot be opened immediately. Two long blasts.

(e) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

(f) The general regulations contained in paragraphs (a) to (e), inclusive, of this section shall apply to all bridges except as modified by the special regulations contained in paragraphs (g) to (l) of this section prescribed where local conditions require to govern the operation of certain bridges. The special regulations shall not apply to vessels owned or controlled by the United States Government or to vessels employed by the City of Boston or other municipality for police and fire protection. All such United States and municipal vessels shall be passed without delay through the draws of all bridges at any hour day or night.

(g) Mystic River-(1) Bridges from mouth to and including Boston and Maine Railroad bridge between Somerville and Medford. The draws of these bridges shall not be required to be opened for the passage of vessels whose draft is less than 18 feet between 7:45 and 9:00 a.m., 9:10 and 10:00 a.m., and 5:00 and 6:00 p.m., except on Sundays and on legal holidays observed in the locality: Provided, That any vessel or other watercraft proceeding either upstream or downstream which has passed any of these bridges shall be afforded continuous passage through the succeeding bridges.

(2) Metropolitan District Commission highway bridge (General Lawrence Bridge) opposite Harvard Street, Medford. The draw need not be opened for the passage of vessels, and paragraphs (b) to (f) of this section shall not apply to this bridge.

(3) Wellington Bridge between Somerville and Medford. The draw need not open for the passage of vessels, and paragraphs (b) to (f) of this section shall not apply to this bridge.

(h) Charles River-(1) Bridges from mouth to and including Metropolitan District Commission Bridge at Charles River Dam. The draws of all bridges, except the Charlestown Bridge and the Metropolitan Transit Authority Bridge, from the mouth to and including the Metropolitan District Commission bridge between Boston and Cambridge (at Charles River Dam) shall not be required to be opened for the passage of vessels between 6:15 and 9:10 a.m., and 4:15 and 7:40 p.m., except on Sundays and on legal holidays observed in the locality: Provided, That when high tide at Charlestown Navy Yard occurs between 6:15 and 9:10 a.m., the draws shall be opened within 45 minutes before or after high tide for a period of 10 minutes for the passage of all vessels or other watercraft whose draft is 12 feet or over if there be any such desiring to pass, the exact time of opening to be prescribed by the railroad companies, due regard being had for causing minimum interference with railroad schedules, highway traffic, and the interests of navigation, and the opening time of each bridge to be so fixed as to permit continuous passage through the next and following bridges located in direction of course of the vessels or other watercraft.

(2) Charlestown Bridge. The draw need not be opened for the passage of vessels, and paragraphs (b) to (f), of this section shall not apply to this bridge.

(3) Metropolitan Transit Authority (East Cambridge Viaduct) Bridge. The draw need not be opened for the passage of vessels, and paragraphs (b) to (f), of this section, shall not apply to this bridge. However, the operating machinery of the draw shall be maintained in an operable condition.

(4) Lechmere Canal, Commercial Avenue Bridge. The draw need not open for the passage of vessels and paragraphs (b) through (f) of this section shall not apply to this bridge.

Note: The temporary special regulations contained in paragraphs (i) and (j) are on a trial basis and are subject to review and amendment at any time by the U.S. Coast Guard.

(i) Fort Point Channel, city of Boston highway bridges. (1) The draw of the Summer and Congress Street bridges need not open for the passage of vessels and paragraphs (b) through (e) of this section do not apply to these bridges. However, the

draws shall be returned to an operable condition within 6 months after notification from the Commandant to take such action.

(2) From 6 a.m. to 8 p.m. the Northern Street bridge draw shall open on signal, except that it need not open from 7 a.m. to 9 a.m. and from 4:30 p.m. to 6:30 p.m., Monday through Friday, excluding legal holidays for the passage of vessels whose draft is less than 18 feet. From 8 p.m. to 6 a.m. the draw need not open for the passage of vessels.

(j) Reserved Channel. The draw of the Summer (L) Street Bridge shall not be required to be opened for the passage of vessels between 4:00 p.m. and 9:30 a.m., Monday to Saturday, inclusive, except on 10 hours' advance notice. Between March 31 and November 1, the draw shall not be required to open for the passage of vessels before 9:30 a.m. and after 4:00 p.m. on Sundays, except on 10 hours' advance notice. Between November 1 and March 31, the draw shall not be required to open for the passage of vessels at any time on Sundays, except on 10 hours' advance notice.

(k) Dorchester Bay. The draw of Dorchester Bay Highway Bridge on William T. Morrissey Boulevard (Old Colony Parkway) between Savin Hill and Commercial Point, Dorchester, Massachusetts, shall not be required to be opened for the passing of vessels from 7:30 a.m. to 9:00 a.m., and from 4:30 p.m. to 6:00 p.m. every day of the week except Saturdays, Sundays or legal holidays observed in the locality and except in case of emergency or during extreme storm conditions.

(l) Neponset River. (1) Granite Avenue Bridge:

(i) From May 1 through October 31 the draw shall open on signal.

(ii) From November 1 through April 30 from 8 a.m. to 4 p.m. the draw shall open on signal.

(iii) From November 1 through April 30 from 4 p.m. to 8 a.m. the draw shall open on signal if at least 24 hours notice has been given.

(2) The 24-hour advance notice will not apply to vessels owned or operated by the United States nor to vessels employed for police and fire protection, nor in an emergency by any vessel when danger to life and/or property is involved. For the type of vessel specified, and in emergencies by any vessel, the owner or agency operating the bridge shall, upon request, arrange for the opening of the drawspan as soon as practicable after receipt of the request.

(3) The owners of or agency controlling the bridge shall post the draw-bridge regulations and the procedures for giving advance notice on the upstream and downstream sides of the bridge or elsewhere in such a manner that they can read from an approaching vessel.

§117.77 North River, Mass.; bridges at Route 3A and Union Street.(a) From May 1 through October 31 the draws shall open on signal if at least 4 hours' notice has been given.

(b) From November 1 through April 30 the draws shall open on signal if at least 24 hours' notice has been given.

(c) The owner of or agency controlling each bridge shall post a notice of the contents of this section in such a manner that it can be easily read from an approaching vessel on both the upstream and downstream sides of the bridges. This notice shall state how advance notice should be given.

(d) The operating machinery of the draws shall be maintained in serviceable condition and the draws opened and closed at least every 3 months to make certain that the machinery will function properly for satisfactory operation.

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 sea, 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 accordance with the U.S. Coast Guard's voluntary Automated 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) For that vessel which is engaged in operations in and out of the same port to sea and return without entering any other port, or on coastwise voyages between ports in the same Coast Guard District, or on voyages between ports in the First, Ninth, Thirteenth, or Seventeenth Coast Guard Districts and adjacent Canadian ports, or between ports of the Commonwealth of Puerto Rico and ports in the Lesser Antilles, or between ports in the Lesser Antilles, or between ports on the east coast of Florida and the Bahama Islands, the Coast Guard District Commander having jurisdiction may, when no reason exists which renders such action prejudicial to the rights and interests of the United States, prescribe conditions under which such vessels may be considered by the Captains of the Port as being in constructive compliance with the requirements of this section.

(8) A westbound vessel which is to proceed to or through United States waters of the St. Lawrence River and/or the Great Lakes 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, at least 24 hours in advance of the vessel's arrival at the first United States port-of-call, advise the Commander, Ninth Coast Guard District, Cleveland, Ohio, of the estimated time of arrival at that port.

(3) [Reserved]

(4) A master of a vessel who reports in accordance with the U.S. Coast Guard's voluntary Automated 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.

(5) A master or agent of a vessel who files a copy of the scheduled route with the Commander, Ninth Coast Guard District, Cleveland, Ohio, at least 24 hours prior to arrival at Snell Lock, and who includes in the schedule the estimated time of arrival at the Snell Lock, Massena, N.Y., shall be considered to be in constructive compliance with requirements of subparagraph (1) of this paragraph and no additional advance notice of the vessel's arrival at the Snell Lock is required. Likewise, a master or agent of such vessel who indicates in this schedule 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.

(6) 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.

§124.14 Advance notice of arrival of vessel laden with explosives or certain specified dangerous cargoes. (a) The master, agent, or person in charge of any domestic or foreign vessel which is bound for a port or place in the United States and which is carrying as cargo any of the dangerous cargoes described in this paragraph, whether for discharge in the United States or not, shall at least 24 hours in advance of arrival at each port or place, notify the Captain of the Port or the Commander of the Coast Guard District in which such port or place is located concerning the amount and location of stowage on board the vessel of any of the following:

(1) Explosives, class A (commercial or military).

(2) Oxidizing materials for which a special permit for water transportation is required by 46 CFR 146.22.

(3) Radioactive materials for which a special approval by the Commandant for water transportation is required by 46 CFR 146.25-30.

(4) Any dangerous cargo considered to involve a particular hazard, when transported or handled in bulk quantities, as further described in paragraph (b) of this section.

(b)(1) A dangerous cargo considered to involve a particular hazard, when transported in bulk quantities on board vessels, or when handled in bulk quantities on waterfront facilities, is any commodity which by virtue of its properties would create an unusual hazard if released. The commodities subject to this section are:

Acetaldehyde; Acetone cyanohydrin; Acetonitrile; Acrylonitrile; Allyl alcohol; Allyl chloride; Ammonia, anhydrous; Aniline; Butadiene; Carbolic oil; Carbon disulfide; Chlorine; Chlorohydrins, crude; Crotonaldehyde; 1,2-Dichloropropane; Dichloropropene; Epichlorohydrin; Ethylene; Ethyl ether; Ethylene oxide; Hydrochloric acid; Methane; Methyl acrylate; Methyl bromide; Methyl chloride; Methyl methacrylate (monomer); Nonyl phenol; Oleum; Phenol; Phosphorus, elemental; Propane;

Propylene; Propylene oxide; Sulfuric acid; Sulfuric acid, spent; Tetraethyl lead; Tetraethyl lead mixture; Vinyl acetate; Vinyl chloride; Vinylidene chloride;

(2) Each commodity listed in subparagraph(1) of this paragraph is considered to possess one or more of the following properties:

(i) Is highly reactive or unstable; or

(ii) Has severe or unusual fire hazards; or

(iii) Has severe toxic properties; or

(iv) Requires refrigeration for its safe containment; or

(v) Can cause brittle fracture of normal ship structural materials or ashore containment materials by reason of its being carried at low temperatures, or because of its low boiling point at atmospheric pressure (unless uncontrolled release of the cargo is not a major hazard to life).

(c) For U.S. vessels, this section is applicable to such vessels on international voyages, coastwise voyages, or Great Lakes voyages. For foreign vessels this section is applicable to such vessels when bound to a port or place in the United States, or a port or place under the jurisdiction of the United States.

(d) When the arrival is a direct result of "force majeure" and it is not possible to give at least 24 hours advance notice, then advance notice as early as possible will be given.

§124.16 Advance notice of fire or other abnormal condition on arriving vessel. (a) The master, agent, or person in charge of any domestic or foreign vessel which is bound for a port or place in the United States shall give notice to the Captain of the Port or the Commander of the Coast Guard District in which such port or place is located as early as possible in advance of arrival of any fire or other abnormal condition which may jeopardize the vessel's safety or that of other vessels or facilities in port.

§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 204-DANGER ZONE REGULATIONS:

§204.1 Gulf of Maine off Seal Island, Maine; Naval aircraft bombing target area. (a) The danger zone. A circular area with a radius of 1.5 nautical miles, having its center just easterly of Seal Island at latitude 43°53′00″ and longitude 68°44′00″.

(b) The regulations. (1) No aerial bombing practice will take place in the danger zone after 5:00 p.m. Mondays through Saturdays, at any time on Sundays, or during foggy or inclement weather.

(2) Vessels or other watercraft will be allowed to enter the danger zone any time there are no aerial bombing exercises being conducted.

(3) No live ammunition or explosives will be dropped in the area.

(4) Suitable Notice to Mariners, by appropriate methods, will be issued by the Commander, First Coast Guard District, Boston, Massachusetts; upon request of the Commandant, First Naval District, Boston, Massachusetts, or his designated agent.

(5) Prior to the conducting of each bombing practice, the area will be patrolled by a non-participating naval aircraft to ensure that no watercraft are within the danger zone and to warn any such watercraft seen in the vicinity by means of a signal that bombing practice is about to take place. The patrol aircraft will employ the method of warning known as "buzzing" which consists of low flight by the airplane and repeated opening and closing of the throttle.

(6) Any such watercraft shall, upon being so warned, immediately leave the designated area and, until the conclusion of the practice, shall remain at such distance that it will be safe from falling projectiles.

(7) The regulations of this section shall be enforced by the Commandant, First Naval District, Boston, Massachusetts, or such agencies as he may designate.

§204.1a Gulf of Maine off Cape Small, Maine; Naval aircraft practice mining range area. (a) The danger zone. Within an area bounded as follows: Beginning at latitude 43°43′00″, longitude 69°46′00″; thence to latitude 43°38′30″, longitude 69°46′00″; thence to latitude 43°38′30″, longitude 69°49′30″; thence to latitude 43°42′10″, longitude 69°49′30″; thence to the point of beginning.

(b) The regulations. (1) Test drops from aircraft will be made within the area at intermittent periods from noon until sunset local time and only during periods of good visibility.

(2) Testing will not restrict any fishing, recreational, or commercial activities in the testing area.

(3) Aircraft will patrol the area prior to and during test periods to insure that no surface vessels are within the area. No test drops will be made while surface vessels are transitting the area.

(4) No live ammunition or explosives will be dropped in the area.

(5) The regulations of this section shall be enforced by the Commandant, First Naval District, Boston, Mass., or such agencies as he may designate.

§204.2 Atlantic Ocean in vicinity of Duck Island, Maine, Isles of Shoals; naval aircraft bombing target area. (a) The danger zone. A circular area with a radius of 500 yards having its center on Shag Rock in the vicinity of Duck Island at latitude 43°00′12″, longitude 70°36′12″.

(b) The regulations. (1) No vessel shall enter or remain in the danger zone from 8:00 a.m. to 5:00 p.m. (local time) daily, except as authorized by the enforcing agency.

(2) This section shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

§204.4 Cape Cod Bay south of Wellfleet Harbor, Mass.; naval aircraft bombing target area. (a) The danger zone. A circular area with a radius of 1,000 yards having its center on the aircraft bombing target hulk James Longstreet in Cape Cod Bay at latitude 41°49′46″, longitude 70°02′54″.

(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) This section shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

PART 205-DUMPING GROUNDS REGULATIONS:

§205.80 Entrance to seaports. (a) The regulations. (1) The areas prescribed in paragraph (b) of this section, except as provided in subparagraphs (9), (10), and (12), may be used only for the dumping of suitable non-floatable materials, not easily transported by the currents. Dumping of objects and materials of any type or class within the areas described in paragraph (c) of this section is strictly prohibited.

(2) No dumping shall be done in areas established for this purpose until prior permission therefor has been obtained from the District Engineer, in charge of the locality. The district engineer may suspend the work or revoke the permission at any time. If inspections or any other operations by the United States are necessary in the interests of navigation, all expenses connected therewith shall be borne by the party responsible for the dumping.

(3) Maps showing the location of the dumping grounds may be seen at the office of the district engineer, in charge of the locality, or upon request, he will furnish a written description of the location of the grounds.

(4) The regulations in this section shall be enforced by the Commanders, Eastern Sea Frontier, Carribbean Sea Frontier and Western Sea Frontier, and such agencies as they may designate.

(b) Dumping grounds. (1) The waters of the Gulf of Maine within an area off Portland, Maine, bounded by a line extending 210° (true) to Portland Lightship and within rays bearing 262° (true) and 277° (true), respectively, to Cape Elizabeth Light and extending East to the 70° meridian of West Longitude.

(2) The waters of the Gulf of Maine within an area off Portsmouth, New Hampshire, lying northerly of a line bearing 270° (true) to White Island Light and within rays bearing 28° (true) and 18° (true), respectively, to Boon Island Light. The northern boundary is the portion of the minor arc of a circle having a radius of 8 nautical miles with its center on Boon Island Light and intercepted by the aforementioned rays to Boon Island Light.

(3) The waters of Massachusetts Bay off Boston, Massachusetts, within an area approximately 2,000 feet wide by 12,000 feet long lying northerly of a line bearing 270° (true) to Minots Ledge Light and about 8 nautical miles therefrom and with its southerly boundary between rays bearing 293° (true) and 299° (true) to Boston Lightship.

(4) to (13) do not include areas covered by this Coast Pilot.

(c) Prohibited dumping grounds. (Does not include areas covered by this Coast Pilot).

PART 207-NAVIGATION REGULATIONS:

§207.4 Gulf of Maine off Pemaquid Point, Maine; Naval Sonobuoy Test Area. (a) The area. The test area or "Foul Area" encompasses a circular area one nautical mile in radius, the center of which is located 7.9 nautical miles, bearing 187° magnetic from Pemaquid Light.

(b) The regulations. (1) Sonobuoy drops will be made only in the designated area and when visibility is at least three miles.

(2) Sonobuoy drop tests will normally be conducted at intermittent periods on a 5-day week basis, Monday through Friday. However, on occasion tests may be conducted intermittently on a seven-day week basis.

(3) Prior to and during the period when sonobuoys are being dropped, an escort vessel from the U.S. Naval Air Station will be in the vicinity to insure that no vessels are in the testing area. Vessels may be requested to veer off when sonobuoys are about to be dropped; however, drops will be made only when the area is actually clear of vessels as ascertained by the project aircraft and the surface vessel.

(4) The sonobuoys drops will be made in connection with the production and experimentation of sonobuoys.

(5) No live ammunition or explosives will be involved.

(6) The regulations in this section shall be enforced by the Commanding Officer, U.S. Naval Air Station, Brunswick, Maine, or such agencies as he may designate.

§207.6 Piscataqua River at Portsmouth Naval Shipyard, Kittery, Maine; restricted area. (a) The area. Beginning at a point on the easterly side of Seavey Island at Latitude 43°04′37″, longitude 70°43′44″; thence to latitude 43°04′36″, longitude 70°43′40″; thence to the pier on the westerly side of Clark Island at latitude 43°04′36.5″, longitude 70°43′34″; thence along the northerly side of Clark Island to a point on the easterly side at latitude 43°04′37″, longitude 70°43′25″; thence northeasterly to the easterly side of Jamaica Island at latitude 43°04′49″, longitude 70°43′24″; thence along the southerly and westerly sides of Jamaica Island; and thence generally along the easterly side of Seavey Island to the point of beginning.

(b) The regulations. All vessels are prohibited from entering the area unless approved by the Commandant, First Naval District, Boston, Massachusetts, or such agency as he may designate, except vessels of other military agencies in case of emergency.

§207.9 Mystic River, Mass.; dam of Commonwealth of Massachusetts, Metropolitan District Commission. (a) Definition and authority of superintendent. The term superintendent as used in the regulations in this section shall mean himself and/or his personnel then on duty at the dam. The positioning and movements of all watercraft of every description while in the locks or within 100 yards of the locks or dam shall be subject to the direction of the superintendent whose orders must be obeyed. This order does not relieve the master of the responsibility for the safety of his vessel.

(b) Description of Locks. There are three (3) locks to be used for the passage of vessels; one large lock 325 feet long, 45 feet wide, shall be used for vessels with draft up to seventeen (17) feet; two small locks each 120 feet long and 22 feet wide shall be used for boats up to six (6) feet draft.

(c) Maximum draft. Vessels drawing within six (6) inches of depth over the sills shall not be permitted lockage except under special permission of the superintendent. Every vessel using the locks and drawing more than ten (10) feet shall be accurately and distinctly marked at bow and stern showing the exact draft of water at such portions of the vessel. Gages set into the walls or the locks, both upstream and downstream of each gate, indicate the depth in feet of water over the sill of the gate.

(d) Vessels denied lockage. The superintendent may deny passage through the locks to any craft with sharp, rough projecting corners, overhanging equipment or cargo, or any craft or tow that is in sinking condition or in any way unseaworthy or insufficiently manned and equipped, or any craft failing to comply with the regulations in this section or with any orders given in pursuance thereof.

(e) Protection of lock gates. (1) In no case shall boats be permitted to enter or leave any of the locks until directed to do so by the superintendent. Boats shall not be permitted to enter or start to leave until the lock gates are at rest within the gate recesses. All persons, whether in charge of vessels or not, are prohibited from willfully or carelessly damaging the locks or any of the appurtenances or the grounds adjacent thereto, and from throwing or allowing any material of any kind to fall from the barge, scow or other vessel into the locks.

(2) No person shall permit or suffer any vessel, scow, raft, or float to come in contact with any gate or any of the locks of the Amelia Earhart Dam.

(f) Damage to walls. The sides of all craft passing through the locks must be free from projection of any kind which might injure the lock walls. All craft must be provided with suitable fenders. One or more men as the superintendent may direct shall be kept at the head of every tow until it has cleared the lock and guide walls, and shall protect the walls by use of the fenders.

(g) Unnecessary delay at locks. No person shall cause or permit any craft of which he is in charge to remain in the locks or their approaches for a longer period of time than is necessary for the passage of the locks unless he is especially permitted to do so by the superintendent, and if such craft is, in the opinion of such superintendent, in a position to obstruct navigation, it shall be removed at once as requested or directed by the superintendent.

(h) Procedure at locks. The locks shall be operated promptly for the passage of all craft upon signal, excepting only in such cases as are specifically provided for in the regulations in this section. All registered merchant vessels shall pass through the locks in the order directed by the superintendent. Other craft shall be allowed to pass through the locks at the discretion of the superintendent.

(i) Navigation of the locks. (1) All barges navigating the locks whether approaching or leaving the locks are required to be assisted by one or more tugs of sufficient power to insure full control at all times. All craft approaching the locks while any other vessel going in the opposite direction is in or about to enter shall be stopped where they will not obstruct the free passage of such other vessel.

(2) All vessels over 100 gross tons including those which are accompanied by towboats must attach not less than two good and sufficient lines, cables, or hawsers to the bollards or other fixtures provided for the purpose to check the speed of the vessel and to stop it as soon as it has gone far enough to permit the lock gate behind it to be closed. Each line, cable, or hawser shall be attended on board while passing into the lock by one or more of the vessel's crew. Where vessels are so long that in order to get them wholly within the locks it is necessary to go within 100 feet of the lock gate ahead, the speed of the vessel must be slow and the vessel must be fully under control at all times by the lines, cables or hawsers. All towboats and vessels less than 100 gross tons may enter the locks without having lines out subject to the discretion of the superintendent. The master or person in charge of a vessel shall arrange to have any line, cable, or hawser handed or thrown from the lock walls by the superintendent, or his assistants, made fast on the vessel as requested or directed, so that in cases of emergency such line, cable, or hawser may also be used to check the speed of and stop the vessel.

(3) Operators of vessels less than 200 gross tons may use the floating moorings in the large lock to fasten lines or hawsers, but they shall not be used to check the way on any vessel greater than 30 gross tons.

(4) Vessels less than 30 gross tons may fasten lines to the floating moorings in the large or small locks. All persons shall keep off the floating moorings at all times.

(5) No line shall be attached to anything on or a part of the dam except the fixtures provided for this purpose.

(6) Equipment of each craft shall include a sufficient bow line and stern line.

(j) Mooring. When a craft is in position in the lock, it shall be securely fastened in a manner satisfactory to the superintendent to prevent the craft moving about while the lock is being filled or emptied, and the lines, cables, or hawsers used for this purpose shall be attended as far as is necessary or required while the filling or emptying is in progress.

(k) Traffic statistics. Upon each passage through the locks, the master or clerk of each craft shall furnish the superintendent such statistical information as may be required.

(l) Signals. (1) All craft desiring lockage shall, on approaching the locks, signal by two long and two short blasts of a whistle or other sound device. Two long blasts from the lock in reply will indicate a delayed opening and direct the craft not to enter the lock.

(2) Lights are located at each end of each lock and will normally show red. No vessel shall come within 100 feet of the outside of any gate when the signal is red except when so directed by the superintendent.

(3) Fireboats and craft owned by the U.S. Government shall be given prompt and preferential lockage when they sound four long blasts.

(4) No vessel shall move into or out of any lock until the controlling signal is green. A green light in addition to audio loud speakers, operated by the superintendent or his assistants, will direct craft through the locks.

(5) It shall be the duty of every master or person in charge of any vessel to ascertain by personal observation that the lock gate is fully open before proceeding.

(m) Operating machinery. Lock employees only shall be permitted to operate the lock gates, signals or other appliances. No person shall deface or injure any part of the Amelia Earhart Dam, or any pier, wall or other structure or any mechanism connected therewith; nor shall any person, without the consent of the superintendent, make fast to the dam, guard, guide wall, pier, or any appurtenance thereof any vessel, scow, raft, or float.

(n) Vessel to carry regulations. A copy of the regulations in this section shall be kept at all times on board each vessel regularly engaged in navigating the locks. Copies may be obtained without charge from the superintendent; the Commonwealth of Massachusetts, M.D.C. Parks Division, Boston, Mass.; New England Division, Corps of Engineers, Division Engineer, Waltham, Mass.

§207.10 Charles River, Mass.; dam of Charles River Basin Commission. (a) The movements of all vessels or boats in and near the lock shall be under the direction of the superintendent in charge of these structures and his assistants, whose orders and signals shall be obeyed.

(b) Every vessel using the lock and drawing more than 10 feet shall be accurately and distinctly marked at the bow and stern, showing the exact draft of water at such portions of the vessel.

(c) All steam vessels desiring to pass through the lock shall signal for the same by two long and two short blasts of the whistle.

(d) (1) All vessels passing through the lock shall have their outboard spars, if any, rigged in, and booms amidships, and secured. All standing and running rigging must be triced in to keep it from blowing out and fouling the drawbridge. Every vessel of 200 tons and under shall be provided with at least two, and every vessel of more than 200 tons shall be provided with at least four good and sufficient lines, cables, or hawsers. Anchors shall either be stowed or shall hang from hawse pipes, hauled up close, clear of the water if possible. Vessels with anchors under foot or hanging from catheads will not be permitted to enter the lock.

(2) All vessels must be sufficiently manned and must have a sufficient number of round and fore-and-aft fenders to protect the lock from injury. All heavy rope fenders must be securely lashed to prevent their falling into the lock and interfering with the gates.

(e) All vessels approaching the lock while any other vessel going in the opposite direction is in or about to enter it shall be stopped where they will not obstruct the free passage of such other vessel.

(f) It shall be the duty of every master or person in charge of any vessel upon approaching the lock from the upstream end to ascertain by personal observation whether or not the upper lock gate is open, and a vessel shall not be permitted to come within 100 feet of the upper lock gate until the gate has been wholly withdrawn into its recess.

(g) All towboats, whether towing or not, and other steam vessels of less than 100 tons gross may enter the lock under their own power and without having lines out, but all other vessels, including those which are accompanied by towboats, must attach not less than two good and sufficient lines, cables, or hawsers to the bollards or other fixtures provided for the purpose to check the speed of the vessel and to stop it as soon as it has gone far enough to permit the lock gate behind it to be closed, and each line, cable, or hawser shall be attended on board while passing into the lock by one or more of the vessel's crew. Where vessels are so long that in order to get them wholly within the lock it is necessary to approach within 150 feet of the lock gate ahead, the speed of the vessel must be slow and fully under control by the lines, cables, or hawsers. Steam vessels of more than 100

tons gross, not including towboats will not be permitted to turn their propellers on entering the lock after the bow of the vessel has entered, but will be drawn in by means of capstans on the lock walls or otherwise, and their speed must be checked and the vessel stopped by lines, cables, or hawsers as in other cases. All steam vessels may leave the lock under their own power. The master or person in charge of a vessel shall arrange to have any line, cable, of hawser handed or thrown from the lock walls by the superintendent or his assistants, made fast on the vessel as requested or directed, so that in cases of emergency such line, cable, or hawser may also be used to check the speed of and stop the vessel.

(h) When a vessel is in position in the lock it shall be securely fastened in a manner satisfactory to the superintendent, or his assistant in charge of the lock at the time, to prevent the vessel from moving about while the lock is being filled or emptied, and the lines, cables, and hawsers used for this purpose shall be attended as far as is necessary or required while the filling or emptying is in progress.

(i) No vessel which has iron or irons projecting from it or lumber or other cargo projecting over its sides shall enter the lock, except at such time and with such precautions to prevent damage to the lock or its appurtenances as the superintendent, or the assistant in charge of the lock at the time, may require.

(j) All persons, whether in charge of vessels or not, are prohibited from willfully or carelessly damaging the lock, any of its appurtenances or the grounds adjacent thereto, and from throwing any material of any kind into the lock. No line shall be attached to anything except the bollards and other fixtures provided for the purpose.

(k) Upon each passage through the lock, the master or clerk of a vessel shall make a statement of the kind and tonnage of the freight carried.

(l) No person shall cause or permit any vessel or boat of which he is in charge to remain in the lock or its approaches for a longer time than is necessary for the passage of the lock, unless he is especially permitted to do so by the superintendent or the assistant in charge of the lock at the time, and if such vessel or boat is, in the opinion of such superintendent or assistant, in a position to obstruct navigation it shall be removed at once as requested or directed by such superintendent or assistant.

(m) All registered merchant vessels shall pass through the lock in the order directed by the superintendent or the assistant in charge of the lock at the time. Unregistered craft will not be allowed to pass through the lock separately unless especially permitted by such superintendent or assistant.

(n) The lock shall be operated promptly for the passage of all vessels upon signal, excepting only in such cases as are specifically provided for in this section.

§ **207.20 Cape Cod Canal, Mass.;** use administration, and navigation. (See United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.)

3. EASTPORT TO CAPE COD

The coasts of Maine, New Hampshire, and part of Massachusetts lie between West Quoddy Head in Maine and Provincetown in Massachusetts. Most of the Maine coast is irregular, rocky, and bold with numerous islands, bays, rivers, and coves. There are numerous fishing villages and towns along the Maine coast which are frequented by tourists during the summer months. The primary deep-draft ports in Maine are at Searsport and Portland. The more densely populated coasts of New Hampshire and Massachusetts have numerous sandy beaches and fewer of the islands, bays, and coves which characterize the Maine coast. Major ports are at Portsmouth, N.H., and Boston, Mass.

The **Gulf of Maine** is the great indentation of the coast between the Canadian Province of Nova Scotia on the northeast and Massachusetts on the southwest. It includes the Bay of Fundy and Massachusetts Bay as subsidiary features. Because of its changeable weather, frequent fogs, and strong tidal currents, this area has a bad reputation among mariners.

From West Quoddy Head to Penobscot Bay the coast is mostly rocky and is indented by numerous large bays and excellent harbors. Among the many islands along this coast are passages that are much used, usually by vessels with less than 12 feet in draft, as they afford anchorage in head winds or thick weather. The many boulders, rocks, and ledges along and off this coast require the closest attention of the navigator, as in many cases they rise abruptly from deep water and soundings do not generally indicate their proximity until it is too late to avoid them. The navigator should also remember that the spring range of tide is 11.2 feet at Rockland, 13 feet at Milbridge, and 20.7 feet at Eastport, and that at high water a vessel may sometimes pass over places on which she would bring up at low water.

Between Penobscot Bay and Cape Elizabeth the coast is rocky and broken by numerous bays and rivers, many of which are excellent harbors. In Muscongus and Casco Bays good channels lead between the islands, affording inside passages that are used by the smaller class of vessels passing along the coast. Extreme caution should be exercised when approaching the bays, sounds, and rivers in this area due to the inset of the flood tidal currents. Particular caution is necessary for small craft crossing Penobscot Bay and the mouths of the Kennebec, Sheepscot, and New Meadows Rivers when the wind is contrary to the current because heavy tide rips are encountered. Great caution is also necessary when standing along this stretch of coast in thick weather due to the numerous dangers which in some places lie nearly 10 miles offshore.

Between Cape Elizabeth and Portsmouth there are fewer harbors and marked indentations. The shore is more thickly settled than farther eastward, and several of the beaches are popular summer resorts. The outlying dangers are well marked and fewer in number.

Southward of Portsmouth the coast is low and mostly sandy, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

Between Cape Ann and Plymouth the coast is rocky, mostly bold, and has numerous islands, dry rocks, boulders, and covered ledges near the shore, with deep channels between them. The shores of Cape Cod Bay are mostly sandy, with extensive sand shoals extending out well from the shore in many places. Boulders also occur in places in Cape Cod Bay.

Prominent features.-The 14-mile coast between West Quoddy Head and Little River presents no special features. From Little River westward to Portland the shore is broken by numerous bays and islands. Grand Manan Island has nearly perpendicular, dark, rocky faces about 200 feet high on its western side.

The numerous radio towers on the peninsula north of Cross Island on the east side of Machias Bay are prominent. The radar towers on Howard Mountain west of Machias Bay can be seen many miles at sea.

Pigeon Hill, on the western side of Pigeon Hill Bay near the head, is 317 feet high. Numerous radio towers are prominent on the eastern side of Prospect Harbor. Schoodic Head, near the south end of Schoodic Peninsula, on the eastern side of the entrance to Frenchman Bay, is 440 feet high.

Cadillac Mountain, the highest on Mount Desert Island, is 1,530 feet high and the most prominent landmark on this part of the coast; near it are other mountains nearly as high. Isle au Haut is 543 feet high near its northern end and is on the eastern side of the entrance to East Penobscot Bay. The Camden Hills (Mount Megunticook, 1,385 feet) are on the western side of Penobscot Bay above the town of Camden. Monhegan Island, 9.3 miles from the mainland, is 165 feet high and is a mark for all vessels bound into Penobscot Bay from westward. Seguin Island, about 2.3 miles off the mouth of the Kennebec River, is about 145 feet high and is a mark for vessels bound into the river or standing along the coast. Observation towers may be seen along the coast west of the Kennebec River to Boston.

Cape Elizabeth, on the southern side of the entrance to Portland Harbor, is about 90 feet high and is marked by a light and an unused light tower. A tall elevated water tank near the mouth of the Saco River is the most prominent landmark between Portland and Portsmouth. Agamenticus Mountain, 691 feet high and the most prominent land feature between Portland and Cape Ann, is about 4.5 miles inland and 9 miles northward of Portsmouth. A ski lodge on the mountain is reported to be prominent. The Isles of Shoals, lying about 6 miles from the coast and southeastward of Portsmouth Harbor entrance, can be seen a long distance, the large hotel on Star Island and an observation tower on Appledore Island being conspicuous marks. Boon Island Light is about 9 miles northeastward of the Isles of Shoals and about 6.5 miles offshore. Cape Ann is high at its northern end, but its eastern end is comparatively low. The two lighthouses on Thatcher Island, one of which is abandoned, are the most conspicuous marks seen when approaching the cape.

The land southward of Cape Ann is comparatively low, is well settled, and has numerous artificial marks. The prominent objects visible in approaching Cape Cod are described in Chapter 12.

In the approaches to Boston Harbor the most prominent landmarks are two radio towers at Nantasket Beach, a tower on Telegraph (Nantasket) Hill, a standpipe on Winthrop Head, the Boston Customhouse tower, the Federal building, several very high office buildings, and the gas tank at Chelsea.

Dumping Grounds.-Dumping grounds are located in the Gulf of Maine in the approaches to Portland, Portsmouth, and Boston Harbors; see **205.80(a) and (b)(1), (2), and (3),** Chapter 2, for limits and regulations.

Aids to navigation.-Lights are numerous, both on the mainland and offshore islands, along the section of coast covered by this Coast Pilot. Lightships are off the entrances to Portland and Boston. Most of the principal light stations and both lightships are equipped with radiobeacons and fog signals. Many coastal and harbor buoys are equipped with radar reflectors, which greatly increase the range at which the buoys may be detected on the radarscope. Most of the critical dangers are marked.

Loran-A and Loran-C stations provide the mariner with good navigation coverage along this section of the coast.

Radar is an important navigation aid in this area, since the shoreline of many of the offshore islands and much of the mainland coast is bold and presents good radar targets. Many of the coastal buoys are equipped with radar reflectors. Radar is of particular importance due to the extended periods of low visibility which are common in this area.

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.

Harbor and river entrances.-The deep-water ports are approached through deep and stable natural channels. The approaches to the major ports are generally wide, but the channels inside the harbor are generally narrow and strong currents develop, making tugs necessary for large vessels. Ships usually enter these ports at or near high water slack.

Most of the small-craft harbors in Maine have entrance channels which are generally deep and stable with numerous submerged, partially submerged, and bare rocks. Most of these dangers are marked and the chart should be followed closely. Along the New Hampshire and Massachusetts coasts, comparatively shallow channels through shifting bars, common at many of the small-craft harbor and river entrances, make caution and current local knowledge advisable for safe entry. Waves break across many of these bars during certain conditions of wind and current; strangers should not attempt to enter under these conditions. On many of the bars the buoys are moved from time to time to mark the shifting channels. The most favorable time to enter most of these harbors is on a rising tide with a smooth sea.

Traffic Separation Schemes (Traffic Lanes) have been established in the approaches to Portland, Maine, and Boston, Mass. (See chapters 8 and 11, respectively, for details.)

Anchorages.-Between West Quoddy Head and Portland, anchorages are numerous, those most frequently used by coasting vessels being Little River, Starboard Cove, Englishman Bay, Narraguagus Bay, Prospect Harbor, Winter Harbor, Southwest Harbor, Rockland Harbor, Port Clyde, Boothbay Harbor, and Portland Harbor. Southward of Portland the only anchorages available for large vessels are in the harbors of Portsmouth, Gloucester, Salem, Boston, Plymouth, and Provincetown. Other harbors available for small vessels and motorboats are described in the text. Anchorage areas established by Federal Regulations are given in **Part 110,** Chapter 2.

Dangers.-The Gulf of Maine is a region of ledges and boulders. The ledges rise abruptly from deep water and the boulders ordinarily lie singly or in clusters on an otherwise flat bottom, so that the navigator cannot depend on soundings to avoid them. The depths are so variable that it is quite impossible to determine a vessel's position by soundings alone, but the navigator will find a frequent use of the sounding apparatus of the greatest assistance in approaching both Georges

and Browns Bank from southward and eastward because the bottom slope in that area is well defined.

As a measure of safety, vessels should avoid broken ground where abrupt changes are indicated by the chart to depths less than 10 to 12 fathoms. Dangers have been found in places where least depths of as much as 20 fathoms were the only indications found by the survey. It is always safest, therefore, to select from the chart a sailing line which leads in the deepest water and well clear of broken ground.

The principal offshore dangers are Ammen Rock, a part of Cashes Ledge; Georges and Cultivator Shoals, both a part of Georges Bank; and Nantucket Shoals.

Chart 13009 (71).-Browns Bank (42°38′N., 65°52′W.) as defined by the 50-fathom curve, is 56 miles long east and west, and has an average width of 15 miles. Near the western end of the bank is a sandy ridge with depths of 16 to 28 fathoms. Between the inner 50-fathom curve of Browns Bank and the coastal bank at the southwestern end of Nova Scotia are depths of 51 to 88 fathoms.

Cape Sable (43°24′N., 65°37′W.), the southern extremity of Nova Scotia, is marked with a light and fog signal, and the principal dangers off it, Brazil Rock and Blonde Rock, are marked by lighted whistle buoys. Seal Island, 17.5 miles west of Cape Sable, has a light, fog signal, and radiobeacon near the southern end.

Lurcher Shoal (43°50′N., 66°30′W.), 13 miles off the west coast of Nova Scotia, has a least depth of 1¼ fathoms. It is the most westerly danger off the coast of Nova Scotia in the approaches to the Bay of Fundy. It is marked by lighted whistle buoys on its southwestern and northeastern sides.

Chart 13260 (1106).-Grand Manan Banks (44°12′N., 67°05′W.), 19 miles southward of Grand Manan Island, have an extent of about 15 miles in a northeast-southwest direction and consist of two sections, **Northeast Bank** and **Southwest Bank,** with a channel 2.5 miles wide between them. The bottom is rocky and the least depth, 19 fathoms, is found on Northeast Bank. The tidal currents on the banks attain a velocity of 1.5 knots at strength, at which time there are extensive tide rips with both flood and ebb. The flood current sets to the north-northeast, and the ebb to the south-southwest. A good check on the position of a vessel may be obtained by soundings on these banks.

Nova Scotia and the Bay of Fundy are described in **H. O. Publication 12, Sailing Directions for Nova Scotia,** published by the **Defense Mapping Agency Hydrographic Center** (DMAHC), Washington, D.C.

Jeffreys Bank (43°22′N., 68°44′W.), with a least found depth of 35 fathoms, lies about 26 miles southward of Matinicus Rock Light.

Platts Bank (43°12′N., 69°40′W.), has a least found depth of 29 fathoms. Banks with depths of 41 to 50 fathoms are about 5 miles northwestward, and 15 miles eastward of the shoalest part of Platts Bank.

Cashes Ledge (42°54′N., 68°57′W.), with depths of 14 fathoms. in places, is about 6 miles long. **Ammen Rock,** covered 4¼ fathoms, is near the middle of the ledge. There is a whistle buoy on the east side. The sea breaks over this rock in heavy weather.

Fippennies Ledge (42°47′ N., 69°18′ W.), with a least known depth of 37 fathoms, lies about 16 miles southwest of Ammen Rock.

Jeffreys Ledge extends northeastward from Cape Ann and has general depths of 16 to 30 fathoms and more. The northeastern point of the ledge is 20 miles eastward of Boon Island Light. A whistle buoy is on the ledge about 32 miles northeastward of Cape Ann.

Stellwagen Bank lies northward of Cape Cod and off the entrance to Massachusetts Bay; depths found over it are 10 to 20 fathoms.

Charts 13200 (1107), 13204 (612).-Georges Bank is an extensive bank with depths of less than 50 fathoms that extend over 150 miles northeastward from the offshore end of Nantucket Shoals.

In heavy weather the danger area is the oval-shaped top of the bank, which is about 80 miles long in a northeast-southwest direction and 50 miles in maximum width. The bottom in this area is extremely broken and irregular, with a great number of ridges and shoal spots having depths of less than 10 fathoms. Between these shoals are channels of varying widths in which depths of about 20 fathoms may be found. All of this area lies within the 30-fathom curve, and so much of it has depths of less than 20 fathoms that it may practically all be considered to lie within a generalized 20-fathom curve.

On the southeast side of the bank, outside the 20-fathom curve, the water deepens gradually and with such regularity that soundings would be of considerable value in approaching the bank. On the northwest side the water deepens more rapidly.

The bottom is mostly sand, sometimes with shell, and in places pebbles. Bottom samples obtained during surveys are described in a great many places on the charts.

The two principal dangers on Georges Bank are Georges Shoal and Cultivator Shoal, which are near the center of the danger area. Around these shoals the sea breaks in depths of 10 fathoms during heavy weather, and the locality should be avoided by deep-draft vessels.

George Shoal is a ridge about 13 miles long on which are several shallow depths of 1½ to 3 fathoms. A submerged obstruction, the remains of an old Texas tower, is on the shoal in 41°41.8′ N., 67°46.4′ W.

Cultivator Shoal, near the western end of Georges Shoal, is a ridge nearly 15 miles long, on which depths of 3 to 10 fathoms are found. The 3-fathom spot is near the north end of the shoal and is marked by a whistle buoy about 1 mile to the northward.

The entire area within the 20-fathom curve has an extremely broken bottom. There are numerous ridges and shoal spots on which depths dangerous to navigation, particularly in heavy weather, may be found. These shoal spots generally have steep sides, and soundings give very little or no indication of their existence. Tide rips and swirls, as well as overfalls, are common in the vicinity of these spots, but are not always visible. They show best with a smooth sea and with the current flowing in certain directions. These disturbances are not usually over the shoalest depths, but are commonly alongside them. Small, detached overfalls may be seen in 20 fathoms of water. The tidal currents are rotary with no period of slack water. The velocity at strength is about 2 knots, and the velocity of the minimum current which occurs about midway between the times of strength is about 1 knot. The flood sets northward, and the ebb southward. The hourly velocities and directions of the tidal current are shown by means of current roses on charts 13200 (1107) and 13204 (612).

Between the 50-fathom curve at the eastern end of Georges Bank and the outer 50-fathom curve on Browns Bank to the northeastward is a gully about 25 miles wide.

Ships passing southward and/or westward of the dangerous part of Georges Bank should not approach the bank beyond a least depth of 25 fathoms.

Nantucket Shoals is the general name of the numerous different broken shoals which lie southeastward of Nantucket Island and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals extend 23 miles eastward and 43 miles southeastward from Nantucket Island. They are shifting in nature and the depths vary from 3 and 4 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest offshore. The easterly edge of the shoals has depths of 3 and 4 fathoms in places.

The currents in the area are strong and erratic, reaching a velocity of 3 to 5 knots around the edges of the shoals. The currents are generally rotary in character, and strongest in a northeast-southwest direction. They are made erratic by the obstruction of the shoals, in some cases being deflected to such an extent as to cause the direction to change 180° from one side of the shoal to the other.

When possible Nantucket Shoals should be avoided entirely by deep-draft vessels and by light-draft vessels without local knowledge because of the treacherous currents. There are, however, channels through these various shoals which can be negotiated with local knowledge and caution. At slack water in calm weather these shoals are sometimes difficult to see and a vessel is liable to be taken into shoaler water than was intended.

Calm, clear days are few; when the sea is calm it is usually foggy, and when clear, it is usually rough. Also, a considerable amount of hazy weather is to be expected, and this limits visibility.

Should it become necessary to anchor in this area, open sea anchorage may be had anywhere that depths permit. Consideration should be given to the proximity of shoals and to the possibility of dragging due to winds and currents. Generally it has been found best to avoid the deeper channels and, when rougher water is experienced, to anchor in the lee of a shoal which would tend to knock down the heavier swells. A scope of five to one or greater should always be used.

Phelps Bank, the southeasternmost part of the Nantucket Shoals, is about 6.5 miles long and 2.5 miles wide. **Asia Rip,** the shoalest point of the bank, covered 5¾ fathoms, is at the southern end. The wreck of the SS OREGON, covered 3¼ fathoms, is 3 miles south-southeastward of Asia Rip in 40°45′ N., 69°19′ W.; a lighted gong buoy is about 1 mile to the south. The other shoals and rips of Nantucket Shoals are described in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

Deep-draft vessels should pass southward and eastward of the wreck off Asia Rip, and eastward of the easterly edge of the shoals as defined above. For a distance of 15 miles eastward and southeastward and 17 miles southward from Nantucket Island, the shoals have depths less than 16 feet, and this area should be avoided by all vessels. The tidal currents are strong, and variable in direction, forming extensive rips and broken water over the shoals.

A submerged obstruction, the remains of an old Texas tower, is on **Fishing Rip** in 41°01.0′ N., 69°29.7′ W.

Nantucket Shoals Lightship (40°30′N., 69°28′W.), with red hull and the name NANTUCKET in large white letters on the sides, is 50 miles south-southeastward of Nantucket Island; the light, 67 feet above the water, is shown from the foremast. A fog signal and a radiobeacon are at the light. The code flag signal and radio call is NNBN. **Storm warning signals are displayed during the daytime.**

Great South Channel is the passage across Georges Bank between the easternmost of the Nantucket Shoals and the westernmost shoal spots of the bank. The channel is about 27 miles wide and has a least depth of 17 fathoms.

Submarine canyons are indentations in the edge of the **Continental Shelf,** which is bounded on its seaward side by the 100-fathom curve. They may be traced from depths of 1,000 fathoms or more to

the shoaler areas of the shelf. The navigator who has available some means of echo sounding should have in mind the various canyons in this locality. The soundings in crossing them are very characteristic in each case and such soundings may be used to determine the vessel's position with considerable accuracy.

Some of the more important canyons are named on the charts. **Corsair Canyon,** in approximate longitude 66°10′ W., on the eastern side of Georges Bank, has a northwesterly trend. On the southern side and toward the western end of Georges Bank, and with a northerly trend, are **Lydonia Canyon,** 67°40′ W.; **Gilbert Canyon,** 67°50′ W.; **Oceanographer Canyon,** 68°05′ W.; and **Welker Canyon,** 68°30′ W. Southeastward and southward of Nantucket Shoals, and with a northerly trend, are **Hydrographer Canyon,** 69°00′ W.; **Veatch Canyon,** 69°35′ W.; and **Atlantic Canyon,** 70°15′W.

Wrecks.-An examination of the record of wrecks along the coast of Maine eastward of Portland shows that wrecks have occurred on practically all of the offlying islands and rocks between Portland and Machias Bay, most of them in thick weather, either fog or snow. Many of the wrecks could have been prevented if frequent soundings had been taken, or due allowance had been made for the tidal currents setting into or out of bays or rivers.

During thick weather great caution is necessary when approaching the coast, especially eastward of Petit Manan Island, where the tidal currents have considerable velocity. If one of the offshore lights has not been made and the position accurately determined before the fog shuts in, it is advisable to keep well outside until it clears. Between Machias Bay and Seguin Island a landfall will be made in clear weather before the outlying dangers are encountered.

South of Portland the wrecks have occurred most frequently on the prominent headlands or the shoals off them, namely, Cape Elizabeth, Cape Ann, and the north side of Cape Cod, with less frequent wrecks on the less prominent headlands. Numerous wrecks have also occurred on the dangers in the approaches to Boston Harbor, more frequently on the south side from Scituate to Point Allerton. Most of the wrecks have occurred during thick weather.

Between Portland and Boston the most dangerous points for coasting vessels are the dangers off Cape Elizabeth, Boon Island, Isles of Shoals, Cape Ann, and the dangers in the entrance to Boston Harbor. The soundings in the vicinity of Cape Ann are very irregular and cannot be depended upon to fix even approximately the vessel's position.

The numerous strandings on the north end of Cape Cod between Highland Light and Race Point Light have usually occurred to vessels approaching Massachusetts Bay or Cape Cod Bay from southward or eastward in thick weather. Keeping in a greater depth than 20 fathoms will insure giving the eastern side of Cape Cod a berth of 3 miles, and if this depth is followed will lead to Peaked Hill Bar lighted whistle buoy, northeastward of the end of the cape.

Lobster pots.-The inland waters, particularly those from St. Croix River to the vicinity of Portland, contain numerous lobster pots. Small painted wooden buoys of various designs and colors, secured by small lines, float on the surface; in some cases a second buoy, usually an unpainted bottle and hard to see, is attached to the lobster pot. These buoys extend from the shore out to, and in many cases across, the sailing routes. Small yachts and motorboats are cautioned against fouling, which is liable to result in a sprung shaft or propeller.

Fishtraps and fish havens are discussed in Chapter 1.

Danger zones have been established within the area of this Coast Pilot; see **Part 204,** Chapter 2, for limits and regulations.

Drawbridges.-Within the area of this Coast Pilot, the general and/or special regulations and the opening signals for drawbridges are given in **117.2 through 117.77,** Chapter 2. Where these regulations apply, references to them are made in the Coast Pilot under the name of the bridge or the waterway over which the bridge crosses. The special regulations, which are prescribed for a number of specific bridges, allow certain drawbridges to be unattended during specified times and dates. Such bridges may not be required to open at all or may open only during specified periods, and normally a specified minimum advance notice must be given to the authorized representative of the bridge owner to have the bridge opened; the exact procedure for contacting this representative must generally be posted on signs at the bridge. Additional information of a very general nature and which applies to all drawbridges is given in **117.1 and 117.1a,** Chapter 2.

ROUTES.-Approaching or standing along the coast of Maine eastward of Portland.-This section of the coast is dangerous on account of the strong tidal currents, frequent fog, and numerous offlying dangers. Soundings are of little assistance to locate the position of a vessel, but they should be taken at frequent intervals to prevent too close an approach to dangers.

Coming from the vicinity of Cape Sable.-Vessels bound to Machias or ports eastward of it should make Machias Seal Island Light and pass westward of it. If bound to Eastport or Calais, the route through Grand Manan Channel is preferable to passing eastward of Grand Manan Island, because in bad weather an anchorage may be made either at Little River or in Machias Bay.

It is not advisable for a stranger to pass eastward of Machias Seal Island or between it and Grand Manan Island, due to the number of ledges

on which the sea breaks in heavy weather, including Bull Rock, an unmarked danger awash at low water.

If bound to ports in Penobscot Bay, vessels should steer so as to make either Mount Desert Light on Mount Desert Rock or Matinicus Rock Light. On a clear day Cadillac Mountain, the highest part of Mount Desert Island, may be sighted before Mount Desert Light, and Isle au Haut may be seen about the same time as Matinicus Rock.

Coming from the vicinity of Cape Cod or Cape Ann.-Vessels, both steamers and large tows, bound into Penobscot Bay, including those coming from Boston and Cape Cod Canal, and also those passing eastward of Cape Cod, usually make the lighted whistle buoy off Cape Ann and then shape course for Manana Island Lighted Whistle Buoy and enter through Two Bush or Muscle Ridge Channels. In the winter and in bad weather the small class of vessels follow the coast, sighting the principal lights, and making an anchorage on approach of bad weather. Vessels bound from Cape Cod or Cape Ann to points eastward of Penobscot Bay usually shape the course from Cape Ann to either Monhegan Island or Matinicus Rock Light.

Standing along the coast.-In clear weather, vessels stand along the coast close enough to make the lights and to recognize the principal landmarks on shore. In thick weather they aim to make the fog signals or the whistle or bell buoys; these buoys are placed close enough to one another and to the fog signals to be readily followed up by vessels if not set too much off their course by the tidal currents. When running in thick weather a vessel should verify her position as often as possible by the aids, and when approaching a fog signal or buoy should proceed slowly, taking soundings, and if necessary stop until the looked-for aid is found and recognized before she continues for the next aid. Three good harbors for which a stranger standing along the coast in their vicinity can make in thick weather and enter with ordinary precautions are Machias Bay, Winter Harbor, and Boothbay Harbor.

Approaching or standing along the coast between Portland and Cape Cod.-Approaching Massachusetts Bay from sea.-The approach to the coast of Massachusetts north of Cape Cod is through the Gulf of Maine. Nantucket Shoals and Georges Bank, on account of their many shoal spots and the strong tidal currents setting over them, are a menace to navigators approaching the coast or standing from Canadian ports to New York. Browns Bank need not be avoided, for its soundings may assist in determining a vessel's approximate position.

The part of Georges Bank lying between latitude 41°05′ N., and 42°00′ N., and longitude 67°17′ W., and 68°35′ W. should be avoided. In heavy weather the sea breaks on the spots with 10 fathoms or less, and strong tide rips are encountered. The tide rips do not always indicate shoal water.

Vessels passing south of the dangerous part of Georges Bank should keep in 25 fathoms or more. Approaching this part of the bank from eastward or southward, the water shoals gradually. Approaching from westward, the depths are irregular and the water shoals abruptly in places of 20 fathoms or less. On the north side of Georges Bank, between longitudes 66°00′ W., and 68°00′ W., the 100-fathom and 50-fathom curves are only a few miles apart, and when approaching the dangerous part of the bank from northward 50 fathoms may be taken as a good depth to avoid the shoals.

Vessels equipped with echo sounding and following the 100-fathom curve along the south side of Georges Bank, can frequently verify their position when crossing the several submarine gorges.

The only known outlying danger in the Gulf of Maine to be avoided by vessels bound to ports in Massachusetts is Ammen Rock, which is a part of Cashes Ledge and is covered 4¼ fathoms.

Vessels from ports in northern Europe or the British Provinces and bound to ports in the United States north of Cape Cod approach the coast passing Cape Sable and Georges Bank, between latitudes 42°00′ N., and 43°10′ N. If bound to Boston, they cross Browns Bank and shape the course for Boston Lightship.

The **North Atlantic Lane Routes** are described in **H.O. Publication 12, Sailing Directions for Nova Scotia,** published by the **Defense Mapping Agency Hydrographic Center** (DMAHC), Washington, D.C. They are shown on the Pilot Chart of the North Atlantic Ocean, N.O. 16 (formerly H.O. 1400) and on the back of the Track Chart of the World, N.O. 65 (formerly 1262).

Vessels approaching the Gulf of Maine from southwest sometimes endeavor to make the 50-fathom curve on the southern edge of Georges Bank, in latitude 40°20′ N., and longitude 68°50′ W., then stand 000° on soundings of over 30 and less than 50 fathoms for about 50 miles, and then shape a 323° course, taking care to keep in a greater depth than 20 fathoms until the course is laid to sight Highland Light. This light, Nauset Beach Light, and the Pilgrim Monument at Provincetown are the most prominent marks on Cape Cod.

Deep-draft vessels coming from Cape Hatteras, Chesapeake Bay, Delaware Bay, or New York make Nantucket Shoals Lightship, thence through Great South Channel to the Gulf of Maine.

Vessels of medium draft coming from southward or alongshore may use the Cape Cod Canal or enter the Gulf of Maine through Vineyard and Nantucket Sounds. The controlling depth for these passages is 32 feet. These routes avoid Nantucket Shoals and are followed by vessels in the coasting trade.

Standing along the coast between Portland and Cape Cod.-The lights and other aids to navigation are sufficiently numerous to enable a stranger to

run either at night or the daytime in clear weather. There are numerous anchorages where a vessel with good ground tackle can ride out any gale. Of these, Provincetown Harbor is the harbor of refuge most frequently used by vessels approaching Massachusetts Bay from seaward. The navigator, when crossing the banks and when approaching the coast, should not neglect to take soundings at frequent intervals, and vessels equipped with the necessary electronic apparatus should make use of radar, loran, and the radiobeacons located along the coast.

Currents.-The Tidal Current Tables should be consulted for specific information about times, directions, and velocities of the current at the numerous locations throughout the area. Tidal current charts are available for Boston Harbor.

The current movement is very nearly simultaneous throughout the offshore area of the Gulf of Maine. It is generally rotary in character, the direction of flow changing continuously in a clockwise movement with no period of slack water.

The velocity at strength over Georges Bank varies from about 1 knot to 2 knots. The velocity of the minimum current which occurs midway between the times of strength is usually about one-half the velocity at strength.

Between Georges Bank and Browns Bank the velocity at strength is about 1.5 knots, and there is a like velocity between Browns Bank and Cape Sable Bank.

Off Nova Scotia, outside the 50-fathom curve, the velocity at strength is about 1.5 knots; inside the 50-fathom curve the velocity is between 1.5 and 2.5 knots. The tidal currents offshore from Cape Sable are very uncertain, both in velocity and direction. It is reported that the tidal current on Browns Bank occasionally runs to the northeastward for 15 hours continuously with a velocity of 2 knots, while at other times the set is as strong to the southwestward.

In Grand Manan Channel the average velocity at strength of the current is about 2.5 knots. The currents set approximately parallel to the channel, the flood setting northeastward and the ebb southwestward.

At the entrance to the Bay of Fundy, 5 miles southeastward of Gannet Rock, the flood current has an average velocity at strength of about 2.5 knots and sets 040°. The ebb has an average velocity at strength of about 4 knots and sets 230°.

Along the axis of the Bay of Fundy from Grand Manan Island to Cape Spencer the currents have an average velocity at strength of from 1.5 to 2 knots. The flood sets northeastward, and the ebb southwestward.

Eastward of Mount Desert Island the tidal currents along the coast are stronger and more regular than those farther west. Between Mount Desert Island and Portland there is a westward resultant drift along the coast.

With easterly or southeasterly winds the currents have a tendency to set toward the shore.

At Portland Lightship the tidal current is weak, being on the average less than 0.3 knot at time of strength, setting 335° on the flood and 140° on the ebb. Since the tidal current is weak, currents of 1 knot or more occur only with strong winds. The largest velocity likely to occur is about 1.5 knots.

At Boston Lightship the tidal current averages about 0.8 knot. The velocity and direction of the current is therefore greatly influenced by the wind. The largest velocity likely to occur is about 1.4 knot.

Over Stellwagen Bank, and in the channel between it and Cape Cod, the flood current sets westward and the ebb northeastward to eastward. The velocity at strength increases from about 0.2 knot at the northern end of the bank to over 1 knot at the southern end.

Along the coast of Maine eastward of Portland the flood sets eastward and has greater velocity than the ebb, which sets westward. In passing from one headland to another it is always necessary to make allowance for the current setting into or out of the bays or rivers, according to the stage of the tide; such allowance frequently amounts to as much as 5°.

Weather.-Climatological tables for coastal localities, a table of fog signal operation, and a meteorological table for the coastal ocean area covered in this volume follow the appendix. The table for the ocean area was compiled from observations made by ships in passage. Also listed are National Weather Service offices and Government radio stations which transmit weather information.

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service. The Marine Weather Services Charts, which also show radio stations which transmit marine weather broadcasts and additional information of interest to mariners, are available for 25 cents a copy from National Ocean Survey, Distribution Division (C44), 6501 Lafayette Ave., Riverdale, Md. 20804, and its authorized sales agents.

General.-The principal influences on the climate of the New England coastal area are its location in middle latitudes on the lee side of the large continent of North America, its position in the area of the most frequent movement of cyclonic storms, and the cold ocean current which flows southward near the coast.

The region between latitudes 41° and 45° N. is in the general zone of west-to-east air motion, on which are superimposed the northward and southward movements of large air masses from tropical and polar regions. These produce frequent changes and great variety in the weather elements, especially in winter.

New England lies along one of the paths most favored by extratropical cyclones. During frontal passages associated with these frequent and periodic storms in the colder months, changes in wind, temperature, and clouds are sometimes abrupt. During the warmer months, with the progressive intensification and expansion of the Bermuda-Azores anticyclone, predominant winds along the coast are between west and southwest, and cyclonic activity declines. Stormy weather during summer and early autumn occasionally results from the movement of tropical cyclones into the area.

The Labrador Current flows southward along the Nova Scotia coast, branching to bring cold water into the Gulf of Maine, and exerts a considerable moderating influence on the immediate coastal and near offshore region. In summer with winds from the southwest and west, the moist air, which is warmer than the water, is cooled; this tends to form fog. In the winter the air temperature over the water may be somewhat warmer than over land. Winds flow predominantly from the colder interior of the continent and are moderated in passing over the now relatively warm water of the Labrador Current and much warmer Gulf Stream to the east. This contrast of surface temperatures also helps maintain a region of cyclogenesis, or storm formation, off the east coast.

Pressure.-In the winter the New England area lies about midway between the Icelandic low-pressure area and the moderate North American continental high-pressure area. These mean pressure systems orient the isobars in a northwest-southeast direction over the region, and result in prevailing west-to-north winds in the coastal sections.

In spring and early summer both the continental high and the Icelandic low weaken, and the Azores-Bermuda high intensifies and expands over most of the Atlantic Ocean. This extensive high pressure area shifts northward during the summer, with the center reaching 35° to 40° N. near mid-ocean in August and September. In the New England area, located in the northwestern quadrant of the high, the isobars during the warmer months are oriented in a northeast-southwest direction, and the prevailing winds are southwesterly.

There are, however, great day-to-day variations in pressure, wind, and weather produced by migratory low- and high-pressure systems which tend to be more intense and to move faster in winter than in summer. The New England area includes some of the paths most frequently traveled by these pressure systems, and deviations from the mean pressure may be large, with consequent changes in wind and weather.

The mean monthly atmospheric pressure shows small variation during the year, the normal level ranging from 1012-1015 millibars (29.88-29.97 inches) in spring and early summer to 1018-1020 millibars (30.06-30.12 inches) in winter.

Winds.-The prevailing wind direction over the ocean area, from October to March, is between west and north. From March until the summer regime is established, the winds are variable, but from June to September they generally are between west and south. The windiest period is from December to March, and the weakest winds are from May to August. In winter the average wind force is between 4 and 5, and in summer between force 3 and 4. Summer winds are more persistent in direction than winter winds.

Along the coast, as shown in the tables in the appendix, the general features of wind direction are similar to those over the water area, except where modified by local topography. Windspeeds over the sea are nearly always greater than over land, and there may be twice the number of gales at sea.

Hot summer afternoons are frequently relieved by a refreshing wind blowing onshore from the cooler water along most of this coast. The effect of this sea breeze seldom penetrates more than 10 miles inland, and much less at several points.

Temperatures.-In January, land temperatures average from 23° F. at Eastport to 30° F. at Boston and 33° F. at Nantucket. In July, temperatures average from 74° F. at Boston and 68° F. at Nantucket to 61° F. at Eastport. Extreme temperatures at these places include: -23° F. at Eastport, -18° F. at Boston, and -6° F. at Nantucket; 104° F. at Boston, 95° F. at Nantucket, and 93° F. at Eastport.

In all seasons, changes in wind direction can cause large temperature fluctuations. In winter, southerly and southwesterly winds may bring mild weather, while northwesterly winds may be very cold. In summer, warm weather occurs with southwesterly and westerly winds, and northeast winds may be cool and sometimes chilly.

Temperatures at sea average about 4° F. to 8° F. higher in January, and 2° F. to 6° F. lower in July than along the coast.

Humidity.-Relative humidity is high throughout the year, and seasonal variations are small. Humidity is generally lower with winds from the continent and higher with southerly and easterly winds from the ocean.

Precipitation.-Although precipitation amounts at sea are not measured, the ship observations reporting precipitation show a maximum in winter and spring, ranging from a high of near 20 percent in January to less than 10 percent in July and August. Some 5 to 10 percent of all observations report snow in January and February.

In the winter when a cyclone passes to the south or southeast, precipitation over the coastal area generally falls as snow. On rare occasions freezing rain may be encountered, which coats all objects with a layer of ice and can cause damage to rigging if prolonged. Along the coastal area precipitation amounts are fairly uniformly distributed throughout the year, ranging from about 2.5 to 4.5 inches per month.

Thunderstorms are not frequent, occurring on an average of less than 20 per year, mainly during June, July, and August. Over the sea their frequency and severity decrease.

Cloudiness.-Low clouds covering 0.6 or more of the sky are reported in nearly one-half the vessel observations in the New England offshore area from November through March, while only 20 to 30 percent of the July-October observations report this condition. Overcast conditions of 0.8 to 1.0 sky cover at the coastal stations range from about 55 to 60 percent in winter to 30 to 40 percent in summer.

Total cloud amounts measured at the coastal stations also indicate the sky cover at sea. In winter the amount will tend to become progressively greater downwind with winds between west and north.

Visibility.-Poor visibility may be produced by fog, haze, rain, and snow. Advection sea fog is the type most common on the New England coast. It occurs when warm humid air is cooled in passing over the cold ocean, usually during warmer months when the winds are from the south or southwest. This may, however, happen at any season. These fogs often set in almost without warning, and have been known to persist for 3 weeks almost without interruption.

The areas along the coast, at the heads of bays and within the rivers, are often comparatively clear while fog is very thick outside. Over the interior waters, fog usually clears during the middle of the day. The frequency of fog over land and ocean is in opposite phase; this is, most land fog occurs in winter, and most sea fog in summer. Consequently, figures for fog or poor visibility at inland or sheltered harbors are no guide to conditions at sea or in the approaches.

Steam fog (sea smoke), sometimes encountered in winter, forms in very cold weather when the air temperature is much lower than that of the water.

Fog is more likely to form with light to moderate winds. The most frequent wind forces accompanying sea fog are 2 to 4. Fog rarely forms and persists with winds of gale force.

Extratropical Cyclones.-The New England area lies on, or very near, the paths most frequently followed by extratropical cyclones, and consequently experiences frequent wind shifts and rapid weather changes in the cooler seasons. These depressions generally enter the area from the west, with the low center passing through New England or down the St. Lawrence Valley; or enter from the southwest, with the center offshore. These latter northeastward-moving storms are likely to be of greater severity, with respect to precipitation and wind, due to a considerable passage over water. Heavy rain or snow before the passage of the storm center may be extensive, and gales of hurricane force sometimes accompany them. In these coastal storms, winds from the north or northeast back to north and northwest as the storm center moves to the northeast out of the region. The northwesterly winds in the western half of these storms, coming directly from the interior, are often bitterly cold.

Tropical Cyclones.-Tropical cyclones, although much rarer than the extratropical variety, occasionally move northward in late summer and autumn. The storm centers generally move through the region in a northeastward direction toward and across Nova Scotia or over the adjacent ocean, but some have passed northward onto the southern New England coast. As a rule, these tropical storms are much more violent than the extratropical storms of the same season. Many of them have taken on some characteristics of extratropical cyclones before reaching the area, and are less intense than in more southerly latitudes.

TROPICAL CYCLONES.-A tropical cyclone is a warm-core, low-pressure system that develops over the warm waters of the tropical oceans, and exhibits a rotary, counterclockwise circulation in the northern hemisphere (clockwise in the southern hemisphere). Although relatively small in area coverage, this storm can attain awesome strength, with winds near its center reaching 175 knots or more. Tropical cyclones occur almost entirely in six rather distinct regions of the world; one of these, the **North Atlantic Region** (West Indies, Caribbean Sea. Gulf of Mexico, and waters off the east coast of the United States), includes the area covered by this Coast Pilot. In this region, tropical cyclones with winds of 34-63 knots are called **tropical storms,** while tropical cyclones with winds greater than 63 knots are called **hurricanes.** Hurricanes are infrequent in comparison with middle-and high-latitude storms, but they have a record of destruction far exceeding that of any other type of storm. Because of their fury, and the fact that they are predominately oceanic, they merit the special attention of all mariners, whether professional or amateur.

Rarely does the mariner who has experienced a fully developed tropical cylcone (hurricane) at sea wish to encounter a second one. He has learned the wisdom of avoiding them if possible. The uninitiated may be misled by the deceptively small size of a tropical cyclone as it appears on a weather map, and by the fine weather experienced only a few hundred miles from the reported center of such a storm. The rapidity with which the weather can deteriorate with approach of the storm, and the violence of the hurricane, are difficult to visualize if they have not been experienced.

As a tropical cyclone moves out of the tropics to higher latitudes, it normally loses energy slowly, expanding in area until it gradually dissipates or acquires the characteristics of extratropical cyclones. At any stage, a tropical cyclone normally loses energy at a much faster rate if it moves over land. As a general rule, tropical cyclones of the

North Atlantic Region move with the prevailing winds of the area. In small hurricanes the diameter of the area of destructive winds may not exceed 25 miles while in some of the greatest storms the diameter may be as much as 400 to 500 miles.

At the center is a comparative calm known as the "eye of the storm". The diameter of this "eye" varies with individual storms and may be as little as 7 miles but is rarely more than 30 miles. The average is 15 to 20 miles. This center is the region of low atmospheric pressure around which winds blow in a more or less circular course, spiraling inward in a counterclockwise direction. Winds at the outer edge of the storm area are light to moderate and gusty, and often increase toward the center to speeds too high for instrument recording. Although the air movement near the center of the hurricane is usually light and fitful, the seas in this area are in most cases very heavy and confused, rendered so by the violent shifting winds which surround it. Furthermore, after the center has passed a vessel, she may expect a sharp renewal of the gales, with winds from a more or less opposite direction. The hurricane may effect an area covering tens of thousands of square miles.

In the North Atlantic, tropical cyclones form over a wide range of ocean between the Cape Verde Islands and the Windward Island, over the western part of the Caribbean Sea, and the Gulf of Mexico. While some may initially move northward, 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 for varying distances from the Atlantic Coast of the United States. Others pass over or to the south of the larger islands and enter the Gulf of Mexico, then curve northward or northeastward and strike some part of the east Gulf Coast. Others may continue westward and strike the west Gulf Coast.

The most common path is curved, the storms moving generally in a westward direction at first, turning later to the northwestward and finally to the northeastward. A considerable number, however, remain in low latitudes and do not turn appreciably to the northward. Freak movements are not uncommon, and there have been storms that described loops, hairpin-curved paths, and other irregular patterns. Movement toward the southeast is rare, and in any case of short duration. The entire Caribbean area, the Gulf of Mexico, the coastal regions bordering these bodies of water, and the Atlantic Coast are subject to these storms during the hurricane season.

Hurricanes develop over the southern portions of the North Atlantic, including the Gulf of Mexico, and Caribbean Sea, **mostly from June through October, infrequently in May and November, and rarely in other months;** the hurricane season reaches its peak in September. An average of nine tropical cyclones form each year (reaching at least tropical storm intensity) and five of these reach hurricane strength. June and July storms tend to develop in the northwestern Caribbean or Gulf of Mexico while during August there is an increase in number and intensity, and the area of formation extends east of the Lesser Antilles. September storms develop between 50° W and the Lesser Antilles; in the southern Gulf of Mexico, the western Caribbean, near the Bahamas, and around the Cape Verde Islands. Formation in October shifts primarily to the western Caribbean and off-season storms are widespread with a slight concentration in the southwestern Caribbean.

The average speed of movement of tropical cyclones in the Tropics is about 10 to 15 knots. This speed, however, varies considerably according to the location of the storm, its development, and attendant meteorological conditions. The highest rates of progression usually occur when the storm is moving northward or northeastward in the middle or higher latitudes.

Locating and tracking tropical cyclones.-By means of radio, the National Weather Service collects weather observations daily from land stations, ships at sea, and aircraft. When a tropical cyclone is located, usually in its early formative stage, it is followed closely. In the North Atlantic, U.S. Navy, Air Force, and NOAA aircraft make frequent flights to the vicinity of such storms to provide information needed for tracking the tropical cyclone and determining its intensity. Long-range shore radar stations follow the movement of the storm's precipitation area when it is in range. Bulletins are broadcast to ships several times daily, giving information on each storm's location, intensity, and movement. As a further aid, the mariner may obtain weather reports by radio directly from other ships in the vicinity of a tropical cyclone.

Signs of approach.-Although radio reports normally prove adequate for locating and avoiding a tropical cyclone, knowledge of the appearance of the sea and sky in the vicinity of such a storm is useful to the mariner. The passage of a hurricane at sea is an experience not soon to be forgotten.

An early indication of the approach of such a storm is the presence of a long swell. In the absence of a tropical cyclone, the crests of swell in the deep waters of the Atlantic pass at the rate of perhaps eight per minute. Swell generated by a tropical cyclone is about twice as long, the crests passing at the rate of perhaps four per minute. Swell may be observed several days before arrival of the storm.

When the storm center is 500 to 1,000 miles away, the barometer usually rises a little, and the skies are relatively clear. Cumulus clouds, if present at all, are few in number, and their vertical development appears suppressed. The barometer usually appears restless, pumping up and down a few hundredths of an inch.

As the tropical cyclone comes nearer, a cloud sequence begins which resembles that associated with the approach of a warm front in middle latitudes. Snow-white, fibrous "mare's tails" (cirrus) appear when the storm is about 300 to 600 miles away. Usually these seem to converge, more or less, in the direction from which the storm is approaching. This convergence is particularly apparent at about the time of sunrise and sunset.

Shortly after the cirrus appears, but sometimes before, the barometer starts a long, slow fall. At first the fall is so gradual that it only appears to alter somewhat the normal daily cycle (two maxima and two minima in the Tropics). As the rate of fall increases, the daily pattern is completely lost in the more or less steady fall.

The cirrus becomes more confused and tangled, and then gradually gives way to a continuous veil of cirrostratus. Below this veil, altostratus forms, and then stratocumulus. These clouds gradually become more dense, and as they do so, the weather becomes unsettled. A fine, mistlike rain begins to fall, interrupted from time to time by showers. The barometer has fallen perhaps a tenth of an inch.

As the fall becomes more rapid, the wind increases in gustiness, and its speed becomes greater, reaching a value of perhaps 22 to 40 knots (Beaufort 6-8). On the horizon appears a dark wall of heavy cumulonimbus, the **bar** of the storm. Portions of this heavy cloud become detached from time to time and drift across the sky, accompanied by rain squalls and wind of increasing speed. Between squalls, the cirrostratus can be seen through breaks in the stratocumulus.

As the bar approaches, the barometer falls more rapidly and wind speed increases. The seas, which have been gradually mounting, become tempestuous squall lines, and one after the other sweep past in ever increasing number and intensity.

With the arrival of the bar, the day becomes very dark, squalls become virtually continuous and the barometer falls precipitously, with a rapid increase in the wind speed. The center may still be 100 to 200 miles away in a hurricane. As the center of the storm comes closer, the ever-stronger wind shrieks through the rigging and about the superstructure of the vessel. As the center approaches, rain falls in torrents. The wind fury increases. The seas become mountainous. The tops of huge waves are blown off to mingle with the rain and fill the air with water. Objects at a short distance are not visible. Even the largest and most seaworthy vessels become virtually unmanageable, and may sustain heavy damage. Less sturdy vessels do not survive. Navigation virtually stops as safety of the vessel becomes the prime consideration. The awesome fury of this condition can only be experienced. Words are inadequate to describe it.

If the eye of the storm passes over the vessel, the winds suddenly drop to a breeze as the wall of the eye passes. The rain stops, and skies clear sufficiently to permit the sun to shine through holes in the comparatively thin cloud cover. Visibility improves. Mountainous seas approach from all sides, apparently in complete confusion. The barometer reaches its lowest point, which may be an 1½ or 2 inches below normal in hurricanes. As the wall on the opposite side of the eye arrives, the full fury of the wind strikes as suddenly as it ceased, but from the opposite direction. The sequence of conditions that occurred during approach of the storm is reversed and passes more quickly, as the various parts of the storm are not as wide in the rear of a storm as on its forward side.

Locating the center of a tropical cyclone.-If intelligent action is to be taken to avoid the full fury of a tropical cyclone, early determination of its location and direction of travel relative to the vessel is essential. The bulletins and forecasts are an excellent general guide, but they are not infallible and may be sufficiently in error to induce a mariner in a critical position to alter course so as to unwittingly increase the danger of the vessel. Often it is possible, using only those observations made abroad ship, to obtain a sufficiently close approximation to enable the vessel to maneuver to the best advantage.

As previously stated, the presence of an exceptionally long swell is usually the first visible indication of the existence of a tropical cyclone. In deep water it approaches from the general direction of origin (the position of the storm center when the swell was generated). However, in shoaling water this is a less reliable indication because the direction is changed by refraction, the crests being more nearly parallel to the bottom contours.

When the cirrus clouds appear, their point of convergence provides an indication of the direction of the storm center. If the storm is to pass well to one side of the observer, the point of convergence shifts slowly in the direction of storm movement. If the storm center will pass near the observer, this point remains steady. When the bar becomes visible, it appears to rest upon the horizon for several hours. The darkest part of this cloud is in the direction of the storm center. If the storm is to pass to one side, the bar appears to drift slowly along the horizon. If the storm is heading directly toward the observer, the position of the bar remains fixed. Once within the area of the dense, low clouds, one should observe their direction of movement, which is almost exactly along the isobars, with the center of the storm being 90° from the direction of cloud movement (left of direction of movement in the northern hemisphere).

The winds are probably the best guide to the direction of the center of a tropical cyclone. The circulation is cyclonic, but because of the steep pressure gradient near the center, the winds there

blow with greater violence and are more nearly circular than in extratropical cyclones.

According to Buys Ballot's law, an observer who faces into the wind has the center of the low pressure on his right (northern hemisphere) and somewhat behind him. If the wind followed circular isobars exactly, the center would be exactly eight points, or 90°, from dead ahead when facing into the wind. However, the track of the wind is usually inclined somewhat toward the center, so that the angle dead ahead varies between perhaps 8 and 12 points (90° to 135°). The inclination varies in different parts of the same storm. It is least in front of the storm, and greatest in the rear, since the actual wind is the vector sum of that due to the pressure gradient and the motion of the storm along the track. A good average is perhaps 10 points in front, and 11 or 12 points in the rear. These values apply when the storm center is still several hundred miles away. Closer to the center, the wind blows more nearly along the isobars, the inclination being reduced by one or two points at the wall of the eye. Since wind direction usually shifts temporarily during a squall, its direction at this time should not be used for determining the position of the center.

When the center is within radar range, it might be located by this equipment. However, since the radar return is predominately from the rain, results can be deceptive, and other indications should not be neglected.

Distance from the storm center is more difficult to determine than direction. Radar is perhaps the best guide. The rate of fall of the barometer is of some help; this is only a rough indication, however, for the rate of fall may be quite erratic and will vary somewhat with the depth of the low at the center, the speed of the storm center along its track, and the stage in the life cycle of the storm.

Maneuvering to avoid the storm center.-The safest procedure with respect to tropical cyclones is to avoid them. If action is taken sufficiently early, this is simply a matter of setting a course that will take the vessel well to one side of the probable track of the storm, and then continuing to plot the position of the storm center, as given in the weather bulletins, revising the course as needed.

However, such action is not always possible. If one finds himself within the storm area, the proper action to take depends in part upon his position relative to the storm center and its direction of travel. It is customary to divide the circular area of the storm into two parts. In the northern hemisphere, that part to the **right** of the storm track (facing in the direction toward which the storm is moving) is called the **dangerous semicircle.** It is considered dangerous because (1) the actual wind **speed** is greater than that due to the pressure gradient alone, since it is augmented by the forward motion of the storm, and (2) the **direction** of the wind and sea is such as to carry a vessel into the path of the storm (in the forward part of the semicircle). The part to the **left** of the storm track is called the **navigable semicircle.** In this part, the wind is decreased by the forward motion of the storm, and the wind blows vessels away from the storm track (in the forward part). Because of the greater wind speed in the dangerous semicircle, the seas are higher here than in the navigable semicircle.

A plot of successive positions of the storm center should indicate the semicircle in which a vessel is located. However, if this is based upon weather bulletins, it is not a reliable guide because of the lag between the observations upon which the bulletin is based and the time of reception of the bulletin, with the ever present possibility of a change in the direction of motion of the storm. The use of radar eliminates this lag, but the return is not always a true indication of the center. Perhaps the most reliable guide is the wind. Within the cyclonic circulation, a **veering wind** (one changing direction to the right in the northern hemisphere and to the left in the southern hemisphere) indicates a position in the dangerous semicircle, and a **backing wind** (one changing in a direction opposite to a veering wind) indicates a position in the navigable semicircle. However, if a vessel is underway, its motion should be considered. If it is outrunning the storm or pulling rapidly toward one side (which is not difficult during the early stages of a storm, when its speed is low), the opposite effect occurs. This should usually be accompanied by a rise in atmospheric pressure, but if motion of the vessel is nearly along an isobar, this may not be a reliable indication. If in doubt, the safest action is usually to stop long enough to determine definitely the semicircle. The loss in valuable time may be more than offset by the minimizing of the possibility of taking the wrong action and increasing the danger to the vessel. If the wind direction remains steady (for a vessel which has stopped), with increasing speed and falling barometer, the vessel is in or near the path of the storm. If it remains steady with decreasing speed and rising barometer, the vessel is on the storm track, behind the center.

The first action to take if one finds himself within the cyclonic circulation is to determine the position of his vessel with respect to the storm center. **While the vessel can still make considerable way through the water, a course should be selected to take it as far as possible from the center.** If the vessel can move faster than the storm, it is a relatively simple matter to outrun the storm if sea room permits. But when the storm is faster, the solution is not as simple. In this case, the vessel, if ahead of the storm, will approach nearer to the center. The problem is to select a course that will produce the greatest possible minimum distance. This is best determined by means of a relative movement plot.

As a very general rule, for a vessel in the northern hemisphere, safety lies in placing the wind on the starboard bow in the dangerous semicircle and on the starboard quarter in the navigable semicircle. If on the storm track ahead of the storm, the wind should be put about two points on the starboard quarter until the vessel is well within the navigable semicircle, and the rule for that semicircle then followed. With a faster than average vessel, the wind can be brought a little farther aft in each case. However, as the speed of the storm increases along its track, the wind should be brought farther forward. If land interferes with what would otherwise be the best maneuver, the solution should be altered to fit the circumstances. If the speed of the vessel is greater than that of the storm, it is possible for the vessel, if behind the storm, to overtake it. In this case, the only action usually needed is to slow enough to let the storm pull ahead.

In all cases, one should be alert to changes in the direction of movement of the storm center, particularly in the area where the track normally curves toward the pole. If the storm maintains its direction and speed, the ship's course should be maintained as the wind shifts.

If it becomes necessary for a vessel to heave to, the characteristics of the vessel should be considered. A power vessel is concerned primarily with damage by direct action of the sea. A good general rule is to heave to with head to the sea in the dangerous semicircle or stern to the sea in the navigable semicircle. This will result in greatest amount of headway away from the storm center, and least amount of leeway toward it. If a vessel handles better with the sea astern or on the quarter, it may be placed in this position in the navigable semicircle or in the rear half of the dangerous semicircle, but never in the forward half of the dangerous semicircle. It has been reported that when the wind reaches hurricane speed and the seas become confused, some ships ride out the storm best if the engines are stopped, and the vessel is permitted to seek its own position. In this way, it is said, the ship rides with the storm instead of fighting against it.

In a sailing vessel, while attempting to avoid a storm center, one should steer courses as near as possible to those prescribed above for power vessels. However, if it becomes necessary for such a vessel to heave to, the wind is of greater concern than the sea. A good general rule always is to heave to on whichever tack permits the shifting wind to draw aft. In the northern hemisphere this is the starboard tack in the dangerous semicircle and the port tack in the navigable semicircle.

Practical rules.-When there are indications of a hurricane, vessels should remain in port or seek one if possible. Changes in barometer and wind should be carefully observed and recorded, and every precaution should be taken to avert damage by striking light spars, strengthening moorings, and if a steamer, preparing steam to assist the moorings. In the ports of the southern States hurricanes are generally accompanied by very high tides, and vessels may be endangered by overriding the wharf where moored if the position is at all exposed.

Vessels in the Straits of Florida may not have sea room to maneuver so as to avoid the storm track, and should try to make a harbor, or to stand out of the straits to obtain sea room. Vessels unable to reach a port and having sea room to maneuver usually observe the previously discussed general rules for avoiding the storm center, which, for power-driven vessels, are summarized as follows:

Right or dangerous semicircle.-Bring the wind on the starboard bow (045° relative), hold course and make as much way as possible. If obliged to heave to, do so with head to the sea.

Left or navigable semicircle.-Bring the wind on the starboard quarter (135° relative), hold course and make as much way as possible. If obliged to heave to, do so with stern to the sea.

On storm track, ahead of center.-Bring the wind two points on the starboard quarter (157½° relative), hold course and make as much way as possible. When well within the navigable semicircle, maneuver as indicated above.

On storm track, behind center.-Avoid the center by the best practicable course, keeping in mind the tendency of tropical cyclones to curve northward and eastward.

Coastal effects.-The high winds of a hurricane inflict widespread damage when such a storm leaves the ocean and crosses land. Aids to navigation may be blown out of position or destroyed. Craft in harbors, unless they are properly secured, drag anchor or are blown against obstructions. Ashore, trees are blown over, houses are damaged, power lines are blown down, etc. The greatest damage usually occurs in the dangerous semicircle a short distance from the center, where the strongest winds occur. As the storm continues on across land, its fury subsides faster than it would if it had remained over water.

Along the coast, particularly, greater damage may be inflicted by water than by the wind. There are at least four sources of water damage. First, the unusually high seas generated by the storm winds pound against shore installations and craft in their way. Second, the continued blowing of the wind toward land causes the water level to increase perhaps 3 to 10 feet above its normal level. This **storm tide**, which may begin when the storm center is 500 miles or even farther from the shore, gradually increases until the storm passes. The highest storm tides are caused by a slow-moving hurricane of larger diameter, because both of these effects result in greater duration of wind in the same direction. The effect is greatest in a partly enclosed body of water, such as the Gulf of Mexico, where the concave coastline does not readily

permit the escape of water. It is least on small islands, which present little obstruction to the flow of water. Third, the furious winds which blow around the wall of the eye often create a ridge of water called a **storm surge,** which strikes the coast and often inflicts heavy damage. The effect is similar to that of a **Tsunami (seismic sea wave)** caused by an earthquake in the ocean floor. Both of these waves are popularly called **tidal waves.** Storm surges of 20 feet or more have occurred. About 3 or 4 feet of this is due to the decrease of atmosphere pressure, and the rest to winds. Like the damage caused by wind, that due to high seas, the storm tide, and the storm surge is greatest in the dangerous semicircle, near the center. The fourth source of water damage is the heavy rain that accompanies a tropical cyclone. This causes floods that add to the damage caused in other ways.

When proceeding along a shore recently visited by a hurricane, a navigator should remember that time is required to restore aids to navigation which have been blown out of position or destroyed. In some instances the aid may remain but its light, sound apparatus, or radiobeacon may be inoperative. Landmarks may have been damaged or destroyed.

Ice.-The extent to which the harbors of Maine are closed to navigation by ice varies greatly in different years. During some winters most of the harbor are open, while in others the only harbors available for anchorages are Quoddy Narrows, Eastport, Little River, Machias Bay (above Avery Rock Light), Mistake Harbor (not much used), Winter Harbor, and Boothbay Harbor. Portland Harbor generally has an open channel in winter, kept so by steamers and tugs. The mouths of the rivers are generally avoided for anchorage in winter and early spring on account of running ice. In the bays and harbors the ice formation is mostly local; beginning at the head, in sheltered places along the shore, it extends outward. During a calm or light winds from northward the local formations rapidly increase, while strong winds break them up and force them as drift ice onto the lee shore. The tidal currents do not prevent the formation of ice or influence its movements in strong winds except in the larger rivers.

In severe winters some of the harbors south of Cape Ann are closed to navigation by ice, and there is more or less drift ice in all the harbors, in Cape Cod Bay, and on Monomoy and Nantucket Shoals. In the principal harbors, steamers and tugs usually keep a channel open. See Ice under the different headings in the text.

During some winter months or when threatened by icing conditions, lighted buoys may be removed from station or replaced by unlighted buoys; unlighted buoys, and daybeacons and lights on marine sites also may be removed. (See Light List.)

The International Ice Patrol is conducted by the U.S. Coast Guard whenever the presence of ice begins to threaten steamship traffic in the North Atlantic Ocean, which usually begins in February and extends to about July. The patrol guards the southeastern, southwestern, and southern limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland for the purpose of informing passing ships of the extent of this dangerous area.

Reports of ice in this area are collected from passing ships and from flights by Ice Patrol aircraft. Should severe ice conditions be encountered, the Coast Guard deploys a surface patrol ship to conduct ice observations. Information on ice conditions are disseminated by Ice Patrol Bulletins which are broadcast by radio and landline circuits. A list of the radio stations, frequencies, and times of broadcast is published annually in Local Notices to Mariners of the First and Third Coast Guard Districts and in the Notice to Mariners issued by the U.S. Naval Oceanographic Office.

All shipping is requested to assist in the operation of the International Ice Patrol by radio reporting all sightings of ice at once to the Commander, International Ice Patrol (COMINTICEPAT), Governors Island, N.Y. The report can usually be made via the nearest Coast Guard station.

Principal ports.-The ports within the area of this Coast Pilot which have regular deep-draft commercial traffic are Bucksport, Maine; South Brewer, Maine; Searsport, Maine; Portland, Maine; Portsmouth, N.H.; Gloucester, Mass.; and Boston, Mass.

Pilotage is compulsary for foreign vessels and U.S. vessels under register in the foreign trade as follows:

Maine-Penobscot Bay and River, and Portland.

New Hampshire-All ports.

Massachusetts-All ports.

Pilotage is optional for coastwise vessels that have on board a pilot properly licensed by the Federal Government for the waters which the vessel travels.

Arrangements for pilots should be made by the ships' agents at least 24 hours in advance at all of the ports. Detailed information on pilotage procedures is given in the text for the ports concerned.

Towage.-Tugs are available at Belfast, Portland, Portsmouth, and Boston. At a number of other places power fishing boats and launches can be secured for handling smaller vessels and barges.

Harbormasters are appointed for most of the ports. They have charge of the anchorage and berthing of vessels.

Supplies.-Boston, Portland, and Portsmouth are the principal ports at which general supplies, provisions, and marine supplies can be obtained. Boston, Portland, Bucksport, Salem, Portsmouth,

and Searsport have stocks of fuel oil. Diesel oil is available at Beverly, Boston, Gloucester, Portsmouth, Searsport, Bucksport, Portland, Rockland, and Boothbay Harbor. Yacht and small-boat supplies including gasoline and diesel fuel are available at most of the smaller ports.

Repairs.-Boston is the only port where repairs of any magnitude to large vessels can be made. Portland and Bath are equipped to handle above-water hull and engine repairs of deep-draft vessels. Tugs and large fishing vessels can be hauled out at Boston, Gloucester, Rockland, and Portland. Smaller vessels, motorboats, and yachts can be hauled out, and ordinary repairs to machinery and hull can be made at most of the smaller ports.

Small-craft facilities.-Marine supplies, repair facilities, and other services for small craft are available at all of the major ports, and most of the coastal towns and villages along the coasts of Massachusetts, New Hampshire, and that portion of the Maine coast southwestward of Boothbay Harbor. Northeastward of Boothbay Harbor the coast is less densely populated and the small-craft facilities are usually farther apart and the services rendered are often limited, thereby making careful advance planning prudent. A description of the facilities are given in the geographic text. Some small-craft charts have been published for the area covered by this Coast Pilot that also show marine facilities.

Sailing vessels and power-driven vessels of less than 65 feet in length, navigating narrow channels, shall not hamper the safe passage of larger steam vessels which can navigate only inside that channel. (Public Law 89-764).

Time.-The area covered by this Coast Pilot uses eastern daylight time (e.d.t.), which is 4 hours slow of Greenwich mean time (G.m.t.). Example: when it is 1000 at Greenwich, it is 0600 along this coast. **Daylight Saving Time** will remain in effect until April 27, 1975.

Legal public holidays.-New Year's Day, January 1; Washington's Birthday, third Monday in February; Memorial Day, last Monday in May; Independence Day, July 4; Labor Day, first Monday in September; Columbus Day, second Monday in October; Veterans Day, fourth Monday in October; Thanksgiving Day, fourth Thursday in November; and Christmas Day, December 25. The national holidays are observed by employees of the Federal Government and the District of Columbia, and may not be observed by all the States in every case.

In addition, other holidays are observed in the New England States: General Election Day, first Tuesday after first Monday in November, in Maine and New Hampshire; March 17, Evacuation Day, and June 17, Bunker Hill Day, in Boston and Suffolk County, Mass.; Patriot's Day, third Monday in April, in Maine and Massachusetts; Fast Day, fourth Monday in April, in New Hampshire.

4. QUODDY NARROWS TO CALAIS, MAINE

This chapter describes the Maine and New Brunswick coasts from Quoddy Narrows through Lubec Channel, Friar Roads, Western Passage, and the St. Croix River to the head of navigation at Calais. Included in the text are discussions of the Maine ports of Lubec, Eastport, and Calais; the Canadian ports of St. Stephen and St. Andrews; several small harbors on Campobello Island; and Head Harbour Passage.

Chart 13328 (801).-The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also used, especially at high water. The tidal currents are strong in both passages.

West Quoddy Head, the easternmost point of the United States, is bold and wooded. **West Quoddy Head Light** (44°48.9'N., 66°57.1'W.), 83 feet above the water, is shown from a 49-foot red and white horizontally banded tower, on the eastern edge of the headland. A fog signal and a radiobeacon are at the light. The abandoned Coast Guard lookout tower near the summit of the ridge westward of the light is the most conspicuous landmark in the approach to Quoddy Narrows from seaward.

Between West Quoddy Head and Calais the United States-Canada boundary is defined by ranges which are white pyramidal-shaped markers that should not be mistaken for navigational aids; they are not charted.

Quoddy Narrows (Quoddy Roads), between West Quoddy Head and Canada's Campobello Island, is the usual anchorage for vessels seeking shelter or waiting for a favorable tide to pass through Lubec Narrows. The entrance, between West Quoddy Head and The Boring Stone, is about 0.8 mile wide and has a depth of 28 feet near the middle.

The anchorage affords shelter from northerly and westerly winds in depths of 12 to 25 feet, but is open to winds from the east and south, and protection from northeast gales is reported poor. The northern and western parts of Quoddy Narrows between West Quoddy Head and Lubec are full of shoals which partly uncover.

Sail Rock and **Little Sail Rock** are two bare rocks on a ledge about 0.2 mile southeastward of West Quoddy Head Light. The ledge extends more than 100 yards east of the two rocks. As swirls form just southward and eastward of Sail Rock during the strength of the tidal current, the rock should be given a good berth. A lighted whistle buoy is about 0.4 mile southeastward of Sail Rock, about in line with the rock and West Quoddy Head Light. A fairway bell buoy, about 0.5 mile north-northeastward of the light, marks the entrance to Quoddy Narrows and the approach to Lubec Channel.

Round Rock and **The Boring Stone** are 500 yards southwest of **Liberty Point,** a bold headland, which is the southern extremity of Campobello Island. These rocks show above water, and vessels should pass at least 300 yards off the southernmost rock. An islet about 200 yards off Liberty Point is conspicuous, as is **Ragged Point** about 0.4 mile northeastward of it.

Wormell Ledges, which partly uncover, are about 500 yards northward of West Quoddy Head, and are marked at their northern end by a buoy.

Middle Ground, covered 4 feet, is a shoal in the middle of Quoddy Narrows, 0.7 mile northward of West Quoddy Head, and is marked on its southwestern side by a buoy.

Lubec Channel and **Lubec Narrows,** between Quoddy Narrows and Friar Roads, have been improved by dredging. In 1970, it was reported that vessels drawing more than 10 feet should not be taken through this channel at low water. The channel is marked by a light and buoys. At spring tides the low water may be 3 or 4 feet below the average. Lubec Narrows has strong tidal currents and eddies. It is not advisable to use this passage without local knowledge.

Shoals bare on both sides of Lubec Narrows at low water. A breakwater extends from **Short Point** on the west side of the channel near the southern end of the narrows.

The **Franklin D. Roosevelt Memorial Highway Bridge** crosses the narrows from Lubec to Campobello Island at a point about 400 yards southward of the abandoned lighthouse on **Mulholland Point.** The fixed span has a clearance of 47 feet.

Another breakwater extends from the shore to **Gun Rock** and 75 yards eastward of the rock on the west side of the channel at the north end of the narrows. This breakwater is marked by a white pyramid midway of its length. The breakwater is reported to be covered at extreme high water. A ledge extending about 150 yards north-northeasterly from Gun Rock has 7 feet over it and is marked on its north end by a buoy.

Lubec is a small town on the west side of Lubec Narrows. Its principal industries are fishing, the canning and smoking of herring, and egg processing. The only regular waterborne commerce in 1970 was that carried on by two small coastal freighters which carried general cargo between the ports of Eastport, St. Andrews, and Lubec.

The most **prominent features** are a large standpipe 1.4 miles southwest of the town, a tall church spire on the hill in the town, and an elevated tank and stack on the north shore of the town, all of which are visible from Friar Roads and Quoddy Narrows. A square red brick stack and three oil tanks are on **Mowry Point** south of the town, with a prominent grammar school and its gymnasium about 500 yards westward of them.

Tides and currents.-The mean range of tide at Lubec is 17.5 feet, but tidal ranges of over 20 feet are not uncommon. Daily predictions are given in the Tide Tables. For current predictions see the Tidal Current Tables.

U.S. Customs and Immigration officers are stationed at the Roosevelt Memorial Bridge 24 hours daily.

There are numerous fish and canning factories in the port with wharves, most of which dry at low water.

An L-shaped 250-foot pier about 0.2 mile northward of the Roosevelt Memorial Bridge is used by a cannery to unload fishing boats. It has 2 feet alongside its outer face, and a suction pump is utilized to unload the boats. There is a 2,400-square-foot storage and transfer shed at the head of the pier. Boats usually unload along the outer end of the southern side of the pier at or near high water.

Another cannery wharf with a 190-foot face is on the north waterfront; depths of 7 feet are reported alongside. Though there are no regular repair facilities at Lubec, emergency repairs can be made at this wharf. A machine shop and a 4-ton crane are available. Due to the large tidal range, boats are usually grounded out for below-the-waterline repairs. Diesel fuel and water are piped to the wharf. There is a public small-craft launching ramp with an adjoining float landing and ample parking about 200 yards eastward of the wharf.

Ice, provisions, and limited marine supplies are available in Lubec. The town has no public transportation.

Pilotage is not compulsory.

Johnson Bay, on the northwest side of Lubec, is a well-sheltered and frequently used anchorage. The approach from southward is through Quoddy Narrows and Lubec Narrows, and the approach from northward is through Friar Roads. The best anchorage for deep-draft vessels is in depths of 42 to 54 feet just southward of a line from Mulholland Point abandoned lighthouse to wooded **Rodgers Island,** 0.8 mile northwest of Lubec.

The southwestern part of Johnson Bay is shoal for a distance of 0.5 mile from its head. A shoal covered 17 feet is near the middle of the bay, and another shoal covered 11 feet is 350 yards off the eastern shore. The wharves of two fish factories, one, inactive in 1970, on the northwest side and one on the east side of Johnson Bay, bare at low water.

Popes Folly is a thinly wooded islet 0.2 mile northward of the northern entrance to Lubec Narrows. The bar that extends southeastward from the islet to Campobello Island has a depth of 12 feet, and vessels bound southward to Lubec or through Lubec Narrows cross it. The ledge that extends northeastward from the islet is marked at its outer end by a buoy.

Dudley Island, 0.5 mile northwestward of the northern entrance to Lubec Narrows, is high and mostly grass covered. An earth dam connects it with Treat Island, 0.2 mile to the northward.

Treat Island, largest of the islands between Lubec Narrows and Eastport, is high and grass-covered on the south end and wooded on the north end. **Burial Islet,** small and grass-covered, is 300 yards northwestward and bare **Gull Rock** is 400 yards westward of Treat Island. The former Government wharf on the west side of the island near its north end has a depth of about 14 feet alongside.

Broad Cove, which makes into the south shore of **Moose Island** west of Eastport, is a good anchorage. The head of the cove is shoal for a distance of 0.2 mile. Rocks, which uncover, extend 400 yards southeastward and southward from **Shackford Head,** on the western side of the entrance, and are marked at their south end by a buoy. The stacks of the reduction plants on the east side of the cove are conspicuous. Each of the two fish-reduction plants has a pier used for unloading fish products. The southernmost pier has a reported 22 feet alongside and uses suction pumps to unload fish from the boats.

Deep Cove is the first cove to the northwestward of Broad Cove on Moose Island. A wharf in the cove is in ruins and is no longer usable. An L-shaped pier about 435 feet in length with a reported 12 feet alongside its outer face is on a former seaplane launching ramp on the southeastern side of the cove. It is used by a nearby pearl essence company to offload fish products.

Snug Cove, on the west side of Campobello Island eastward of Dudley Island, is of no importance except to small craft. Between Snug Cove and Dudley Island is an unmarked rock covered 17 feet. Vessels entering Friar Roads from the southward pass on either side of the unmarked rock.

Friars Head, to the north of Snug Cove, is on the south side of the entrance to **Friars Bay,** on the western side of Campobello Island. Friars Bay is used as an anchorage, and on its northern side is the village of **Welshpool,** where small craft can find protection in all weather at the government wharf, which has a 215-foot face with 12 feet alongside. A light, 24 feet above the water, is shown from a skeleton tower on the head of the wharf.

For a distance of 1.3 miles from Welshpool, the west shore of Campobello Island continues northward to **Bald Head,** a point just south of

which is a prominent circular hill 101 feet high. From Bald Head the coast trends northeastward 0.6 mile to **Man of War Head,** which is on the south side of the entrance to Harbour De Lute. The L-shaped breakwater-wharf, in the cove near the northwestern end of Man of War Head, has 7 to 9 feet alongside its 192-foot north face. A light, 23 feet above the water, is shown from a skeleton tower at the outer end of the breakwater. The basin behind the breakwater has been dredged to depths of 7 to 5 feet.

Harbour De Lute is used as an anchorage by small vessels, but those without local knowledge should not go beyond the 9-foot spot, known as **Racer Rock,** in the middle of the entrance to the inner harbor. The inner harbor is obstructed by fishweirs. Indenting the north shore of Harbour De Lute east of **Windmill Point,** which is on the north side of the entrance, are four coves that are of little importance except to the fishing industry.

In **Curry Cove,** the northernmost, there is an L-shaped wharf with a depth of 6 feet alongside its 150-foot outer face. A light, 23 feet above the water, is shown from a skeleton tower with white enclosed bottom portion on the outer corner of the wharf.

The harbors on the west side of Campobello Island are used as harbors of refuge by fishing vessels during heavy easterly gales.

Friar Roads (Eastport Harbor), which lies between Moose Island and Campobello Island, is approached from northward through Head Harbour Passage and from southward through Quoddy Narrows and Lubec Narrows. Friar Roads is the principal approach to Passamaquoddy Bay and St. Croix River.

Eastport, a city situated on the hilly east side of Moose Island, is the easternmost deep-water port in the United States. The docks of the port are along the waterfront on the east shore of the island. There is a hospital in town.

The principal industries are fishing, with its attendant phases of canning and smoking herring, and manufacture of the byproducts of fish oil, meal, and pearl essence, and some lobstering. There is also a woolen mill. Two small coastal freighters maintain freight service between the ports of Lubec, St. Andrews, and Eastport.

Prominent features.-The principal landmarks are: a green painted standpipe, yellow brick high school, the storm warning signal tower on the summit of the hill overlooking the town, the customhouse with its square tower and two flagpoles, the prominent spire of a church, and the stacks of several canneries along the waterfront and about the island. The numerous concrete pylon boundary markers on the tops of the hills are also conspicuous but are not charted.

A dredged small-craft harbor for commercial and pleasure craft is off the customhouse in Eastport. The harbor is protected on its northerly and easterly sides by a steel piling, solid fill, L-shaped breakwater-wharf onto which fishing vessels can unload their catch into trucks. In February 1974, depths of 14 feet and 9½ feet were available in the southern part and northern part of the harbor, respectively. A town float with 10 feet alongside is on the inner side of the breakwater at the north end of the harbor. Boats usually moor along the inner face of the breakwater. In fair weather, berthing is available along the east and north seaward faces of the breakwater in depths of 20 feet and 9 feet, respectively. Electricity is available at all the berths, and gasoline and diesel fuel can be delivered by truck on short notice. The breakwater is floodlighted at night. The **harbormaster** is usually in attendance and assigns berths. A small-craft launching ramp is in the northwest corner of the harbor.

Deep-draft vessels may anchor off the town with the customhouse tower in line with the standpipe on the hill, and the fog signal tower on Cherry Island bearing 027°. The bottom here is broken and rocky, and the tidal currents are strong. This anchorage is not recommended in easterly weather, when more favorable conditions may be found off Broad or Deep Coves on the west side of the island.

Dangers off Eastport include: **Margie Rock,** covered 12 feet and marked by a buoy, about 100 yards south-southeastward of the breakwater; and **Clark Ledge,** marked by a daybeacon, about 0.5 mile north of the breakwater.

A rock-filled crib, the remains of an old pier and dangerous to small craft an hour before and after low water, is about 100 yards southward of the southern tip of the town breakwater-wharf.

Dog Island, 0.3 mile northward of Clark Ledge, has a grassy top and a shelving ledge extending about 100 yards off the high waterline of the island. **Dog Island Light** (44°55.1′ N., 66°59.4′ W.), 32 feet above the water, is shown from a white skeleton tower. A red sector in the light covers Clark Ledge; a fog signal is at the light.

Whirlpools and eddies that are dangerous at times for small boats are encountered between Dog Island and Deer Point, 0.5 mile northeastward. They are reported to be worst about 3 hours after low water.

Tides and currents.-The mean range of tide at Eastport is 18.2 feet. Daily predictions are given in the Tide Tables. For current predictions see the Tidal Current Tables.

See page T-1 for **Eastport Climatological** Table and the chart for **storm warning displays.**

Pilotage is not compulsory. Pilots for local inside waters can be found among the boatmen at Lubec or Eastport. Towboats are not available, but small launches can be hired for light tows.

Eastport is a **customs port of entry.**

Immigration officials are stationed in Eastport; see appendix for address. **Quarantine** is arranged through the Collector of Customs whose office is in the U.S. Post Office Building. The Coast Guard

vessel documentation office at Rockland serves Eastport; see Appendix for address.

There are several cannery and private wharves at Eastport, many of which dry at low water. Wadsworth Wharf, at which marine supplies are available, is about 50 yards southward of the southern tip of the town breakwater-wharf; depths of about 5 feet are reported along its eastern face. The former steamer and railway wharves to the southward are in disrepair and not used.

Gasoline and diesel fuel can be delivered to the town breakwater-wharf by truck. Ice, groceries, and limited marine supplies are available. A machine shop in the port handles repairs to any size gasoline or diesel engine. Electrical repairs can be made. Small vessels are usually grounded out at high water for hull repairs. There are a private facility for hauling out craft up to 60 feet in length and a boatbuilder who makes hull repairs; contact the harbormaster for additional information.

Eastport has no coastwise steamer service. An automobile ferry connects Eastport with Deer Island in summer only.

There is a railroad spur line to Eastport, but no passenger service. A good highway parallels the St. Croix River to Calais. There is an airport at Eastport which is used occasionally. Taxi service provides the only connection with the coastal bus service at Perry about 6 miles to the northwestward.

Western Passage is between Moose Island and **Deer Island,** the next large Canadian island northwestward of Campobello Island, and connects Friar Roads with Passamaquoddy Bay. **Deer Island Point (Deer Point) Light,** 35 feet above the water, is on the southern extremity of the island. The light is exhibited from a pole and is not easily seen in the daytime. Strangers coming up Friar Roads are apt to take the white wooden fog signal tower on the southeastern end of Cherry Island for a light structure.

Johnson Cove and **Kendall Head** are on the northeast side of Moose Island. An elevated tank painted green just southward of Johnson Cove, an elevated tank and a ground tank, close northwestward of it, at **Quoddy (Quoddy Village),** are all prominent.

Earth dams block the shallow passages north and south of **Carlow Island,** which is 0.2 mile northwest of Moose Island and 0.6 mile south of **Pleasant Point.** A prominent red brick Indian mission church with square belfry and numerous houses of the Indian reservation are on Pleasant Point.

Frost Island and **Frost Ledge** are at the northern end of Western Passage and between Pleasant Point and **Gleason Cove,** 0.9 mile to the northward. Frost Ledge extends 0.4 mile offshore and is marked by a bell buoy. Between Carlow Island and Frost Island, foul ground extends as much as 400 yards from shore.

The northeastern, or Deer Island, shore of Western Passage is clear; indentations are **Cummings Cove** and **Clam Cove.**

The east coast of **Campobello Island** is mostly clear and can be approached to within a reasonable distance without danger.

Local magnetic disturbance.-Differences of as much as 5½° from the normal variation have been observed off the east coast of Campobello Island.

Herring Cove (Herring Bay), near the south end of Campobello Island's eastern shore, is a good temporary anchorage for large vessels. **Schooner Cove,** midway along the eastern shore, and **Mill Cove,** near the northern end, affords temporary anchorage for small craft. A 14-foot spot in the middle of the entrance to Mill Cove is marked by a buoy.

East Quoddy Head is the northeasternmost point of Campobello Island. **Head Harbour Light** (44°57.5′ N., 66°54.0′ W.), 64 feet above the water, is shown from a 50-foot white octagonal wooden tower, with a red cross, a red iron lantern, and an attached dwelling, on the outermost rock. The fog signal is on a small building just north of the light.

Head Harbour, between East Quoddy Head and **Head Harbour Island,** 0.2 mile to the southeastward, is one of the best sheltered, small-craft harbors in the area. Excellent berthage is available on the westerly side of the harbor about 1.2 miles above East Quoddy Head Light at a 541-foot L-shaped government breakwater-wharf which is used by commerical fishing vessels. The wharf has 20 feet alongside its outer southeastern face. Mooring poles are provided eastward of the pier for pleasure craft. Diesel fuel is available by truck and gasoline is obtainable at Wilsons Beach. In October 1970, construction had begun on an addition to this wharf which when completed would transform it into a T-head breakwater-wharf. The harbor affords good anchorage and wet winter storage for small vessels. There are several small boatyards along the shores of the harbor that build boats up to 35 feet in length. The preferred channel into the harbor is northward of Head Harbour Island. The channel south of the island, shoaler and with numerous fishweirs, should not be used without local knowledge. Shoals, marked by buoys, are on both sides of the northerly channel about 0.6 mile above the entrance light. Fishing craft drawing 9 feet and more frequent the harbor.

Wilsons Beach, on the northwest side of Campobello Island and about 2 miles southwestward of East Quoddy Head, affords good protection in all weather at the 519-foot breakwater-wharf with a U-shaped end, which has 30 feet of water alongside. There is a freight shed on the wharf and a floating slip on the inshore side of the breakwater. The light, 24 feet above the water, on the end of the breakwater is shown from a skeleton tower. Gasoline and diesel fuel are available at the wharf.

Head Harbour Passage is a deep and clear fairway, about 4 miles long, that follows the

northwestern side of Campobello Island from the sea to Friar Roads, opposite Eastport, where it joins Western Passage. The route through Head Harbour Passage and Western Passage is the one usually followed by vessels going to Passamaquoddy Bay and St. Croix River.

White Horse Islet, bare, rocky, and 68 feet high, is about 2.3 miles northeastward of East Quoddy Head. The islet, whitish in appearance and easily identified, is a good mark for the approach to Head Harbour Passage.

Little White Horse Ledges, close northeastward of White Horse Islet, are two dangerous unmarked sunken rocks about 200 yards apart. **North Rock,** steep-to and covered 1 foot, is about 0.5 mile northwestward of White Horse Islet and is marked by a buoy off its eastern side.

White Island, 1.6 miles northward of East Quoddy Head, has fringing shoals that extend as much as 400 yards from shore. A group of islets and shoals 0.5 mile northwestward of the island includes Nubble Island, Spectacle Island, and Hospital Islands.

Spruce Island, 0.8 mile north of East Quoddy Head, is steep-to on its eastern side. Islets and shoals extend 0.8 mile westward of the island. The westernmost of these dangers are **Tinkers Lower Ledge** and **Tinkers Upper Ledge,** about 200 yards east-northeastward and 300 yards south-southwestward of **Tinkers Island,** respectively. Each ledge is marked by a daybeacon.

Black Rock, small and bare, covered at high-water springs, and marked by a daybeacon, is 0.2 mile northwestward of East Quoddy Head and 0.6 mile southwest of Spruce Island.

Casco Bay Island, 0.5 mile southwestward of Black Rock and 0.5 mile from the nearest part of Campobello Island, is 85 feet high. The eastern side of the island is fairly steep-to, but ledges extend 300 yards off its northern end. Several shoals and ledges are within 0.3 mile of the western side of the island, one of which about 0.3 mile to the westward is marked by buoys on its northerly and southerly sides.

Green Island is about 0.4 mile southwestward of Casco Bay Island. An unmarked 26-foot shoal, near the middle of Head Harbour Passage, is 0.3 mile east-southeastward of Green Island and 0.4 mile from the shore of Campobello Island. **Sandy Ledge,** 400 yards westward of Green Island, is marked by a daybeacon.

Popes Island is 0.5 mile southwestward of Green Island. Shoals extend 300 yards southwestward of Popes Island. **Popes Shoal**, unmarked and covered 10 feet, is 300 yards southeastward of the islet. An unmarked 24-foot rocky shoal is about 700 yards southeastward of the islet. About 0.4 mile westward of Popes Island is Chocolate Shoal, which is covered 9 feet.

Indian Island, 109 feet high near its northern end, is 0.4 mile eastward of Deer Point, the south end of Deer Island. The channel between Indian and Deer Islands is deep. A shallow bank, on which are three islets extends about 500 yards off the southeastern part of Indian Island.

Cherry Island, at the southeastern end of this bank, is marked at its southeastern end by a light, 40 feet above the water, and shown from an aluminum skeleton tower on a white square building; a fog signal is at the light.

Passamaquoddy Bay is the large indentation in the shore of New Brunswick east of the mouth of St. Croix River. The principal entrance is by way of Western Passage, which has deep water and is comparatively free from dangers.

St. Andrews, a Canadian town in the east side of the entrance to St. Croix River, is a railroad terminus and has some commerce. A large hotel with a red roof and tower is prominent.

A dredged channel, with a depth of about 11 feet and marked by buoys and a light, leads to St. Andrews from the southeastward. **Western (Gut) Channel** to the westward of the town had a depth of 7 feet in 1968 and is marked by buoys. The anchorage, between the town and **Navy (St. Andrews) Island,** can be used by light-draft vessels.

The 350-foot railroad wharf at **North Point,** on the south side of the town, is reported to have depths of 10 feet alongside. The L-shaped 848-foot government wharf with depths of 10 to 13 feet alongside its 152-foot outer face is about 0.4 mile northwestward of the railroad wharf. A float landing is on the eastern outer end. Some supplies, including gasoline, are available in the town and water and electricity are available on the wharf. A light, 30 feet above the water, is shown from a pole on the outer end of the railroad wharf and another light, 25 feet above the water, is displayed from a tower on the outer end of the government wharf.

St. Croix River extends north-northwestward for 8 miles from the southern part of Passamaquoddy Bay, then turns westward between **Devils Head**and **Todd Point.** The Channel is deep and comparatively clear as far as the turn, then is narrow and winding, and has a controlling depth of about 16 feet for some 3 miles to Hills Point.

A dredged channel leads from above Hills Point to Calais. In 1961, the controlling depth was 6 feet to Calais, except for shoaling to bare along the north side of the channel in the vicinity of the public landing (45°11.5'N., 67°16.6'W.) at St. Stephen. The channel is marked by lights and buoys, but is not maintained. The two buoys on the north side of the channel at **The Narrows,** opposite **Whitlocks Mill Light,** tow under during the strength of the tide. Local knowledge is necessary for the river above Whitlocks Mill.

Small craft up to 40 feet in length can anchor in 14 feet on the west side of the channel just above Whitlocks Mill Light, but larger craft should anchor off Devils Head.

The scattered remains of an old breakwater, which uncover 12 feet in spots, extend southeastward across the mudflats on the south side of St. Croix River for about 300 yards from near channel Buoy 9. The mudflats, which uncover 11 feet, are opposite **The Ledge,** a village on the north side of the river about 9.7 miles above the mouth; caution is advised in this area.

Tides.-The mean range of tide is 19.2 feet at Robbinston and 20 feet at Calais.

Ice.-From January to March, St. Croix River is obstructed by ice, and usually is not navigable above Robbinston, but the channel to the oil wharf at Calais is kept open by Coast Guard ice breakers. Quoddy Narrows and Eastport Harbor are never closed by ice.

Freshets.-Spring freshets sometimes cause the water to rise above the level of the wharves at Calais and are accompanied by strong current. They are seldom noticeable outside of the river.

South Robbinston is at the head of **Mill Cove,** an unimportant bight on the west side of the mouth of St. Croix River.

Liberty Point is 0.7 mile northward of Mill Cove. **Robbinston** is a village just above Liberty Point. There is a prominent yellow brick stack of a former fish cannery, about 0.75 mile above the point. About 300 yards southward of this stack, are a red brick chimney and large green painted building of an inactive cannery, which has a wharf with a reported depth of 14 feet alongside.

On the Canadian side of the river, about 0.3 mile above Joes Point, the 3-story brick and concrete building and wharf of the Atlantic Biological Station of the Fisheries Research Board of Canada are conspicuous. The 580-foot wharf has 18 feet alongside. **Red Beach** is a small village on the west bank about 3 miles north of Robbinston.

St. Croix (Dochet) Island is in midriver off Red Beach. **St. Croix River Light** (45°07.7'N., 67°08.1'W.), 101 feet above the water, is shown above a platform on a white tubular steel tower on the island. The abandoned lighthouse, close northward of the light, is conspicuous. The white wooden structure of a former fog signal tower is on the west side of the island. In 1968, a part of St. Croix Island was established as a National Monument.

Scattered shoals, covered and awash, which fringe the island and extend southeastward 1.1 miles in midriver, are marked by buoys. The deeper and broader channel is eastward of the island and the shoals. The channel between the shoals and **Little Dochet Island,** a wooded islet midway between the southern end of the shoals and the western shore, is used considerably by local vessels, but it is not advisable for strangers to use it as the dangers are not marked.

An L-shaped wharf, owned by the Canadian Government, is on the east side of the river about 1.9 miles northward of St. Croix Island. In 1970, depths of 20 feet were reported along the 167-foot outer face of the wharf. The wharf is used primarily by tuna clippers to tranship their catch to a nearby cannery. Self-propelled cranes are used to unload the boats. Water is available.

Calais is a small city on the south bank of St. Croix River, about 14 miles above the river mouth and 24 miles from Eastport. The city has no waterborne commerce. It is a railroad freight terminus, and the manufacture of clothing and knit goods and berry packaging are the primary industries. There is a hospital in town.

International Bridge, between Calais and St. Stephen, is a fixed highway bridge with a clearance of 9 feet at the head of vessel navigation on St. Croix River. Small craft proceed to the dam above the bridge at high water.

Most of the wharves are in ruins and dry at low water. There is a town wharf and float landing on the south bank of the river, about 0.3 mile below the bridge; depths of 8 feet are reported alongside the float.

Calais is a **customs port of entry.** The customhouse is at the American end of the bridge, as is the immigration office. The city has taxi service, and is also served by a busline from Boston. There is no harbormaster, and no known local harbor regulations in force.

St. Croix Boat Club is on the south bank at **Todd Point.** There is a gravel ramp there for launching small craft.

There are no facilities on the American side of the river for servicing small craft, but gasoline, provisions, and some supplies can be obtained in town. Small fishing craft are reported to go upriver at high water as far as the milldam about 1.3 miles above the International Bridge at Calais.

Pilotage is not compulsory.

St. Stephen is the Canadian town on the opposite side of the river from Calais. A large inactive fertilizer plant 0.8 mile east of the bridge has a wharf which in 1970 was used to unload petroleum products from small coastal tankers at high water. Provisions of all kinds and a limited variety of deck and engineroom stores can be obtained. Minor repairs can be made by various machine shops in the town. The town has a hospital and plants which manufacture building materials, hockey sticks, and candy. There is a telegraph office, bus service, and freight rail connections. A public wharf with float at St. Stephen is maintained from June to September. There is reported to be 4 feet at the head of the wharf.

Canadian **Customs** and **Immigration** officers are stationed at the International Bridge. St. Stephen is a customs port of entry, and marine documents are issued.

Cobscook Bay, extending westward from Moose Island, is large and irregular and has several arms. The approach channel is between Moose Island and **Seward Neck,** about 0.6 mile southwestward. Local knowledge is needed to navigate the arms of

the bay because of the numerous rocks and dangerous currents.

The deepest draft using Cobscook Bay is 14 feet. Strangers seldom enter. Local knowledge is recommended.

Cobscook Falls, the western passage from Cobscook Bay to Dennys Bay, are reversing falls; a State park is on **Mahar Point** at the falls.

Good anchorage can be found in many of the arms or coves in Cobscook Bay, but in most of the channels the currents are too strong and the bottom is too rocky. In the winter, ice obstructs navigation near Whiting at the head of Whiting Bay (chart 13327 (303)) and Dennysville, and in severe winters other parts of the bay also are affected.

Bar Harbor, a shoal arm of the bay northwest of Moose Island, can no longer be used as a shortcut between Cobscook Bay and Western Passage because the eastern passages north and south of Carlow Island have been closed by earth and rock dams. An overhead power cable crossing the entrance has a clearance of 45 feet.

Pennamaquan River empties into Cobscook Bay from northwestward about 4 miles west of Moose Island. The river has ample depth for about 1.7 miles above the entrance, and the principal dangers are marked by buoys. Low-water flats extend 0.8 mile downstream from **Pembroke,** a town 3 miles above the mouth of the river.

Deepest-draft vessels now using Pennamaquan River are the coastal oil tankers carrying 14 feet to the oil pier on **Hersey Neck,** about 1 mile west of **Garnet Point,** the southeastern extremity of Hersey Neck. The wooden pier is owned and operated by the Mobil Oil Company. It is about 200 feet long and has a deck height of 5 feet and a reported 18 feet alongside the breasting dolphin at its outer end. It is used to unload petroleum products. The manifold is at the end of the pier. There are no facilities available at the pier, which was in poor condition in 1970.

At **West Pembroke,** about 0.8 mile southwest of Pembroke and on the northwest prong of Pennamaquan River, there is an inactive fish factory with a wharf to which it is reported a draft of 12 feet can be carried at high water.

Dennysville is a village about a mile up **Dennys River** at the head of **Dennys Bay,** an arm of Cobscook Bay. U.S. Route 1 highway bridge just above the mouth of the river has a fixed span with a clearance of 14 feet. There is no waterborne commerce, and the river is important only as a salmon fishing stream.

Whiting is a village at the head of **Whiting Bay** (see chart 13327 (303)), which is an arm of Cobscook Bay. Low-water flats filled with boulders extend about a mile below the village. With local knowledge, small craft at high water can go as far as the dam at the mouth of **Orange River** at the village. The channel is unmarked and difficult to follow.

Currents.-In Grand Manan Channel, the flood current sets in a general northeast direction and attains a velocity of about 2.8 knots at strength. The ebb sets in a southwesterly direction with a velocity of about 2.2 knots at strength. Daily predictions are given in the Tidal Current Tables.

Less than 2 miles from the northern shore on the approach to the entrance to Quoddy Narrows, the set of the flood currents is more northward; about 1 mile southeastward of West Quoddy Head the flood sets directly into the narrows. For a distance of 0.5 mile southeastward of West Quoddy Head the currents are dangerous because of swirls and eddies which, in a light breeze, are apt to draw a vessel onto Sail Rock.

Along the eastern side of Campobello Island the flood current follows the trend of the shore in a northeasterly direction and the ebb sets in the opposite direction.

In Head Harbour Passage the tidal current is said to attain a velocity of 5 knots at times. The flood sets strongly westward toward the islands about 1 mile northward of Campobello Island. The direction of the flood then changes more southward, following the general direction of the passage until nearly to Eastport, where the set is more westerly, toward Western Passage between Deer and Moose Islands, and toward the entrance to Cobscook Bay. The ebb generally sets in a reverse direction.

Through Lubec Narrows, the flood current sets northward, following the general trend of the channel; southward of the narrows it has a velocity about 4 knots at strength, but in the narrows attains a velocity of about 6 knots during the spring tides. The ebb sets southward, following the general direction of the channel, and in the narrows has a velocity of about 8 knots during spring tides. Below the narrows its velocity is about 4 knots, and the set is in the general direction of the channel. The currents at strength form dangerous eddies on both sides of the channel in the narrows; these are avoided by keeping in midchannel. The duration of slack in the narrows is only 5 to 15 minutes.

Northward of Lubec Narrows, the first of the flood current sets along the west shore of Campobello Island eastward of Popes Folly; it afterwards sets more westward, south of Popes Folly, and across the entrance to Johnson Bay, meeting the flood from Friar Roads westward of Treat Island, and both setting into Cobscook Bay.

The flood current sets northward into Western Passage; and off Deer Point, abreast Dog Island, it forms whirlpools and eddies which are dangerous to open boats. The whirlpools and eddies are strongest 2 to 3 hours before high water and during spring tides; the flood then attains a velocity of about 6 to 7 knots. The least disturbance is usually about 300 yards northward of Dog Island, where there is a comparatively narrow direct current which can be readily followed between the whirl-

pools and eddies on either side. The ebb sets southward but is weaker than the flood.

Above Deer Point the flood sets northward with decreasing velocity and follows the general direction of the channel with strong countercurrents and eddies close to the shore, where the configuration of the land is favorable. The ebb sets southward with reduced velocity and disturbance off Deer Point, and the inshore reverse currents are less marked than on the flood. For predictions, the Tidal Current Tables should be consulted.

In St. Croix River, the flood current sets northward with countercurrents inshore on both sides where the conformation of the land is favorable for them. The ebb sets southward with less marked countercurrents. The tidal current normally attains a velocity of about 2 knots between the mouth of the river and Devils Head and 3 to 4 knots between Devils Head and Calais.

In Cobscook Bay and its tributaries the tidal currents follow the general direction of the channels, but in the coves there are strong reverse eddy currents, and heavy overfalls form over the submerged rocks and ledges. The velocity is estimated at 5 to 8 knots, and some of the buoys are towed under when the currents are at strength.

5. QUODDY NARROWS TO PETIT MANAN ISLAND, MAINE

This chapter describes the rugged Maine coast, with its numerous bays, coves, islands, and rivers, from Quoddy Narrows westward to Petit Manan Island. Cutler, Bucks Harbor, Machiasport, Machias, Jonesport, Millbridge, and several other coastal towns are discussed.

Charts 13325 (1201), 13327 (303).-Grand Manan Channel, between the coast of Maine and Grand Manan Island, is an approach from westward to Quoddy Narrows and Passamaquoddy Bay. It is the most direct passage for vessels bound up the Bay of Fundy from along the coast of Maine. The channel varies in width from 5.5 miles abreast Campobello Island to 10 miles abreast Southwest Head, the southern point of Grand Manan Island. The western approach is marked by Machias Seal Island Light, which also marks most of the rocks and ledges that lie southwestward of Grand Manan Island. With the exception of the dangers between Machias Seal Island and Grand Manan Island, and the 33-foot unmarked rocky shoal known as **Flowers Rock,** 3.9 miles west-northwestward of Machias Seal Island, the channel is free and has a good depth of water. The tidal current velocity is about 2.5 knots and follows the general direction of the channel. Off West Quoddy Head the currents set in and out of Quoddy Narrows, forming strong rips. Sailing vessels should not approach West Quoddy Head too closely with a light wind.

Southwest Head, the southern extremity of Grand Manan Island, is a high cliff. **Southwest Head Light** (44°36.0′ N., 66°54.4′ W.), 200 feet above the water, is shown from a 30-foot concrete tower on the cliff. A fog signal and radiobeacon are at the light. It is the principal mark for Grand Manan Channel. A lighted whistle buoy is 0.7 mile south-southwestward of the light.

It is reported that the fogs often hang close in to the Maine coast between Machias Bay and West Quoddy Head, extending about one-third the way across Grand Manan Channel, while the rest of the passage may be entirely clear of fog.

Machias Seal Island, 10 miles southwestward of Southwest Head, is about 500 yards long and 28 feet high. **Machias Seal Island Light** (44°30.1′N., 67°06.1′W.), 82 feet above the water, is shown from a 60-foot white octagonal tower on the summit of the island; a fog signal is at the light. The island is steep-to on its western side. A drying reef, on the end of which is an islet, extends 0.4 mile northeastward. A covered rock is about 300 yards northward of the islet. Depths of 20 feet 0.6 mile eastward and 30 feet 1.2 miles east-northeastward of the light are unmarked as is a 14-foot shoal, sometimes marked by a tide rip, 0.3 mile southeastward of the island.

Southeast Shoal, 1.2 miles southeastward of Machias Seal Island, is covered 9 feet. This shoal breaks in heavy weather and shows a rip during the strength of the tidal current, which reaches a velocity of 3 knots. A depth of 30 feet is about 450 yards southeastward of the shoal.

North Rock, 4 feet high and surrounded by shoal water to a distance of 800 yards, is 2 miles northward of Machias Seal Island Light.

North Shoal, covered 9 feet, is 1.5 miles northward of the light. A depth of 40 feet is 700 yards northward and a depth of 28 feet is 0.1 mile southward of the shoal. The shoal breaks in heavy weather, and the whole area is marked by tide rips.

Middle Shoal, 5 miles northeastward of Machias Seal Island, is covered 17 feet, with deep water close-to. The shoal shows a tide rip and breaks in heavy weather.

Bull Rock, awash at low water and usually breaking, is 5 miles eastward of Machias Seal Island, and is marked by a lighted whistle buoy. It is surrounded by deep water. **Little Shoal,** a rocky patch covered 28 feet and usually marked by a tide rip, is about midway between Bull Rock and Machias Seal Island. **Guptill Grounds,** covered 29 feet and unmarked, are 1.2 miles south-southwestward of Bull Rock.

Local magnetic disturbance.-Magnetic disturbance has been reported in the vicinity of 44°31.5′N., 66°55.0′W.

Southeast Ledge, nearly 6 miles southeastward of Machias Seal Island, covered 24 feet, shows a tide rip and breaks in heavy weather. **Middle Breaker,** a 36-foot patch, marked by tide rips, is 1.4 miles northwestward of this ledge.

Wallace Ledge, the northernmost of the Murr Ledges, 3.2 miles northeastward of Bull Rock, uncovers 9 feet.

Eastward of this area are numerous reefs and ledges which are shown on NOS chart 13260 (1106) and N.O. Chart (H.O. 1057) 14061. These dangers are beyond the limits of chart 13325 (1201) and are described in H.O. Pub. 12, Sailing Directions for Nova Scotia. Some of the dangers are **Murr Ledges, Halftide Rock, St. Mary Ledge, Yellow Ledge, Cross Jack Ledge, Long Ledge, White (West) Ledge,** and **Gannet Rock.** Gannet Rock is about 15 feet high and is marked by **Gannet Rock Light** (44°30.6′N., 66°46.9′W.), 106 feet above the water, shown from a red lantern on a 91-foot octagonal wooden tower painted in black and white stripes; a fog signal is at the light.

Chart 13327 (303).-The coast southwestward between West Quoddy Head and Moose Cove (44°44.2′N., 67°05.6′W.) is in general rocky,

wooded, and steep-to, and is indented by several coves of slight importance. Along this stretch of coast from West Quoddy Head to Long Point (44°40.1'N., 67°09.3'W), and particularly off Jims Head (44°45.7'N., 67°03.0'W.), a very rough sea builds up quickly when the wind is contrary to the tidal current and small craft may find themselves beset and unable to make the shelter of the coves without assistance.

Boundary lines of inland waters.-The lines established for this section of the New England Coast are described in **82.5**, Chapter 2.

Carrying Place Cove, on the west side of West Quoddy Head, has a few buildings at its head. **Wallace Cove**, 1.9 miles southwest of West Quoddy Head Light (44°48.9'N., 66°57.1'W.), and **Hamilton Cove**, 3 miles southwest of the light, have no distinguishing features.

Morton Ledge, covered 6 feet and marked by a buoy, is 2.2 miles southwestward of West Quoddy Head Light, and 0.3 mile offshore. **Boot Cove**, 4 miles southwestward of the light, has a few small fishermen's houses at the head.

Baileys Mistake, 5.5 miles southwest of West Quoddy Head Light, appears from offshore to be a good anchorage, but the holding ground is poor and it is not a good harbor even though a few fishing boats moor here. There are three wharves in the cove; one on the east side, halfway up the cove; and two on the western head of the harbor, where there is also an inactive herring smokehouse. A conspicuous white house and a white church steeple are on the slope in the village of **South Trescott** at the head of the harbor. **Bailey Ledge**, which uncovers 5 feet, obstructs the western half of the entrance. A buoy marks the southern side of the ledge. **Jims Head** on the northeastern side of the entrance, is 160 feet high and prominent. A whistle buoy is 0.2 mile off the head.

Haycock Harbor, the head of which is locally known as **The Pool**, is 6.3 miles southwestward of West Quoddy Head Light. The Pool is sometimes entered by small craft at high water. The depth inside is reported to be 7 feet. **Sandy Cove** is an open bight just southwestward of the harbor.

Moose Cove is 7.8 miles southwest of West Quoddy Head Light. **Eastern Head**, the eastern extremity of the north entrance point, has a 198-foot hill behind it. **The Porcupine**, a distinctive 280-foot hill, is 1.8 miles northwestward of the head. **Mink Islet**, and **Little Mink Islet**, feet high, are on **Eastern Head Ledges**, which extend over 0.2 miles offshore. **Little Moose Islet**, 10 feet high, is 250 yards northward of the ledges.

Moose River is at the head of Moose Cove. There is a small wharf on the south side of the river at its narrowest point. On the north side of the river a rocky spit makes out, forming a natural shelter for small boats.

From Moose Cove to Little River, a distance of about 6.5 miles, the coast has no features of importance. The several open, shallow coves include **Bog Brook Cove, Holmes Cove, Black Point Cove,** and **Long Point Cove.** Just north of Little River are **Almore Cove** and **Money Cove.**

Little River is 15 miles southwestward of West Quoddy Head Light. In the middle of the entrance is **Little River Island**, which is wooded and has rocky sides. **Little River Light** (44°39.1'N., 67°11.5'W.), 57 feet above the water, is shown from a 41-foot white conical tower on the northeast corner of the island; a fog signal is at the light. A bell buoy, 0.5 mile east-northeastward of the light, marks the entrance to the harbor. A lighted whistle buoy is 2 miles southeastward of the light.

A tree-covered islet on the north side of the entrance, about 350 yards north of Little River Island, and two tree-covered islets off Western Head, on the south side of the entrance, are conspicuous. About 0.5 mile westward of Little River Island, on the prominent point on the south side of Little River, there is a conspicuous white house; and on the north side, about the same distance in, there is a conspicuous white building with a cupola in the village of Cutler.

Little River is small, but is easy of access and is an excellent harbor of refuge, sheltered from all winds and depths of 12 to 30 feet, good holding ground. The channel leads northward of the light and has a depth of about 28 feet. The anchorage just inside of Little River Island is about 0.5 mile long and 0.2 mile wide. The harbor is never obstructed by ice sufficient to prevent vessels from entering.

Eastern Knubble is the point on the northern side of the entrance to Little River. Just south of Eastern Knubble and 100 yards offshore is **Little River Ledge**, which uncovers and is marked by a buoy. A ledge extends 100 yards from the south shore, just eastward of a prominent point 0.5 mile west of Little River Island. With these exceptions, there are no dangers in the harbor if the shores are given a berth of 100 yards. Care should be taken in entering to stay in midchannel because of the fishweirs and fishweir ruins, often covered at high water, that extend a considerable distance from the shores on both sides just within the entrance. Numerous mooring piles are in the harbor and a lobster car is some distance off the large wharf.

To enter Little River, pass northward of Little River Island, giving it a berth of 150 yards. Anchorage can be selected anywhere in midchannel inside the island. Small local craft anchor off the wharves in depths of 6 to 18 feet. The passage southward of Little River Island has a rocky bar across it with a least found depth of 10 feet in midchannel. This passage should not be used by strangers.

Cutler is a village on the north shore of Little River. Many fishing vessels and lobster boats base at the harbor, and it is a popular yacht haven. There are two wharves with float landings; at the

largest and westernmost, there is reported to be a depth of 8 feet. Gasoline, diesel fuel, and water are available at this wharf and gasoline at the other. Groceries and limited marine supplies are available. Good roads lead to East Machias and to Lubec. A **harbormaster** who supervises the moorings lives at the shore end of the western wharf.

Between Little River and Little Machias Bay there are no features of importance. **House Cove,** 0.6 mile west of **Western Head** (44°38.7′N., 67°11.5′W.), the point on the south side of the entrance to Little River, is a small open bight extending somewhat behind **Great Head 13327 (303). Deer Island,** 1.7 miles westward of Western Head, is a small island close to shore. About 0.3 mile offshore in this vicinity is a series of ledges on which depths as shoal as 13 feet are found.

Little Machias Bay, 2.5 miles west of Little River Light (44°39.1′N., 67°11.5′W.), is not used for an anchorage as it is exposed to southerly and southeasterly winds and is close to Little River and Machias Bay, both excellent anchorages. Little Machias Bay is 0.6 mile wide at the entrance, wider inside, and about 2 miles long. **Black Ledges** are bare islets 4 feet and 24 feet high in the middle of the entrance to the bay with deep water close-to on both sides. **Long Ledge,** which uncovers 14 feet, is in the middle of the bay 1 mile inside the entrance. Above Long Ledge the bay is much obstructed by shoals and ledges, two of which are **Upper Ledge** and **Widows Ledge;** both uncover 13 feet. Fishweirs and the ruins of fishweirs are numerous in the bay. There are some houses on the shores of the bay, but no wharves except for small craft at high water. **North Cutler** is a settlement on the north shore of the bay.

Old Man is a small but conspicuous rocky island 71 feet high and grassy on top, 0.5 mile southeastward of Cape Wash Island off the entrance to Little Machias Bay. Old Man is a good mark and may be safely approached as close as 400 yards.

Cape Wash and **Cape Wash Island** are on the western side of the entrance to Little Machias Bay. Reefs extend about 0.2 mile south of the island. Just westward of Cape Wash are **Holly Cove** and **Little Holly Cove,** which are important only to small craft. The peninsula as far north as Sprague Neck and North Cutler is a naval reservation. Numerous radio towers of various heights on the reservation are conspicuous.

Cross Island, 1.6 miles southwestward of Old Man, is the large wooded island on the east side of the main entrance to Machias Bay. A few unpainted shacks on low, flat, **Grassy Point,** the northern extremity of the island, are prominent when approaching Cross Island Narrows from westward. Small thickly wooded **Mink Island** is 0.2 mile off the northeast shore of Cross Island. From seaward, the most conspicuous mark on Cross Island is a skeleton lookout tower on a hill at the eastern end.

Cross Island Narrows is a channel leading into Machias Bay northeast of Cross Island. **Thornton Point** and **Quaker Head** are on the northern side of the passage. The channel is much obstructed by rocks, covered or awash at various stages of the tide, and should not be used without local knowledge. Small craft can go through the narrows by closely following the chart and not placing too much reliance on the floating aids, which are apt to drag from station during heavy weather. **Dogfish Rocks,** about 350 yards northward of Grassy Point, uncover 8 feet. A buoy is north of the rocks.

Cross Island Narrows are seldom obstructed by ice in the winter, and consequently **Northeast Harbor,** the cove southwestward of Mink Island, is much used as a winter anchorage by small fishing boats.

Northwest Harbor, a bight in the northwestern shore of Cross Island has depths of 21 to 54 feet, but is little used as an anchorage.

Chart 13326 (304).-Machias Bay, about 22 miles southwestward of West Quoddy Head Light, is the approach to Machias River, and the towns of Machiasport and Machias. The bay is about 6 miles long and 1 to 3 miles wide, is easily entered day or night, and affords well-sheltered anchorage for large vessels. The 2 mile wide main entrance is between Cross Island on the east and Stone Island on the west. Sheep are kept on several of the islands in Machias and Englishman Bays during the summer.

Libby Islands, in the middle of the entrance, are two flat grassy islands connected by a bare ledge. Sunken ledges extend about 300 yards off the southern end of the southwestern island and about the same distance off the eastern shores of both of the islands.

Libby Island Light (44°34.1′N., 67°22.1′W.), 91 feet above the water, is shown from a 42-foot white granite conical tower on the southwestern island. A fog signal is at the light. The light is obscured from 208° to 220°. The light is the principal guide to the entrance to Machias Bay. This light and the buildings of the light station, the numerous radio towers on Cutler Peninsula northward of Cape Wash (see chart 13327 (303)), and the domes of the three radar towers on Howard Mountain (44°37.8′ N., 67°23.8′ W.) are the prominent objects in the area.

Several vessels have been wrecked on the eastern side of Libby Islands during thick weather, indicating a possible dead zone for sound signals to the eastward.

Avery Rock is in the middle of the bay, 4 miles from the entrance. **Avery Rock Light** (44°39.3′N., 67°20.7′W.), 52 feet above the water, is shown from a 30-foot white steel skeleton tower on the rock. It is the guide for vessels bound up the bay. A bell buoy is close southwestward of the rock. The best anchorages are in Starboard Cove and in the head of the bay above Avery Rock Light.

A 452-foot U.S. Navy oil handling pier with a 244-foot T-head is on the east side of the entrance to **Deep Cove,** about 2.2 miles southeastward of Avery Rock Light. There is reported to be 30 feet of water alongside the head.

Ram Island and **Foster Island,** about 1.5 miles west of the Libby Islands, are grass-covered and surrounded by ledges.

Foster Channel, between Foster and Ram Islands, is a narrow passage between Englishman Bay and the western side of the entrance to Machias Bay. The buoyed channel has a depth of about 18 feet.

Starboard Island Ledge, 0.5 mile east of Foster Island, is covered 7 feet and marked by a buoy off its southeastern end.

Stone Island, 1.1 miles northwest of Libby Islands, is wooded and has an 89-foot bare rocky face at the south end. **Stone Island Ledge,** 0.2 mile east of the island and covered 8 feet, is marked by a daybeacon.

Starboard Island, 0.7 mile west of Stone Island, is 70 feet high and grassy at the southwest end and sparsely wooded at the northeast end, and has a conspicuous house in the western slope. **Starboard Island Bar,** which uncovers 7 feet, connects the island with the shore.

Starboard Cove, on the western side of Machias Bay 2.5 miles northward of Libby Island Light, is formed on the south by Starboard Island and the bar.

Excellent anchorage, except in easterly weather, is available in Starboard Cove in depths of 15 to 24 feet. The cove is frequented by coasting vessels bound through Moosabec Reach making anchorage for the night. A good berth is in the middle of the cove, with the north end of Starboard Island in line with the south end of Stone Island, in depths of 18 to 21 feet. Small vessels can anchor closer to the bar, provided they take care not to shut out the north end of Stone Island by the north end of Starboard Island. The cove is entered eastward of Starboard Island, passing on either side of Stone Island.

Starboard, a small village on the western side of Starboard Cove, has no wharves.

Howard Cove, northward of Starboard Cove, is not a good anchorage; the holding ground is poor and the cove is exposed to southeast winds. **Jasper Beach** at the head of the cove is composed of small stones of Jasper quartz of all colors. There are no wharves. Broken ground, including a rock which uncovers 4 feet, extends 0.3 mile southward and 0.7 mile eastward from **Howard Point,** the eastern entrance point of the cove. The eastern extremity of this broken ground is **Seashore Ledge,** covered 4 feet, and marked by a buoy.

Bucks Harbor is a shallow cove in the west shore of Machias Bay 4 miles northward of Libby Island Light. **Bar Island** is on the northern side of the entrance to the harbor, and **Bucks Head** is on the southern side. The small fishing village of **Bucks Harbor** is on the slope westward of the harbor. Small vessels can anchor 200 yards off the southern side of Bar Island in depths of 8 to 15 feet. The ruins of a footbridge, which formerly connected Bucks Neck with the settlement of Bucks Harbor, are on the western side of the harbor. On the southwest side of Bucks Harbor, opposite Bar Island, and 0.4 mile in from Bucks Head, is a 130-foot pier with a 30-foot T-head and a float which has from 4 to 6 feet alongside. Gasoline is piped to the float. Another 140-foot pier with 6 feet alongside its float landing is on Bucks Neck. Gasoline is piped to the float. An elevated shed on the end of this pier is prominent. Provisions and some marine supplies may be obtained at a store in the village.

A wreck, visible at low water, is off **Mountain Head** and 0.3 mile northwest of Bar Island. Vessels entering the harbor should keep in midchannel, because of the fishweirs on both sides just inside the entrance, which may be covered at high water.

Colbeth Rock, 0.7 mile east-southeastward of the northern tip of Bucks Head, is covered 28 feet, breaks in heavy weather, and is unmarked.

All of the islands in Machias Bay above the entrance are high and wooded, with rocky shores. **Yellow Head,** 0.5 mile east of Bar Island, is high, yellow in color, and a good landmark. **Chance Island,** 0.8 mile eastward of Yellow Head, is 123 feet high and wooded on its northern part. **Bare Island** is 0.2 mile northward of Yellow Head and Bar Island. **Salt Island,** 137 feet high, is 0.8 mile north of Bare Island. **Round Island,** 134 feet high, is 300 yards northeastward of Salt Island. **Hog Island,** 30 feet high, is 0.8 mile northeast of Round Island.

Larrabee Cove, largely dry at low water, and **Indian Cove** are small indentations in the west shore of Machias Bay northwest of Avery Rock Light. These coves are of little importance. Good anchorage for vessels of 8 feet draft will be found on the flats between Salt Island and Bare Island, near the entrances to the coves. The ruins of a fishhouse and small wharf, nearly bare at low water, are in Indian Cove. A rock, which uncovers 9 feet, in the middle of the cove, is the principal danger. The small village of **Larrabee** is at the head of Larrabee Cove.

Holmes Bay, a large bight in the northeastern part of Machias Bay and northeast of Hog Island, is shallow and has extensive reefs. A seafood-packing plant and wharf which dries at low water are on the north shore of the bay. A white schoolhouse on the point close eastward of the factory and a white church with belfry, about 0.6 mile westward, are conspicuous. Most of the bay dries at low water and is used only by fishermen.

Machias River, which empties into the northwestern part of Machias Bay, has a narrow, winding channel leading through flats that are mostly bare at low water. The least depth in the channel to the town of Machiasport is about 17

feet. Above Machiasport, the channel has shoaled to less than 1 foot in the bend below Machias, but with local knowledge 2 to 3 feet can be carried to Machias.

A fixed highway bridge with a clearance of 25 feet crosses the river about 2 miles below Machias. A powerplant and milldam cross the river at **Machias Falls** at Machias.

The mean range of tide is 12.6 feet at Machias.

In severe winters, Machias River is closed to navigation by ice, and drift ice will sometimes fill the bay above Avery Rock. In ordinary winters the bay and river are open to Machiasport.

Machiasport is a town on the west bank of the Machias River, 2.5 miles above the entrance. Prominent landmarks include a church spire, the cupola of the town hall, northward and below the spire, the tall metal stack of a cannery, and a white church with belfry on the slope of the east bank of the river opposite the town. **Customs** duties are attended to by an officer from Jonesport. There is a **harbormaster** in the town.

The wharves of two canneries have 8 feet alongside. The lower cannery was inactive in 1970 and the wharf was in poor condition. There is a boatyard with marine railways capable of hauling out craft up to 50 feet in length. Hull repairs and open and covered storage are available. A good road connects Machiasport with U.S. Route 1, the main coastal highway, at Machias.

East Machias River, which empties into Machias River from northeastward 1 mile above Machiasport, is practically bare at low water at **East Machias,** a village on the railroad 1.5 miles above the entrance. The channel is difficult and is little used except by small craft. There is a U.S. Public Health Service **contract physician's office** at East Machias; see Appendix for address.

Machias is a town of marked historical interest at the head of navigation on Machias River. There is no waterborne commerce. Most of the wharves are in ruins, dry at low water, and unsafe to lay at due to projecting underpinning. A town concrete ramp is on the west side of the entrance to **Middle River.** The entrance to the river is crossed by an earth-fill causeway with culvert openings. The Machias Boat Club is at Machias. Gasoline, limited marine supplies, banks, groceries, motels, a pharmacy, and hospital are available in the town.

Craft bound for Machias Bay and River from the eastward should not attempt passage through Cross Island Narrows without local knowledge. With the aid of the chart they should have no trouble passing southward of Cross Island, and when clear of the buoyed ledge southwest of the island, shape up the bay for Avery Rock Light. Pass either side of the rock, preferably to the westward, passing eastward of Round Island then head up for the river entrance, which is marked by a buoy on its southwestern side. The chart is the guide.

Approaching from the southward and westward, vessels with the aid of the chart may pass either side of Libby Islands and head up the bay for Avery Rock Light, keeping clear of Stone Island Ledge and unmarked Colbeth Rock. Pass westward of Avery Rock and proceed as in the preceding paragraph.

Anchorage may be had anywhere between Avery Rock and Round Island, or eastward or northeastward of the latter at a distance not greater than 0.5 mile, in depths of 30 to 45 feet.

The channel in Machias River is marked by buoys to about 0.8 mile below Machiasport and should be followed with the aid of the chart. The best time is at low water when the flats are visible and the channel more clearly defined. Small vessels often anchor in the channel off the wharves at Machiasport, or for a distance of about 0.5 mile southward of the wharves.

Above Machiasport, the channel that leads between shoals which uncover is sometimes marked by stakes. Local knowledge is necessary to carry the best water, but strangers in small craft should have no trouble in going to Machias on a rising tide with the aid of the chart.

Englishman and Chandler Bays form a large bight in the coast between Libby Islands and Head Harbor Island. **Roque Island,** 6 miles west of Libby Islands, and numerous smaller islands are in the middle of the bight. The bays join northward of Roque Island and form a good anchorage, with depths of 18 to 32 feet and good holding ground.

Englishman Bay, northward of Roque Island, has numerous dangers, most of them unmarked, in the approach to the anchorage northward of Roque Island, but the buoyed channel is broad and is easily followed in daytime and in clear weather with the aid of the chart. The principal entrance to the bay from eastward is between Scabby Islands on the east and The Brothers on the west, and affords a straight channel to Shoppee Island above which is the anchorage. The principal dangers are Scabby Island Ledge, Codhead Ledge, Halifax Island Reef, and Boundary Ledges.

The bay may be entered from Machias Bay through Foster Channel. Vessels from westward, bound to the anchorage at the head of Englishman Bay or to Chandler River, usually pass through Chandler Bay. Foster Channel and the adjacent islands have been discussed previously.

Scabby Islands, on the eastern side of the main entrance to Englishman Bay, are grass covered. A 93-foot mound on the larger Scabby Island is the most prominent mark in approaching Foster Channel from westward. Sheep are kept on Scabby Islands and several other islands in the bay. A covered rock is 400 yards north of Scabby Islands. **Scabby Island Ledge,** awash at low water and unmarked, is 250 yards southwestward of the islands.

Codhead Ledge, awash at low water and marked by a buoy, is 1.5 miles northwestward of the Scabby Islands.

Shag Ledge, 0.9 mile eastward of Codhead Ledge, has a low grass-covered islet 13 feet high on its western end. The northeast end of the ledge is covered only at high water, and the south end shelves off to 13 feet. An unmarked shoal covered 5 feet is midway between Codhead and Shag Ledges.

Pierson Ledge, 0.4 mile northward of Shag Ledge and 350 yards west of **Point of Main,** uncovers 4 feet.

Hickey Island, 0.7 mile northwestward of Shag Ledge and in the entrance to Little Kennebec Bay, is 38 feet high and partly wooded. Sheep are kept on the island. Small craft can find shelter in a small cove in the north side of the island. A rock awash at low water is 250 yards off the east side of the island, and a ledge extends 200 yards south of the island. About 300 yards north of the island is a shoal covered 7 feet.

Little Kennebec Bay, which extends northward from the eastern part of the Englishman Bay, is of little commercial importance and is frequented mostly by fishermen. Good well-sheltered anchorage can be found in depths of 12 to 40 feet, soft bottom, northward of **Sea Wall Point,** 1 mile north of Hickey Island. However, this anchorage is seldom used, as nearby Machias Bay and Starboard Cove are much easier of access and are better anchorages. There are fishweirs in the upper part of the bay.

The Brothers, grassy islands with rocky shores, are on the southwestern side of the main entrance to Englishman Bay. A bell buoy is off the northeast end of The Brothers.

Green Island, 0.3 mile north of The Brothers, is grassy. **Green Island Ledge,** partly bare at low water, extends 0.3 mile eastward from the island and is marked by a buoy on its eastern side. A ledge, awash at high water, extends 200 yards westward from Green Island.

Brothers Passage, between Green Island and The Brothers, has a depth of 27 feet in midchannel.

Pulpit Rock, 1 mile westward of The Brothers, is a bare rocky islet. The southern and eastern sides should be given a berth of at least 300 yards, as a rock covered 7 feet is about 150 yards southeastward of it.

Jumper Ledge, about 0.6 mile southward of Pulpit Rock and covered 5 feet is marked by a buoy. An unmarked 28-foot spot is 0.8 mile east-southeastward of the ledge. **Misery Ledge,** covered 14 feet, about 0.6 mile south-southeastward, is also unmarked.

Halifax Island, 0.8 mile northwestward of Green Island, is grass-covered with rocky sides, and has a prominent mound at its western end. **Anguilla Island, Double Shot Island, Great Spruce Island,** and **Little Spruce Island,** all westward of Halifax Island, are wooded. A rock, which uncovers 6 feet, is 350 yards southeastward of Halifax Island. A bar with depths of 15 to 26 feet extends from Halifax Island to Green Island. The current is reported to boil over the bar, and this passage should be used with caution.

A rock that uncovers 7 feet is 300 yards southward of Double Shot Island. **Shag Rock,** 500 yards eastward of Double Shot Island, is 14 feet high and bare.

Roque Island Harbor is formed on the north and west by Roque Island and Lakeman and Bar Islands, and on the south by Great Spruce Island and the islands extending eastward to Halifax Island. The harbor affords shelter from all winds and is used by small vessels, but the holding ground is not good except in spots. The best anchorage is in the western or northwestern parts of the harbor where the bottom is soft.

The best entrance to Roque Island Harbor is northward of Halifax Island across a rocky reef with spots of 5 to 10 feet. Kelp is reported to be visible at low water on the reef.

Lakeman Island, Bar Island, and **Marsh Island** are off the northeast side of Roque Island and on the northern side of the entrance to the harbor.

To enter Roque Island Harbor, follow the chart carefully, keeping clear of unmarked dangers in the entrance. The principal dangers in Roque Island Harbor include a spot with 8 feet on it 0.2 mile off the middle of the north side of Great Spruce Island, and unmarked **Seal Ledge,** which uncovers 5 feet and is 300 yards westward of the southern point at the eastern end of Roque Island.

Lakeman Harbor, on the northeast end of Roque Island Harbor, is a good anchorage for small craft.

The **Thorofare,** connecting the southwest side of Roque Island Harbor with Chandler Bay, has a depth of 8 feet and a reported covered rock in a narrow, crooked channel. The bottom is visible in the shoaler parts of the channel. The Thorofare is used considerably by small vessels with local knowledge. Strangers should avoid it.

Bunker Cove, between Great Spruce and Little Spruce Islands and the Thorofare, is a good harbor and is used for winter storage of small craft. Small craft often anchor in its entrance just off the Thorofare.

Shoppee Island (44°36.1′ N., 67°29.4′ W.), 2 miles northwest of Halifax Island, is flat and wooded except at the northwest end. Sheep are kept on the island. **Boundary Ledges** extend northeastward from Roque Island to within 0.4 mile of Shoppee Island. The rocks at the outer end of the ledges, bare at low water, are marked by a buoy.

Shoppee Point is on the mainland 0.3 mile north of Shoppee Island. A private wharf with a 45-foot outer face is on the northwest end of the point; a depth of 9 feet is alongside the face. There is a pier with float landing and shed near its head, about 0.3 mile southward of the private wharf. Gasoline is available at the float landing; depths of 4 feet are reported alongside.

Roque Bluffs is a village 0.6 mile eastward of Shoppee Point. The mouth of **Englishman River,**

southeast of Roque Bluffs, is crossed by a fixed highway bridge with a clearance of 3 feet. The yellow bluffs at the mouth of the river are prominent from the southward.

Shorey Cove, a bight in the north shore of Roque Island, has depths of 7 to 13 feet. The cove is a good anchorage for small vessels, but is little used. There are no dangers if the southern and western shores of the cove are given a berth of over 300 yards. There is a private landing in the cove on the east side of **Squire Point,** the northwest extremity of Roque Island.

Great Cove, on the northeast side of Englishman Bay above Shoppee Point, has its entrance between **Pond Cove Island,** 1.2 miles northwestward of Shoppee Island, and **Little Ram Island,** 1 mile north of Roque Island. The entrance is clear of dangers with the exception of **Lapstone Ledge,** which uncovers 3 feet, 300 yards northward of Little Ram Island. Excellent anchorage may be had in depths of 10 to 17 feet, soft bottom, up to 0.6 mile westward or northwestward of Pond Cove Island. The part of the cove northward of Pond Cove Island is shoal. There are numerous fishweirs in the cove.

Chandler River, at the head of Englishman Bay, is very narrow and crooked to the head of navigation at **Jonesboro,** a village about 3.5 miles above the mouth. The river is bare at low water at Jonesboro. There are several fishweirs in the river. The channel is unmarked, and strangers should not attempt to enter without a pilot. Pilots may be had from among the local fishermen at the mouth of the river. Drafts of 14 feet have been taken to **Kilton Point,** about 1.5 miles above the mouth. The only traffic to Jonesboro consists of small boats engaged in fishing and clamming. On the northeast side of the river, 0.5 mile above Kilton Point, is a clam factory which was inactive in 1970. Small boats sometimes venture up the river to the highway bridge, above which are the ruins of a former dam; rapids are above the ruins.

Ice closes Chandler River to Kilton Point from about December to April. It is reported that the river seldom freezes below **Deep Hole Point,** 0.3 mile southeastward of Kilton Point, but in extreme winters the bay is said to have been frozen as far as Roque Island.

Mason Bay, extending westward from the head of Englishman Bay, is practically bare at low water and has many rocks inside the entrance. An unmarked channel with a depth of 13 feet leads to the entrance from southward. The northern entrance is foul. The small settlement of **Mason Bay** is on the south side of the bay just inside the entrance. Fishweirs are numerous in the vicinity.

Chandler Bay, on the west side of Roque Island, extends northward from Mark Island to Squire Point where it joins Englishman Bay. A channel leads eastward of Ballast Island and around Squire Point into Englishman Bay and Chandler River. The principal dangers are buoyed, and the channel can be followed readily during daytime in clear weather with the aid of the chart. The bay is the approach from the westward to Chandler River and the anchorage in Englishman Bay, and is the one generally used by strangers. There are no good anchorages in the bay until north of Roque Island. Care should be taken to avoid the unmarked 17-foot rocky shoal in the southern entrance 0.7 mile westward of Little Spruce Island.

There are numerous dangers off Chandler Bay. **Big Breaking Ledge,** a pinnacle awash at low water, is on the western side of the approach from sea, 0.2 mile eastward of Head Harbor Island. **Little Breaking Ledge,** covered 9 feet and marked by a lighted gong buoy 200 yards eastnortheast of it, is about 0.4 mile north-northeastward of Big Breaking Ledge. **Eastern Ledges,** about 600 yards long, are 1.4 miles south of Great Spruce Island. At the easterly end of Eastern Ledges is a rock that uncovers 4 feet, and at the westerly end is a rock covered 3 feet. A rock which uncovers 10 feet, and nearly always marked by a breaker, is 0.7 mile northeastward of Eastern Ledges. **Fifth Rock,** covered 7 feet, is 400 yards southwest of Eastern Ledges. A buoy is south of the rock.

In Chandler Bay, **Great Spruce Ledges** are close to the south side of Great Spruce Island; the southernmost rock is 3 feet high. **Wallace Ledge,** 350 yards off the southwestern side of Little Spruce Island, uncovers 4 feet. **Ballast Island** on the western side of the main channel through Chandler Bay and 0.9 mile west of Roque Island is grassy; a buoy marks the eastern end of **Ballast Island Ledge,**which extends 200 yards eastward of the island. **Roque Island Ledge,** marked by a buoy at its western end, extends 700 yards off the west side of Squire Point. Just above Squire Point, **Great Bar** extends from the western shore of Chandler Bay for 0.5 mile. The buoy off the end of the bar marks the western side of the channel into Englishman Bay.

Vessels bound into the anchorage northward of Roque Island, either through Englishman Bay or Chandler Bay, should have no difficulty, with the aid of the chart. Due regard should be given to the many unmarked dangers and the necessity for caution if the waters are unfamiliar.

Moosabec Reach is the narrow passage west of Chandler Bay leading between the mainland on the north and the group of islands on the south between Chandler Bay and Pleasant Bay. The passage is an important thorofare, and is much used by vessels drawing up to 10 feet in the daytime; a draft of 21 feet can be taken through at high water. **Mark Island,** 123 feet high and heavily wooded, is the prominent guide to the eastern entrance,and Nash Island Light (see chart 13324 (305)) to the western approach. **Kelley Point** is the northeastern entrance point on the mainland, 1.2 miles west of Mark Island.

The channel in Moosabec Reach is well marked. With local knowledge, a depth of about 11 feet can

be carried. Vessels can readily follow the channel in daytime with the aid of the chart in clear weather, but strangers should not attempt passage at night. **Emms Rock Light** (44°31.7′N., 67°34.0′W.), 28 feet above the water, is shown from a white skeleton tower on the south side of the channel and on the north end of the stone jetty extending southeastward to **Nova Rocks.** The jetty uncovers about 3 feet. A daybeacon is on **Gilchrist Rock,** 0.5 mile west of Mark Island; and another daybeacon is on **Snows Rock,** about 0.5 mile southwest of Kelley Point.

A fixed highway bridge with clearance of 39 feet crosses Moosabec Reach from Jonesport to Beals, about 2 miles west of Kelley Point. Lights in the center of the span and on each side of the fender piling mark the navigation channel through the bridge.

Vessels caught by fog in the reach anchor anywhere in the channel where there is swinging room and the bottom is soft.

Pilots can usually be obtained from among the local fishermen.

The mean range of **tide** is 11.5 feet. The tidal currents have considerable velocity in the dredged channel, particularly at the light on the stone jetty. The current floods to the eastward and ebbs to the westward. Back eddies form with the beginning of the tidal flow on each side of the bridge. This condition is caused by the solid fill causeway approaches to the bridge. The channel is reported to have been ice-free in recent years.

Jonesport is a fishing village on the north shore of Moosabec Reach. There is considerable trade in fish and lobsters, and the canning of sardines. Boatbuilding is important, especially sport fishing boats in recent years.

The bridge over the reach is prominent. Conspicuous on the north side of the reach are a green painted church belfry, in West Jonesport; and a large red brick two-story schoolhouse and the spire of a church and oil tanks, about 0.8 mile eastward of the bridge and just westward of **Sawyer Cove.** On the south side of the reach, the belfries of two white churches in Beals are prominent.

Jonesport is a **customs port of entry.** Vessels subject to **quarantine** inspection are boarded at dockside by Public Health Service officials from Bar Harbor. The Coast Guard **vessel documentation** office in Rockland serves Jonesport; see Appendix for address.

A Coast Guard station is on the north side of Moosabec Reach, just westward of the bridge. The wharf at the station has a depth of 14 feet alongside. On the west side of the entrance to Sawyer Cove is a 450-foot oil pier with a 30-foot T-head and tieup dolphins 125 feet apart. The terminal has storage tanks for a million gallons of kerosene and No. 2 fuel oil. Gasoline and diesel fuel are available at a pier, about 100 yards eastward of the terminal pier; depths of 3 feet are reported alongside the pier's float landing. There are three boatyards at Jonesport, one of which has built craft up to 80 feet in length. The yard in Sawyer Cove has a marine railway that can handle boats up to 60 feet in length for hull repairs. A ship's carpenter is available, and a machine shop can handle repairs to gasoline and diesel engines. Another boatyard in a cove about 0.7 mile eastward of the bridge builds boats up to 45 feet in length and can haul out on skids boats up to 40 feet in length for hull or engine repairs. Groceries and marine supplies are available in town. There are good roads to U.S. Route 1, the primary coastal highway.

Beals is a village on the northern end of Beals Island, which is on the south side of Moosabec Reach opposite Jonesport. The main wharf at the northeastern extremity of the island, close eastward of the bridge, has 2 feet alongside. Diesel fuel, gasoline, provisions, and limited marine supplies are available at the wharf. In 1970, a clam processing plant was in operation close eastward of the wharf.

Beals Harbor is on the northwest side of Beals Island about 0.2 mile westward of the bridge. The fish wharves in the harbor bare at low water. Depths of about 6 feet are available in the anchorage area in the middle of the harbor.

There are several boatyards on Beals Island where fishing craft up to 65 feet in length are built.

Indian River and **West River,** extending northward at the western end of Moosabec Reach, have crooked unmarked channels fringed by rocks. The rivers are frequented only by local fishermen. There are no landings except for small craft at high water.

Wohoa Bay, 3 miles west of Jonesport, is the large bay east of **Moose Neck** and south of Bickford Point. Good anchorage is reported between **Carrying Place Island,** 300 yards northeast of Moose Neck, and Fessenden Ledge, in depths of 12 to 37 feet.

Several islands are adjacent to the usual route westward from Moosabec Reach through Tibbett Narrows. **Pomp Island,** 1.2 miles west of Beals Island, is wooded. **Hardwood Island,** 0.7 mile west of Pomp Island, also is wooded and has a house on the north end and a prominent quarry on the south side. A 13-foot shoal is in midchannel between this island and **Fessenden Ledge,** 0.5 mile northwestward. Fessenden Ledge uncovers 1 foot and is marked by a buoy. **Shabbit Island Ledge,** 0.5 mile westward of Hardwood Island, uncovers 11 feet and is marked by a buoy. **Shabbit Island,** 1.1 miles southwestward of Hardwood Island, is low and wooded in the center and has several small cottages on it; a buoy is 200 yards northwest of the island.

Head Harbor is between **Head Harbor Island,** the easternmost island of the group, and **Steele Harbor Island.** The harbor affords sheltered anchorage in depths of 14 to 20 feet. It is small, and has unmarked rocks bare at low water on both sides of the entrance and anchorage. Strangers

should not enter without local knowledge. The rocks of **Man Island** and **Balck Head,** the eastern side of the entrance, are dark, while those on the western side are light in color.

Mistake Harbor, westward of Steele Harbor Island, is small, but affords secure anchorage in depths of 20 to 42 feet. The entrance from southward is through **Main Channel Way,** a deep but narrow channel leading between Steele Harbor Island on the northeast and **Mistake Island** and **Knight Island** on the southwest. With care, the harbor may also be entered through Mud Hole Channel.

Moose Peak Light (44°28.5'N., 67°32.0'W.), 72 feet above the water, is shown from a 57-foot white tower on the southeastern extremity of Mistake Island; a fog signal is near the light. **Moose Peak Whistle Buoy MP** is 3 miles southeastward of the light.

To enter Mistake Harbor through Main Channel Way, give the south end of Steele Harbor Island a berth of about 0.3 mile when southeastward of it and enter in midchannel. When through the narrowest part of the channel, select anchorage in depths of 20 to 42 feet between the northwest end of Knight Island and the buoy 0.5 mile northwestward of it. This buoy, in the middle of Mistake Harbor, marks a rock which uncovers 1 foot.

Green Island is the largest of the islands and rocks extending northwestward along the south side of Mistake Harbor. Rocks awash at low water are 300 yards northward and over 400 yards northwestward of the island. Two rocks covered 4 feet are 600 yards northwestward of the island.

Eastern Bay is northward of Mistake Harbor between Head Harbor and Great Wass Islands; thorough local knowledge is required to navigate the bay.

Mud Hole Channel, 0.5 mile westward of Moose Peak Light, leads northwestward to the Mud Hole, which is a narrow cove in Great Wass Island, and to the western end of Mistake Harbor. Good anchorage is available for small vessels at the entrance to Sand Cove and Mud Hole, in depths of 14 to 30 feet, soft bottom.

Black Ledges, on the southwest side of Mud Hole Channel and extending nearly 1 mile in a southeasterly direction from **Little Cape Point** on Great Wass Island, consist of a group of rocks and ledges, some of which uncover 10 feet. **Channel Rock,** the southeasternmost of the Black Ledges, uncovers 14 feet. **Freeman Rock,** 600 yards southwestward of Channel Rock, is bare and about 40 feet high.

The principal dangers on the northeast side of Mud Hole Channel are a rock which uncovers 5 feet, 150 yards off the southwest side of the island on the northeast side of the entrance, and the shoals west of Green Island.

Local knowledge is advisable for passage through Mud Hole Channel from Mistake Harbor to the sea, or northward through Eastern Bay to Moosabec Reach as the dangers are numerous and unmarked. Passage can be made in daytime only with the aid of the chart.

In 1968, there were reported at least six abandoned, broken-off weirs on the west side of Eastern Bay from Mink Island north, most of them unbrushed and visible only at near low water.

Pig Island Gut Channel, dredged to 6 feet and marked by buoys, leads from the head of Eastern Bay through Pig Island Gut and Alley Bay into Moosabec Reach. In September 1968, a depth of 5 feet could be carried in the channel via a natural channel which had formed about 50 feet northward of the dredged channel in the vicinity of Buoy 5 at the east entrance to the anchorage; depths of 4½ feet were available in the anchorage.

Great Wass Island, 1.5 miles westward of Steele Harbor Island and southward of Jonesport, has a number of coves that are frequented by small craft. A lobster pound is on the west side of the island in **Black Duck Cove,** about 2.0 miles northward of **Pond Point,** the southernmost tip of the island. During the spring and fall gasoline and diesel fuel are available at the pound's wharf which, bares at low water. **Sand Cove,** on the east side of the island about 2.5 miles northward of Pond Point, is used by fishermen; **Mud Hole,** immediately southward of Sand Cove, is occasionally used by fishermen for winter haul-out storage. There are a number of boatyards on the island which build boats up to 45 feet in length. **Red Head,** on the southern side of the island, appears reddish from offshore.

Western Bay, westward of Great Wass Island, has numerous groups of islands which lie mostly in a north-and-south direction. Between the groups are passages leading to the western end of Moosabec Reach that are used by vessels with local knowledge.

Crumple Island, 0.6 mile west of the south end of Great Wass Island, is a high, bare, rocky island with several nubbles. **Fisherman Island,** 0.2 mile northwestward of Crumple Island, and **Browney Island,** 1.2 miles northwestward of Crumple Island, have rocks and ledges between them. The passage between Great Wass Island and Crumple, Fisherman, and Browney Islands, has numerous unmarked covered rocks. A line of ledges and rocks extends from Browney Island to Great Wass Island. There is a narrow channel with a depth of about 17 feet through these ledges. Strangers, except in small craft drawing less than 5 feet, should not attempt this passage.

Egg Rock, a bare rocky islet 15 feet high, is 1.3 miles west-southwestward of Crumple Island. Between the two are numerous rocks and ledges, including **Curlew Rock,Green Rock,** and **Seal Rock. Drown Boys Ledges,** awash at low water, are about 0.7 mile northward of Egg Rock. **Seahorse Rock,** which uncovers 5 feet, is 0.4 mile southwestward of Egg Rock and is marked by a bell buoy southwestward of it.

Outer Sand Island, 44 feet high, is 2.4 miles northwest of Egg Rock. **Inner Sand Island,** 54 feet high, is 0.6 mile north of Outer Sand Island. Both are wooded.

Drisko Island, Little Drisko Island, and **Stevens Island,** northward of Sand Islands, are wooded. **Flat Island,** 1.4 miles west of Outer Sand Island, and **Green Island,** 1.6 miles north of Flat Island, are comparatively low and covered with grass. **Plummer Island,** 0.4 mile east of Green Island, is 65 feet high and wooded.

The highest part of **Stanley Ledge,** 0.3 mile southward of Outer Sand Island, is 5 feet high, and **Batson Ledges,** 0.4 mile eastward of Inner Sand Island, are 22 feet high. **Black Rock** is a 7-foot-high bare rock, 1.3 miles southward of Flat Island, and 2.2 miles southeastward of Nash Island Light. An unmarked 35-foot shoal is 2.7 miles southward of Black Rock.

The passage between Seahorse Rock, Drown Boys Ledges, and Ram Island on the east and the Sand and Drisko Islands on the west has a broad channel in its southern part, although there are unmarked dangers on either side. The northern end of the passage on either side of Hardwood Island is foul, and the passages should be used only with local knowledge.

The passage westward of the Sand and Drisko Islands and Shabbit Island and eastward of Black Rock, Flat Island, and Plummer Island is comparatively clear. Another comparatively clear passage (chart 13324 (305)) is westward of Black Rock, Flat Island, and Green Island, and eastward of Big Nash Island. Both passages can be used in the daytime in clear weather with the assistance of the chart.

Tibbett Narrows is a narrow buoyed channel southward of Moose Neck on the sheltered inshore route for vessels westbound from Moosabec Reach. It is about 2 miles southwest of the western entrance of the reach. It is about 150 yards wide at its narrowest part and has a depth of 36 feet. Wooded **Tibbett Island** is on its northwestern side, and wooded **Ram Island** is on its southeastern side. An unmarked 25-foot spot is off its eastern entrance, and a 28-foot spot is on the north side of the channel about 250 yards off Tibbett Island.

Chart 13324 (305).-Eastern Harbor, on the west side of **Moose Neck** and 2 miles northeastward of Nash Island Light (44°27.9′ N., 67°44.9′ W.), is a secure anchorage for small vessels. The buoyed entrance is easily navigated in the daytime. The harbor has extensive flats and ledges, between which is a channel 200 yards or more wide. Fishweirs and fishweir ruins, partly covered at high water, are on both sides of the entrance.

The anchorage with the best swinging room is in depths of 18 to 22 feet in midchannel, about 0.4 mile inside **Eastern Pitch,** the point on the west side of the entrance. Craft of less than 9-foot draft can anchor in depths of 9 to 15 feet in **Otter Cove,** which makes into Moose Neck, 0.6 mile northeastward of Eastern Pitch. Another good anchorage spot, in depths of 8 to 12 feet, is 200 yards northwestward of the wharf on the east side of the harbor, about 0.9 mile above the entrance.

There are several rocky ledges that uncover to stay clear of in the northeastern part of the harbor. The flats are soft mud in places, and small craft sometimes are beached on them. A reef which shows well at low water extends 400 yards southward and southwestward from the point on the east side of the entrance. It is marked on its west side by a buoy.

The wharf of a seafood processing plant is on the east side of Eastern Harbor, about 0.9 mile above the entrance at the village of **South Addison.** Depths of 5 feet are reported alongside the wharf. Gasoline, groceries, and limited marine supplies are available at the wharf; water can be obtained from a nearby spring. Engine and hull repairmen are available in the village in an emergency. Boats are usually grounded out for hull repairs.

The approach is clear to Eastern Harbor, between Tibbett Island and Ladle Ledges, if these islands are given a berth of over 300 yards. From westward the approach is clear between the daybeacon southwest of Norton Island and Pot Rock. The approach from Moosabec Reach is through Tibbett Narrows. Enter the harbor midway between the buoys at the entrance, staying midchannel and keeping a sharp lookout for an old fishweir on the eastern side of the entrance.

Pleasant, Narraguagus, and Pigeon Hill Bays, which indent the coast between Nash Island on the east and Petit Manan Island on the west, are the approaches to the villages of Addison, Harrington, Milbridge, and Cherryfield, all on tributaries of the bays. These waters are frequented mostly by local fishing boats. The bays are separated by islands and rocks, through which are several thorofares.

Good anchorage can be found in Pleasant and Narraguagus Bays, the latter being used much as a harbor of refuge.

The mean range of tide is 11.8 feet at Addison, 11.1 feet at Trafton Island, and 11.3 feet at Milbridge.

From December to April, ice usually forms on Pleasant River and Harrington River to their mouths, and very frequently on Harrington Bay. Ice seldom obstructs navigation in Narraguagus River except in January and February, during which time the river usually is frozen to the mouth. In ordinary winters, the ice that forms in these bays goes out with the tides.

Pleasant Bay, 1.2 miles westward of Eastern Harbor and 6.5 miles west of Jonesport, is a secure anchorage and is easily entered in the daytime. **Nash Island** and **Big Nash Island,** on the eastern side of the entrance to Pleasant Bay, are grassy. **Nash Island Light** (44°27.9′N., 67°44.9′W.), 51 feet above the water, is shown from a white square

tower on the west side of Nash Island. A lighted whistle buoy is about 0.5 mile west of the light. A ledge, the southern end of which uncovers 10 feet, extends about 500 yards southward from Nash Island.

There are numerous islands and ledges in Pleasant Bay, but the important dangers are marked by buoys. A channel with a least width of 0.5 mile, and with depths of 36 feet or more, leads up the bay to the anchorages.

Anchorage is available in depths of 30 to 36 feet westward of **Nightcap Island,** a grassy island with a few bushes on its north side 3.4 miles north of Nash Island, and southward of **Barton Ledge,** a buoyed danger awash at low water 0.4 mile northwest of Nightcap Island. A better anchorage, and the one used most frequently, is in depths of 14 to 18 feet southeastward and eastward of **Birch Islands,** wooded islands 0.7 mile north of Nightcap Island.

No difficulty should be experienced approaching Pleasant Bay anchorage during daytime in clear weather with the aid of the chart. At other times it would not be prudent for strangers to pass northward of the vicinity of Nash Island Light, as there are no lighted aids in the bay. If need for shelter demands it, craft can proceed on a 344° course for 2.2 miles from the lighted whistle buoy 0.5 mile westward of Nash Island Light, to a temporary anchorage in 60 feet in the middle of Pleasant Bay.

Ladle Ledges are about 0.9 mile north of Big Nash Island, and 0.7 mile southwestward of the entrance to Eastern Harbor. A bare symmetrical 78-foot mound at the northern end is conspicuous. **Pot Rock,** 0.6 mile southwestward of Ladle Ledges, is 6 feet high and bare.

Flint Island, on the west side of the entrance to Pleasant Bay and 1.8 miles northwest of Nash Island, is 75 feet high and wooded. The island is a private wildlife sanctuary. Flint Island should be given a berth of 0.4 mile on its eastern and southern sides. **Coles Ledge,** 0.3 mile eastward of the island, is awash at low water and marked on its eastern side by a buoy.

Flint Island Narrows is a deep passage leading from Pleasant Bay to Narraguagus Bay between Flint Island and **Dyer Island,** 0.4 mile northward. The passage is used principally by fishing boats. The channel has a width of only about 200 yards at its narrowest part, but in clear weather with the aid of the chart little difficulty should be experienced in its passage, having due regard for the ledges that make out from the south shore of Dyer Island. A buoy, on the northern edge of the ledges making out from the northern end of Flint Island, marks the eastern entrance to the narrows.

Norton Island, on the east side of Pleasant Bay and 2 miles north of Nash Island, is grassy. **Norton Island Ledge,** 400 yards westward of Norton Island, is 5 feet high in spots and unmarked. The reef extending 400 yards southward from the island is partly bare at high water and is marked by a daybeacon at its outer end.

The channel between Norton Island and Cape Split, 0.4 mile eastward, is obstructed inside the entrance by a small rocky unmarked shoal, covered 9 feet. Northward of Norton Island the channel is restricted by rocks and ledges.

Bay Ledge, 0.7 mile south of **Willard Point** in the northwestern part of Pleasant Bay, uncovers 10 feet. Unmarked 13- and 15-foot rocky shoals are 500 yards northeastward and northward of it.

Nightcap Ledge, unmarked and extending southward from Nightcap Island, uncovers about 5 feet at the inner end.

Bunker Ledge, 0.3 mile westward of the southern Birch Island, uncovers about 5 feet and is marked on its eastern side by a buoy.

Raspberry Island and **Mink Island,** northward of Birch Islands, are grassy. **Fort Island** is 0.5 mile north of Raspberry Island.

Pleasant River empties into Pleasant Bay from the northward. The channel is marked from just below **Look Point** to within 0.7 mile of Addison. The river is seldom used except by fishermen, and the once extensive trade in lumber ceased many years ago. Passage up the river is suitable for small craft only, except with local knowledge, as the river is reported to have shoaled in many places. Above Addison, the river is still navigable to Columbia Falls, but is seldom used except by small craft which can clear the bridge just above Addison. Ice obstructs the river from December to April.

The **West Branch** of the river at Addison is closed by highway fill and a bridge-dam which is fitted with clapper valves that prevent the flood tide entering the branch, but allow it to drain on the ebb and during freshets. A small clam-processing plant is on the east side of the entrance to West Branch.

Addison is a village about 5 miles above the mouth of Pleasant River. There is no waterborne traffic except some fishing vessels. Gasoline and some supplies can be obtained from a general store with a service station. On the west side of the river, at the bend at Addison, there is an inactive cannery with a wharf in disrepair. A highway bridge, which has a channel width of 36 feet and a clearance of 5 feet, crosses the river just above Addison. It was formerly a swing bridge, but has been inoperable for years.

Columbia Falls is a village with a small shingle mill 5 miles above Addison. The falls and dam at the mill are the head of navigation on the river. The village has railway and bus service, and gasoline and groceries can be obtained here.

Harrington Bay is separated from the upper part of Pleasant Bay on the east by **Ripley Neck** and from Narraguagus Bay on the west by **Foster Island.** The bay extends about 2.5 miles in a northerly direction to Harrington River. Good anchorage may be found in Harrington Bay in

depths of 30 to 47 feet; the channel has a depth of 27 feet. The bay and anchorage are seldom used except by local vessels.

Strout Island, in the middle of the entrance to Harrington Bay from Pleasant Bay, is wooded. **Strout Island Ledges,** southeastward of Strout Island, uncover 9 feet; the south end of the ledges is marked by a buoy. A rock awash at low water and marked by a buoy is 0.5 mile southeastward of Strout Island. **Shag Islet,** 0.3 mile northward of the island, uncovers 11 feet The channel between Strout Island and **Otter Island,** 0.2 mile southward, is called **Strout Island Narrows.**

With the aid of the chart, small craft approaching and entering Harrington Bay should have no trouble, but larger vessels and strangers should not attempt it without local knowledge.

Dyer Island Narrows, the passage between Dyer Island and Foster Island that connects Harrington Bay and Narraguagus Bay, has a depth of 8 feet. This passage is buoyed. There are numerous dangers close to the channel, and the buoys must be followed closely. Local boatmen report dangers in this channel and that a boat drawing 3 feet has struck boulders. Strangers should not attempt passage through Dyer Island Narrows without local knowledge.

Chamberly Island, 2.5 miles north of Strout Island, is at the head of Harrington Bay.

Flat Bayand **Mill River** extending northwestward from the head of Harrington Bay, are mostly bare at low water and are seldom used except by boats engaged in clamming.

Harrington River, which empties into the head of Harrington Bay from northward, has a narrow, crooked, unmarked channel. The river shoals to a depth of 1 foot near the town of **Harrington,** at the head of navigation, about 4 miles above the mouth. An overhead power cable with a clearance of 48 feet crosses the river on poles, about 0.3 mile below the town. A telephone cable crosses on the same poles about 20 feet below the power cable.

The channel above **Nash Point,** 2.4 miles north of Chamberly Island, is narrow and tortuous. Motorboats and small fishing boats run up to the town at high water, but there are no arrangements for supplying them with gasoline and water. There is an inactive blueberry cannery and wharf on the north bank of the river, just below the bridge, which is reported to have 2 feet alongside. The town has bus service. Ice forms in the river and bay between December and April as far down as Ripley Neck.

Narraguagus Bay is northward of Petit Manan Island and 3.5 miles westward of Nash Island Light. The principal dangers in the channel are marked. The lights on Nash Island and Petit Manan Island and the lighted bell buoy just eastward of Pond Island are guides for the entrance. The bay is connected with Pleasant Bay by Flint Island Narrows, and with Harrington Bay by Dyer Island Narrows, both of which have been described previously.

The lower part of Narraguagus Bay is a well-sheltered anchorage, used as a harbor of refuge in all seasons by vessels up to 18-foot draft. The usual anchorage for vessels seeking shelter in the bay is between Trafton Island and Lower Middle Ground buoy in depths of 21 feet, soft bottom. Vessels of 10-foot draft or less sometimes anchor in depths of 14 to 17 feet north of Trafton Island, about midway between it and the daybeacon on Trafton Halftide Ledge. Vessels bound up to Milbridge anchor in depths of 12 to 16 feet about 0.7 mile east of Mitchell Point, with the cannery pier bearing 274°. Good anchorage in a depth of 24 feet, soft bottom, will be found about 0.4 mile northeastward of the daybeacon on Trafton Halftide Ledge.

Vessels should experience no trouble in approaching the anchorage in Narraguagus Bay with the aid of the chart in daytime and in clear weather, but should not go above Pond Island at night or above the anchorages in daytime without local knowledge.

Bois Bubert Island, 5 miles west-southwestward of Nash Island, is on the western side of the approach to Narraguagus Bay. The high wooded island has several cottages along its western shore. **Jerry Ledge,** off the southeast end of Bois Bubert Island, uncovers 2 feet. A 15-foot spot just south of this ledge is marked by a buoy on its southern side.

Jordans Delight Ledge, in the middle of the entrance to Narraguagus Bay and 1.6 miles east of Bois Bubert Island, has a rock at its south end that is awash at low water and marked by a daybeacon. **Black Ledge,** at the northeast end of Jordans Delight Ledge, uncovers 11 feet. The ground in this vicinity is very broken.

Mackerel Rock, unmarked and covered 10 feet, is 0.6 mile north-northeastward from Black Ledge. The rock is slightly west of the range made by Black Ledge and Petit Manan Light. **Jordans Delight,** 3.5 miles west of Nash Island, is a rocky island 91 feet high and sparsely wooded on top. **Pond Island,** 3.7 miles west of Nash Island, shows from southward as a bare conical hill 158 feet high. Narraguagus abandoned lighthouse tower is on the eastern side of the island. This 18-foot tower, white in color and connected with a dwelling, is a conspicuous landmark easily seen to the eastward and southward, but cannot be seen to west and northward of it, being hidden by the trees and high land behind it. A cupola of a house near the north end of the island is conspicuous to northward. A lighted bell buoy is 0.3 mile eastward of the tower.

Douglas Islands, between Pond Island and Bois Bubert Island, are wooded. **Douglas Island Harbor** is north of the Douglas Islands and west of Pond Island. The harbor has anchorage in depths of 24 to 36 feet, but is seldom used, since better anchorage is available above Trafton Island. Considerable sea makes into the harbor in heavy southerly weather. The harbor is clear except at its

southwest end where **Douglas Island Ledge,** which uncovers 3 feet in places, extends 350 yards northwestward from the middle Douglas Island.

Entering Douglas Island Harbor northward of Pond Island, pass northward and at least 0.3 mile westward of the buoy 0.3 mile north of the island. The harbor may also be entered from southward between the islands; the best channel is between the wooded island near the southwest end of Pond Island on the east, and the easternmost of the three Douglas Islands and the 6-foot high bare rock 250 yards southward from it on the west. Entering by this passage, avoid two rocks, which uncover, 125 yards southwestward of the wooded islet 250 yards off the middle of the west side of Pond Island.

A narrow unmarked channel leads from Douglas Island Harbor into the head of Pigeon Hill Bay. This channel is bordered on both sides by rocks covered and awash. The best water leads about 100 yards northward of **Currant Island,** which is wooded in the center and 0.3 mile north of Bois Bubert Island. While this channel is much used by local fishermen who follow the fishweirs as guides during the summer, it is not recommended for strangers.

Shipstern Island, 0.5 mile west of Flint Island and on the eastern side at the entrance of Narraguagus Bay, is 95 feet high, round, and wooded and has rocky bluffs on its south side.

Tommy Island, 0.8 mile northwest of Shipstern Island, is low and sparsely wooded. **Western Reef,** extending 0.4 mile southward from Tommy Island, has a bare rock 2 feet high on it and is marked by a buoy.

Trafton Island, 0.5 mile west of Tommy Island, is 84 feet high and wooded. There is a good channel on either side of Trafton Island. **Trafton Island Ledge,** in the middle of the entrance to the cove on the north side of Trafton Island, is a bare rock. **Trafton Halftide Ledge,** 0.6 mile northward of Trafton Island, is partly bare at low water and marked by a daybeacon.

Lower Middle Ground, an extensive shoal on the west side of the bay westward of Trafton Halftide Ledge, is covered 2 feet and marked on its eastern side by a buoy. A private pier with float landing is on the point on the south side of **Stover Cove,** which indents the shore westward of Lower Middle Ground and about 0.8 mile southward of Mitchell Point (44°30.6′ N., 67°51.4′ W.). A reef extends from the point close southeastward of the pier. There is a lobster pound and wharf, dry at low water, on the south side of **Smith Cove,** immediately northward of Stover Cove. Gasoline is piped to the wharf.

Wyman is a village on the western side of Narraguagus Bay, 1.8 miles northwestward of Trafton Island and westward of **Mitchell Point.** A 300-foot fish cannery pier, with a reported depth of 6 feet at its outer end, is on Mitchell Point. The green roof and aluminum painted metal stack and tanks of the cannery are conspicuous. Gasoline and diesel fuel can be delivered to the wharf by truck. A good highway connects with Milbridge.

Narraguagus River empties into Narraguagus Bay from the northward. A dredged channel, marked by buoys, leads from the bay to an anchorage area off Mitchell Point, thence to and in the river to two anchorages off Milbridge, and thence to the Milbridge town wharf, on the east side of the river about 0.2 mile eastward of the bridge. In 1966-June 1968, the controlling depths were 10 feet to and in the anchorage off Mitchell Point, thence 9 feet to the lower anchorage, about 0.6 mile below the bridge at Milbridge, and thence 6 feet in and through the lower and upper anchorages to the town wharf. The channel is narrow and crooked and leads between flats that bare at low water. Strangers should navigate the river on a rising tide. Old fishweirs, only part of which show at low water, are on either side of the channel just above the fairway buoy off the entrance. Care should be taken in entering to have this buoy close aboard before heading up for the channel entrance, as the weirs are reported to be not visible at high water.

The mean range of tide is 11.3 feet at Milbridge and is reported to be about 3 feet at Cherryfield, 4.5 miles above Milbridge.

Milbridge is a small town on the west side of the river about 2 miles northward of Wyman. A cannery is just inside the entrance to Wallace Creek, which empties into the west side of Narraguagus River over the mudflats, about 1.6 miles above Mitchell Point. The cannery wharf dries at low water, and the narrow crooked channel leading to it is marked by stakes.

The Milbridge town wharf and float are on the east side of the river, about 0.2 mile eastward of the bridge. Depths of 8 to 10 feet are reported alongside the wharf, but less than a foot at the float. The wharf is used by fishermen to unload their catch for the cannery on Wallace Creek. There were no facilities at the wharf in 1970.

Care must be taken in the river channel when passing between buoys 13 and 15 to clear the ruins of several piers and a wreck, which are in the east side of the river and extend from the shore to the western edge of the channel. The ruins consist primarily of submerged and partially submerged piling and timbers. Part of the lower ruin, which was formerly known as the upper steamboat wharf, is used occasionally by fishermen to unload their catch. A medical center is at Milbridge, and gasoline, diesel fuel, water, groceries, and limited marine supplies are available. U.S. Route 1, the primary coastal highway, passes through the town, and bus service is available.

U.S. Alternate Route 1 highway crosses the river at Milbridge on a highway fill and two bridges. The bridge over the west channel has a swing span with a channel width of 28 feet and a clearance of 5 feet; drawbridge regulations are given in **117.2a,**

Chapter 2. The bridge over the east channel has a fixed span with a clearance of 5 feet. The west channel is used by craft when taking shelter in the anchorage above the bridge during heavy weather. There is reported to be a depth of 15 feet in the anchorage just above the bridge.

The Narraguagus River above Milbridge as far as the head of navigation at Cherryfield, about 4 miles upstream, is mostly full of boulders that uncover. It is seldom used by any craft. Small boats drawing 3 feet are reported taken to Cherryfield at high water, and then only with local knowledge.

Cherryfield is a town at the head of navigation on Narraguagus River. It has railway freight connections and bus service. The town is a center of salmon sport fishing. The primary industries in the town are a lobster trap plant, a lumbermill, and two blueberry canneries. An overhead telephone cable crossing the river a short distance below the highway bridge has a clearance of 21 feet.

Pigeon Hill Bay, about 6 miles southwestward of Nash Island Light (44°27.9′ N., 67°44.9′ W.), is entered eastward of Petit Manan Bar and northward of Petit Manan Island. The bay is not difficult to enter by day with the aid of the chart, but caution should be exercised to avoid the partly submerged fishweirs and fishweir ruins along the shores of the bay. One particularly dangerous fishweir is reported in the bay, about 0.2 mile eastward of **Chitman Point** (44°27.3′ N., 67°52.7′ W.). The bay affords good anchorage in depths of 12 to 24 feet, but is seldom used except by local fishermen. The channel is unmarked except at the southern entrance. The small settlement of **Pigeon Hill** is on the west side of the bay, about 0.7 mile southward of Chitman Point. Small boats anchor on the west side of the bay off the settlement. There is a lobster pound and float, which bares at low water, about 0.6 mile northwestward of Chitman Point; gasoline is pumped to the float.

Whale Ledge, 1.4 miles south of Bois Bubert Island and on the east side of the entrance to Pigeon Hill Bay, uncovers about 6 feet. A buoy marks a 13-foot rocky shoal 300 yards southward of the ledge.

Egg Rock, 1 mile south of Bois Bubert Island, shows at low water as a large ledge of dark boulders, with several high parts that are always out of the water. There is a narrow unmarked channel between Egg Rock and Bois Bubert Island.

Gull Rocks, extending 0.2 mile off the west shore of Bois Bubert Island 1.4 miles northward of Egg Rock, consist of a large outer ledge which uncovers 6 feet and smaller ledges inshore. These rocks can be avoided by keeping in midchannel.

The mean range of tide is 10.6 feet on the bar. The tidal currents set over it with considerable velocity, the flood northeastward and the ebb southwestward.

Pigeon Hill, conspicuous for some distance at sea, is a 317-foot-high, bare-topped hill on the western shore of the bay westward of Chitman Point.

The thorofare connecting the head of Pigeon Hill Bay with Douglas Island Harbor has been described previously.

Petit Manan Island, 7.7 miles southwestward of Nash Island, is low and bare, and marked by several buildings. **Petit Manan Light** (44°22.1′N., 67°51.9′W.), 123 feet above the water, is shown from a 119-foot gray granite tower on the east side of the island; a fog signal is at the light. **Petit Manan Reef,** marked by a buoy at its southern end, extends about 0.4 mile southward from the island. A fairway bell buoy is about 0.9 mile southward of the island.

Petit Manan Bar extends from Petit Manan Island to **Petit Manan Point** on the mainland. The bar consists of ledges and large boulders through which is a channel, marked by two fairway buoys, that can be used by small vessels when the sea is smooth. There is 13 feet in the channel which is 1.3 miles northwestward of Petit Manan Light and 0.9 mile southeastward of Petit Manan Point. The buoys can be left close-to on either side.

Inner Bar is another channel across the bar, 0.4 mile southeastward of Petit Manan Point; it is used by small local boats at all stages of the tide, but it is unmarked and difficult, and should not be attempted by strangers. The sea breaks along the whole length of the bar with a swell or in heavy weather.

Green Island is 0.4 mile northwest of Petit Manan Island. **Petit Manan Pool,** on the southeast side of Green Island and north of Petit Manan Island, is a small-boat harbor. The pool is bare at low water, but the bottom is soft and boats ground out at low water.

Simms Rock, 1.7 miles south-southeastward of Petit Manan Light, is covered 6 feet and marked on its northwest side by a buoy. A rock covered 20 feet, about 0.2 mile southeastward, is unmarked.

Southeast Rock, 3.2 miles southeastward of Petit Manan Light, is covered 5 feet and is marked by a lighted whistle buoy. An unmarked 41-foot shoal is 1.7 miles southwestward of Southeast Rock.

Jackson Ledge, covered 23 feet, is an unmarked danger 2.6 miles east of Petit Manan Light.

Tibbett Rock, 3.6 miles east-northeastward of Petit Manan Light, is covered 12 feet and another rock, about 0.8 mile southeastward of it, is covered 10 feet; both rocks are marked by buoys.

Jo Leighton Ground, an unmarked danger covered 15 feet, is 2.1 miles northeastward of Petit Manan Light.

6. PETIT MANAN ISLAND TO JERICHO BAY, MAINE

Chart 13312 (1202).-The coast between Petit Manan and Jericho Bay is indented by Frenchman Bay, Blue Hill Bay, and numerous smaller bays and harbors. **Mount Desert Island,** between Frenchman and Blue Hill Bays, is mountainous and is the highest land feature on the coast of Maine. The summits are rounded, and several of them are nearly the same height, making it difficult to identify individual peaks at a distance.

Acadia National Park comprises the greater part of the southern half of Mount Desert Island, particularly the mountainous areas and the lower half of Schoodic Peninsula on the eastern side of Frenchman Bay, including the scenic Schoodic Point, and part of Isle au Haut. **Schoodic Mountain,** about 16 miles northward of Schoodic Point, is visible for a good distance off the coast.

Mount Desert Rock, 17.5 miles southward of Mount Desert Island and 11.5 miles outside of the nearest island, is a rocky islet about 20 feet high.

Mount Desert Light (43°58.1'N., 68°07.7'W.), 75 feet above the water, is shown from a 58-foot conical gray granite tower on the rock. A fog signal and a radiobeacon are at the light.

Columbia Ledge, 0.7 mile southward of the rock, is covered 18 feet and unmarked.

Boundary lines of inland waters.-The lines established for this section of the New England coast are described in **82.5,** Chapter 2.

Chart 13324 (305).-The bight between Petit Manan Bar and Schoodic Peninsula is the approach to Dyer Bay, Gouldsboro Bay, and Prospect Harbor. Local fishermen are the principal users of these waters. Vessels should use caution when crossing broken areas where the charted depth does not considerably exceed the vessel's draft. The most important village is Prospect Harbor. Gouldsboro and Steuben can be reached by small craft at high water.

Moulton Ledge, off the entrance to Dyer and Gouldsboro Bays and 3 miles westward of Petit Manan Light, is awash at low water, and is marked by a buoy west of the ledge. Broken ground, and several unmarked ledges, are in the vicinity of Moulton Ledge; vessels should avoid this area. An 18-foot spot, 0.6 mile to the southward; a 23-foot rocky shoal 0.3 mile to the southeastward; and **Stone Horse Ledge,** covered 11 feet about 0.8 mile to the northward, are all unmarked.

Dyer Bay, westward of Petit Manan Point, has excellent anchorage in depths of 20 to 42 feet. The entrance, 3.3 miles northwestward of Petit Manan Light, and the bay channel are unmarked and seldom used except by small local vessels. A group of ledges and rocks, with narrow and deep passages between them, extends from the westward part way across Dyer Bay entrance.

A good passage nearly 0.5 mile wide is between Petit Manan Point and **The Castle** (44°24.4' N., 67°55.2'W.), the easternmost bare ledge. One mile above The Castle the channel narrows to a width of 250 yards because of rocks and ledges which extend out from both shores and are covered 8 to 11 feet. Above this the channel widens to 0.5 mile, and then narrows gradually to 400 yards westward of **Sheep Island,** 3.3 miles north of The Castle. The least depth in midchannel is about 18 feet, but a stranger should not attempt to enter at low water with a vessel drawing more than 8 feet.

Strangers can enter Dyer Bay with the aid of the chart in clear weather in the daytime. Local knowledge should be obtained before attempting it at any other time, as there are many fishweirs covered at or near high water.

The mean range of tide is 10.9 feet. Tidal currents are strong in the entrance of Dyer Bay, but follow the general direction of the channel except near Dyer Point, on the west side of the entrance, where they set in and out of Gouldsboro Bay.

The Castle, **Bonney Chess Ledge,** 300 yards west of The Castle, and **Little Ledge,** 0.5 mile west of The Castle, are bare and lack distinguishing marks. **Yellow Birch Head,** on the east side of Dyer Bay near the entrance and 0.7 mile northeastward of The Castle, is a high bare bluff.

Stanley Cove and **Yeaton Cove** indent the west side of Dyer Bay, 0.7 mile and 1.5 miles northward of Dyer Point, respectively. A commercial lobster pound with service wharf is in each cove. Gasoline is available at the wharves, which dry at low water. Another lobster pound with service wharf is reported in the unnamed cove, 0.5 mile eastward of the north end of Sheep Island.

Carrying Place Cove extends southeastward from Dyer Bay north of Sheep Island. The head of the cove, 300 yards from Pigeon Hill Bay, is soft mud and dries at low water.

Pinkham Bay, at the head of Dyer Bay, has numerous rocks and ledges. A narrow crooked channel with a depth of 7 feet leads for some distance toward the head of the bay which dries at low water.

Dyer Harbor, a shallow bight the upper part of which is dry at low water, is northwestward of Sheep Island and west of **Goods Point,** 0.6 mile northwest of Sheep Island. There is a pier in the cove on the west side of Goods Point, with 2 feet of water at the head.

Gouldsboro Bay, separated from Dyer Bay by **Dyer Neck,** is 4 miles northwestward of Petit Manan Light, and 6 miles northeastward of

Schoodic Island. Excellent anchorage may be had in depths of 12 to 54 feet. The bay is the approach to the villages of Gouldsboro and Steuben, 6.5 and 7 miles, respectively, above the entrance. However, the approaches are unmarked and used only by small craft at high water.

The mean range of tide is 10.8 feet. Ice obstructs navigation in the bay from December to March. In severe winters the bay is closed to the entrance. Clusters of piling in the bay, the remains of old fishweirs, are hazardous to small craft. It has been reported that most of the weirs can be avoided by remaining in the middle of the bay.

Sally Islands, a chain of small islands and ledges, extend across the entrance to Gouldsboro Bay. Included in the Sally Islands are **Eastern Island,** grassy with tree stumps and 0.5 mile southward of Dyer Neck; **Bald Rock** with sparse grass on it, 700 yards westward of Eastern Island; **Sally Island,** rocky, with grass on top and a small cottage and two lone trees on its northerly side just southwestward of Bald Rock; and **Sheep Island,** thickly wooded in the center and 0.4 mile southwestward of Sally Island. Through the islands are two navigable channels, Eastern Way and Western Passage. When approaching from westward, care must be taken not to mistake the passages as the islands are difficult to recognize. The bay inside the islands is free from outlying dangers, and the water shoals gradually toward the head of the bay.

Eastern Way leads into Gouldsboro Bay between Eastern Island and Bald Rock. The passageway is about 300 yards wide between the 18-foot curves, and has a spot covered 17 feet about 250 yards west of Eastern Island. A depth of 45 feet is available for a width of 75 yards in the channel between the 30-foot curves. The channel has strong tidal currents; when the current is ebbing, more especially with southerly and easterly winds, small craft or those under sail alone should not attempt the passage. The current sets diagonally across the channel.

Western Passage, with a least depth in the channel of 16 feet, leads into the bay between Sally Island and Sheep Island. The passage is about 100 yards wide and is close along the eastern side of Sheep Island and westward of the ledges, bare at half tide, which extend about 500 yards west of Sally Island. It is not advisable for strangers to attempt it. The tidal currents run true with the channel and have a velocity of 2 to 3 knots at strength.

A passage from Dyer Bay to Gouldsboro Bay north of Sally Islands is obstructed by a ledge, which uncovers, that extends 350 yards south of the southern extremity of Dyer Neck, and a shelving ledge covered 8 feet at the end extending 200 yards northeastward from Eastern Island. The channel is about 75 yards wide between the 30-foot curves, and the controlling depth is about 28 feet. The tidal currents have a velocity of 2 to 3 knots at strength through these passages, and in Eastern Way they set diagonally.

Routes.-Approaching Gouldsboro Bay from eastward and entering through Eastern Way from off the fairway bell buoy southward of Petit Manan Light, steer **310°** for 4.5 miles until abeam of the southern tip of Eastern Island, bearing 40°, distant 550 yards, then steer **000°** through the passage. The tidal currents set across this course with considerable velocity, the flood northeastward and ebb southwestward. Change course as necessary to pass midway between Eastern Island and Bald Rock. When inside the islands, steer **300°** until abeam of the south tip of Youngs Point, then stand up the middle of the bay. The water shoals gradually toward the head, and anchorage can be had anywhere between the entrance and Point Francis by giving the shores a berth of at least 500 yards.

Approaching from westward and entering through Eastern Way, from the whistle buoy off Schoodic Island, steer **046°** for 4.4 miles, passing 0.4 mile southeastward of Little Black Ledge to a position where Cranberry Point is in line with Prospect Harbor Point Light. Then steer **028°** for the eastern end of Eastern Island until about 550 yards from the island, and then round up to the northward to pass midway between Eastern Island and Bald Rock. Then continue as directed in the preceding paragraph. Strangers should have no difficulty in making the passage with the aid of the chart in clear weather in the daytime.

Point Francis, on the western shore of Gouldsboro Bay 3.2 miles above Sally Islands, is high and wooded, and is prominent from the lower end of the bay.

A lobster pier with float landing is on the east side of the bay on **Dolly Head,** about 1.3 miles north-northeastward of Point Francis. Gasoline is available at the float, and depths of 4 feet are reported alongside. Another lobster pier, dry at low water, is on the west side of the bay, nearly opposite Dolly Head. Gasoline is available at the pier, and marine supplies can be obtained at a store which is within walking distance of this pier.

Joy Bay, a shallow body of water 1.5 miles long, extends northward from Gouldsboro Bay at **Rogers Point,** 1.5 miles north of Point Francis. Two coves are at the head of Joy Bay: **Steuben Harbor,** extending northeastward, and **Joy Cove,** extending westward. The narrow, crooked, and unmarked channels through Joy Cove and Steuben Harbor are nearly bare at low water and are seldom used. **Steuben,** a village at the head of Steuben Harbor, can be reached at high water by vessels of 7 to 8 feet in draft. Groceries and gasoline are available in the village.

West Bay, a large shallow arm of Gouldsboro Bay, extends northwestward from the bay for about 2.5 miles. The village of **Gouldsboro,** on the western side of the bay near its head, is of no commercial importance. The entrance has numerous ledges and rocks. The narrow, crooked, unmarked channel in the bay is nearly dry at low water and seldom used.

Corea Harbor is a small cove between Gouldsboro Bay and Prospect Harbor. A number of islands including grassy **Bar Island,** partially wooded **Outer Bar Island,** and wooded **Western Island,** are off the entrance to Corea Harbor. The harbor is well protected. **Corea** is a small village at the head of the harbor. The principal industries are fishing and lobstering. The most prominent objects are a church spire and a group of houses at the head of the harbor, which are visible for a considerable distance offshore.

The unmarked channel into the harbor leads to the westward of Western Island and then along the northeastern side of the entrance. A ledge extending from the western side of the entrance is cleared by keeping close to the northeastern side. Lobster pots, which are usually placed on the edge of the ledge, are a good indication of the location of the channel. Low water is the best time to enter.

The controlling depth is about 7 feet in the anchorage in the middle of the harbor. The harbor outside the limits of the anchorage has shoaled considerably. The moorings in the harbor are administered by the harbormaster. At times a heavy surge is felt in the harbor.

Ice usually obstructs the inner harbor from December to March, but fishing is carried on during the winter from piers on both sides of the entrance to the harbor.

There are numerous piers in the harbor, most of which dry at low water. A wharf on the northeast side of the entrance has a float landing with 9 feet alongside. An old lobster pound with a wharf which dries at low water and a 75-foot wharf with a float landing with 6 feet reported alongside are on the western side of the entrance. Diesel fuel and gasoline are available at the wharf on the northeast side of the entrance, but only gasoline is available at the 75-foot wharf.

Prospect Harbor, 4 miles north-northeastward of Schoodic Island and 6 miles northwestward of Petit Manan Light, is a large deepwater bight, about 1.3 miles wide between **Cranberry Point** and **Prospect Point.** It has ample depth and offers good anchorage for the largest vessels, but is exposed to southerly and southeasterly weather. A bell buoy is off Cranberry Point.

The town of **Prospect Harbor** is at the head of the harbor. The upper part of the harbor is divided into two coves by **Prospect Harbor Point.Sand Cove,**the eastern branch, has ample depth until near the head with its west side obstructed by rocky ledges.

The mean range of tide is 10.5 feet.

Prospect Inner Harbor, the western branch of the harbor, is used commercially on its western shore; the upper half is obstructed by unmarked rocky ledges. There is no shipping, but fishing and lobstering are important.

The houses around the head of the harbor, the spire of the Community House, and a large green warehouse are conspicuous. The radio antennae of the naval communications station north of Cranberry Point and the dome on Prospect Harbor Point are also prominent.

Prospect Harbor Point Light (44°24.2'N., 68°00.8'W.), 42 feet above the water, is shown from a 38-foot white conical tower on the point. The former residence buildings of the light station, now part of a naval communications station, and the radio antennas are conspicuous behind the light.

A fairway bell buoy, about 0.3 mile southward of the light, marks the entrance to the inner harbor.

Anchorage can be found according to draft anywhere in the outer harbor, and in soft bottom in the entrance to the inner harbor about 200 yards northward of a line between **Clark Ledges Daybeacon** and the end of the cannery wharf on **Clark Point.**

Little Black Ledge awash, **Big Black Ledge,** 5 feet high, and **Old Man** and **Old Woman,** which partly uncover 5 feet, are ledges off the entrance to Prospect Harbor. A gong buoy is off the southwest side of Old Woman Ledge. The white sectors of Prospect Harbor Point Light cover the fairways either side of these ledges.

Clark Ledges, extending 500 yards eastward of Clark Point, on the southwestern side of the entrance to the inner harbor, have a rock 4 feet high and are marked by a buoy and a daybeacon on their easterly side.

The approach to Prospect Harbor and the anchorage can be readily made with the aid of the chart in daytime in clear weather; at night the white sectors of Prospect Harbor Point Light clear all dangers in the approaches. Ice seldom obstructs the harbor.

Customs are attended to by an officer from Bar Harbor. There is a **harbormaster** ,and the moorings are under his control.

There are a number of private piers and commercial wharves on the westerly side of Prospect Inner Harbor. A cannery wharf with a reported depth of 12 feet alongside is on Clark Point. There is a lobster pier with a reported depth of 2 feet alongside just northwestward of the cannery wharf. Gasoline is available at the pier, and a lobster car is moored about 30 yards off. Groceries can be obtained in town.

Birch Harbor, on the western side of Prospect Harbor 1.4 miles south of Prospect Harbor Point Light, has a depth of 6 feet for 0.5 mile and then shoals rapidly above this point. The small fishing village of **Birch Harbor** is at the head of the harbor. The landings are bare at low water. The channel is unmarked and difficult. The best water in entering favors the southwest side to avoid **Roaring Bull,** a rock awash at low water in the entrance. A church spire at the head of the cove is conspicuous.

Bunker Harbor, on the west side of Prospect Harbor 0.8 mile south of Birch Harbor, has a small

village of fishermen at the head. There are two lobster pounds in the inner harbor; one is at the head and the other is on the southwest side. Gasoline, diesel fuel, water, and some marine supplies can be obtained at a pier adjoining the lobster pound at the head of the harbor. The pier's float landing has a reported depth of 6 feet alongside.

The entrance is obstructed by ledges. **Bunker Ledge,** on the south side of the entrance, has a rock awash at low water at the eastern end and the inner part uncovers 6 feet; a buoy is eastward of the rock. The channel northward of the ledge is said to be the best of the unmarked channels leading into the harbor. An anchorage area has been dredged in the middle of the inner harbor. In May 1973, depths of 6 feet were available in the anchorage except for shoaling along the easterly edge.

Schoodic Harbor, between Prospect Harbor and Frenchman Bay, has ample depth, but is exposed to the sea and rarely used as an anchorage. **Wonsqueak Harbor,** the northern part of Schoodic Harbor, has small fish wharves at its head which dry at low water. An overhead power cable with a clearance of 26 feet crosses near the head of the harbor. Wonsqueak Harbor is difficult to enter. Several islands and ledges are in the entrance to Schoodic Harbor.

Schoodic Island, 7.5 miles west-southwestward of Petit Manan Island and on the south side of Schoodic Harbor, is low, wooded on the south end, and grassy with a lone tree on the north end. The island is bordered by extensive ledges. **Schoodic Ledge,** 0.4 mile northward of Schoodic Island, uncovers 9 feet, and breakers are always visible on it. The channel between Schoodic Island and Schoodic Ledge is marked by a buoy on either side. It has a depth of 24 feet and is generally used by small local vessels and motorboats bound along the coast.

Middle Ledge, 0.8 mile north of Schoodic Island, uncovers 5 feet and is unmarked. **Brown Cow,** a rocky ledge about 800 yards south of **Spruce Point,** on the northeastern side of the entrance to Schoodic Harbor, uncovers 4 feet and is marked by a lighted buoy. **Rolling Island,** 0.9 mile north-northwestward of Schoodic Island, is wooded.

Chart 13318 (306). Frenchman Bay, westward of Schoodic Peninsula and eastward of Mount Desert Island, is the approach to the towns and important summer resorts of Bar Harbor, Winter Harbor, Southwest Harbor, Seal Harbor, Northeast Harbor, and many smaller villages. The bay is frequented by yachts, small pleasure craft, and fishing vessels, and in summer is the scene of many sailing yacht races. The bay proper is about 10 miles long and has an average width of about 4 miles. Near the center of the bay, a group of islands extends across the bay; between the islands are two deep channels. Vessels of any size and draft can find anchorage. Navigation is not difficult for strangers.

The principal guides to the entrance of Frenchman Bay from the sea are **Frenchman Bay Approach Lighted Whistle Buoy FB** (44°14.5'N., 67°57.2'W.), Chart 13312 (1202), about 7 miles southeastward of Schoodic Point, the lights on Mount Desert Rock, Great Duck Island (chart 13312 (1202)), Baker Island, and Egg Rock. A brief description of Mount Desert Island and Mount Desert Rock is given in the first part of this chapter.

Cadillac Mountain (44°21.1′ N., 68°13.6′ W.), 1,530 feet high, is the highest point on Mount Desert Island and the highest point along the east coastline of the United States. On a clear day the mountain is visible from 35 to 45 miles seaward. An excellent scenic highway leads from Bar Harbor to the summit of Cadillac Mountain.

Schoodic Head (44°21.1′ N., 68°03.2′ W.) on **Schoodic Peninsula,** across the bay from Mount Desert Island, is 440 feet high and is the most prominent land feature at the eastern entrance to the bay.

Big Moose Island, the southern extremity of Schoodic Peninsula, is connected to the peninsula by landfill, and is part of **Acadia National Park. Schoodic Point Observation Spot** and a large parking lot are on the southern extremity of the island. **Little Moose Island,** rocky and with a few trees, is about 0.3 mile eastward. **Arey Cove,** the bight between the two islands, is unsafe in southerly weather.

The principal entrance to Frenchman Bay is from southward between Schoodic Peninsula and Baker Island, but small vessels can enter from southwestward through Western Way and Eastern Way. Small boats also may enter the head of Frenchman Bay at high water through Mount Desert Narrows.

Anchorages.-Winter Harbor is a good anchorage, and is frequently used by vessels entering for shelter; it is usually open throughout the winter. Bar Harbor is partially protected, except against heavy southeasterly winds, but has poor holding ground except near the head of the harbor. Large vessels sometimes anchor northward or northwestward of Bar Island. Stave Island Harbor is a good anchorage. Southwest Harbor is a well-sheltered and frequently used anchorage.

Frenchman Bay is rocky, but the water is deep and in general free from dangers except near the shores. The main part of the bay from a little southward of Egg Rock Light to the entrances of Sullivan Harbor, Skillings River, and Eastern Bay, including the channels between Jordan and Long Porcupine Islands, and between Burnt Porcupine and Sheep Porcupine Islands, is clear. Vessels navigating the tributaries should proceed with caution when crossing areas where the charted depth does not substantially exceed the draft.

Little difficulty should be experienced in approaching and entering Frenchman Bay at any

time, as the approaches are clear, and outlying dangers for the most part are well marked.

The mean range of tide is 10.5 feet. Between Bar Harbor and Ironbound Island the flood current velocity is less than 0.3 knot. The ebb velocity at strength is about 0.7 knot and sets southeastward. For current predictions see the Tidal Current Tables.

During mild winters Frenchman Bay is usually clear of ice to Skillings River, but the bays and rivers connected to the northern part of the bay are frozen over. Winter Harbor is reported to be generally clear. It is reported that during foggy weather Frenchman Bay usually clears during the day although the fog remains heavy outside Schooner Head and Ironbound Island. No licensed pilots are available, and none are needed to enter. Local fishermen usually can be engaged as pilots for the tributaries.

Chart 13322 (204).-Winter Harbor on the eastern side of Frenchman Bay just inside the entrance, is a frequently used harbor of refuge. The principal entrance from southward, 0.7 mile wide between Turtle Island and Schoodic Peninsula, is deep and free of dangers. The entrance from the northward is used only by local vessels drawing 10 feet or less. The aids in the northern approach are colored and numbered for vessels bound north. Good anchorage in depths of 30 to 54 feet, good holding ground, will be found in Winter Harbor. The harbor is comparatively free of danger, and, although open to the southward, a heavy sea never enters. Ice seldom interferes with navigation. The mean range of tide is 10.1 feet.

Turtle Island, wooded, is on the western side of the main entrance to Winter Harbor and 0.8 mile west of Schoodic Peninsula. **Turtle Island Ledge,** uncovers 5 feet and extends 500 yards off the southwest side of the island; a gong buoy is 0.2 mile southward of the ledge.

Mark Island, 0.5 mile west of Schoodic Peninsula and on the west side of the entrance to Winter Harbor, is grassy and marked by a conspicuous abandoned lighthouse, a white tower 19 feet high connected to a dwelling. A lighted bell buoy is 0.2 mile south-southeast of the tower. Depths of 12 to 16 feet are up to 300 yards south-southeast of the tower.

Of the islands northward of Turtle and Mark Islands, **Ned Island,** 0.1 mile north of Mark Island, and **Heron Island,** 0.5 mile northwestward of Turtle Island, are wooded. **Spectacle Island,** just north of Turtle Island, has a house on it and is wooded. The outer islands, including **Flat Island** and the **Crow Islands,** are grassy or bare rocks, the largest of the Crow Islands having a few trees on it. All of the islands are surrounded by extensive ledges which uncover at various stages of the tide.

The channel between Turtle Island, and Mark and Ned Islands is not recommended for deep-draft vessels because of unmarked 16- and 17-foot spots in midchannel, about 350 yards westward of the north end of Mark Island. **Roaring Bull,** a shoal about 200 yards off the northwestern end of Ned Island, is covered 3 feet and breaks during southerly and easterly weather; it is marked by a buoy off the northwest side.

Grindstone Neck, forming the western side of Winter Harbor, is wooded and has many summer homes, several churches, and a club hotel. A round gray house, built to resemble a lighthouse and with a glass cupola on top, is on the west side of Grindstone Neck, about 0.9 mile north-northwestward of Grindstone Point. The structure is conspicuous from the southwestward in Frenchman Bay.

Grindstone Ledge, which uncovers 5 feet, extends 400 yards southwestward from Grindstone Neck, and is marked by a daybeacon on the ledge and a buoy south-southwestward of it. A 12-foot shoal is 235 yards southward of the daybeacon and in the middle of the channel between Ned Island and Grindstone Ledge. A narrow unmarked channel, with a depth of 16 feet, is almost midway between the daybeacon and **Grindstone Point,** the southeastern extremity of Grindstone Neck. This channel should not be used without local knowledge. The channel south of the ledge and buoy is the recommended passage.

Pulpit Ledge, about 150 yards off the southwestern end of Grindstone Neck, is marked by a daybeacon on the ledge and a buoy on its eastern side. The narrow channel between the ledge and the neck is used only by small local craft.

The eastern shore of Winter Harbor from **Frazer Point,** opposite Grindstone Point, to Abijah Ledge, 0.5 mile northward, should be given a berth of more than 150 yards. **Abijah Ledge,** near the head of Winter Harbor about 300 yards off the eastern shore, is awash at low water. A buoy is westward of the ledge. Shoal water extends from the ledge to the small cove northeastward.

Sand Cove, the northwest arm at the head of Winter Harbor, affords the best anchorage with excellent holding bottom of black mud. Shoal water extends 130 yards off **Harbor Point,** the eastern entrance point of the cove. A buoy southeastward of the point marks it. Only partly submerged stones remain of a wharf on the west side of the cove, about 0.2 mile from the head. Winter Harbor Yacht Club, on the west side of Sand Cove, about 0.4 mile from the head, has a pier and float landing with 22 feet alongside. Water is piped to the float. Fishweirs obstruct the upper shoal end of the cove.

Inner Winter Harbor, immediately northeastward of Sand Cove, is entered between **Guptill Point**and Harbor Point, 300 yards southward. **Guptill Ledge,** extending southward and southeastward from Guptill Point, is marked by a daybeacon on the ledge and a buoy off its southeastern end. The harbor is secure in all weather, and is extensively

used by fishing craft, yachts, and pleasure craft. The Winter Harbor town pier and float landing, with 5 feet reported alongside, are on the west side of Guptill Point, just inside the entrance; water is piped to the float. Another pier, whose float landing grounds out at low water, is on the north side of Inner Winter Harbor, about 300 yards westward of the town pier; gasoline and diesel fuel are available at the pier. Gasoline can also be obtained in cans at a lobster car moored in the middle of the harbor.

Henry Cove, at the head of Winter Harbor eastward of Guptill Point, is wider but less sheltered than Inner Winter Harbor. It has good holding ground in soft mud, but is open to southerly winds. Reefs and shoal water extend about 60 yards from shore on both sides of the entrance. The northern end of the cove is extremely shoal, with the upper 300 yards dry at low water. A large gray private boatshed at the head is conspicuous. An L-shaped, unused pier with 9 feet at the end is on the east side of the cove. About 90 yards northward of the unused pier are an L-shaped pier, a launching ramp, and several smaller piers.

The town of **Winter Harbor** is at the head of Winter Harbor. The principal industries are fishing, and lobstering. The homes on Guptill Point, the church spire, and a large private boatshed at the head of Henry Cove are conspicuous. Gasoline, diesel fuel, water, provisions, and electronic repairs can be obtained in town, and a bank is available. The town **harbormaster** controls the moorings. Winter Harbor is seldom closed by ice.

Winter Harbor is deep and clear from the entrance to the recommended anchorage in Sand Cove. Little trouble should be experienced when entering at any time, with strict attention to the charts and the aids, which mark most of the important dangers. To enter Inner Winter Harbor and Henry Cove, midchannel courses are recommended, but only small craft should enter these coves for anchorage.

Chart 13318 (306).-Egg Rock'about 2 miles west of the entrance to Winter Harbor is bare and low. **Egg Rock Light** (44°21.2'N., 68°08.3'W.), 64 feet above the water, is shown from a 40-foot white square tower on a dwelling on the island. It is the most prominent leading mark for this section of the bay. A fog signal is at the light. **Handiron Ledge** extends about 0.1 mile northeast of Egg Rock, and another ledge extends 0.4 mile southwestward from the light. Parts of both ledges uncover. A whistle buoy is 1 mile southward from Egg Rock Light.

Ironbound Island, 1.5 miles northward of Egg Rock Light, the largest of the islands in Frenchman Bay, is thickly wooded and has high vertical cliffs. **Cod Ledges,** eastward of Ironbound Island, have two critical spots covered 11 feet. Vessels should pass to the eastward of the buoy on the eastern side of the ledges. An unmarked shoal with a depth of 12 feet is about 250 yards off the east shore of Ironbound Island at a point 0.6 mile northeast of **Seal Cove,** a bight in the southern end of the island.

Shoal water extends 100 yards north of **Fish Point,** on the west side of Ironbound Island, and along the cove eastward from the point. A ledge, extending northward from the north end of the island, has depths 12 feet 250 yards off the shore. A buoy, northward of the ledge, marks the southern side of the northwestern entrance to Halibut Hole.

Halibut Hole is the passage between the north end of Ironbound Island and **Jordan Island,** 0.2 mile northeastward. The passage is deep and clear with the exception of a rock covered 19 feet on the northeast side of the passsage, 200 yards off the south shore of Jordan Island. The ledge shoals rapidly northward to the beach. The channel is southward of the rock.

Local magnetic disturbance.-Differences of as much as 3° from the normal variation have been observed in the vicinity of Jordan Island.

Stave Island Harbor is an excellent harbor of refuge on the eastern shore of Frenchman Bay. The mainland is on the east, Jordan Island is on the south, and **Stave Island,** 1.4 miles north of Ironbound Island, is on the north. The anchorage has depths of 21 to 37 feet, soft bottom, and is sheltered from all except southwest winds; it is used considerably as an anchorage.

The main entrance to Stave Island Harbor is between Stave and Jordan Islands. An unmarked rock, covered 25 feet, is nearly midway between Jordan and Stave Islands, the deeper channel being southward of it. **Yellow Island,** 200 yards westward from the north end of Jordan Island, is so named from the color of its rocks. The island is wooded. A ledge with a rock awash at low water is 150 yards south of Yellow Island.

Approaching Stave Island Harbor from southward, the mariner will find a broad, clear channel between Ironbound and Long Porcupine Islands; the approach northward of the Porcupines is also clear. The passage from Stave Island Harbor to Flanders Bay east of Stave Island is obstructed by **Stave Island Bar** and is navigable by small craft only at high water. The north end of the harbor eastward of Stave Island is shoal. There is a narrow channel into the harbor from southward over **Jordan Island Bar,** between Jordan Island and the mainland. The channel which is used only by small local craft has a depth of 5 feet 100 yards off Jordan Island.

Summer Harbor is a small settlement on the east side of **Summer Harbor** in the southeastern part of Stave Island Harbor. The cove is clear with the exception of a rocky ledge, covered 7 feet, making out 250 to 500 yards from shore, the northwestern end of which is marked by a buoy.

South Gouldsboro is a village on the northeastern shore of Stave Island Harbor. A wharf and an in-

active fish cannery are in **Bunker Cove.** The ruins of a brick boiler house are near the end of the reef extending off the south entrance point to the cove. The ruins are partially submerged at high water; caution is advised. A lobster pier with 3 feet reported alongside its float landing is on the south side of the entrance. Gasoline is piped to the float.

Calf Island, 0.7 mile northwestward of Stave Island, is wooded except on the south where it is low and bare. A house and barn on the southeast side are visible from southward. **Little Calf Island** and **Thrumcap** are partly wooded islands on the extensive shoal extending southward from Calf Island.

Flanders Bay, on the northeast side of Frenchman Bay, is protected by Stave and Calf Islands. An excellent anchorage may be found, but the bay is seldom used except by small craft. The villages of West Gouldsboro and East Sullivan are on the eastern shore. The bay can be entered through a narrow marked 8-foot channel across **Calf Island Bar** between Calf and Stave Islands, or around the northwest end of Calf Island. The channel northwest of Calf Island has the best water.

An extensive chain of bare and sunken ledges extends through the middle of Flanders Bay from the north end to near the south end. **Halftide Ledge,** the southerly ledge, uncovers about 5 feet; a buoy is off its southeast end. The channel through the bay is eastward of the buoy.

Long Ledge, 0.4 mile northwest of Halftide Ledge, partly uncovers at high water. The ledge southeastward of Long Ledge is covered 5 feet. Between the 5-foot ledge and Long Ledge is an opening with a depth of 19 feet.

Treasure Island, at the northwest side of Flanders Bay, is connected to **Waukeag Neck** by a private stone causeway. The area between Treasure Island and Long Ledge is foul. **Junk of Pork,** a small dirt cone of unusual appearance, **Shelldrake Island,** and **Ash Island** are in the area. A buoy is on the eastern side of the foul area.

Hall Point, marked by prominent residences, is on the southeast end of **Schieffelin Point,** on the northeast side of the bay.

West Gouldsboro is a village at the head of **Jones Cove,** the southeasterly tributary of Flanders Bay. There is a depth of 4 feet to within 500 yards of the village; above this point the channel dries at low water. The channel is unmarked, difficult, and seldom used.

East Sullivan is a village at the northern end of Flanders Bay. A white church with belfry is conspicious near the northwestern end of the bay.

Eastern Point Harbor is a sheltered anchorage for small craft between Waukeag Neck and the eastern half of **Preble Island,** 0.3 mile west of Calf Island. The head of the harbor is shallow and is separated from Sorrento Harbor by a partly dry reef. The cove on the northwest end of the harbor has been dammed up for a lobster pound. The pier close eastward of the pound has a reported depth of less than 1 foot at the end; gasoline is available. A boatyard with boatsheds and a marine railway is on the north side of Eastern Point Harbor, about 200 yards eastward of the pier; craft up to 35 feet can be hauled out for hull repairs and winter storage. The mean range of tide is 10.5 feet.

Sorrento Harbor is a small anchorage, used by small pleasure craft in summer, on the north side of Frenchman Bay north of Preble Island and **Dram Island,** 0.2 mile west of Preble Island. In bad easterly weather the excursion launches from Bar Harbor sometimes anchor here.

The entrance from southward, which favors Dram Island slightly, is about 125 yards wide between reefs that extend from Dram Island and Preble Island. It has a depth of 23 feet in midchannel.

The entrance from westward is about 75 yards wide between the 10-foot curves and has a depth of 15 feet in midchannel. A reef that uncovers extends about 150 yards from the north side of the entrance. The best water in this entrance is found about 100 yards from Dram Island on a 91° course. **Dram Island Ledge,** awash at low water, is 0.2 mile west of Dram Island; a buoy marks the ledge.

Sorrento, a summer resort on the north side of Sorrento Harbor, is frequented by small yachts. Some piling of the former steamer wharf are submerged and above water off the north shore opposite the west end of Preble Island. A town wharf with float having about 7 feet alongside is on the point east of the old steamer wharf ruins. The yacht club uses the town wharf, which has water piped to it. Numerous summer homes are on the estates on Waukeag Neck northward of Sorrento.

Sullivan Harbor is an arm on Frenchman Bay making northward from the north end. It is the approach to the villages of Hancock Point, Mount Desert Ferry, Sullivan, and Franklin. The least depth to the falls just above Sullivan is about 25 feet. The channel to Sullivan is marked by a daybeacon and buoys to near Ferry Point. The mean range of tide is 10.5 feet.

The main entrance to Sullivan Harbor is between Bean Island and Crabtree Ledge. Vessels also can enter by the buoyed channel eastward of Bean Island, but this channel is seldom used. The channel from the entrance to Sullivan has ledges bare and covered on either side, but has ample depth and most of the dangers are marked.

Bean Island, in the middle of the entrance to Sullivan Harbor, is partly wooded. The channel used most frequently is westward of the island. **Bean Ledge,** 0.2 mile eastward of Bean Island, has a rock 4 feet high on it.

Back Cove, eastward of Bean Island and on the southeast side of Sullivan Harbor, has a boatyard on its southerly side near its head. A marine railway at the boatyard can handle craft up to 40 feet for hull and engine repairs; dry covered or open winter storage is available.

Crabtree Ledge, on the west side at the entrance to Sullivan Harbor and 0.4 mile west of Bean Island, is marked by a bell buoy just east of the ledge. The ruins of an old lighthouse on the ledge are reported to bare at low water.

Hancock Point is the southeastern extremity of Crabtree Neck. The village of **Hancock Point** has many summer homes. There is a town wharf with a float landing, which has 7 feet alongside, about 0.4 mile northward of the point. The harbormaster supervises the moorings. There are no facilities at the landing.

Mount Desert Ferry is a settlement on **McNeil Point,** about 1.7 miles northward of Hancock Point. The wharf is in ruins, with only three isolated dolphins remaining, with no connection to shore. There is reported to be a depth of 18 feet at the dolphins. The large building of a former oil distributing plant on the point is conspicuous.

Sullivan is a small village on the east side of Sullivan Harbor, 3 miles above the entrance. There are several private piers with float landings at Sullivan.

Sullivan Falls, locally known as **The Tidal Falls,** are reversing falls in the contracted section of **Sullivan River** which joins Sullivan Harbor with Taunton Bay. They are about 0.5 mile northward of **Ferry Point,** the eastern extremity of **Crabtree Neck.** The channel is reported to have a depth of 10 feet, but is obstructed by ledges. The tidal currents are swift and dangerous. Navigation through the falls is safe only at slack water. Most craft go up on the last of the flood, but come out only at high water slack as there is great turbulence whenever the current is running at strength. The cove on the west side just at the bottom of the falls has a lobster pound, and there is a wharf and float landing, with 15 feet alongside, on the north side of the cove. Gasoline and water are available on the wharf.

The channel is unmarked above Ferry Point, has dangerous ledges on both sides, and is unsafe without local knowledge.

The mean range of tide is about 10.5 feet below Sullivan Falls, and about 6.5 feet above. The tidal currents through the falls are dangerous at strength. High-water slack is 1 hour and 20 minutes, and low-water slack 1 hour and 45 minutes later in the falls than below them. Ice obstructs navigation in Sullivan River from January through March.

West Sullivan, on the north side of the river just above Sullivan Falls, has several abandoned quarry wharves at which vessels formerly loaded. U.S. Route 1 highway bridge across the river about 0.5 mile above the falls, has a swing span with a clearance of 10 feet; drawbridge regulations are given in **117.3,** Chapter 2. The bridge connects West Sullivan with the town of **Hancock.** The customs and immigration duties for this area are handled by officers from Bar Harbor.

Taunton Bay, an expanded section of Sullivan River, is about 6 miles above Bean Island. An unmarked channel with a depth of about 8 feet leads through the bay to near the head. The bay outside of this channel is bare, or nearly so, at low water. The granite quarries along the east side of the bay have been abandoned. **Franklin** is a town on the Maine Central Railroad at the head of Taunton Bay.

Skillings River is an arm of the northern part of Frenchman Bay westward of Sullivan Harbor. The entrance is 1.7 miles wide at the mouth between **Hancock Point** on the east and **Meadow Point** on the west, but it contracts rapidly to a width of 400 yards at **Pecks Point,** about 2 miles above Hancock Point. Above this, the river leads about 4 miles in a northwesterly direction to North Hancock.

The channel above Pecks Point is narrow and crooked, and has numerous rocks and ledges, which make navigation difficult. Strangers wishing to enter the river should anchor 1.5 miles above Hancock Point in depths of 30 to 42 feet and obtain a pilot from among local boatmen. The river is unmarked and is seldom used except by local fishing craft. The wharves usually are small and bare at low water. Strangers in small craft can enter with the aid of the chart.

Raccoon Cove is a large shallow cove on the west side of Skillings River near the entrance. The cove is obstructed by **Shooting Ledge** and other ledges as well as by many fishweirs. Boats are often hauled out and stored on the small point of land jutting out from the western end of Marlboro Beach, on the north side of the cove.

Large commercial lobster pounds have been formed by damming the bight at, and immediately south of **Youngs Point,** 3 miles above Hancock Point at the entrance to **Youngs Bay.**

Eastern Bay, together with Mount Desert Narrows, forms a thorofare from the head of Frenchman Bay to Blue Hill Bay, north of Mount Desert Island. **Googins Ledge,** nearly 0.5 mile long and bare in the center at low water, is near the center of the bay. A buoy is on the southwest side of the ledge. The channel leads southward of the buoy. Except for Googins Ledge the bay is mostly deep and clear in midchannel to the entrance of Mount Desert Narrows, but the eastern half is open and unprotected in easterly and southeasterly weather.

Good anchorage for deep-draft vessels is available westward of Googins Ledge in depths of 36 to 54 feet. There is also good anchorage southward of Googins Ledge, about 0.3 mile from shore off the entrance of Salisbury and Emery Coves in depths of 42 to 48 feet. An unmarked 16-foot spot is off Emery Cove.

The north shore of Eastern Bay 0.7 mile west of Meadow Point is foul; a rock which uncovers 6 feet is 0.2 mile offshore.

Lamoine Beach extends about 0.6 mile westward of Meadow Point. At the western end of the beach there are the pilings of a pier which bare at low water.

Lamoine State Park, which includes the grounds of a former naval coaling plant, is about 0.8 mile westward of Lamoine Beach. Most of the steel piling of the former coaling pier, which were set in heavy concrete bases, has been removed but caution should be exercised when approaching within 200 feet of the Lamoine State Park pier. The park pier has a float landing and a prominent "A" frame structure on its outer end; depths of 15 feet are reported alongside the float. A private small-craft launching ramp is adjacent to the park pier. The stone foundations of the former coaling plant together with three white adjacent buildings are conspicuous.

Sand Point is on the south shore of Eastern Bay at the entrance. A boatyard at the point can haul out craft up to 75 feet in length and 10-foot draft for hull or engine repairs, or dry open or covered winter storage. Electric and electronic repairs can be made. **Salsbury Cove** and**Emery Cove** are 0.8 mile and 1.1 miles westward of Sand Point. On the point between these two coves is a biological experimental station with a float landing.

At **Hadley Point,** 2.2 miles west of Sand Point, Eastern Bay merges with Mount Desert Narrows. **Berry Cove** makes into the northern shore opposite Hadley Point. Good anchorage can be had in 18 to 24 feet off the entrance to this cove, which is shallow at its head. A pier with float landing, a small private marine railway, and a lobster pound are on the east side of Berry Cove.

Mount Desert Narrows, northward of Mount Desert Island, connects the head of Frenchman Bay with the head of Blue Hill Bay; see chart 13316 (307). The passage is crossed by State Route 3 highway bridge and causeway. The fixed span over the navigation channel has a clearance of 25 feet.

The channel is nearly bare at low water with scattered boulders and ledges of rock, and is used at high water by boats up to 9-foot draft. It is narrow, difficult, and fringed with reefs. Strangers should not attempt passage with drafts greater than 4 or 5 feet, and should go through on a rising tide. The mean range of tide is about 10.5 feet. The current sets westward on the flood and eastward on the ebb.

Passage through Mount Desert Narrows from Frenchman Bay to Blue Hill Bay should not be attempted without local knowledge. The channel approaches to the bridge from Thomas Island past Trap Rock to deep water in Blue Hill Bay, southward of Haynes Point, are narrow, treacherous, difficult, and unmarked. The most favorable time is at high-water slack, as the current at other times is strong and turbulent.

Jordan River, making northward from Mount Desert Narrows just west of Berry Cove, has a narrow, crooked, and unmarked channel, and dries for almost half of its upper length above Lamoine. Local knowledge is necessary for its navigation. The few wharves are in ruins. Bar Harbor airport is on the west side of the river entrance. The buildings, control tower, and aero light and tower of the airport are conspicuous.

Cape Levi (44°25.8′ N., 68°14.8′ W.) is on the northeastern shore of Mount Desert Island 1.2 miles east-southeastward of Sand Point. **Sunken Ledge,** covered 5 feet, is 0.5 mile north-northwestward of the cape, and is marked on its north side by a buoy. From Cape Levi to Lookout Point, 0.6 mile southward, **Halftide Ledge,** a triangular-shaped shoal with scattered boulders which uncover 6 feet makes out from the shore for about 0.6 mile, where it is marked by a buoy. All craft should avoid it.

Chart 13323 (205).-Hulls Cove is a broad open bight on the northeast side of Mount Desert Island. Several dangers are off the cove, but they are marked by buoys. The cove shoals rapidly from the entrance to the head, and the low waterline extends about 200 yards from its head. Piling of a fishweir obstructs most of the cove. A boatyard with a 175-foot pier is on the north side of the cove, about 250 yards southwestward of Lookout Point. The yard can provide gasoline, ice, and open and covered storage; a marine railway is available. There is a small private marine railway and boatshed on the south side of the cove near the head.

The Bar Harbor Yacht Club is at **Canoe Point,** the southern point of the entrance to Hulls Cove. A float landing at the club pier is reported to have 20 feet alongside. A shoal with a least depth of 2 feet, just off the entrance to Hulls Cove, is marked on its south side by a buoy. Passage into the cove is on either side of the shoal.

Bald Rock, 20 feet high, is about 1.4 miles east-northeastward of Canoe Point. A buoy is northward of a ledge that uncovers 6 feet just north of Bald Rock. **Bald Rock Ledge,** about 0.5 mile in width, is 0.3 mile southwest of Bald Rock. The high part of the ledge uncovers 5 feet. A buoy is on the southwest side of the ledge. The passage between Bald Rock Ledge is dangerous without complete local knowledge. A dangerous rock awash is near the middle of the passage, about 0.3 mile west-southwestward of Bald Rock.

The shoreline from Hulls Cove to Bar Harbor is backed by many large summer homes. The area between Bald Rock Ledge and Bar Island to the southward is sometimes used as an anchorage by larger yachts.

The **Bar Harbor-Yarmouth (Bluenose) auto-passenger ferry** terminal is 0.9 mile southeastward of Canoe Point. The ferry has daily sailings from Bar Harbor to Yarmouth, Nova Scotia, dur-

ing the summer and less often the remainder of the year. An unmarked ledge that uncovers 5 feet is about 350 yards northwestward of the ferry pier; a rock that uncovers is about 140 yards southwestward of the ledge.

Bar Harbor is an anchorage on the eastern side of Mount Desert Island, 3.5 miles above Egg Rock Light (chart 13318 (306)). The harbor is formed by the east shore of Mount Desert Island on the west, **Bar Island** and **Sheep Porcupine Island** on the north, and on the south by a breakwater extending southwesterly from **Bald Porcupine Island** across **Porcupine Dry Ledge** to within 250 yards of the shore. The breakwater, marked by a daybeacon at its southwestern end, is covered at high water for most of its length except for a part of Porcupine Dry Ledge.

A deep channel, about 150 yards wide, extends into the harbor between the western end of the submerged breakwater and the shore of Mount Desert Island. This channel is used by small local craft, but extreme caution should be exercised when using it. It has been reported that on extreme high tides with a smooth sea there is no indication of the position of the breakwater by tide rips or otherwise, except for the daybeacon marking the southwesterly end of the breakwater.

All the islands surrounding Bar Harbor are high and wooded, and have no prominent marks. When approaching from southward, Bald Porcupine Island is distinguishable because of its bare rocky slopes. The bar extending between Bar Island and the town consists of scattered boulders on soft bottom. Automobiles drive from the town, at low water, to the national park, which occupies the western half of Bar Island.

The principal entrance is from the eastward, between Bald Porcupine and Sheep Porcupine Islands, and is clear. A rock awash is about 40 yards off the southeastern shore of Bald Porcupine Island. Local vessels sometimes enter from northward between Sheep Porcupine Island and the small islet 2 feet high eastward of Bar Island, where the depth is 13 feet in midchannel.

Some shelter from southerly winds is afforded by the breakwater. A swell makes in during southeast winds, and vessels should not attempt to ride out a gale from that direction in Bar Harbor. The usual anchorage is southward and southeastward of the eastern end of Bar Island in depths of 6 to 78 feet, the depths shoaling rapidly toward the bar southward of Bar Island. Large vessels sometimes anchor northward or northwestward of Bar Island, in 42 to 60 feet, soft bottom. The western shore is fairly bold. Vessels should keep over 0.4 mile southward of a line joining Bald Rock Ledge and Bald Rock, a bare rocky islet. The mean range of the tide is 10.5 feet.

Bar Harbor is a town on the shore of Bar Harbor with a hospital, pharmacy, several banks, and good highway connections. It is an important summer resort and yachting center, and during the summer many sightseeing cruises and fishing trips are scheduled daily for the vicinity of Frenchman Bay and Mount Desert Island.

Bar Harbor is a **customs port of entry. Customs, Immigration, and Quarantine** officials maintain offices in Bar Harbor; see Appendix for addresses. The Coast Guard **vessel documentation office** in Rockland, Maine, services Bar Harbor; see Appendix for address.

The town **harbormaster** assigns moorings and maintains an office on the municipal pier.

The large municipal pier, on the north shore of the town, has a reported depth of 10 feet at the end. Floats for yachts and commercial craft are on each side of the pier; water and electrical shore power are available at the floats. The ruins of a float extend eastward about 40 feet from the northeast corner of the pier. A small-craft launching ramp is at the east and inshore end of the municipal pier. The other wharves at Bar Harbor have depths of less than 1 foot to 5 feet alongside. Gasoline, diesel fuel, water, ice, marine supplies, and rental boats are available at most of the wharves; provisions and bottled gas can be obtained in town. Charter and excursion boats operate from the municipal pier and the other wharves.

There are facilities for only minor engine repairs in the town, but there is a boatyard with marine railway at Sand Point, about 4 miles northwestward, where craft up to 75 feet in length and 10-foot draft can be hauled out for repairs or winter storage. There is a compass adjuster at Bar Harbor; he can be contacted through the harbormaster. The town has bus and taxi service.

Cromwell Cove, westward of the end of the breakwater, is seldom used. A pier in ruins is on the south side of the cove.

Burnt Porcupine Island, northeastward of Bar Harbor, is about 0.5 mile eastward of Sheep Porcupine Island. A deep clear channel to the upper part of Frenchman Bay is between the islands. **Rum Key** is between Burnt Porcupine and Long Porcupine Islands.

Chart 13318 (306).–Another deep channel to the upper part of Frenchman Bay is between **Long Porcupine Island** (44°24.4′ N., 68°09.8′ W.), 0.4 mile east of Burnt Porcupine Island, and Ironbound Island. **The Hop** is off the northeast side of Long Porcupine Island.

The southeast shore of Mount Desert Island between Bar Harbor and Seal Harbor (44°17.5′ N., 68°14.5′ W.) is rocky and precipitous. Several dangers are off the shore, but the most dangerous either show above water or are marked by buoys.

The Thrumcap (Thrumcap Island), 1.4 miles southward of Bald Porcupine Island, is a round, rocky island with a clump of trees in its center. It is reported that there are downdraft wind currents around Thrumcap Island, and, accordingly, small sailboats should keep offshore.

Caution.-An 8-foot spot is 0.2 miles north-northwest from The Thrumcap. It is unmarked and has been struck by several yachts navigating along the coast at this point.

Newport Ledge is 400 yards from shore, midway between The Thrumcap and Schooner Head. The ledge uncovers at extreme low water; a buoy is on its eastern side. The bottom west of the ledge is broken and should not be crossed by vessels.

Schooner Head, 1.2 miles south of The Thrumcap (44°20.7′ N., 68°10.6′ W.), and **Great Head,** 2.1 miles southward of the island, are prominent rocky headlands on the eastern side of Mount Desert Island. On the summit of the eastern hill at Great Head, the ruins of a small round flat-topped stone building are conspicuous. Numerous boulders lie awash between the two headlands.

Old Whale Ledge, 350 yards from shore, midway between Schooner Head and Great Head, is awash at low water. A lighted bell buoy is 300 yards eastward of the ledge.

Newport Cove, a small cove westward of Great Head, is exposed southward, has poor holding ground, and is never used as an anchorage. **Old Soaker,** a bare rock 6 feet high, is off the entrance. Because of a prominent sand beach at the head of the cove, the area is known locally as **The Sand Beach.**

Otter Cliff Ledge, which uncovers 6 feet, is 400 yards eastward of **Otter Point,** 1.5 miles southward of Great Head. A bell buoy is eastward of the ledge.

Otter Cove, a long cove making northward of the west side of Otter Point, has deep water in the entrance and is bare for 0.4 mile from the head. The cove is exposed southward, but is used by local fishermen who lay to moorings. A causeway and fixed bridge cross the cove 0.7 mile above the entrance.

Chart 13321 (206).-Southwest Harbor, Somes Sound, Northeast Harbor,Seal Harbor, and several other coves are in the southeast side of Mount Desert Island, inside a large group of islands and shoals. These waters are the approaches to several important villages and summer resorts, and are frequented by many pleasure craft and fishing boats. Southwest Harbor is used extensively as a harbor of refuge. The harbors can be approached through the channels on either side of Sutton Island or through Western Way.

Baker Island, 3.7 miles south of Otter Point and the most southeasterly of the group of islands in the vicinity, is mostly wooded, but grassy on its northwest end. There are several houses on the island. **Baker Island Light** (44°14.5′N., 68°12.0′W.), 105 feet above the water, is shown from a 43-foot white stone tower in the center of the island. A whistle buoy, (see chart 13318 (306)), is 0.9 miles southeastward of the island. The island is surrounded by ledges, bare and covered, and should be given a berth of at least 0.4 mile.

The Thumper is a ledge, which uncovers 5 feet, 300 yards southward of Baker Island. A dangerous rock awash is close southeastward of the ledge. **Southwest Rocks,** which uncover 1 foot, are 500 yards off the southwest shore of the island.

Harding Ledge, covered 1½ feet, about 0.2 mile off the east end of Little Cranberry Island, **Gilley Ledge,** covered 11 feet and about 0.55 mile north of Baker Island and the ledges extending northeastward and eastward of Baker Island, are all marked by buoys.

Little Cranberry Island, about 1 mile northwest of Baker Island, is low and wooded. A large white abandoned Coast Guard building with lookout tower is prominent on the southeast point of the island. **Islesford** is a village on the west side of the island. Three piers with float landings and the ruins of an old stone breakwater-pier, close northwestward, are on the north side of **Hadlock Cove,** a bight off Islesford. The southernmost pier, the village landing, has a reported depth of 9 feet alongside its float. Gasoline and diesel fuel are available at the floats of the other two piers. The mail and passenger ferry uses the village pier. Groceries can be obtained in Islesford. A boatyard southward of the piers has several marine railways that can handle craft up to 50 feet for hull and engine repairs.

The Gut, a passage between Little Cranberry and Great Cranberry Islands, is used at any stage of the tide by small local craft, but it has many unmarked ledges and should not be used by strangers. Small passenger and mail boats maintain service between the Cranberry Islands and Southwest Harbor the year round, and between the islands and Seal Harbor during the summer.

Cranberry Harbor, southward of Sutton Island and between Little Cranberry and Great Cranberry Islands, is frequented by small local vessels. Sometimes small coasting vessels anchor in the harbor, but Southwest Harbor offers much better anchorage. The usual anchorage in Cranberry Harbor is in depths of 14 to 20 feet in the middle of the harbor with the wharves at Islesford bearing about 050°. Care must be taken to keep well clear of the buoy on the end of the ledge which extends 350 yards westward from the east side at the entrance. An obstruction, cleared 6 feet, is 0.3 mile northward of Long Point on the west side of the entrance to the harbor.

The Pool is a large shallow cove on the east side of Great Cranberry Island southwest of Cranberry Harbor. A rock awash is nearly in midentrance. Several small piers, dry at low water, and a boatyard are on the west side of the pool. A marine railway at the yard can handle craft up to 45 feet for engine repairs; open and covered storage for 60 boats is available.

Great Cranberry Island, about 2 miles west of Baker Island, is wooded and has no prominent marks visible from southward. **Cranberry Isles** is a village on the island. **Spurling Cove** makes into the north shore of the island. The 280-foot village pier,

the more westerly of two piers on the south side of the cove, has a float landing at which the mail and passenger ferry lands. About 50 yards southeastward of the village pier is a 300-foot commercial pier, also with a float landing. Depths of 8 feet are reported alongside both float landings. Gasoline, diesel fuel, and water are available at the commercial pier. **Long Point** is the northeast end of the island. **Crow Island,** northeast of **Deadman Point,** the southeast point of Great Cranberry Island, is 26 feet high and grassy with reefs to the east and southeast.

Chart 13318 (306).-South Bunker Ledge(44° 13.6′ N., 68°17.0′ W.), 0.7 mile southwest of Great Cranberry Island and in the southern approach to Western Way, uncovers about 4 feet. A daybeacon is on the ledge.

Long Ledge, westward of South Bunker Ledge, is a dangerous reef extending 0.5 mile southeastward from Mount Desert Island, on the western side of the southern approach to Western Way. The ledge uncovers with a few rocks which show at high water. A lighted gong buoy is off the southeastern side.

Chart 13321 (206).-Western Way, between the western side of Great Cranberry Island and Mount Desert Island, is a passage frequently used by small vessels bound to Southwest Harbor and vicinity. Also, small vessels bound between points westward and any point in Frenchman Bay use it, except in rough weather. The channel is buoyed, and the least midchannel depth is 13 feet on a bar toward the northern end, but there are unmarked spots of 10 to 12 feet close to the sailing lines. The passage should not be used by strangers in craft drawing more than 10 feet. A lighted fairway bell buoy marks the southern entrance.

Cranberry Island Ledge, covered 9 feet near its southwestern end, about 500 yards from the southwestern end of Great Cranberry Island, and with lesser depths closer to shore, is marked by a buoy. **Flynns Ledge,** covered 2 feet, extends about 0.5 mile southeastward from Seawall Point, where it is marked by a buoy. A bare rock, 6 feet high, is near the middle of the ledge.

Southwest Harbor, an important harbor in the south side of Mount Desert Island, is the approach to the villages of Southwest Harbor and Manset. The harbor affords an excellent, well-sheltered anchorage and can be entered from the eastward by deep-draft vessels. A small islet, about 400 yards from the head of Southwest Harbor, is marked by a daybeacon.

Greening Island, on the north side of the entrance to the harbor, is low and wooded. Several houses are visible on the island, and a large house at the eastern end is prominent. Shoals which border the island on all sides are marked on the northern, southeastern, and southwestern ends by buoys. Several private piers with float landings are on Greening Island, and three private boathouses with marine ways are conspicuous.

Eastern Way, a well-marked channel approaching Southwest Harbor northward of Sutton Island, is deep and the recommended route for deep-draft and low-powered vessels. This passage is used by all vessels entering Southwest Harbor from the northward in Frenchman Bay and by most vessels entering from the eastward and southeastward.

Gilley Thorofare, the channel southward of Sutton Island, has unmarked rocks with cleared depths of 13 to 18 feet. **Spurling Rock,** covered 7 feet, on the south side of the channel about 0.3 mile off the northeastern end of Great Cranberry Island, is marked by a buoy to the northward. This passage has been examined by means of a wire drag. With the aid of the chart it is easy to navigate in the daytime, but in hazy weather it should be avoided by all vessels.

Excellent sheltered anchorage may be found in Southwest Harbor in depths of 6 to 50 feet. Deep-draft vessels can anchor midway between Greening Island and the southern shore in depths of 34 to 50 feet. Smaller vessels can anchor farther in the harbor; the depths shoal gradually to 12 feet at a point 100 yards eastward of the islet near the head of the harbor.

Vessels approaching Southwest Harbor from any direction in good weather should experience no trouble, with strict attention to the chart and following the aids.

Normally, navigation in Southwest Harbor and approaches is not restricted by ice. In very severe winters ice is reported to have formed as far out as the Cranberry Islands, but is carried to sea at the first ebb tide by the current out of Somes Sound or is broken up by icebreakers.

A pilot is not required if entering from eastward in daytime with clear weather. Strangers coming from westward and crossing Bass Harbor Bar and Cranberry Island Bar (Western Way) usually can obtain a pilot from among the fishermen at Bass Harbor if desired.

The village of **Southwest Harbor** is on the north side and at the head of Southwest Harbor. **Customs** are handled by an officer from Bar Harbor. The U.S. Public Health Service maintains a **contract physician's office** in town; see Appendix for address. The town **harbormaster** supervises the moorings in the harbor; he can be contacted through the Coast Guard.

The Coast Guard wharf on **Clark Point,** on the north side of Southwest Harbor, has a reported depth of 15 feet alongside. **Storm warning signals are displayed;** see chart.

The lower town wharf and ferry landing at Clark Point, close westward of the Coast Guard wharf, has three floats, at which there is a reported depth of 12 feet at the outer end. The wharf is used by the mail and passenger ferry which calls year-

round at Cranberry Isles, on Great Cranberry Island, and during the summer at Islesford, on Little Cranberry Island, and at Sutton, on Sutton Island.

The upper town landing, about 0.3 mile westward of Clark Point, has float landings with depths of 6 feet reported alongside. The mail and passenger ferry also calls at this landing.

There are other commercial and private wharves, some with float landings, on the north side of the harbor with depths of 4 to 15 feet alongside. Gasoline, diesel fuel, water, and some marine supplies are available at the wharves.

A shipyard, between the two town facilities, can build craft up to 100 feet in length and can make hull, engine, electrical, and electronic repairs. A marine railway at the yard can handle craft up to 100 feet; a 25-ton crane is also available.

A large cannery wharf with a pier extending eastward from its end is on the west side of the harbor; depths of 5 feet are reported at the end of the pier.

Manset is a village on the south side of Southwest Harbor. The town pier is about 0.5 mile westward of **Kings Point,** the southern entrance point to the harbor; depths of 5 feet are reported alongside the pier's float landing. A marina, about 0.1 mile eastward of the town pier, has a reported depth of 3 feet alongside its float landing at which gasoline and water are available. A 2½-ton fixed lift and covered winter storage are available at the marina, and hull and engine repairs can be made. The large boatyard, about 0.15 mile eastward of the town pier, has a marine railway that can handle craft up to 70 feet for hull, engine, and electronic repairs. A 10-ton mobile lift and covered and open winter storage are also available at the yard. Depths of 12 feet are reported alongside the yard's service float; gasoline, diesel fuel, and water are piped to the float. Guest moorings, a restaurant, and ice can be obtained at a hotel just east of the boatyard. There are several commercial marine facilities eastward of the town pier, and numerous private wharves and float landings westward of the town pier.

The passage between Greening Island and Clark Point has a least depth of 14 feet and is extensively used. A daybeacon is on the west side of the channel northward of Clark Point. The best water from the southward leads 100 to 150 yards westward of the buoy off the southwestern end of Greening Island and 100 yards eastward of the daybeacon.

Charts 13321 (206), 13318 (306).-Somes Sound is a fjord, about 4.5 miles long and 0.2 mile wide, making into the south shore of Mount Desert Island. The sound is between steep rocky shore and has a narrow entrance with few dangers. **Middle Rock,** covered 9 feet, on the west side of the entrance to **The Narrows,** is marked by a buoy on its northeast side. Greening Island is in the middle of the approach, with a channel on each side of it. With the aid of the chart, good anchorage can be selected in 54 to 72 feet. Small sailing vessels should be prepared for downdraft winds.

Norwood Cove, on the west side of the entrance to Somes Sound, is not navigable, and has a causeway with a footbridge across its entrance. **Jesuit Spring,** where the first settlers in 1613 obtained water, is still free flowing; it is near the high-water mark on the north side of **Fernald Cove,** about 200 yards inside **Fernald Point.**

Several private float landings are on the east side of the sound above **Manchester Point,** 0.7 mile north of Greening Island.

Hall Quarry, the site of an inactive quarry, is a small settlement on the west side of Somes Sound 3 miles above the entrance. A boatyard, on the east side of the sound opposite Hall Quarry, has a marine railway that can handle craft up to 40 feet for partial hull and engine repairs; open or covered winter storage is available.

Somes Harbor is a small cove at the head of Somes Sound. The entrance is narrow and is marked by buoys. Several private piers and float landings for pleasure craft are in the harbor.

Mount Desert (Somesville) is a village on the west side of Somes Harbor. A church spire in the village is conspicuous. Gasoline, ice, provisions, and limited marine supplies can be obtained at a float landing at the village store; the float dries at low water.

A boatyard is in the northeast corner of Somes Sound. A marine railway at the yard can handle craft up to 60 feet in length and 7 feet in draft for hull repairs; a 3-ton crane, covered storage, and gasoline are also available.

Chart 13321 (206).-Gilpatrick Cove, on the east side of the entrance to Somes Sound, is small and shoal, and the upper end dries at low water. A fixed wooden footbridge across the entrance has a clearance of 4 feet. A float landing in about the middle of the bridge has 4 feet alongside. A pier and float landing of the Northeast Fleet Yacht Club is on the east side of the entrance. Many small yachts moor off the entrance to the cove in the summertime. A wharf, with oil storage tanks on it, is about 0.3 mile northwestward of Gilpatrick Cove. In 1970, the wharf was in poor condition and had a reported depth of 3 feet alongside.

Gilpatrick Ledge, just east of the entrance to Gilpatrick Cove, extends about 300 yards southward and is marked by two daybeacons along its southwesterly edge and by a buoy to the westward. Vessels should keep south of the daybeacon.

Northeast Harbor, 0.6 mile eastward of Gilpatrick Cove, is 300 yards wide at its entrance and extends into the south shore of Mount Desert Island about 0.8 mile. The harbor is an important yachting center, and there is a summer hotel on the north shore overlooking the harbor. The upper part

of the harbor is shoal, but anchorage for very small vessels is available in depths of 14 to 28 feet in the lower part of the harbor. This anchorage is about 200 yards wide and favors the western shore. Anchorage is also available in depths of 3 to 10 feet off the town pier, on the southwest side of the inner harbor.

In the middle of the entrance to Northeast Harbor is a rock which uncovers 3 feet. A buoy is on each side of the rock. The best passage into the harbor is westward of the rock. In average winters the harbor is reported to be clear of ice except at its head, but in severe winters it is reported to freeze as far out as Bear Island.

The summer resort of **Northeast Harbor** is on the western shore of the harbor.

The town pier, on the southwest side of the inner harbor, has float landings and finger floats for berthing yachts. All have reported depths of 6 to 8 feet alongside. Water is piped to the pier, and electrical shore power is available. Guest berths are maintained. A concrete ramp and a marine railway are close eastward of the town pier. Telephone, washrooms, ample parking, and showers are available at the town pier. Gasoline and diesel fuel can be obtained by truck on short notice, and ice, provisions, and marine supplies are available. A boatyard with shed and a 3-ton crane is about 200 yards northwestward of the town pier. Craft up to 35 feet in length can be lifted out for repairs. There are many private piers with float landings about the harbor. The **harbormaster** supervises the town pier and the anchorage; his office is at the landing.

Gasoline, diesel fuel, water, ice, and limited marine supplies can also be obtained at a pier on the west side of Northeast Harbor, about 0.4 mile above the entrance.

Bear Island, on the eastern side of the entrance to Northeast Harbor, is high and wooded. **Bear Island Light** (44°17.0'N., 68°16.2'W.), 100 feet above the water, is shown from a white cylindrical tower on the southwestern side of the island; a fog signal is at the light. Only the stone foundation, covered 2 feet, and a few submerged piles remain of the old Coast Guard wharf; a buoy is about 90 yards westward of the ruins. A Coast Guard boatshed and ways are close northward of the light. A private pier with float landing is on the north side of the island. The passage north of the island is almost blocked by rocky ledges awash at various stages of the tide, and passage should not be attempted.

Sutton Island, about 1 mile long and wooded, is in the middle of **Eastern Way,** between the south shore of Mount Desert Island and Cranberry Islands. The channel north of Sutton Island has a depth of 40 feet near the center and depths of 31 and 36 feet near its northern and southern edges, respectively, and is the recommended channel generally used.

On the northern side of this channel opposite Sutton Island and eastward of Bear Island are **Long Pond Shoal,** covered 5 feet, and **Bowden Ledge,** covered 2 feet. Buoys are south of these dangers.

Sutton, a summer resort, is on the western part of Sutton Island. The island has many summer cottages along its shores and several piers with float landings, including a town wharf on the western side with a reported depth of 6 feet alongside its float landings. The town wharf is used by the mail and passenger ferry. The approach to the wharf, near **Fernald Point,** leads between two rock ledges; mariners are advised to exercise care in approaching it.

Bracy Cove, 0.5 mile northeastward of Bear Island, is exposed to southeast winds, has a rocky and uneven bottom, and is unfit for anchorage. There is a private pier with float landing on the east side of the cove.

Seal Harbor makes into the south shore of Mount Desert Island about 1 mile east of Bear Island. Anchorage for small vessels may be had in the middle of the harbor in depths of 15 to 18 feet. This anchorage, about 400 yards in diameter, is exposed to southeasterly winds. The approach is between the buoy off Bowden Ledge on the west and a lighted bell buoy on the east. A ledge which uncovers 6 feet at the outer end extends halfway across the entrance from **Crowninshield Point,** the western entrance point. A buoy is off the ledge. A ledge which uncovers 3 feet is 200 yards from the head of the harbor.

The village of **Seal Harbor,** on the shore of the harbor, has numerous summer homes. The town wharf, on the east side of the harbor about 0.25 mile above the entrance, has a reported depth of 9 feet alongside its float landing. Gasoline and water are available at the wharf. The Seal Harbor Yacht Club, close northward of the town wharf, has a pier and float landing with a reported depth of 8 feet alongside. The town **harbormaster** has an office at the town wharf. A former coal wharf, on the west side of the harbor opposite the town wharf, has private facilities for hauling out and storing yachts. A compass adjuster is available in town; he can be contacted through the harbormaster.

East Bunker Ledge , southeastward of Seal Harbor and 1 mile eastward of Sutton Island, is 0.3 mile long and has two islets 4 feet high on it. A daybeacon with a red and white checkered diamond daymark on a stone structure is on the southwestern islet. A buoy marks **Lewis Rock,** covered 6 feet, which is 200 yards northwestward of the ledge. A lighted gong buoy is about 0.5 mile southeastward of the ledge.

Chart 13313 (308).-Bass Harbor Bar connects Great Gott Island with **Bass Harbor Head,** the southwestern point of Mount Desert Island. **Bass Harbor Head Light** (44°13.3'N., 68°20.3'W.), 56

feet above the water, is shown from a white tower, connected to a dwelling on the head.

Caution should be exercised in navigating the channel, which has a depth of 13 feet about 325 yards southward of Bass Harbor Head Light. Buoys mark the channel across the bar. The channel is on the through route used by vessels drawing 9 feet or less, and is sometimes used by vessels drawing 18 feet proceeding at high water and with a smooth sea.

In heavy weather breakers occasionally form across the bar. A heavy chop builds up on the bar and off Long Ledge, 1.6 miles eastward, with the wind contrary to the tidal current, which might beset small craft and open boats.

Of the many islands off the entrance to Blue Hill Bay, those southward of Bass Harbor Bar and Casco Passage, and westward from Duck Islands to Swans and Marshall Islands, are discussed in this chapter. The islands in this area are in general wooded and have few conspicuous marks. The only ones having settlements are Swans, Long, and Great Gott Islands. The area is very broken and rocky, with numerous bare and submerged ledges, many of them unmarked. The through route by way of Casco Passage and Bass Harbor Bar is used by many vessels, while the passages through the islands southward are seldom used except by local fishermen and yachtsmen.

Great Duck Island, about 5 miles south of Great Cranberry Island, is the most southeasterly of the islands off Blue Hill Bay. The island is partly wooded, and from a distance eastward or westward appears as two islands. There are a small white house and a private landing strip on the northern slope of the island.

Great Duck Island Light (44°08.5′N., 68°14.8′W.), 67 feet above the water, is shown from a 42-foot white cylindrical tower on the south end of the island; a fog signal is at the light. The buildings of the light station are prominent. The light is partially obscured by trees from about 143° to 206° 30′.

Little Duck Island, 0.7 mile northward of Great Duck Island, is partly wooded and has no distinguishing marks.

The Drums, a dangerous ledge 2.5 miles west of Great Duck Island and 2 miles northeastward of Long Island, is awash at low water. A bell buoy is southeast of the ledge. The range formed by the western ends of Green and Placentia Islands leads well westward of this ledge.

Horseshoe Ledge, 1 mile north of The Drums, is awash at low water. A daybeacon is on the ledge.

Green Islands, 4 miles northwestward of Great Duck Island Light and 0.7 mile southward of Black Island, are two rocky islets with grass on top.

Black Island, 4.5 miles northwestward of Great Duck Island Light, is 157 feet high and wooded. Three ledges are off the east side of the island: **Inner Dawes Ledge,** the northernmost off the northeast side of the island, is bare at high water; **Outer Dawes Ledge,** about 0.4 mile to the southward, is awash at high water; and **Grindstone Ledge,** about 0.4 mile farther southward, uncovers about 5 feet and is marked by a buoy. An unmarked shoal with a clear depth of 11 feet is about 500 yards southeastward of the buoy. **Little Black Island,** off the southwest side of Black Island, is wooded in the center.

Placentia Island, 0.4 mile northwest of Black Island, is 135 feet high and wooded except on its eastern end, which is grassy. Two houses are visible on the slope of the hill on the northeastern extremity. A buoy marks the shoal extending off the northeast end of the island.

Little Gott Island and **Great Gott Island,** 0.4 and 1 mile northeastward of Black Island, are mostly wooded. **Gotts Island** is a small town on the west side of Great Gott Island. The approach to the town is via the passage between Little Gott and Great Gott Islands, which can be entered from southward at low water. A bar, bare at low water, obstructs the passage at the northwest end. The houses are the most prominent marks in this vicinity. There are no wharves.

Staple Ledge, between Placentia Island and the northeast end of Swans Island, is awash at low water. A buoy is off the northeast side of the ledge.

Long Island, 4.3 miles west-southwestward of Great Duck Island, is the most southerly of the large islands off Blue Hill Bay. The island is 210 feet high and wooded, but has no conspicuous marks visible from seaward.

Lunt Harbor is a cove in the north side of Long Island.

Frenchboro is a village on the shore of the cove. The cove has good holding ground and is used as an anchorage by local boats, but it is somewhat exposed in northeasterly weather. Ice seldom interferes with navigation. A crib wharf on the northeast side of the harbor has a depth of 6 to 7 feet alongside. A large fish packing wharf has a depth of 1 to 2 feet alongside. The other wharves are bare before low water. Gasoline and provisions are available. Mail comes by the Swans Island State auto-passenger ferry that calls at Lunt Harbor.

Northward of Long Island are numerous small islands and ledges. **Harbor Island,** just off Lunt Harbor, is wooded, and a reef which uncovers extends west of the island. A bell buoy is off a 12-foot spot 600 yards west of the island. **Crow Island,** 0.4 mile north of Long Island, is wooded except at its eastern end which is a bare rock. **Dry Money Ledge,** 400 yards west of Crow Island, has a white rock islet about 10 feet high on it. **Sunken Money Ledge,** 400 yards southwest of Dry Money Ledge, uncovers. **Northeast Ledge,** 0.5 mile northeast of Long Island, is covered 13 feet. **Crow Island Ledge,** 0.3 mile north of Crow Island, is covered 9 feet. A fairway lighted gong buoy is

northward of Northeast Ledge and eastward of Crow Island Ledge. **Beaumont Ledge,** 0.5 mile north of Crow Island, is covered 7 feet. **Otter Ledge,** about 0.8 mile north of Crow Island, is awash at low water.

Sister Islands, 0.5 mile northwestward of Crow Island, are wooded. **Sister Ledge,** awash at low water, extends 300 yards southward of the westerly of the Sister Islands. **Ram Island,** 0.5 mile north of Sister Islands and 0.2 mile off Swans Island, is marked by a single tree.

A 12-foot spot is 450 yards off **East Point,** the eastern extremity of Swans Island, and 950 yards northeastward of Ram Island.

Westward of Long Island is a deep passage. **Beach Ledge,** about 0.4 mile westward of Long Island, is covered 14 feet. A bell buoy is west of the ledge. **John Island,** 1.1 miles west of Long Island, is grassy and has many dead trees and a few scrub trees. **John Island Dry Ledge** 0.5 mile southwest of John Island, is 0.2 mile in diameter and has rocks showing at high water. **John Island Sunken Ledge,** 0.6 mile south of John Island, is covered 4 feet; a buoy is south of the ledge.

The passage northward between Long and Swans Islands has deep water, but there are many unmarked ledges. The best channel is between John Island and the bell buoy off Beach Ledge, thence between the westerly of the Sister Islands and Ram Island. **Red Point,** on the southeast side of Swans Island 0.4 mile west of Sister Islands, has a low bare reddish bluff. Any of the passages can be used by small craft with the aid of the chart. A 15-foot spot is in midchannel between Red Point and the westernmost of the Sister Islands, and a 24-foot spot is about 0.6 mile southwestward of the same islands; both are unmarked.

Swans Island, about 2 miles northwest of Long Island, is the largest of the islands off Blue Hill Bay. The three villages on the island are Atlantic, Swans Island, and Minturn. The island has several sheltered coves, but all except Mackerel Cove and Burnt Coat Harbor are foul and little used. There is no piped water supply on the island, but there is a power station and electricity.

Mackerel Cove is a good anchorage on the north side of Swans Island south of the eastern entrance to Casco Passage. There are islets and numerous ledges in the cove, but the entrance from northward is easy of access in the daytime.

North Point, the northernmost point of Swans Island, is on the east side of the northern entrance to Mackerel Cove. A lighted gong buoy, about 0.2 mile northwestward of the point, is off a rock covered 1 foot.

Crow Island, about 0.6 mile west of North Point, is on the western side of the northern entrance. A buoy is eastward of a ledge, awash at low water, 400 yards east of the island. A buoy is off a shoal, covered 11 feet, near the center of the harbor.

A narrow channel into Mackerel Cove from York Narrows follows close to the shore of Swans Island, and passes southward of Orono and Round Islands.

The anchorage in Mackerel Cove is westward of the buoy off the 11-foot spot. Anchorage can be had between this buoy and the buoy off Crow Island in depths of 24 to 32 feet. Care must be taken to give the eastern shore a berth of 300 yards. Another good berth is between the buoy off the 11-foot spot and a bare ledge 0.3 mile southwestward. A 4-foot spot is 500 yards northwest of the ledge, and another 4-foot spot is 500 yards east of the ledge and off the village; both are unmarked.

Most of the dangers in the entrance to Mackerel Cove are buoyed, and, although there are many dangers inside, it should not be difficult even for a stranger to enter and anchor safely by daylight with the aid of a chart. Enter between the lighted gong buoy off North Point and the buoy off Crow Island and steer about **181°** so as to pass westward of the buoy marking the 11-foot spot.

Atlantic is a village on the southeast side of Mackerel Cove. The church spire and several houses are prominent from eastward. The wharves are nearly bare at low water. Gasoline and some marine supplies are available on the island. The State auto and passenger ferry operates throughout the year between Atlantic and Bass Harbor. The ferry slip is close southward of Fir Point on the east side of the cove.

Seal Cove, on the northwest side of Swans Island just south of **Buckle Island** and York Narrows, and **Toothacher Cove,** on the southwest side of Swans Island, have many unmarked dangers and are important to fishermen. A shoal covered 4 feet is in the middle of the approach to Toothacher Cove.

Burnt Coat Harbor, a small well-sheltered anchorage on the southwestern side of Swans Island, is much used by fishermen and yachtsmen. **Burnt Coat Harbor Light** (44°08.1′N., 68°26.9′W.), 75 feet above the water, is shown from a white square tower connected to a dwelling on **Hockamock Head,** on the west side of the harbor entrance. A fog signal is at the light.

The anchorage, eastward of the light, is about 500 yards wide, with depths of 21 to 34 feet, soft bottom. A good anchorage for small craft is in the channel northward of the light in depths of 13 to 24 feet. A stone wharf and power plant are on the north side of **Long Cove,** on the east side of the harbor near the entrance.

Swans Island is a village on the west shore of Burnt Coat Harbor. The largest of several wharves has two floats with 5 to 6 feet alongside. The other wharves have less depth. Gasoline, diesel fuel, provisions, and some marine supplies are available. There is a small machine shop that can do minor engine repairs.

Minturn is a small village on the east shore of the harbor. The largest of several fish wharves has 5 feet alongside. Gasoline, diesel fuel, and some

provisions and supplies are available at the wharf. Pilots may be obtained from among the fishermen at the harbor.

Off the entrance and approach to Burnt Coat Harbor are several islands and reefs. **Harbor Island,** in the middle of the entrance, is wooded except for its southwest and southeast sides. There is a house on the northeastern slope. **Potato Island** is the small islet about 700 yards north of Harbor Island.

Baker Islands, 0.3 mile southeast, and **Scrag Island,** 0.2 mile south, respectively, of Harbor Island, are wooded. **Green Island,** 0.3 mile southwest of Scrag Island, and **Gooseberry Island,** 0.6 mile west of Harbor Island, are bare and grassy. **Gooseberry Island Ledge,** 0.2 mile southeastward of Gooseberry Island and on the northwestern side of the approach to the harbor, is awash at low water; a buoy is off the ledge. **High Sheriff,** a bare rock, and **Sheriff Ledge,** awash at low water, are westward of Gooseberry Island. A buoy, 0.4 mile southwestward of High Sheriff, marks a 24-foot spot. A rocky shoal, covered 18 feet, 0.5 mile southwest of Gooseberry Island, is unmarked.

Routes.-The main entrance to Burnt Coat Harbor is from the southwestward between the daybeacon on the rock off the northwest side of Harbor Island and Burnt Coat Harbor Light. Strangers should have no trouble entering in the daytime with strict attention to the charts and by following the aids.

From a position about 100 yards north of the fairway bell buoy off the entrance, steer for a position midway between the light and the daybeacon, passing south of the buoy off Gooseberry Island and favoring the daybeacon slightly. Anchorage may be selected eastward or northeastward from the light, or in midchannel north of it.

The passage between Baker Islands and Swans Island is buoyed and is available for small craft entering Burnt Coat Harbor from the eastward. It is used by local craft, but is narrow and difficult, and strangers are advised to use it only after obtaining local knowledge, and on a rising tide.

Marshall Island, 2 miles westward of Harbor Island, is the largest of the group of islands southward of the western end of Swans Island; the island is about 100 feet high and wooded. A rocky shoal, covered 7 feet near its end, extends 0.4 mile north of Marshall Island; a buoy is off the end of the shoal.

Hat Island, 0.9 mile north of Marshall Island and just south of the western end of Swans Island, is 111 feet high, bare on the summit, and wooded elsewhere. A buoy is 700 yards southwestward of **Hat Island Ledge,** which extends 0.4 mile westward of the island.

Ringtown Island, just off the northeast side of Marshall Island, is wooded. **Yellow Ledge,** southeastward of Ringtown Island, has two bare rocks and a considerable area which uncovers. **Brimstone Island,** 1 mile east of Marshall Island, is bare and grassy. **Heron Island,** 0.5 mile south of Brimstone Island, is grassy with trees in the middle.

Many bare and covered rocks and ledges are southward of Brimstone and Heron Islands and southeastward of Marshall Island. Extreme caution must be used in navigating in this area as most of the dangers are not marked. Two small ledges awash at low water are between Brimstone and Heron Islands.

Heron Island Point Ledge, 0.2 mile south of Heron Island, is awash at high water. **Mason Ledge,** 0.4 mile west of Heron Island, and **Black Ledge,** 1.2 miles southwest of Heron Island, are bare rocks. About 0.2 mile northeast of Black Ledge is a depth of 6 feet. **Seal Ledge,** 0.9 mile south of Heron Island, is covered 10 feet; a buoy east of the ledge marks a 16-foot spot. **Cod Ledge,** 0.3 mile southwest of Mason Ledge, is covered 3 feet. A depth of 4 feet is 300 yards southwestward of the ledge. **Jobs Ledge,** 0.6 mile south of Marshall Island, and **Sprague Ledge,** 0.3 mile south, are covered 9 and 7 feet, respectively, and are unmarked.

Spirit Ledge, 0.7 to 1.2 miles southwestward of Marshall Island, is in two sections. The northern part has a bare rock on it, and the southern part uncovers about 5 feet. **Boxam Ledge,** off the southwest side of Marshall Island, uncovers.

These ledges, together with numerous other ledges and islands, extend across Jericho Bay and southwest across the entrance of that bay to Isle au Haut. The other ledges and islands are discussed in chapter 7.

Chart 13315 (227).-Casco Passage and **York Narrows,** northward of Swans Island and between Swans Island and Black and Johns Islands, form a part of the inland passage between Mount Desert and Whitehead Island. The narrow passage separates into two branches in its western part. The eastern end and northern branch form Casco Passage; the southern branch is York Narrows.

Johns Island, 1.3 miles northwestward of the northern extremity of Swans Island, **Opechee Island** and **Black Island,** on the north side of the passage, and **Orono Island,,Phinney Island,** and **Round Island,** on the south side of the passage, are, in general, low and wooded. They have the following distinguishing marks: Johns Island has a wooden tripod on its southwestern end; Opechee Island, whitewashed rocks on its southeastern end; Black Island, whitewashed rocks on its southeastern and southwestern extremities; and Phinney Island has a distinctive boulder on its northern end.

Buckle Island, on the south side of the western end of York Narrows, has a large area of whitewashed rocks on its northern extremity. **The Triangles,** a ledge at the eastern end of Casco Passage, has a rock 7 feet high on it, and a reef

that uncovers about 5 feet extends 400 yards northward.

Long Ledge, awash, and **Hawley Ledge**, covered 6 feet, both marked by buoys, are westward of Orono Island and between the western part of Casco Passage and York Narrows. **Egg Rock**, off the western entrance, is marked by a daybeacon on the ledge and a bell buoy southwestward of it. **Sunken Egg Rock**, covered 8 feet, about 0.4 mile south-southwestward from Egg Rock, is marked by a buoy northward of it.

Casco Passage and York Narrows are well marked, the aids being colored and numbered for the passage westward. A fairway bell buoy marks the eastern approach to the passage.

Casco Passage is the straighter and better channel, has a least depth of 12 feet for a width of about 100 yards, and is the one recommended. A rock, awash at low water, is 125 yards off the south side of Black Island, and care should be taken to avoid it. There are rocks with little depth over them on each side of the passage.

The current through Casco Passage floods eastward and ebbs westward at a velocity of 0.7 knot. The velocity is influenced greatly by strong winds. For current predictions, see the Tidal Current Tables.

York Narrows is the deeper, with a least depth of 13 feet, but its width is not much over 100 yards, with dangerous unmarked ledges on both sides. It is not recommended. A lighted bell buoy marks the western entrance. Vessels should not attempt passage except with local knowledge, as the currents are reported to be very strong at times.

Chart 13316 (307).-Blue Hill Bay, west of Mount Desert Island, is about 14 miles long. In the bay are several large and some small islands, between which are good channels with deep water. The dangers are comparatively few; the most prominent are marked by buoys. There are numerous coves on both sides of the bay.

The head of the bay is divided into several large arms, the most important of which is Union River Bay. Blue Hill Bay forms the approach to the villages of Bass Harbor, South Blue Hill, Blue Hill Falls, Blue Hill, East Blue Hill, and Surry, and the city of Ellsworth.

The bay is frequented by a few cruise sailing vessels, fishing craft, and yachts. Gasoline and provisions are obtainable at most of the villages. Repair yards for small vessels are at Bass Harbor, Bernard, and East Blue Hill.

Routes for entering Blue Hill Bay are given at the end of this chapter.

Tides and currents.-The mean range of tide in Blue Hill Bay is about 10 feet. The current floods northward and ebbs southward. Velocities of 2 knots have been observed near Staple Ledge Buoy 1A at the south end of the bay. For current predictions, see the Tidal Current Tables.

Bass Harbor, in the southwest end of Mount Desert Island just westward of Bass Harbor Head, is an important fishing port. The harbor is sometimes used as an anchorage by vessels bound through the inside passage. The outer harbor is exposed southward, but clear with the exception of **Weaver Ledge**, which is in the middle of the entrance and uncovers 3 feet. Two buoys mark the ledge.

Vessels can enter on either side of Weaver Ledge and anchor between the ledge and the entrance to the inner harbor in depths of 30 to 46 feet, soft bottom in places.

There are three dredged anchorages available in the inner harbor. The anchorages consist of a 10-foot basin in the middle of the harbor with an adjoining 6-foot basin to the northward and one to the westward. In 1968, depths of 10 feet were available in the middle anchorage basin, and 5 feet in each of the adjoining basins. Buoys mark the inner harbor.

Bass Harbor (McKinley) is a village on the east shore of Bass Harbor. It has a fish cannery and is the headquarters for many fishing vessels. The stack and the twin elevated tanks of the cannery are conspicuous, as is the belfry of a church at the head of the harbor. The cannery wharf, on the east side of the inner harbor about 1.1 miles north of Bass Harbor Head Light, has a reported depth of 7 feet alongside. A smaller seafood company wharf, close northward, has a depth of 10 feet reported alongside. Gasoline, diesel fuel, water, ice, and some marine supplies are available at this wharf.

A boatyard and machine shop, about 250 yards above the upper seafood wharf, has two marine railways that can handle craft up to 45 feet for hull and engine repairs. Welding and electric repairs can also be made.

A marina with a float landing, small-craft launching ramp, and a marine railway is on the east side of the outer harbor, about 400 yards southward of the cannery wharf; depths of 10 feet are reported at the float landing. The railway can handle craft up to 30 feet for hull and engine repairs. Gasoline, diesel fuel, water, and ice are available. The slip for the State automobile and passenger ferry to Swans Island and Lunt Harbor on Long Island is close northward of the marina.

Groceries, ice, lodgings, and some marine supplies can be obtained in town.

Bernard is a village on the west side of Bass Harbor. There are two fish wharves with float landing with 5 feet reported alongside. Gasoline, diesel fuel, water, and some marine supplies can be obtained at the landings.

A boatyard with covered sheds and marine ways, about 400 yards northward of the fish wharves, can build craft up to 55 feet, or haul out for hull and engine repairs craft up to 40 feet. It has a pier and float landing with 3 feet reported alongside. Covered storage is available.

Mitchell Cove, about 0.5 mile northwestward of Bass Harbor, is shoal and foul, and has no landings.

Duck Cove, about 1.5 miles northwestward, has a boatyard at the head with covered sheds; the yard can build or haul out for repairs craft up to 60 feet in length. It has two ways, and covered and open winter storage is available.

Goose Cove, on the eastern side of Blue Hill Bay 2 miles northwestward of Bass Harbor, is frequented by fishing boats. The cove has good holding ground and offers excellent anchorage for small boats except in heavy southwesterly weather. A shoal in midharbor is marked by a buoy. **West Tremont** is a village at the head of the cove. A church spire at the village is prominent from seaward. There is a wharf which dries at which gasoline can be obtained; water can be had from a nearby well.

Goose Cove Rock, 0.6 mile northwest of Goose Cove and 0.2 mile offshore, is a rocky islet 5 feet high with grass on top. **Rumell Island,** 0.6 mile northwestward of Goose Cove Rock, is a rocky islet 4 feet high with grass on top. The ruins of fishweirs are between the island and mainland. **Latty Cove** is an indentation between Goose Cove Rock and Rumell Island.

Seal Cove, 4 miles northwestward of Bass Harbor, is a sheltered anchorage for small vessels, except in westerly winds. Rocks that uncover 7 feet are about 300 yards offshore just inside **Reed Point,** the northern entrance point, and a ledge partly showing at high water is off the shoal bight just inside **Dodge Point,** on the south side of the entrance. Craft entering in midchannel will find anchorage near the middle of the cove in depths of 11 to 37 feet. There are several private piers and float landings on the south side of the cove near Dodge Point, and a paved town launching ramp on the north side of the cove near its head.

Moose Island, north of the entrance to Seal Cove, is wooded. A bar which uncovers connects the island to a point 0.3 mile northward of Reed Point. The point has a few buildings, a wharf, and a small flagpole. Small craft anchor northward of the bar. A rocky ledge, awash at low water, is reported to be 125 yards north of Moose Island.

Hardwood Island, 0.7 mile northwest of Moose Island, is 113 feet high and wooded. A bar extends 0.3 mile southwestward from the island; a buoy is off a rock covered 11 feet at the end of the bar.

Sawyer Cove, on the eastern shore of Blue Hill Bay eastward from the north end of Hardwood Island, is an anchorage for small craft. A ledge awash at high water is in the middle of the entrance. Several float landings are in the cove.

Pretty Marsh Harbor makes into the eastern shore of Blue Hill Bay northeastward of Hardwood Island. There is good anchorage in depths of 8 to 37 feet. **Folly Island,** a grassy island with a few trees, is in the entrance. The northern and western sides of the harbor are shoal inside **West Point,** on the western side 0.6 mile northeast of Folly Island. A shoal, covered 9 feet at the end, extends 350 yards southeastward from West Point. There are no dangers away from the shore, except for a ledge, covered 3 feet, about 250 yards from Folly Island. In 1970, two bare rocks were reported on this ledge; caution is advised. Several float landings are on the east side of the harbor.

John Island, an islet 750 yards northward of Folly Island, and a lower islet 400 yards northwestward are grassy. **Birch Island,** 0.4 mile northwestward of John Island, is wooded.

Bartlett Island, 0.7 mile northward of Hardwood Island, is 279 feet high and mostly wooded, with a few houses on it. A grass-covered islet is close to the northeast end of the island.

Bartlett Narrows is between Mount Desert Island and Bartlett Island. The channel is narrow, but has deep water with few dangers and is not difficult. The channel westward of Folly and John Islands is clear in midchannel. If passing eastward of Folly Island, give it a berth of about 400 yards, and give the south end of John Island a berth of 200 yards. The eastern shore of the narrows from West Point to its northern end is bold and should be favored. In the narrowest part keep the eastern shore close aboard, distant 100 yards, to avoid a ledge extending 200 yards southward from a group of bare rocks, southeastward of **Ledges Point,** on Bartlett Island.

A ledge covered 2 to 3 feet is 400 to 600 yards from the eastern shore 0.4 mile northward of Bartlett Narrows. It will be avoided by keeping westward of a range formed by the northwest tangent of Black and Alley Islands.

Western Bay, northeastward of Bartlett Island, is a part of the waters that separate Mount Desert Island from the mainland northward. Mount Desert Narrows, described previously, is at the head of Western Bay.

Black Island, about 1 mile northeastward of the north end of Bartlett Island, is thickly wooded. **Green Island,** close to the southern shore of the bay, is 0.5 mile east of Black Island. **Alley Island,** the largest island in Western Bay, is 1.2 miles north of Green Island.

Vessels of any size can select anchorage in the bay southwestward of Alley Island in depths of 44 to 64 feet; the rocky broken ground with depths of 34 to 36 feet extending 0.4 mile off the southeast side of **Oak Point,** 1.5 miles westward of Alley Island, should be avoided. With the aid of the chart, good anchorage can be selected also in depths of 21 to 38 feet southeastward and eastward of Alley Island.

The range formed by the summit of Bartlett Island and the middle of Black Island clears the shoal extending 500 yards southeastward from Alley Island.

Foul ground extends about 500 yards from the south shore of Western Bay between Green Island

and **Indian Point,** 1 mile northeastward. **Northwest Cove,** eastward of Indian Point, has anchorage in depths of 10 to 20 feet, but a ledge with little water over it extends 500 yards from its southeast shore 600 yards eastward from Indian Point. **Clark Cove,** 1 mile northeast of Indian Point, has a wharf and landing for small boats.

Goose Cove is a large shallow bight on the north side of Western Bay northward of Alley Island. The villages of **Trenton** and **West Trenton** are on the northern shore. The head of the cove is dry at low water for a distance of 0.5 mile, and thence it deepens gradually to 7 feet 0.5 mile farther out. There are no wharves in the cove.

Mahoney Island (44°13.0′ N., 68°30.7′ W.), on the west side of Blue Hill Bay 7.5 miles west of Bass Harbor Head and just eastward of the entrance to Eggemoggin Reach, is wooded. **Smutty Nose Island,** 0.5 mile northwestward of Mahoney Island, is grassy. **Mahoney Ledge,** southwestward of Mahoney Island, is awash at low water. A buoy southwestward of the ledge marks a shoal covered 5 feet, and another buoy is off the shoal water southeast of Mahoney Island.

Pond Island, 1.3 miles eastward of Mahoney Island, is wooded on its eastern side. The western side is grassy. Lamp Islet, 0.2 mile northward of Pond Island, is grassy.

Pond Island Passage, the channel north of Pond Island, is used by vessels entering Blue Hill Bay from westward and sometimes by vessels following the inside route eastward or westward. The passage has a least depth of 19 feet in the buoyed channel, but there are dangers close to the sailing lines. The buoys are colored and numbered for vessels bound westward.

Between Pond Island and Casco Passage, 1.5 miles southward, are several islands. Opechee, Johns, and Black Islands have been previously discussed. **Sheep Island** is grassy, and **Eagle Island** is wooded. A reef that uncovers 7 feet is 500 yards eastward of Eagle Island.

The passages between these islands are obstructed by reefs.

Channel Rock, 1 mile northward of Pond Island, is 3 feet high and has a whitish top. A ledge covered 3 feet extends 0.4 mile eastward of the rock.

Green Island is grassy and marked by an abandoned lighthouse tower, white with dwelling, and by **Blue Hill Bay Light** (44°14.9′N., 68°29.9′W.) 25 feet above the water, shown from white skeleton tower with a white square daymark. The ledges, of which Green Island is a part, uncover from the island to the shore 1.1 miles northwestward and for a distance of nearly 0.3 mile southward of the island.

Other islands on the ledges include **Flye Island,Goose Island,** and **Gander Island.** A buoy is off the south end of the ledge. **Sand Islet,** 0.3 mile northeastward of the light, is bare and nearly covered at high water. A buoy westward of the islet and a fairway bell buoy mark **Flye Island Channel** between Green Island and Sand Islet.

Flye Island Ledge, having rocks covered 7 to 15 feet, extends to a point 1 mile south-southwestward of Blue Hill Bay Light.

Herrick Bay is a shallow and unimportant bight on the western side of Blue Hill Bay northwestward of Blue Hill Bay Light. **Naskeag Point,** 0.8 mile northwest of Mahoney Island, is on the western side of the approach. The bay dries at low water for nearly 1 mile from its head. There is good anchorage in the approach to the bay 0.5 mile from the western shore northward of Naskeag Point in depths of 24 to 45 feet. In the approach to the anchorage the range formed by the western tangents of Flye and Long Islands leads westward of Flye Island Ledge.

Ship Island,Trumpet Island,Bar Island, and **Tinker Island** are a chain of islands 4 miles long in the middle of Blue Hill Bay, eastward of Blue Hill Bay Light. The islands are joined by shoals that uncover, except for a channel between Trumpet and Bar Islands that has a depth of 17 feet and is marked by a fairway buoy. Ship and Bar Islands are grassy. A buoy marks the end of the shoal extending 0.3 mile from the northeastern side of Bar Island. Trumpet Island is low and grassy, Tinker Island, partially wooded, has a shack on its southeast end.

Ship and Barges Ledge, 0.6 mile southeastward of Ship Island, is 350 yards long and uncovers about 5 feet. The ledge is marked on each end by a daybeacon, and by a bell buoy 0.1 mile off the east side.

West Barge is a flat grass-topped rock 0.3 mile westward of Ship Island. **East Barge** is a round grassy islet on the end of the shoal extending 0.1 mile southward from Ship Island.

Cow and Calf Ledge, extending 0.4 mile westward and northward from Tinker Island, has several rocks with little water and one rock which uncovers 5 feet; two buoys are north and west of the ledge.

Allen Cove, on the west side of **Herriman Point** 3.5 miles northwestward of Blue Hill Bay Light, is used as an anchorage. The cove is open northward, and the shores are foul. Vessels may anchor in the middle of the cove in depths of 12 to 30 feet. **Herriman Ledge,** covered 10 feet and marked by a buoy, is 0.3 mile eastward of Herriman Point.

Long Island, a large uninhabited island in Blue Hill Bay 1.5 miles west of Bartlett Island, is in general wooded with a few clear sections. **Long Island Hub,** off the south end of Long Island, is conspicuous because of high trees covering it.

Sand Point (44°21.4′ N., 68°32.8′ W.) is on the west shore of Blue Hill Bay 3.3 miles northward of Herriman Point. **South Blue Hill,** a village on the western side of Blue Hill Bay just south of Sand Point, has a wharf with a 50-foot face which is dry at low water. This is all that remains of a former town wharf, the outer 60 yards of which were

destroyed by a hurricane. The submerged ruins and foundation, extending 200 feet out from the present wharf, remain and are dangerous at all stages of the tide. Extreme caution is necessary in approaching the area. Fishermen obtain fuel from oil drums delivered to the wharf. A private stone pier and float landing with 3 feet alongside is just north of the wharf.

The start and finish of the annual Maine Retired Skippers Sailing Race, usually held in Blue Hill Bay on the last Monday in August, is off Sand Point.

Salt Pond has its entrance about 1.2 miles northward of Sand Point and just south of the entrance to Blue Hill Harbor; tidal falls are at the entrance. The channel is southward of **Mill Island,** on the north side of the entrance. State Route 175 highway fixed bridge crosses the entrance; clearance is 7 feet. The strength and turbulence of the current is such that passage is not recommended except with local knowledge. A private pier with float landing is on the east side of Mill Island.

Blue Hill Harbor, northwestward of Long Island, is a large bight in the northwestern part of Blue Hill Bay. **Parker Point,** on the western shore of the harbor 3 miles north of Sand Point, and **Sculpin Point,** on the northern shore of the harbor 0.3 mile northeast of Parker Point, divide the harbor into an inner and outer harbor. The village of Blue Hill is at the head of the inner harbor.

Blue Hill (44°26.1′ N., 68°35.5′ W.), a rounded hill which appears blue in the distance and gives its name to the village, bay, and area, is 934 feet high and conspicuous. A fire lookout tower is on the summit.

Dangers.-The approach to the harbor is fringed with ledges with numerous rocks and boulders, some of which are awash. On the western side these ledges extend 200 to 700 yards from the western shore of the outer harbor, and, at a point 1 mile southward of Sculpin Point, they extend 0.5 mile from shore.

The northeastern end of these ledges, where they extend eastward of Parker Point, is marked by a buoy. A depth of 8 feet is close eastward of the buoy.

Ledges extend along the northern shore of the outer harbor from **Woods Point** to Sculpin Point and 100 yards off **Closson Point.** An unmarked rock, covered 6 feet, is 225 yards southward of Woods Point.

Middle Ground, a detached shoal about 400 yards long and dangerous with rocks nearly awash, is off the entrance to the inner harbor. It is marked on its eastern edge by two buoys.

Sculpin Ledge, on the north side at the entrance to the inner harbor, uncovers about 2½ feet; the ledge extends about 120 yards west-southwestward of Sculpin Point and is marked on its western end by a buoy.

Routes.-Vessels may enter the inner harbor by passing or either side of the Middle Ground. The eastern channel is easier and safer, and leads eastward of the two buoys and northward of the shoal.

Caution.-It is reported that some small craft, at or near low water, have attempted to pass between the buoys marking the eastern edge of the Middle Ground. It is advisable at all times to pass east and north of both buoys when using the eastern channel.

The western channel, deep and more direct, leads between the unmarked western edge of the Middle Ground and the buoy eastward of Parker Point. Most powered craft use the western channel, and sailing craft the eastern.

The entrance to the inner harbor has a depth of about 19 feet. The channel is only about 50 feet wide southward of Sculpin Point, and so narrow that a stranger should not carry a draft of more than 12 feet at low water. Craft entering should pass not more than 30 feet southward of the buoy off Sculpin Ledge before rounding up into the inner harbor.

The channel in the inner harbor is narrow and crooked. Many of the rocks in the inner harbor show except at high water, and buoys are off the principal dangers.

Triangles, northward of Parker Point, is a ledge on which there are three rocks that uncover 2 to 3 feet; a buoy is off the rocks.

The upper part of the inner harbor is divided into two arms by **Peters Point;** both of the arms are shoal and foul at the heads. The western arm is used by local craft, and cruise schooners usually anchor off a private wharf with float landing on the southwestern tip of the point. There is a reported depth of 12 feet at the float, and water is piped to it.

Anchorage sheltered from northerly and westerly winds will be found in the outer harbor in depths of 23 to 50 feet.

In the inner harbor anchorage in depths of 10 to 28 feet, soft bottom, is available in midchannel from 200 to 600 yards above Sculpin Point off the yacht club, and in the western arm in 14 to 27 feet southwestward of Peters Point. There are numerous private moorings in the harbor, most of which are under the supervision of the **harbormaster;** when unoccupied they are usually unlighted at night and care should be taken to avoid them.

Blue Hill (Kollegewidgwok) Yacht Club is on the east side of the inner harbor, about 700 yards northward of Sculpin Point. There is a reported depth of 9 feet at the club float landing, and water and gasoline are piped to it. The club maintains a small-craft launching ramp and four guest moorings.

The village of **Blue Hill** has a hospital, pharmacy, churches, restaurants, lodgings, markets, and a bank. Provisions, water, ice, bottled gas, and marine supplies are available. Diesel fuel and

gasoline can be supplied at the landings from tank trucks.

In severe winters, ice usually closes the harbor from December to April, but during mild winters it is reported to be comparatively free of ice.

Darling Island (44°24.0′ N., 68°31.3′ W.), covered with bushes, is about 0.5 mile eastward of Woods Point, the northern entrance point to Blue Hill Harbor. **Darling Ledge,** the top of which is awash at low water, extends 0.3 mile southward of the island. The ground is foul between the ledge and the shore. A buoy is about 0.2 mile southeastward of the ledge. There is a granite wharf with float landing, now used for pleasure craft, on the mainland westward of Darling Island.

McHeard Cove is 0.7 mile north of Darling Island. **Mink Island** and a reef bare at high water are in the center of the cove. A crib wharf, nearly dry at low water, is at **East Blue Hill,** a village at the head of the cove. A church spire is prominent, as are several large homes on the slope of the hill on the east side of the cove.

A boatyard is on the east side of McHeard Cove, about 0.3 mile above the entrance. The yard builds wood and fiberglass craft up to 75 feet in length, and has a marine railway that can handle craft up to 110 feet. Hull, engine, and electrical repairs can be made, and a 12-ton mobile hoist and a 2-ton crane are available. Open and covered storage is also available. Gasoline and water can be obtained at the boatyard or at the fish wharf close southward. Diesel fuel can be supplied by tank truck. Both the yard wharf and the fish wharf are dry at low water. The yard maintains moorings.

Morgan Bay, northward of Long Island and on the west side of **Newbury Neck,** is about 3 miles long. The bay is seldom used by yachts as there are no landings in it. Two 279-foot high radio towers of Station WDEA are prominent on the east side of Newbury Neck.

The entrance to Morgan Bay is obstructed by **Jed Islands** and the surrounding ledges, leaving a deep, narrow channel close to the western shore on either side of Conary Nub. **Conary Nub,** 500 yards off **Conary Point** on the west side of the entrance, is a rock with a clump of scrub. **Seal Ledge,** 0.3 mile northeast of Conary Nub, is awash at high water. **Black Rock,** which uncovers 2 feet, is on a shoal with depths of 3 to 10 feet extending 0.4 mile northeastward of Seal Ledge. **Bird Rock,** westward of Jed Islands, is about 3 feet high. **South Ledge,** 0.2 mile southward of Jed Islands, uncovers about 5 feet. A rock, covered 4 feet, is 0.2 mile southwestward of South Ledge; a buoy is west of the rock. Danger will be avoided by keeping westward of a line from Conary Point to the southwest end of Newbury Neck.

Routes.-To enter Morgan Bay, using the chart as a guide, pass westward of the buoy marking the 4-foot shoal, then in midchannel between Conary Point and Conary Nub, thence about 200 yards off the western shore until abreast of Seal Ledge. Good anchorage can be selected in the bay in depths of 8 to 36 feet. It is not advisable to use the channel eastward of Conary Nub without local knowledge.

Webber Cove, on the west side of Morgan Bay, about 1.3 miles above Conary Nub, is used as an anchorage by small craft. There is a private boatshed and marine railway at the cove.

Union River Bay, at the head of Blue Hill Bay, is large and extends about 5 miles in a northerly direction between Oak Point on the east and Newbury Neck on the west. The bay is free of dangers, except near its northern end. The head of the bay is separated into two arms: Union River, the eastern arm, and Patten Bay, the western arm.

Patten Bay is a long, narrow arm making northwestward from Union River Bay. The village of **Surry** is at the head. The bay is used primarily by small pleasure craft and fishing boats. Good anchorage is at the entrance near midchannel, and as far as 1.5 miles above the entrance in depths of 20 to 38 feet. A ledge, which uncovers about 5 feet, extends 400 yards from the northern shore 0.7 mile westward of **Weymouth Point** at the head of Union River Bay. A buoy is south of the ledge. Between this buoy and a point 1 mile above, the northern shore of Patten Bay is fairly bold, while the south shore should be given a berth of 300 yards. Ice closes the upper end of the bay from January through March. About 1.3 miles westward at Weymouth Point and close eastward of **Contention Cove,** there are camp grounds with a pier and float landing. Gasoline and water are available at the float, which is reported to have 5 feet alongside.

Union River empties into the head of Union River Bay from northward and forms the approach to the city of Ellsworth, 4 miles above the entrance, where there is a dam. There is no commercial waterborne traffic on the river. The river is about a mile wide at the entrance but contracts to 100 yards 1.3 miles above. In March 1968, the controlling depths were 3 feet for a midwidth of 125 feet in the entrance channel to Hortons Rocks, about 1 mile above the entrance on the west side of the channel, and thence 4 feet at midchannel for about 2.3 miles to near Black Point. Depths of 2 to 4 feet can be carried from Black Point to Ellsworth with local knowledge; mariners are advised to navigate with caution as several places in this stretch have shoaled to bare. Freshets occur in the spring occasionally. Ice usually closes the river from December to April.

Mill Cove, on the eastern side of Union River at the entrance, is small and shoal. Off the entrance are several rocks, the most prominent of which are buoyed. **Tupper Ledge,** with rocks awash at low water and from which broken bottom extends northward, is off the river entrance. Two buoys mark the ledge. **Lord Rock,** covered 9 feet, is close to the eastern shore off the entrance. A buoy is on the west side of the rock.

The channel in Union River is narrow and difficult. Strangers should not enter without assistance; local boatmen will act as guides if desired. With the aid of the chart, small craft should be able to go up to Ellsworth, but should do so on a rising tide.

The dredged entrance channel leads northward from Union River Bay for about 1 mile; it is marked by two buoys and a daybeacon. From this point to the entrance to the upper dredged section of the river channel, about 1 mile below Ellsworth, there are no marks and a general midchannel course is best, although in the bend just before reaching the dredged channel the best water favors the east side. The upper dredged channel does not follow a midchannel course; it is marked on the westerly side by three buoys. The chart is the guide.

Ellsworth is a city on the main coastal highway at the head of navigation on Union River. It has a railroad freight terminal and some industry in the manufacture of yarn. The city has a hospital, hotels, motels, banks, restaurants, markets, pharmacy, churches, and bus and taxi service. There are no commercial marine shipping facilities at Ellsworth. Most of the wharves are in ruins or in need of repair. There is one wharf, dry at low water, at which water may be obtained. The river is fresh at low water.

Charts 13316 (307), 13313 (308).-Routes for entering Blue Hill Bay.-Blue Hill Bay is approached from eastward across Bass Harbor Bar; from southward through Eastern Passage between Placentia Island and Swans Island, and from westward through Jericho Bay, which is entered through Merchants Row, Deer Island Thorofare, or Eggemoggin Reach. The channels between Blue Hill and Jericho Bays are Casco Passage, York Narrows, Pond Island Passage, and Flye Island Channel. These approaches are more or less obstructed by islands and ledges, but are sufficiently marked to be safely navigated in clear weather. At high water small boats can also enter the head of Blue Hill Bay from Frenchman Bay through Mount Desert Narrows, previously described.

The inside route across Bass Harbor Bar through Casco Passage, used most frequently by small craft of 9-foot draft or less, leads across the south end of Blue Hill Bay. Small craft bound to points in Blue Hill Bay seldom exceed 9 feet in draft and usually follow the inside passage. In general, they enter from eastward across Bass Harbor Bar, and from westward by Flye Island Channel or Pond Island Passage between Pond Island and Blue Hill Bay Light.

Vessels of drafts too deep for that route can enter the bay southward of Little Gott Island, southeastward of Placentia Island, and northward of Black Island, but this passage is not recommended for drafts greater than 15 feet. This passage also is desirable for vessels of 9-foot draft or less when there is too much easterly or southeasterly swell on Bass Harbor Bar.

Vessels of the deepest draft can enter by Eastern Passage, between Black and Placentia Islands on the east, and Long and Swans Islands on the west.

Above the entrance, Blue Hill Bay is deep and generally free from dangers, and several channels are available.

Vessels bound from Bass Harbor Bar to Union River usually use the channel between Tinker and Hardwood Islands, and between Long and Bartlett Islands. This channel is deep and unobstructed, and the chart and buoys are the guides. Small craft sometimes use the more protected passage between Moose and Hardwood Islands and through Bartlett Narrows.

Bound to Blue Hill Harbor from Bass Harbor Bar, the most direct route leads eastward of the chain of islands and reefs extending from Ship and Barges Ledges to Tinker Island, and southward and westward of Long Island. This passage is deep and clear, and the chart is the guide.

The passages between Little Gott and Black Islands, and Black and Placentia Islands, have a rock with a cleared depth of 16 feet, about 250 yards off the southwest end of Little Gott Island, and a rock with a cleared depth of 13 feet, about 350 yards off the southeastern side of Placentia Island. Vessels drawing 15 feet or less may use them by favoring the north shore of Black Island, 250 yards off, after passing Inner Dawes Ledge, a rock islet, and rounding the north end of Black Island at a distance of 200 yards. Then steer southwestward to round the southwestern end of Placentia Island at a distance of 400 to 500 yards. The course then can be shaped northward into Blue Hill Bay, or if bound to Casco Passage, northwestward to pass northward of the buoys off Staple Ledge and North Point of Swans Island.

The preceding paragraphs describing the area give the simplest directions, by pointing out the islands, dangers, prominent features, and land marks, and, where necessary, the need for local knowledge. The navigator should have no difficulty in entering the bay from any direction, in daytime and clear weather. The chart must be carefully followed.

7. JERICHO BAY TO PENOBSCOT BAY, MAINE

This chapter describes the Maine coast from Jericho Bay to but not including Muscongus Bay, and the waters and tributaries of East and West Penobscot Bays, Penobscot River, and the many passages and thorofares leading into and connecting these waterways. Also discussed are the important ports of Rockland, Searsport, Bucksport, and Bangor, and many smaller fishing ports and resort towns on these waterways.

Charts 13312 (1202), 13302 (1203).-Between Jericho Bay and Penobscot Bay are numerous islands. **Deer Isle,** 10 miles westward of Mount Desert Island, is the largest. Eggemoggin Reach, Deer Island Thorofare, and Merchant Row are the three principal passages between the bays. Eggemoggin Reach, between Deer Isle and the mainland, connects Blue Hill Bay and the head of Jericho Bay with Penobscot Bay near its head. The reach is 11 miles long and has a least width of about 0.4 mile at Byard Point. There are several villages along its shores.

Chart 13313 (308).-Jericho Bay is between Swans and Marshall Islands on the east, and Isle au Haut and Deer Isle and adjoining islands on the west. The inside routes from Casco Passage and York Narrows to Deer Island Thorofare and Merchant Row, and the passage north of Pond Island to Eggemoggin Reach, lead across the head of Jericho Bay. This section of the bay is used by many craft.

The part of the bay southward of these thorofares has deep water, but there are many ledges, rocks, and islets. This area is little used except by local fishermen and yachts.

The dangers in the passages into Jericho Bay from the southward, eastward of Isle au Haut, in the channels between that island and Marshall Island, are for the most part not marked. This is the most direct way from the sea from that direction. There are, however, a number of unmarked shoal spots which must be avoided.

Halibut Rocks, in Jericho Bay 0.8 mile northwest of Marshall Island, are two in number. **Halibut Rocks Light** (44°08.0'N., 68°31.6'W.), water, is shown from a white skeleton tower with a red triangular daymark on the northerly rock; a bell buoy is about 250 yards northward of the light.

West Halibut Rock, 1 mile westward of Halibut Rocks, is covered 2 feet; a buoy is off the rock. A rock covered 9 feet is 400 yards northeastward of the buoy. **Southern Mark Island Ledge,** 2.3 miles west of Halibut Rocks, has a rock bare at high water.

Colby Ledge, 0.8 mile southwest of Southern Mark Island Ledge, uncovers about 5 feet. A daybeacon is on the ledge. A ledge covered 15 feet is 400 yards southward of the daybeacon. **Colby Pup,** covered 3 feet and marked by a buoy, is 0.5 mile south of the daybeacon. Unmarked **Channel Rock,** 0.6 mile southwest of Colby Pup, uncovers 8 feet.

McGlathery Island (44°07.5'N., 68°37.0'W.), 2.5 miles southeast of Stonington, is the largest island on the west side of the bay and on the north side of Merchant Row. A rocky ledge with at least two rocks awash and a covered rock extends between the east side of the island and **Gooseberry Island.** The area is foul, and passage through it should be avoided. The remaining islands and dangers in the bay are described in connection with the various channels leading out of the bay.

Routes.-In approaching Jericho Bay from the southeastward, it is advisable to pass between Marshall Island and Swans Island, through Toothacher Bay where most of the dangers are marked but then only in daytime. In clear weather, strangers should have no trouble navigating any of the passages, or through Merchant Row or Deer Island Thorofare, by giving strict attention to the chart and following the aids, which are colored and numbered for passages to the northward and westward.

Charts 13316 (307), 13309 (311), 13310 (311-SC).-Eggemoggin Reach is a generally broad and deep thorofare. which extends in a general northwesterly-southeasterly direction between the mainland and Deer Isle, and joins Jericho Bay with East Penobscot Bay.

The eastern entrance to Eggemoggin Reach is well marked by **Devils Head,** a prominent, high, rock bluff on the south end of **Hog Island,** 2.8 miles west of Pond Island. Off the western entrance are **Cape Rosier,** high and thickly wooded; a light on Green Ledge, 1.3 miles south of Cape Rosier; and an abandoned lighthouse tower on **Pumpkin Island,** 3.6 miles east of Cape Rosier.

The depth in the main channel through Eggemoggin Reach is sufficient for deep-draft vessels, but the channel is narrow and the bottom is irregular in places. The principal dangers are buoyed and can be easily avoided in the daytime and in clear weather. An unmarked rocky shoal, covered 27 feet, lies about 250 yards southeastward of the north tower of the Deer Isle-Sedgwick Bridge.

Vessels can anchor anywhere in the reach where the depth is suitable and the bottom soft, making a lee of either shore, according to the wind. Small

craft anchor in the coves off the reach. The mean range of tide is about 10 feet.

Chart 13316 (307).-Devils Head Ledge, extending 0.3 mile southeastward from Devils Head at the eastern end of Eggemoggin Reach, is partly bare at high water; a buoy is off the end of the ledge. **Hay Island Ledge,** 0.5 mile southeastward of Devils Head, is covered 7 feet, and marked by a buoy off its southern side. An unmarked 15-foot spot is 0.7 mile southeastward of the ledge. A fairway bell buoy, 300 yards southward of the ledge, marks the eastern entrance to Eggemoggin Reach.

Channel Rock, 900 yards south of Devils Head and covered 2 feet, is marked by a buoy. **The Boulders,** 400 yards westward of Channel Rock, uncover 3 feet.

Greenlaw Cove, on the southwest side of the eastern entrance to Eggemoggin Reach, has a narrow unmarked channel with shoals on both sides, and is suitable only for small craft with local knowledge. **Mountainville** is a village near the head of the cove. The landing is nearly bare at low water.

White Island, Bear Island, and **Conary Island** are off the entrance to Greenlaw Cove and on the southern side of the passage through Eggemoggin Reach. **Conary Ledge,** 0.4 mile north of Conary Island, is covered ½ foot and marked by a buoy north of the ledge.

Naskeag Harbor is north of Hog Island and **Harbor Island,** which is 0.3 mile east of Hog Island. The village of **Naskeag** is on the north side. The harbor can be entered from eastward or westward, but there are many unmarked dangers, and strangers should not attempt to enter except in small craft.

At the eastern approach to the harbor, the bar from the northern shore extends two-thirds of the way across. Between the end of this bar and Harbor Island is a covered rock close to the island shore. At half tide the bar is marked by ripples.

The Triangles, a reef with rocks awash, is in the middle of the western entrance to the harbor. There are several private float landings between Naskeag Harbor and Center Harbor, 2 miles to the northwestward. **Northwest Cove** is a small cove with middle depths of 15 feet, about 2.5 miles westward of Naskeag Point. **Babson Island** and **Little Babson Island** are wooded islands on the north side of the reach between Naskeag Harbor and Center Harbor. They are occupied only in the summer.

Center Harbor, an anchorage for small craft only, is a small cove on the north side of the reach northeastward of **Torrey Islands,** 2.2 miles northwest of Hog Island. A buoy 200 yards west of Chatto Island marks the entrance. The town of **Brooklin** is at the head of the harbor. A church spire in the town is conspicuous. A rock marked by a daybeacon is in the middle of the entrance northward of **Chatto Island,** which is 0.6 mile north of Torrey Islands. The channel is close southward of the rock. Between the daybeacon and an abandoned cannery wharf near the head, on the north side of the cove, the channel has depths of 8 to 10 feet; above the old cannery it is mostly dry at low water. Good anchorage is available off the entrance in depths of 22 to 24 feet, soft in places.

The main approach to Center Harbor is from westward, but local vessels enter by the channel eastward of Torrey Islands, passing in midchannel on either side of the bare rock 350 yards eastward of the easterly of the islands. This passage should not be attempted by strangers.

A boatyard, close west of the abandoned cannery, has a marine railway that can haul out craft up to 50 feet in length for hull or engine repairs or dry open or covered storage. Its pier and float landing has 6 feet alongside; gasoline is available. Provisions and marine supplies may be obtained in Brooklin. The yard can build craft up to 50 feet.

The Center Harbor Yacht Club pier and float landing, with 6 feet alongside, is on the north side of the entrance; water is available. The signal mast and clubhouse are conspicuous. There are several float landings in the harbor. Anchorage in soft mud bottom may also be had south of a line between the yacht yard and the daybeacon at the entrance.

Bridges Point Shoal extends over 0.5 mile from **Bridges Point,** 4.8 miles northwestward of Naskeag Point, and is covered 5 to 17 feet; a buoy marks the outer end.

Benjamin River, the approach to the town of **Sedgwick,** empties into the north side of the reach 5.5 miles northwestward of Naskeag Point. The channel at the entrance northward of **Cape Carter** has a least depth of 19 feet, but is restricted on both sides, leaving a passage 100 yards wide at its narrowest part. A rock awash is at the outer end of the ledge and sand shoal extending into the river from the east side 0.6 mile northward of Cape Carter; it is marked by local interests in the summer. Sedgwick can be reached only at high water as the river dries out some distance below.

On the east side of the river about 1 mile above Cape Carter, there is a boatyard which builds craft up to 40 feet in length. The yard has a 2-ton crane and a marine railway that can haul out craft up to 30 tons or 40 feet in length for hull and engine repairs or dry open or covered storage. Gasoline and diesel fuel are available at the boatyard wharf, which dries at low water. Provisions and some marine supplies are available in Sedgwick. A number of mooring buoys are available off the boatyard.

The village of **West Brooklin** is near the boatyard. A church spire in the village is conspicuous.

North Deer Isle, on the southern side of Eggemoggin Reach, is a village at the north end of Deer Isle. The old ferry wharf 0.4 mile westward of Tinker Ledges is in ruins. There is a rock crib breakwater just east of the old wharf, and the en-

closed space between the two is sometimes used for beaching local small craft. The breakwater extends about 200 feet from shore and is covered most of its length at high water. It is not marked and is a danger to all craft approaching close to shore.

Tinker Ledges, about 0.7 mile long and covered 13 feet, are on the south side of the reach about 6.7 miles westward of Naskeag Point; a buoy is on the northeast side of the ledges.

A highway causeway extending from the northwest corner of Deer Isle to the eastern side of **Little Deer Isle,** 0.4 mile northwestward, closes the passage between the two islands to all craft. **Stave Island,** just northward of the eastern end of Little Deer Isle, is wooded.

Billings Cove is on the northern shore of Eggemoggin Reach 2.3 miles northwestward of Benjamin River and east of **Byard Point.** It dries out 300 yards from the head. Anchorage can be had in the middle of the cove just inside the entrance in depths of about 25 feet. **Sargentville,** a village near the eastern shore of the cove, has a town wharf and float landing with 8 feet alongside. An abandoned clam factory wharf adjacent to the eastward is in disrepair. A good beach for hauling out or launching small craft is just eastward.

Charts 13309 (311), 13310 (311-SC)-The **Deer Isle-Sedgwick Bridge** (State Route 175), a suspension type fixed highway bridge, crosses Eggemoggin Reach between Byard Point and Little Deer Island. The bridge has a clearance of 85 feet for a midwidth of 200 feet. The village of **Little Deer Isle** is near the south end of the bridge. A small-craft facility with a 300-foot pier is in the cove just westward of the south end of the bridge; depths of 4½ feet are reported in the approach and alongside the pier. Gasoline, diesel fuel, water, ice, and a launching ramp are available.

Howard Ledges, on the south side of Eggemoggin Reach about 1.4 miles northwestward of the bridge, are covered 1 to 9 feet and marked by a buoy on the northwestern end.

Eggemoggin is a summer resort with a float landing at the northwest end of Little Deer Isle, southeastward of Pumpkin Island. Several boatsheds, where small craft are hauled out for winter storage, are at Eggemoggin.

Buck Harbor, on the north side of Eggemoggin Reach opposite Pumpkin Island, affords excellent anchorage and is often used by small vessels. **Harbor Island,** in the middle of the harbor, has a good channel around it which forms the anchorage. Shoals extend 250 yards off the northeast side of Harbor Island, and the channel is narrow between them and the shore northeastward. Harbor Ledge, covered 5 feet at the north end of the shoals, is marked by a buoy. The channel between the ledge and the northern shore has a depth of 23 feet. Small craft can anchor in the bight on the northeast side of Harbor Island. The best anchorage is west and northwestward of Harbor Island in depths of 28 to 37 feet.

South Brooksville, a village at the head of Buck Harbor, has a marina with 12 feet reported alongside its float landing. Buck Harbor Yacht Club, close westward of the marina, has a float landing with 12 feet alongside. Gasoline, diesel fuel, water, ice, and some marine supplies are available at the marina.

There are several private float landings in the harbor, and several moorings are available for hire. The village has a general store and guest houses. Engine repairs and electric welding can be made by a garage in the village.

Orcutt Harbor, just westward of Buck Harbor, is about 1.3 miles long and 500 yards wide. Good anchorage is available in depths of 14 to 52 feet in the middle of the harbor northward of a small wooded islet on the western side near the entrance. A reef, awash at low water, extends 300 yards southward from **Condon Point,** on the east side of the entrance. When northward of this reef, favor the eastern side of the entrance to avoid a rock covered 5 feet nearly 200 yards from the western shore and the same distance southward of the wooded islet. In the slight expansion 0.5 mile above the islet, care must be taken to avoid two rocks covered 5 feet, one of which is 200 yards from the western shore and the other 150 yards from the southeast side of the expansion. A boatyard is at the head of the cove making into the east side of the harbor, about 0.6 mile northward of Condon Point. A rock, covered 5 feet, is on the south side of the entrance. The yard can haul out craft up to 30 feet on skids for hull and engine repairs; open storage is available. Another boatyard with a marine railway is at the head of Orcutt Harbor; craft up to 45 feet in length can be hauled out for engine and hull repairs; open storage is available. There are also several private float landings at the head of the harbor.

Horseshoe Cove is a long, narrow cove, the entrance to which is 0.6 mile southwestward of Orcutt Harbor. The cove is navigable only for small craft with local knowledge for about 1.4 miles; above that point for another mile it dries out. There are no wharves. Privately maintained seasonal aids mark the channel to a boatyard on the west side about 1 mile above the entrance daybeacon. The yard has a marine railway and can build, or haul out for hull and engine repairs, craft up to 50 feet in length and 7-foot draft. Covered and open dry winter storage is available. The yard maintains a number of moorings off the yard. The best anchorage secure in all weather is reported to be in 15 feet, mud bottom, 0.8 mile northward of the entrance northward of the inner daybeacon.

Weir Cove, about 0.7 mile southwestward of Horseshoe Cove, has several private float landings on its east and west sides. **Buck Island** is a wooded islet off the entrance to the cove. A drying ledge, unmarked, extends about 0.2 mile southward from

the eastern entrance point. Several rocks awash have been reported on the ledge, and some may exist between the southern extremity of the ledge and Buck Island; mariners are advised to exercise caution in this area. The upper half of Weir Cove is mostly dry at low water.

Thrumcap Island, 1 mile northwestward of Pumpkin Island, is grassy and low. **Thrumcap Ledge,** southward of Thrumcap Island, is partly uncovered at high water. **Spectacle Island Ledge,** 0.8 mile southwestward of Thrumcap Island, is covered 6 feet; a buoy is south of the ledge. **Two Bush Ledge,** 1.2 miles south of Thrumcap Island, is covered 2 feet; a buoy is off its west side. **Merriman Ledge,** awash at low water, is 0.4 mile westward of Pumpkin Island; a buoy is on its north side.

About midway between Merriman Ledge and Spectacle Island Ledge is a 13-foot spot marked by a buoy. **Pumpkin Island Ledge,** 0.4 mile northwestward of Pumpkin Island, is covered 12 feet; a buoy is on its west side. A daybeacon is on the shoal just north of Pumpkin Island. **The Triangles,** 0.4 mile northeastward of Pumpkin Island, is a ledge covered 2 feet and marked by buoys on the north and west sides.

A lighted fairway bell buoy, 0.7 mile north of Pumpkin Island, marks the western entrance to Eggemoggin Reach.

Of the islands near the western entrance to Eggemoggin Reach, **Spectacle Islands,** 1.7 miles westward of Pumpkin Island, are grassy. A fairway bell buoy is 0.4 mile southeastward of the islands. **Two Bush Island,** 1.8 miles southwestward of Pumpkin Island, is bare; **Hog Island,** 2.5 miles southwest of Pumpkin Island, has scattered trees, a house, and a barn in the center. **Fiddle Head** is a small islet off the northeast end of Hog Island and is connected to it by a bar which uncovers.

Pond Island, 0.4 mile northwest of Hog Island, is grassy and has a small clump of trees on the northeast side. **Western Island,** 0.5 mile west of Pond Island, is grassy on its eastern end and has a thick clump of trees on its western end. **Green Ledge,** west of Western Island, is marked by **Green Ledge Light** (44°17.4′N., 68°49.7′W.), 31 feet above the water and shown from a white skeleton tower with a red triangular daymark on the ledge; the light marks the western approach to Eggemoggin Reach from East Penobscot Bay. A bell buoy is 0.3 mile southwestward of the light.

Chart 13315 (227).-Deer Island Thorofare is a narrow passage leading along the south side of Deer Isle, between it and the numerous islands southward. The passage joins Jericho Bay and East Penobscot Bay. It is a link in the chain of inland passages. Stonington is a town on the passage. The thorofare is used occasionally by coastal tankers and extensively by small craft bound through the inland passages. It has a least width of 100 yards in several places, and a least depth of 15 feet in a channel through the bar between Moose and Crotch Islands. Vessels drawing up to 18 feet are reported to use the passage, but there are unmarked rocks covered 9 to 14 feet close to the channel. Local knowledge is advisable. The more important dangers are marked, and the channel is easily followed in the daytime in clear weather.

The standpipe at Stonington and the stiff-leg crane and derricks at the inactive quarries on Crotch Island are prominent from all directions.

Anchorages.-The best anchorage for vessels bound through the thorofare and overtaken by night or bad weather is in Southeast Harbor. When overtaken by fog, they may anchor anywhere near the channel where the bottom is soft and the depth suitable. Small vessels anchor on the north side of the channel off Stonington, and between the wharves off Staple Point and the buoy 800 yards eastward. There are a considerable number of moorings off the wharves. A berth at one of these can usually be obtained on application to the harbormaster. There is also a good anchorage north of **Round Island,** 2 miles southeast of Crotch Island.

Tides and currents.-The mean range of the tide at Stonington is 9.7 feet. The tidal currents follow the general direction of the channel and are not strong. The direction of the currents is influenced by the wind; with strong easterly winds the flood and ebb set westward, and with westerly winds they set eastward. When not influenced by the wind, the flood sets eastward and the ebb westward, and continues to run about 0.8 hour after high and low waters.

Ice seldom closes Deer Island Thorofare and Southeast Harbor and then is soon broken up by icebreakers. During severe winters, solid ice has existed from Stonington to Isle au Haut.

Routes.-There are two well-marked channels into Deer Island Thorofare from the eastward. The northern channel passes east and south of the buoys marking the ledges off **Green Ledge,** 0.8 mile eastward of Stinson Neck, and enters the thorofare between **Long Ledge,** 0.5 mile south of Green Ledge, and **Potato Ledge,** which extends 0.6 mile northeastward from **Shabby Island,** 20 feet high and wooded. A daybeacon is on Long Ledge, and a bell buoy is south of the ledge. A buoy is north of Potato Ledge. The channel then leads westward, passing south of **Lazygut Ledge,** 0.6 mile west of Long Ledge, and entering the thorofare at **Eastern Mark Island Ledge,** 1.4 miles west of Potato Ledge. The channel then continues between **Sheldrake Ledge** and **Haycock Rock,** marked by a daybeacon, 0.6 mile southwest of Eastern Mark Island Ledge; between **Haskell Ledge,** 0.8 mile west of Haycock Rock, Bold Island Ledges, and several other dangers, most of which are buoyed. The northern channel then joins the southern channel in the thorofare west of Bold Island Ledges, 3.5 miles west-southwestward of Potato Ledge.

The southern entrance channel passes south of **Whaleback Ledge,** about 0.8 mile southward of Shabby Island, and runs nearly due west between **Shingle Island,** 1.1 miles southwest of Shabby Island, and **Saddleback Island,** 0.5 mile south of Shingle Island. The channel then swings northwestward and passes between **Bold Island,** 1.3 miles west of Shingle Island, and **Bold Island Ledges.** This channel is well marked by buoys to its junction with the other channels. Its eastern entrance is marked by a fairway bell buoy, about 700 yards east-northeastward of Saddleback Island.

Entering from the westward, the principal leading mark is **Deer Island Thorofare Light** (44°08.0′N., 68°42.2′W.), 52 feet above the water, shown from a white square tower on the west side of **Mark Island;** a fog signal is at the light. Westward of the light care must be taken to avoid **The Brown Cow,** a ledge with a rock 3 feet high on it, 1.3 miles west-southwestward from the light, and **West Mark Island Ledge,** covered 4 feet, about 0.7 mile northwestward of the light; a buoy is south of the ledge. Passing north of the light and south of **Western Deer Island Ledge,** 5 feet high, and **Bay Ledge,** covered 11 feet, 0.4 mile north of Mark Island, there should be no difficulty in following the aids, which are colored and numbered for passage westward.

Southeast Harbor, is northwestward of the eastern end of Deer Island Thorofare, between **Stinson Neck** on the east and **Whitmore Neck** on the west. The entire harbor is shown on chart 13313 (308), but the entrance and eastern part are shown on chart 13315 (227), of larger scale. The harbor is an excellent anchorage for vessels using the thorofare. The entrance is easily distinguished and the principal dangers are marked by buoys. **Oceanville** is a village on Whitmore Neck, on the south side of the harbor. The stone wharf at the village is in ruins.

Webb Cove, about 2 miles southwestward of Southeast Harbor and on the north side of Deer Island Thorofare, has rocks in the entrance, but good anchorage inside in depths of 8 to 12 feet. **Grog Island, Grog Ledge,** and **Humpkins Ledge** are off the entrance, and **Channel Rock** is about in the middle of the entrance. A detached, unmarked, and nearly L-shaped 400-foot long fishweir is in the middle of the cove, about 500 yards above Channel Rock. In 1961, an obstruction, believed to be two pinnacle rocks covered 8 feet, was reported to be about in the middle of the channel between Grog Island and Grog Ledge. A 400-foot barge wharf of a stone quarry is on the northeast side at the entrance to the inner half of Webb Cove; depths of 7 feet are reported alongside the wharf.

Stonington, a town on the north shore of Deer Island Thorofare, has a sizable seafood industry. Many fishing vessels, lobster boats, draggers, and some charter and excursion boats operate from the port.

Most of the wharves along the Stonington waterfront are used by commercial vessels. The cannery wharf (44°09′15″ N., 68°39′38″ W.), on **Staple Point,** has reported depths of 7 feet along its easterly side. A ledge off the wharf has little water on it; a buoy marks the outer end. Alley Wharf, close westward of the cannery wharf, has depths of 12 feet reported alongside. The pier, about 50 yards westward of Alley Wharf, is used by the Stonington-Isle au Haut mail and passenger ferry; depths of 5 feet are reported alongside. Two lobster wharves, about 250 and 500 yards eastward of the cannery wharf, have reported depths of 8 and 7 feet, respectively, alongside their float landings. There are also several fish wharves at the western end of the harbor, eastwards of **Greens Head.**

Gasoline, diesel fuel, water, and ice are available at most of the facilities along the main waterfront. Provisions and marine supplies can be obtained in town. The nearest vessel repair facility is on Moose Island, just westward of Stonington.

Berthage for transient craft is very limited at Stonington; most vessels anchor off the town or moor to mooring buoys off Staple Point. The town harbormaster controls and assigns the moorings.

Stonington has banks, restaurants, markets, stores, hotels, and motels. Good roads on the island connect with the bridge to the mainland.

Allen Cove, just west of Stonington and east of **Moose Island,** is protected by a pier and breakwater built out from the southeast end of Moose Island. It is known locally as **Yacht Basin.** Sheds of a shipyard on the southeast end of Moose Island are prominent from westward. A causeway connects Moose Island with Deer Isle. Large lobster pounds occupy the northeast end of the cove and the areas on both sides of the causeway.

The shipyard has several marine railways that can handle vessels up to 200 tons for general hull and engine repairs; electrical and electronic repairs can also be made. A 25-ton mobile hoist and open or covered dry storage are available. Gasoline, diesel fuel, water, ice, and marine supplies can be obtained at the yard's service floats. The shipyard piers have depths of 10 feet reported alongside. Small craft anchor in the cove.

Crotch Island, on the south side of Deer Island Thorofare opposite Moose Island, is the site of extensive granite quarries. The large quarry wharf on the north side of the island is reported to have a depth of 12 feet alongside. A 75-ton stiff-leg crane is on the wharf. In 1970, the quarry was inactive.

On the northern side of the western entrance to the thorofare is **Andrews Island,** 60 feet high. Northward of Andrews Island and extending 0.5 mile south of **Fifield Point,** are **Fort Island** and **Second** Island, surrounded by off-lying reefs. The 9-foot spot 700 yards westward and the 15-foot spot 700 yards southwestward of Second Island are unmarked and should be avoided. A rock awash at low water is in midchannel between Fort Island and Fifield Point.

Burnt Cove, northeastward of Fifield Point, is secure in all weather except westerlies. Good anchorage is found in mud bottom in midchannel just inside the entrance. The upper half of the cove is shoal and foul. A church spire in the village of **West Deer Isle,** at the head of the cove, is conspicuous. A lobster company pier and float landing are on the south side of the entrance; depths of 8 feet are reported alongside the float. Gasoline and some marine supplies are available, and water can be obtained from a nearby well. A boatyard, on the north side of the cove near the head, can haul out boats up to 45 feet in length for open winter storage and hull repairs. There are several other private wharves in the cove, but these are mostly dry at low water.

The western shore of Deer Isle is described with East Penobscot Bay.

South of Deer Island Thorofare and north of Merchant Row are many small islands, the more important of which are mentioned below. Navigation among these islands must be considered dangerous, for there are many ledges and the channels are unmarked.

Barter Island Ledges, 0.5 mile west of McGlathery Island, are covered at high water; a daybeacon is on the ledges.

Harbor Island Ledge, covered 3 feet, is 0.8 mile southward of **George Head Island,** a wooded island 80 feet high, 1.4 miles west of McGlathery Island. A buoy is north of the ledge. A 14-foot spot in midchannel 0.5 mile southwest of George Head Island is marked by a buoy on its south side.

Farrel Island, 40 feet high and 2.6 miles west of McGlathery Island, and **Scraggy Island,** 0.8 mile west of Farrel Island, are wooded. There are several grassy rocks off the south side of Scraggy Island. **Sparrow Island,** 0.5 mile southwest of Farrel Island, is 40 feet high and wooded. **Sparrow Island Ledges** extend 0.5 mile west of the island.

Of the remaining islands in the area, **Bare Island** and **Round Island** are wooded, and **Buckle Island, Little Camp Island,** and **Potato Island** are bare. **No Mans Island** is wooded on the western end and grassy elsewhere. **Enchanted Island** has scattered trees. **Camp Rock** and **Russ Islands** are partly wooded. **Phoebe Island, Millet Island, Spruce Island, Coombs Island,Wreck Island, St. Helena Island, Green Island, Sand Island,** and **John Island** are wooded.

Charts 13313 (308), 13305 (310), 13306 (310-SC).-Merchant Row is a passage from Jericho Bay to East Penobscot Bay between the islands and ledges between Deer Isle and Isle au Haut. This passage is used by vessels in winter when Deer Island Thorofare is closed by ice, and by deep-draft vessels at all times. It is not quite as direct as Deer Island Thorofare, but the channel is wider and much deeper. There are numerous ledges and rocks on both sides of the passage, but the principal dangers are marked by buoys or daybeacons and the channel can be readily followed in clear weather and daylight.

Deep-draft vessels can enter from the eastward through Toothacher Bay, the passage between Marshall and Swans Islands, through the channels between Marshall Island and Isle au Haut, or from Jericho Bay. Close attention should be given to the chart and the aids, with due regard for unmarked dangers. The description of the dangers, when entering Merchant Row from the southwestward in Isle au Haut Bay, is given later in this chapter.

The islands and reefs on the north side of Merchant Row, including many of those in the channel, have been previously described under chart 13315 (227). In fact, Merchant Row could be navigated on that chart for the greater part, but it is better to use charts 13313 (308) and 13305 (310), which, although on a smaller scale, show the islands and reefs on both sides of the channel as well as the approaches. There are two entrances to Merchant Row from the eastward which are separated by the islands and reefs in Jericho Bay.

In the eastern approach to Merchant Row, south of Halibut Rocks and west of Marshall Island, a series of islands and reefs extends to the eastern entrance to the passage. **Southern Mark Island,** 2.1 miles southwest of Halibut Rocks, is about 30 feet high and grassy. About 1 mile south of Southern Mark Island is **Fog Island,** which is wooded. The numerous ledges east of Fog Island, and between it and Marshall Island, are mostly all bare. The more important of these, since they are closest to the channels, are **North Popplestone Ledge** and **Saddleback** on the north, and **Green Ledge, White Ledge,** and **Drunkard Ledge** to the south. **Saddleback Island** in the summer shows some grass on its two humps, which are conspicuous.

Torrey Ledge, covered 17 feet, about 0.6 mile southward of Drunkard Ledge, is unmarked. **Blue Hill Rock,** covered 7 feet and about 1.2 miles eastward of Green Ledge, is marked on its southeast side by a buoy.

Of the other islands and ledges on the south side of Merchant Row, **Burnt Island,Pell Island, Bills Island, Merchant Island,** and **Ewe Island** are wooded, **Harwood Island** is round and heavily wooded; and **Ram Island,** 0.3 mile southwestward of Hardwood Island, is wooded.

Channel Rock, 0.5 mile westward of Ram Island, uncovers 9 feet and is unmarked. **Ram Island Ledge,** awash at low water, about 400 yards southeastward of Channel Rock, is also unmarked. **Scraggy Ledge** is a bare ledge 700 yards westward of Channel Rock. There is foul ground between Scraggy Ledge and **West Halibut Ledges,** bare ledges 0.3 mile northward. **Outer Scrag Ledge,** 1 mile northwestward of Scraggy Ledge, is 4 feet high. **The Brown Cow,** 1 mile northwestward of Outer Scrag Ledge, is a ledge with a rock 3 feet high on it, and is the westernmost danger at the

western end of Merchant Row. A whistle buoy, about 0.6 mile south-southwestward of The Brown Cow, marks the western entrance to Merchant Row.

Chart 13313 (308).-Isle au Haut, a large wooded island, 543 feet high, 3.5 miles southward of Deer Isle, is one of the principal landmarks of the locality. It has few year-round inhabitants, but a considerable number of summer residents. The coast is mostly foul and must be approached with caution. Part of the island is included in Acadia National Park.

York Island is about 0.3 mile off the eastern side of Isle au Haut near its northern end. A ridge of shoals and reefs extends about 1 mile northward from York Island, ending in **Airy Ledge,** which has a buoy off its eastern side.

The channel between York Island and Isle au Haut is almost blocked by a group of rocks. Between **Richs Point,** the northeastern end of Isle au Haut, and York Island are numerous reefs and rocks, most of which are marked by kelp. This area should be avoided by all except those having local knowledge.

Foul ground also extends about a mile southward of York Island and includes **Turnip Yard,** awash, **Halfway Rock,** which uncovers 6 feet, and **Horseman Ledge,** awash in places at low water. These are unmarked. An unmarked shoal, cleared 15 feet, is about 500 yards eastward of Horseman Ledge; and a cleared depth of 12 feet, in midchannel between Halfway Rock and Little Spoon Island, is also unmarked.

Little Spoon Island, Great Spoon Island, White Horse, and **Black Horse** are a group of grass-covered islands about 1.5 miles south-southeast of York Island. **Great Spoon Ledge,** awash at low water, is 0.3 mile northeast of Great Spoon Island. **Colt Ledge,** 0.6 mile south of White Horse and covered 8 feet, is marked by a buoy south of it. The chart should be carefully followed in this locality.

Eastern Ear Ledge, which has a rock awash at low water on it, is 0.6 mile southward of **Eastern Ear,** a small island close to the southeast corner of Isle au Haut. A buoy is southeastward of the ledge.

Head Harbor is a small bight in the south shore of Isle au Haut, just west of 129-foot high **Eastern Head,** the southeast point of the island. The harbor is used mostly by lobstermen and affords good protection for small boats except in southwest weather. In normal weather, the off-lying ledges break up the swell, causing the water in the northeastern part of the harbor to be fairly calm. The bottom is rocky in general, but some parts are clay. Depths are 9 to 21 feet in the northeastern semiprotected part, and 60 feet and more outside. There are a few houses on the shore in the northeastern part.

The inner or northeastern cove of the harbor should not be entered without local knowledge, except in periods of good visibility. There are three wharves in the cove, which dry at low water. A gasoline pump and storage tank are on the innermost of the wharves on the west side. The bottom is mostly sand in the cove.

Roaring Bull Ledge, 1 mile south-southwestward of Head Harbor, uncovers 4 feet. A bell buoy and a lighted whistle buoy are about 500 yards and 2.6 miles, respectively, southward of the ledge.

Western Ear is a wooded island at the southwest end of Isle au Haut. **Western Ear Ledge,** 0.2 mile southward of Western Ear, is awash at low water.

The western side of Isle au Haut is fringed with many rocks and shoals, bare and covered. The westernmost ones visible at high water include one of the three bare rocks of **The Brandies,** which is 4 feet high about 1 mile westward of the southern part of Isle au Haut, and **Kimball Rock,** which uncovers 10 feet, 0.6 mile westward of **Kimball Island,** off the northwest shore of Isle au Haut.

Several rocky spots with depths of 18 to 30 feet are outside the line joining these rocks. An obstruction, cleared to a depth of 10 feet, is about 0.2 mile northwestward of Kimball Head, and a rock awash is about 200 yards west of the northern extremity of the head.

Marsh Cove Ledges, drying ledges which extend about 0.4 mile southwestward of **Marsh Cove,** Kimball Island, are marked by a buoy off the southwest end.

Moore Harbor is a cove on the western side of Isle au Haut about 2.5 miles north of Western Ear. This harbor has many outlying ledges off the entrance and in the harbor, and is an unsafe anchorage.

Isle au Haut Thorofare is on the northwestern side of Isle au Haut, between Isle au Haut and Kimball Islands.

A marked 75-foot-wide dredged channel leads across the bar at the northeast end of the breakwater. In 1970, shoaling of unknown extent was reported in the channel; caution is advised.

The thorofare has a width of 100 to 500 yards, being widest at the western end. Secure anchorage for small craft or very small vessels can be had in depths of 33 feet near the village of Isle au Haut.

Isle au Haut Light (44°03.9'N., 68°39.1'W.), 48 feet above the water, is shown from a tower with its lower part conical, gray in color, and the upper part cylindrical, white in color, at Robinson Point on the south side of the western entrance. There is a white bridge to the shore. A buoy and daybeacon are off the two principal dangers on the north side near the western entrance, and buoys mark both ends of the dredged channel.

Off the town of Isle au Haut and southeastward of **Moxie Island,** the channel is narrowed by a ledge with a depth of only 2 to 4 feet. The ledge is so close to the charted 16-foot depth that boats either run on it unawares or come to anchor and are set aground by the falling tide.

Enter Isle au Haut Thorofare between Isle au Haut Light and Sawyer Ledge buoy, and pass southward of Inner Ledge Daybeacon, giving it a berth of over 50 yards. Then keep in midchannel except in the choke at the entrance of the anchorage, where the northern side should be favored slightly. Avoid a rock, bare at low water, which is 90 yards from the northwest side of the anchorage.

Isle au Haut, the village on the southeastern shore of Isle au Haut Thorofare, has a town wharf and float landing with 6 feet reported alongside. Gasoline is available, and provisions and some marine supplies can be obtained from the village store. Water can be procured from a nearby well. The harbor is reported to be free of ice in winter.

Several other landings in the harbor dry at low water. A white church spire in the village is conspicuous, as is a large hotel on Point Lookout. A motorboat ferry carries mail and passengers daily between Isle au Haut and Stonington.

Lookout is a village and summer resort at the eastern end of Isle au Haut Thorofare. A buoyed channel to the wharf from Merchant Row leads between Merchant and Hardwood Islands, northeastward of Bay Ledges, and westward of grassy **Flake Island** off the village. The wharf has a reported depth of 8 feet alongside. A buoy off the southwestern end of Flake Island marks the turn in the channel to the wharf. In 1965, dangerous rocks, covered at low water, were reported in the channel between Flake Island and Birch Point at the north end of Isle au Haut.

Chart 13302 (1203).-Penobscot Bay, the largest and most important of the many indentations on the coast of Maine, is about 20 miles wide from Isle au Haut on the east to Whitehead Island on the west and 28 miles long from its entrance to the mouth of Penobscot River. A chain of large and small islands divides the bay into two parts, **East Penobscot Bay** and **West Penobscot Bay.** The southern part of East Penobscot Bay is Isle au Haut Bay. **Vinalhaven Island** and **North Haven Island**are large islands dividing the southern part of the bay. Islesboro Island divides the bay near its head. Numerous harbors indent the shores of Penobscot Bay, the most important being Rockland, Rockport, Camden, Belfast, and Searsport on the western shore; Castine and Stonington on the eastern shore; and Vinalhaven and North Haven in the center of the bay. The bay is the approach to Penobscot River, on which are several towns and the city of Bangor at the head of navigation.

The sea approaches to the bay are well marked by the lights on Monhegan Island and Matinicus Rock; the entrance is marked by Saddleback Ledge Light on the east and by Whitehead and Two Bush Island Lights on the west side of the bay. The harbors are well lighted, and the more important dangers are marked by buoys or daybeacons. Some deep-water and coasting vessels enter the bay, especially in summer. In winter many of the harbors are obstructed by ice. The Penobscot River seldom is entirely closed by it as icebreakers usually keep the channel free. The thorofares are only occasionally obstructed by ice and are much used by small vessels bound along the coast.

Penobscot Bay, a region of rocks and ledges, requires extreme caution in navigating. After unusually high tides many logs are present in the bay, particularly from Belfast northward. These logs are dangerous to small craft. Penobscot Bay can be entered from eastward through Eggemoggin Reach, Deer Island Thorofare, or Merchant Row, and from westward through Muscle Ridge Channel or Two Bush Channel.

Large vessels approaching Penobscot Bay from southward, either from Boston, Cape Cod Canal, or from eastward of Cape Cod, usually make Cape Ann Lighted Whistle Buoy 2 (42°37.9′ N., 70°31.2′ W.), chart 13260 (1106), then shape the course for Manana Island Lighted Whistle Buoy 14M (43°45.3′ N., 69°22.5′ W.), and then enter through Two Bush or Muscle Ridge Channels. Approaching from westward along the coast, they usually make Bantam Rock Lighted Whistle Buoy 16BR (43°42.0′ N., 69°38.0′ W.), chart 13260 (1106). Two Bush Channel is used by most vessels and tows, and by all except small local vessels when the visibility is not good. Muscle Ridge Channel has good water, and most of the dangers are marked, but it is narrow in places and has a number of unmarked 16-to 22-foot spots near the track. It is not recommended for deep-draft vessels.

The preceding paragraphs give the simplest directions by pointing out the difficulties and the dangers, and especially, when necessary, the need for local knowledge. The channels are well buoyed, most of the dangers well marked, and the approaches clear. No difficulty should be experienced in approaching and entering the bay in clear weather with the aid of the chart and by following the aids.

The area in Penobscot Bay northwesterly of Islesboro Island within a circle having a 1-mile diameter with its center in 44°23′20″ N., 68°55′00″ W., has been designated as a vessel-to-vessel oil transfer area by the State of Maine Environmental Improvement Commission.

Boundary lines of inland waters.-The lines established for Penobscot Bay and approaches are described in **82.5,** Chapter 2.

The mean range of the **tide** varies from about 9 feet near the entrance to about 10 feet in Eggemoggin Reach and near the head of Penobscot Bay. The rise and fall increases in passing up Penobscot River, the mean range at Bangor being 13.1 feet.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade, with a draft of 9 feet or more, entering or departing from any port or harbor within the waters of

Penobscot Bay and Penobscot River north of a line drawn from Marshall Point Light at Port Clyde, thence to Matinicus Rock Light, and thence to Western Head, Isle au Haut. Pilotage is optional for vessels under enrollment, fishing vessels, and vessels powered by sail.

Pilots are arranged for in advance through the ships' agents (Cable PENBAY), or by radiotelephone through the Boston Marine Operator (telephone 207-338-1640 or 207-763-3149). Special arrangements can be made for a pilot to meet the ship at Boston.

Pilots request a 48-hour and a 24-hour ETA, as they do not maintain a pilot boat on station. The pilot boats, lobster fishing-type boats, maintain radio watch on 2182 kHz and VHF-FM channel 16 (156.80 MHz) 1 hour before ETA. Whistle signal for the pilot is 3 long and 2 short blasts. At night the pilot boat displays a red light over a white light, and by day the code flag **H.** Pilot stations are: for the western entrance, Manana Lighted Whistle Buoy 14M (43°45.3′ N., 69°22.5′ W.), or at 43°53.9′ N., 69°12.6′ W., south of Mosquito Island, during periods of inclement weather; for the eastern entrance, at 43°49.0′ N., 68°50.0′ W., 2 miles northeast of Matinicus Rock Light; and for the river, 0.5 mile north of Odom Ledge (44°30.9′ N., 68°48.1′ W.), chart 13309 (311), or at Searsport Harbor.

Towage.-Four well-equipped tugs up to 1,200 hp are available at Belfast. Arrangements for tugs are usually made through ships' agents; advance notice of 24 hours is required. Large oceangoing vessels require the use of tugs for docking at Searsport and at most of the ports on Penobscot River. A tug usually accompanies large vessels bound upriver to Brewer and other river ports; tugs meet vessels off Fort Point. Vessels bound for Searsport are met by tugs off Sears Island Bell Buoy 2. Tugs maintain radio communications on 2182 kHz and VHF-FM channel 16 (156.80 MHz); channel 16 is the working frequency.

Chart 13303 (322).-There is no secure harbor for vessels at any of the islands southward off Penobscot Bay, but small craft and local fishermen moor at Monhegan Island, in Matinicus Harbor, which is the cove on the eastern side of Matinicus Island northward of Wheaton Island, and in Criehaven Harbor. The waters of this area are well surveyed; deep passages exist between the islands, as shown on the chart. Because of the broken nature of the bottom, vessels, particularly deep-draft ones, should avoid all broken ground having depths less than 60 feet. These waters are frequented mostly by local fishermen. The only settlements are on Monhegan, Matinicus, and Ragged Islands. There is a 63-foot diesel-powered motorboat ferry carrying passengers and freight from Rockland to Matinicus, and from there a lobster boat can be hired to take passengers to Criehaven Harbor on Ragged Island.

Dangers.-Seal Island, the easternmost of the islands off Penobscot Bay, is bare, rocky, about 60 feet high, and 1 mile long. **Eastern Ledge,** awash at low water on which the sea usually breaks, extends 350 yards off the east end of the island. **Three Fathom Ledge,** 1.4 miles northeastward of Seal Island, has been cleared to 16 feet. **Gully Ledge,** covered 24 feet, is about 650 yards south of Western Head, the westernmost point of the island.

Seal Island is within the **danger zone** of a naval aircraft bombing target area, centered in 44°53′ N., 68°44′ W., just eastward of the island; limits and regulations are given in **204.1,** Chapter 2. A wooden target float with a 10-foot tripod equipped with a radar reflector is located about 0.4 mile off the southeastern side of the island.

Snippershan Ledge, about 3.7 miles north-northwestward of Seal Island, has a least depth of 36 feet.

Malcolm Ledge, midway between Seal Island and Wooden Ball Island, is 0.4 mile long. The north end of the ledge uncovers 9 feet; the south end uncovers 3 feet.

Wooden Ball Island, 3 miles southwest of Seal Island, is 62 feet high, 1 mile long, and rocky with grass on top. The eastern point of the island is a prominent knob. There are a few small abandoned houses at the low place in the western part of the island and a few summer camps.

Matinicus Rock, the southernmost islet in the approach to Penobscot Bay, is about 40 feet high, and is marked near its south end by **Matinicus Rock Light** (43°47.0′N., 68°51.3′W.), 90 feet above the water, shown from a 48-foot cylindrical gray granite tower. A fog signal and a radiobeacon are at the light.

About 2.3 miles northward of Matinicus Rock, a group of islands and rocks extends about 5 miles northward. Ragged, Tenpound, and Matinicus Islands and No Mans Land are the principal islands of the group.

Ragged Island, the southernmost, is partly wooded. There are numerous high bare rocks, including **Green Ledge, Seal Ledge,High Ledge,** and-**Brig Ledge,** on the east and south sides of the island. Broken ground extends 0.8 mile southward from the island to **Inner Breaker,** which is covered 3 feet and marked by a buoy.

South Breaker is a small rock awash 1.7 miles southward of Ragged Island and 1.6 miles northwestward of Matinicus Rock Light. A buoy is south of the rock. A bell buoy is west of **Southwest Ledges,** 0.4 mile southwest of Ragged Island, which uncovers 6 feet in places.

Criehaven is a village on **Criehaven Harbor,** on the western side of Ragged Island. There are several year-round residents on the island and some summer visitors. A breakwater extends northward from the southern entrance point; it is marked by**Criehaven Breakwater Light** (43°50.1′N., 68°53.6′W.), 32 feet above the water, shown from a

white skeleton tower with a red triangular daymark. A buoy is 700 yards westward of the harbor entrance off**Harbor Ledges,** which uncovers 4 feet and are on the south side just outside the entrance to the harbor. The best water favors the north side. There are several fish wharves in the harbor which dry out at low water; the main service wharf at the inner end of the breakwater has 5 feet alongside. Gasoline, diesel fuel, and some provisions are available and a limited supply of water can be obtained from wells on the island. The harbor affords anchorage for lobster boats, but there is no protection from northwesterly blows. The bottom slopes gently except for one dangerous ledge which uncovers 2 feet on the southwest side of the harbor just inside the breakwater. The ledge makes out from the northeast corner of the service wharf with a very narrow channel east of it. The island has telephone communication with the mainland.

Seal Cove, on the opposite side of the island from Criehaven Harbor, is used when the Criehaven Harbor is rough. The wharf has almost no depth alongside at low water. Fairly good anchorage is available off Seal Cove in depths of 70 feet, flat sand and shell bottom, for vessels up to 100 feet in length; this anchorage is sometimes used by trawlers during northerly blows.

Pudding Island and **Shag Ledge,** close to the northeast end of Ragged Island, are 35 feet high, bare, and rocky. **The Hogshead,** 0.2 mile northward of Shag Ledge, is a small bare rock 9 feet high in the middle of the eastern entrance to Matinicus Roads.

Tenpound Island, 0.4 mile north of Ragged Island and 0.3 mile off the southeast side of Matinicus Island, is 41 feet high and grassy. **Matinicus Roads,** between Ragged Island and Tenpound Island, has a controlling depth of about 18 feet. A 7-foot rocky shoal is on the south side of the roads.

Matinicus Island, 0.8 mile northward of Ragged Island, is mostly wooded and is the largest of the group. There are about 100 year-round residents, but in the summer many people spend vacations here. A telephone relay tower, about 100 feet high near the center of the island, is prominent from all around the island. **Western Black Ledge,** 13 feet high, and **Eastern Black Ledge,** 15 feet high, are bare rocks 0.6 and 0.9 mile eastward of Matinicus Island. **Tuckanuck Ledge,** 200 yards eastward of Eastern Black Ledge, has two rocks which uncover 1 and 8 feet.

Mackerel Ledge, 700 yards north-northeastward of Eastern Black Ledge, uncovers 7 feet. A buoy is north of the ledge. A rock covered 12 feet is 0.2 mile southward of Eastern Black Ledge.

Wheaton Island is just off the east side of Matinicus Island. The passage between the islands is bare at low water. There are small wharves which dry out in the cove between the two islands, and small craft anchor here. **Old Cove,** westward of the south end of Wheaton Island, is seldom used as an anchorage.

The narrow passage between Wheaton Island and Matinicus Island is used considerably by lobstermen at half tide or better. A small boat attempting this passage should hug the Matinicus side no more than 5 feet from shore because of the rounded ledge which uncovers 3½ feet near midchannel.

Matinicus Harbor, on the east side of Matinicus Island, is protected by Wheaton Island and a 450-foot breakwater extending from the north side. A private light is close eastward of the breakwater. **Indian Ledge,** 2 feet high, is in about the center of the harbor. Small vessels can anchor in the outer harbor between Wheaton Island and Indian Ledge in depths of 6 to 26 feet. Except during easterly weather, the anchorage is quite calm. Numerous fishing boats moor to communal mooring lines in the inner harbor behind Indian Ledge in depths of 4 to 8 feet.

Matinicus, the village at the head of the harbor, has a general store and a snack bar. There is microwave telephone communication with the mainland. Gasoline and diesel fuel are available at the main wharf, which has a reported depth of only 1 foot alongside at low water. A limited supply of fresh water may be obtained at a well near the wharf. A 63-foot diesel-powered motorboat ferry carries mail, passengers, freight, and an occasional vehicle from Rockland on Tuesday, Thursday, and Saturday of each week in the summer and Tuesday and Friday of each week during the winter. A lobster boat can usually be hired to take passengers to Criehaven on Ragged Island.

Harbor Ledge is a rock covered 4 feet, 300 yards northeastward of the entrance to Matinicus Harbor. A bell buoy south of the rock marks the entrance to the harbor. **The Barrel,** 300 yards northeastward of Harbor Ledge, is a rock which uncovers 10 feet at the south end of a ledge 300 yards long.

No Mans Land, the largest of the rocks and islets northeastward of Matinicus Island, is 51 feet high and grassy. **Two Bush Islet** is 22 feet high, grassy on top, and is joined to the northeast end of Matinicus Island by a ledge which is covered 2 to 8 feet. **Two Bush Ledge,** 15 feet high and bare, is 0.2 mile southeastward of the islet. Rocks covered 3 feet extend 350 yards eastward and northeastward from the ledge.

Beach Ledges are two rocks which uncover 1 foot and 3 feet between Two Bush Ledge and Matinicus Island. A buoy marks the southeast end of the ledge. **Whaleback** is a ledge which uncovers 5 feet, 0.3 mile westward of No Mans Land. A buoy is on the northwest side of the ledge.

Zephyr Ledges are two rocks, the easternmost uncovering 3 feet, 0.3 mile northeastward of No Mans Land. **Zephyr Rock,** the northeast end of the group, is covered 5 feet, 0.6 mile northeastward of

No Mans Land. A lighted buoy is north of the rock.

A lighted bell buoy, 0.6 mile north of Matinicus Island, is westward of the dangers northeastward of the island.

Local boats bound to Matinicus Harbor from northward drawing 6 feet pass through the channel between Matinicus Island on the west and Two Bush Island and Beach Ledges on the east, at low water. Strangers should use this passage only in small boats and with a smooth sea, being careful to avoid the ledges.

Black Rocks, two rocks 3 feet high, are on a ledge 0.3 mile westward of Matinicus Island.

Bantam Ledge, which covers 5 feet and is surrounded by deep water, is 2.5 miles westward of Ragged Island. A buoy is southeastward of the ledge.

Foster Ledges, 2 miles westward of Matinicus Island, are covered 6 and 13 feet; the southwestern and shoalest rock has a buoy off its west side. A ledge covered 30 feet is about 0.9 mile northward of the buoy.

Bay Ledge, covered 3 feet, is about 5 miles northward of No Mans Land. A whistle buoy is southwest of the ledge, and a fairway lighted bell buoy is about 1.3 miles southward of it. A ledge covered 24 feet is about 0.5 mile southwestward of Bay Ledge.

Pigeon Ground, 3.5 miles west of Matinicus Island and 2 miles southward of Large Green Island, is broken ground about 2 miles long in an east-northeasterly direction. It is covered 15 feet on the western part of the broken ground and 21 feet on the eastern part.

Large Green Island, 5 miles northwestward of Matinicus Island, is 43 feet high and grassy, and has some houses on its northern part. **Herring Ledge,** which partly uncovers 7 feet, extends 0.3 mile southward from the island.

Green Island Seal Ledges are 0.6 and 0.9 mile south-southeastward of Large Green Island, with broken ground between. The southern part of the ledges uncovers 8 feet; the north end uncovers 5 feet. Green Island Seal Ledges Whistle Buoy is about 0.8 mile east of the ledge.

Collins Rock, about 1 mile north of Large Green Island, is covered 5 feet. **Junken Ledge,** covered 19 feet and marked by a buoy, is about 5 miles north-northeastward of Large Green Island. Two Bush Island Lighted Whistle Buoy TBI is 1.3 miles southwest of Junken Ledge.

Little Green Island, about 1 mile northwestward of Large Green Island, is 43 feet high and grassy, and has several cottages on it.

Northern Triangles, 1 mile northward of Little Green Island, is a reef about 1 mile long in an east-southeasterly direction. In the western half of the reef are some ledges awash at low water. A buoy is about 0.7 mile northward of the reef. A shoal covered 15 feet is 2 miles northward of Little Green Island and 2 miles southeastward of Two Bush Island Light; the ledge is marked by Two Bush Channel Shoal Buoy.

Alden Rock, covered 4 feet and marked by a buoy, is 1.4 miles northwestward of Little Green Island. An unmarked rock covered 14 feet is 0.8 mile west-northwestward of Alden Rock. The 14-foot rock is at the eastern end of broken ground nearly 1 mile long and covered 22 to 30 feet.

Southern Triangles are three groups of rocks, awash at low water, located midway between Little Green and Metinic Islands. The southwestern rock, 0.6 mile from the other two, uncovers 3 feet. A buoy is 75 yards southeastward of the easternmost rock.

Metinic Island, 5 miles west-southwestward of Large Green Island, is nearly 2 miles long, 78 feet high near its northern end, and partly wooded. The island is occupied during the summer by fishermen. There are no wharves, supplies, or mail service available. **Metinic Green Island,** low and grassy, is 0.4 mile southward of Metinic Island, with foul ground and ledges between.

There is a passage for small craft drawing about 7 feet between Metinic and Metinic Green Islands; local knowledge is advised. A rock covered 2 feet is 300 yards southwest of Metinic Green Island.

A bell buoy, about 0.6 mile northward of Metinic Island, guards **Wheeler Rock,** covered 5 feet, about 0.3 mile northward of the island. **Wheeler Big Rock,** which uncovers 9 feet, is 300 yards northward of the island. **Green Point Shoal,** covered 17 feet, is 0.8 mile eastward of Metinic Island. **Hog Island,The Nubble,** both of which are bare, and **Cat Ledge,** which uncovers 3 feet, are close off the east side of Metinic Island.

Chart 13301 (313).-Broken ground extends 2 to 3 miles westward and southwestward from Metinic Island. **Black Rock,** which uncovers 5 feet, is 0.7 mile westward of Metinic Island. A rock covered 14 feet is 0.3 mile southwestward of Black Rock.

Metinic Island Ledge, covered 8 feet and marked by a buoy at its southwest end, is 1.8 miles westward of the northern end of Metinic Island. Kelp is reported on Metinic Island Ledge. A rock covered 26 feet is 0.6 mile northeastward of the ledge. **Hooper Shoal,** covered 17 feet, is 0.6 mile southwestward from the ledge.

Roaring Bull, awash at low water and generally marked by breakers, is 2.8 miles westward of Metinic Green Island. A buoy is off the northwest side. A ledge covered 27 feet is 0.6 mile northwestward of Roaring Bull.

Southeast Breaker is on a ledge about 0.5 mile long in a northeast direction; the higher part uncovers 4 feet. The ledge is 2 miles southwestward of Metinic Green Island, on the range of the south end of Metinic Green Island and the north end of Large Green Island. Unmarked shoals covered 11 to 16 feet are within 0.5 mile of the ledge.

Haddock Ledge, covered 11 feet, is 1.3 miles southward of Southeast Breaker and 2.5 miles

southwestward of Metinic Green Island; it is not marked.

Monhegan Island, 9 miles off the mainland and 20 miles westward of Matinicus Rock, is one of the important landmarks for vessels bound along the coast. The island is 1.4 miles long and 165 feet high, and presents a rocky shore with high bluffs in places.

Monhegan Island Light (43°45.9'N., 69°19.0'W.), 178 feet above the water, is shown from a 47-foot gray conical tower connected with a white building, on the middle of the island. Within 3 miles of the island the light is obscured between west and southwest. The fog signal and radiobeacon are on **Manana Island,** a small rocky island about 110 feet high, close westward of Monhegan Island. Manana Island Lighted Whistle Buoy 14M is 2 miles westward of the island. Penobscot Bay pilots usually board at this buoy.

Monhegan Harbor, between Monhegan and Manana Islands, is an anchorage for small craft, but is exposed southward. The harbor, used principally by local fishermen and yachts, has depths of 15 to 25 feet with poor holding ground and scant room at the anchorage for a small vessel to swing.

The deeper water in the harbor favors Manana Island. A depth of 12 feet can be taken through the northern entrance between the wharf on Monhegan Island and the grass-covered rocky islet on the end of the ledge making out from Manana Island. The channel west of the small islet is shoal and has a depth of only 3 feet.

In entering from the north the best water leads close to the end of the wharf. Even small craft should not attempt to ride out bad weather in this roadstead. During heavy weather the daily mail boat seldom is unable to land at the wharf.

Monhegan is a village of fishermen and summer residents on the east side of Monhegan Harbor. The principal wharf has a depth of about 12 feet at the end. The village has microwave telephone communication with the mainland. A diesel-powered motorboat ferry carries mail, freight, and passengers daily from Port Clyde. Gasoline and provisions are obtainable. There are good hotel accommodations in the summer, and excursion boats from Boothbay Harbor call at Monhegan in the summer.

Eastern Duck Rock, 400 yards off the north end of Monhegan Island, is a large, bare rock with some grass on top; the narrow channel between the rock and the island is nearer the rock because of Seal Ledges, which extend from Monhegan Island and show partly at high water. A gong buoy is about 250 yards northwest of the rock. **The Barrel,** a rock which uncovers about 5 feet off the northwest shore of Manana Island, is marked by a buoy.

Duck Rocks, 0.6 mile off the northwest side of Monhegan Island, are two large, bare rocks; on the western rock is a daybeacon. **Sunken Duck Rock,** covered 5 feet, is 350 yards north-northeastward of the daybeacon; a bell buoy is northwest of the rock.

Allen Shoal, 1.9 miles northeastward of Monhegan Island and cleared to 22 feet, is unmarked.

Gull Rock Ledge, cleared to a depth of 20 feet and marked by a bell buoy, is 1 mile south-southeastward of Monhegan Island Light. Kelp has been reported on this ledge.

Chart 13305 (310).-East Penobscot Bayis that part of Penobscot Bay located eastward of Vinalhaven, North Haven, and Islesboro Islands. The southern part of it, between Isle au Haut and Vinalhaven Island, is called **Isle au Haut Bay.**

There are many islands and numerous unmarked ledges in Isle au Haut Bay and East Penobscot Bay. The islands have numerous coves and small harbors, but few of these are available as anchorages, except for small craft, because of their shoal depths or obstructed entrances.

The principal traffic through East Penobscot Bay moves in an east-west direction, with access through Eggemoggin Reach, Deer Island Thorofare, or Merchant Row from the eastward; or through Fox Islands Thorofare or the channels northward of North Haven Island, from the westward.

A clear channel, good for the deepest-draft vessels, leads through Isle au Haut Bay from Saddleback Ledge Light to the head of East Penobscot Bay, passing eastward of Eagle Island, marked by a light, and a gong buoy northeastward of the light; thence in a northwesterly direction through the islands, northward of Eagle Island, and thence northward passing close westward of Cape Rosier.

The principal dangers in this channel are marked, and the main part of it, with the exception of the areas near the shores, has been swept. The principal thorofares east and west have also been swept.

Saddleback Ledge Light (44°00.9'N., 68°43.6'W.), 54 feet above the water, is shown from a 42-foot gray conical tower with white base and white dwelling attached, on a rocky islet in the middle of the southerly entrance to East Penobscot Bay. There is broken ground between the light and Vinalhaven, and deep-draft vessels should enter eastward of the light.

A fairway gong buoy is 0.9 mile southwestward of the light, and a fairway whistle buoy is 0.5 mile eastward of the light.

The western side of Isle au Haut Bay is very foul. **Saddleback Ledge Shoal,** covered 2 feet and marked by a buoy, is 0.8 mile northwest of Saddleback Ledge Light. The mile-wide channel west of this shoal and east of 40-foot-high **Diamond Rock** and Diamond Rock Ledge has several shoal spots with depths ranging from 14 to 28 feet. The fairway gong buoy, about 0.9 mile southwestward of Saddleback Ledge Light, marks the southern entrance to this channel. **Diamond Rock Ledge,** covered 2 feet, is marked by a buoy.

Between this channel and the southeast shore of Vinalhaven Island are many islands and reefs dangerous to navigation. A buoyed channel through these islands and reefs enables vessels of moderate size to run parallel to the shore, at distances of 0.5 to 1 mile, in daylight and with good visibility, on a partially protected route around the south end of Vinalhaven Island, to Carvers Harbor, or West Penobscot Bay.

On the edges of this channel, along the southeast side of Vinalhaven Island, are **Little Triangle Ledge, Triangle Ledge, Halibut Ledge, Crosby Ledge, Sheep Island Ledge,** and **Bunker Ledge,** all marked by buoys, and **Point Ledge,** marked by a daybeacon, off the entrance to Indian Creek.

Farther inshore, and unmarked, are **Green Island, Narrows Island, Sheep Island, Point Ledge, House Ledge, Sister Ledge, Griffin Ledge, Green Ledge, Clam Ledges, Old Duke Ledges, Wreck Ledge,** and **Folly Ledge.** Southward of the buoyed channel are **Brimstone Island, Hay Islands, Roberts Islands, Carvers Island,** and **Otter Island**

Surrounding and interspersed between these islands are numerous rocks and ledges, unmarked and dangerous to navigation. **Arey Ledges,Colt Ledge, Heron Neck Ledge,Old Horse Ledge, Channel Ledge,** and **Knubble Ledge,** and **The Breakers,** dangerous ledges only partially marked by buoys, lie to the westward, in the southern approach to Carvers Harbor.

Arey Cove and **Roberts Harbor,** on the southeast side of Vinalhaven Island, are much obstructed by rocks and ledges, and are unsafe for strangers.

The coast northward to Bluff Head and the eastern entrance to Fox Islands Thorofare has many off-lying islands and reefs, extending in some places nearly a mile offshore. The coves are small and foul, and of no value as harbors.

Winter Harbor, locally known as Pleasant River, **Seal Bay,** and **Smith Cove** make into the northeastern part of Vinalhaven Island, south of the eastern entrance to Fox Islands Thorofare. They are not safe for a stranger to enter and are of little commercial importance.

The islands and dangers on the east sides of Isle au Haut Bay and East Penobscot Bay from the entrance to Barred Island (44°10.0′ N., 68°43.2′ W.), off the southwestern side of Deer Isle were nearly all described previously in this chapter under the discussion of Deer Island Thorofare, Merchant Row, and Isle au Haut. Between Deer Island Thorofare and Eggemoggin Reach, the eastern side of the bay is formed by the western shores of Deer Isle and Little Deer Isle.

The only off-lying dangers from Barred Island off Crockett Cove to Southwest Harbor are **Sellers Rock,** part of which bares at low water and marked by a buoy, and the 18-foot spot 700 yards west of it.

Crockett Cove, northwestward of Burnt Cove, is shoal and foul in its upper half. There is reported to be a good small-craft anchorage, secure in all weather, in 18 feet of water about 0.6 mile inside the entrance. It should be approached only after 3 hours following low water on a rising tide, and favoring the western side of the cove.

Goose Cove is a small bight close westward of Crockett Cove. It is foul with awash and sunken rocks in the center, and great care should be taken in entering. A summer school and resort are on the cove.

Two rocks awash at low water are off the entrance to the cove eastward of Barred Island, and another one farther eastward is off the entrance to Crockett Cove.

Southwest Harbor is on the western side of Deer Isle, about 4 miles north of Deer Island Thorofare Light. The harbor is about 0.3 mile wide at the entrance and 1 mile long. The anchorage in depths of 18 to 28 feet is not used much, being open southward. A spire in the village of **Sunset** on the eastern shore of the harbor is prominent. There are no wharves. The western side of the harbor is formed by **Sheephead Island,** from which **Sheephead Island Ledges** extend 0.3 mile southward.

Mill Pond, northward of Southwest Harbor, is of little importance. **Sylvester Cove** is northwestward of Mill Pond. The Deer Isle Yacht Club pier and float landing, with 9 feet alongside, and a fish wharf with a town float, dry at low water, are on the north side of the cove. The stone foundation, ruins of a pier, is on the south side of the cove. The mail and passenger boat, with year-round service to Eagle Island and summer service to Great Spruce Head Island and Barred Islands, leaves from the yacht club float. Eastward of the yacht club landings, the cove shoals rapidly to a fine shelving beach.

The anchorage in the entrance of the cove is partly sheltered by a long reef on the south side of the entrance; the reef bares at about half tide. A buoy is northwestward of the reef. Caution should be used in rounding this reef, by passing northward of the buoy; it is reported that several small craft have grounded on the reef.

The yacht club maintains a guest mooring in the anchorage, and, except for a public telephone at the landing, there are no other services available.

Dunham Point, 0.8 mile northwest of Sylvester Cove, is the westernmost point on Deer Isle. **Dunham Point Ledge,** awash at low water, extends 300 yards offshore from the point.

Pressey Cove, about 1 mile northeastward of Dunham Point, is shoal and foul. There are islets on the west side and in the middle of the entrance to the cove. The middle one is wooded, and the western one has a lone tree and some brush and is connected with the shore by a sandbar. A number of private homes are around the cove.

Northwest Harbor, on the northwestern side of Deer Isle, is about 0.3 mile wide and over 1 mile

long. A large part of the upper half of the harbor is shoal and foul and dries out. Good anchorage will be found for small vessels in midharbor in depths of 13 to 17 feet, soft bottom. The harbor is sheltered from all but northwesterly winds. Good anchorage also is off the entrance of the harbor, between Gull Ledge and Heart Island, in depths of 19 to 30 feet. During January and February the harbor is closed by ice.

Gull Ledge, partly uncovered at high water, is 0.4 mile northwest of the southern entrance point to Northwest Harbor. Between Gull Ledge and the buoy off the ledge extending from the southern entrance point is a narrow channel. Southwestward of Gull Ledge is a reef with rocks awash at low water, which must be avoided even by small boats if using this channel. Its southwest end is marked by a buoy, about 0.5 mile from Gull Ledge and 0.4 mile off the main shore.

The village of **Deer Isle** is at the head of the harbor; some marine supplies and provisions are available. The remains and stone foundation of the old steamer wharf extend about 50 to 100 feet off the northeastern shore of the harbor and are dangerous at all stages of the tide. A crib wharf, with two lumber sheds on it, at the west end of the bridge at the head of the harbor, dries at low water.

The harbor is seldom used except by pleasure craft as an overnight anchorage in fair weather. With the aid of the chart, little trouble should be experienced in approaching and finding anchorage in midchannel up to 0.4 mile inside the entrance, as the entrance is wide and clear. **Heart Island,** 60 feet high and wooded, is 0.5 mile northward of the entrance.

North of Northwest Harbor, the western shore of Deer Isle extends in a northeasterly direction to Eggemoggin Reach. It was formerly possible for small boats to follow this shore and pass between Little Deer Isle and Deer Isle directly into Eggemoggin Reach. This passage now is closed by a causeway.

The islands off the western end of Eggemoggin Reach were previously described in this chapter.

Between Little Deer Isle and North Haven Island, there is a chain of islands through which are many passes; these passes must be used with care because of the many reefs between the islands.

Pickering Island, 1 mile southwest of Little Deer Isle and about 90 feet high, and **Bradbury Island,** 2.5 miles southwest of Little Deer Isle and about 170 feet high, are both wooded, and are the principal islands north of the main ship channel through East Penobscot Bay.

Hardhead Island, a grassy islet 76 feet high, is 1 mile southward off Bradbury Island. About 0.4 mile northwest of Hardhead Island is **Middle Rock,** a shoal covered 10 feet on the north side of the main ship channel. A buoy is west of the rock.

Southwest of the main ship channel, and between it and North Haven Island, the passes between the islands are nearly obstructed by reefs in many cases. Navigation between these islands, even by small craft, must be done with caution. A few of the reefs are buoyed. Most of the islands are wooded.

Eagle Island, 1.5 miles west of Dunham Point, is wooded. **Eagle Island Light** (44°13.1′N., 68°46.2′W.), 106 feet above the water, is shown from a white granite tower on the northeast end of the island. A gong buoy is 320 yards east-northeastward of the light. **Eagle,** a small settlement on the island, has year-round mail and passenger boat service to Sylvester Cove, on the northwest side of Deer Isle. A bell buoy marks a shoal, covered 12 feet, extending 0.6 mile eastward of the island. **The Porcupines** are two high wooded islands off the south end of the island.

Great Spruce Head Island, 231 feet high and 2.1 miles northwest of Eagle Island, is the highest island in the group. **Bear Island,** just south of Great Spruce Head Island, has a protected anchorage in a cove at its north end in depths of 12 to 30 feet, rocky bottom. A wharf and float in the cove have a depth of about 9 feet alongside.

Butter Island, 186 feet high and 0.5 mile northwest of Eagle Island, is wooded. The passage between Butter Island and the northeast island of the **Barred Islands,** 300 yards westward, is reported to uncover at low water. **Oak Island,** 1.5 miles west-southwestward of Eagle Island, is grassy and uninhabited. **Burnt Island,** just south of Oak Island, is wooded except for its northeast end, which is grass covered.

There is a passage northward of North Haven Island which is used in winter when Fox Islands Thorofare is closed by ice. To go through this passage, pass about 300 yards southward of Eagle Island steer for **Spoon Ledge,** 15 feet high with grass on top, about 0.5 mile northwest of Oak Island. On this course pass 400 yards northward of **Grass Ledge,** 15 feet high and grass covered, 0.9 mile east of Oak Island, to a position about 400 yards northward of Oak Island. Then pass midway between Oak Island and Spoon Ledge and steer for Rockland Breakwater Light (44°06.2′N., 69°04.7′W.). The least charted depth in this passage is 25 feet.

The preceding paragraphs give the simplest directions for Isle au Haut Bay and East Penobscot Bay by pointing out the difficulties and the dangers, and especially, when necessary, the need for local knowledge. By close attention to the chart and following the aids, no difficulty should be experienced in navigating the area in daylight and in clear weather.

Chart 13308 (235).-Fox Islands Thorofare, leading from East Penobscot Bay to West Penobscot Bay, between North Haven and Vinalhaven Islands, is one of the chain of inshore passages

commencing at Bass Harbor and ending at Whitehead. Fox Islands Thorofare is about 7 miles long.

Prominent features-**Widow Island,** inside the eastern entrance to Fox Islands Thorofare, is marked by a small cottage.

Goose Rocks Light (44°08.1'N., 68°49.9'W.), 51 feet above the water, is shown from a white conical tower on a black cylindrical foundation; a fog signal is at the light. A white sector in the light, from 301° to 304°, marks the fairway for the eastern approach to the thorofare.

Browns Head Light (44°06.7'N., 68°54.6'W.), 39 feet above the water, is shown from a white cylindrical tower connected with a dwelling; a fog signal is in a white pyramidal tower close northward of the light and is higher; in daytime the fog signal tower is more conspicuous than the light structure. A white sector in the light, from 050° to 061°, with a red sector on either side of it, marks the fairway for the western approach to the thorofare. A fairway lighted bell buoy, about 2.4 miles southwestward of the light, marks the western entrance.

Sugar Loaves, a group of prominent high rocks surrounded by a ledge, are 600 yards northwestward of Browns Head Light. **Fiddler Ledge Daybeacon,** a gray, square stone shaft with a pyramidal top marks **Fiddler Ledge** which uncovers 5 feet 1.2 miles southwestward of Browns Head Light. It is the most conspicuous mark when approaching from westward.

A large standpipe on the high ground just back of North Haven shows up prominently in approach from either direction.

Channels.-The controlling depth of 17 feet is in midchannel between Iron Point Ledge and Grindstone Ledge. The narrowest part of the channel is about 100 yards wide between **Iron Point Ledge,** marked by a daybeacon, and **Dobbin Rock,** marked by a buoy. Extreme caution should be exercised here as the currents are reported to be strong at times, especially during strong winds from the east or west. At low water, the thorofare is seldom used by vessels drawing over 14 feet.

Anchorages.-Good anchorage can be selected in the channel of the thorofare between the entrance of Seal Cove and the western end of the village of North Haven, in depths of 23 to 33 feet, soft bottom.

Good anchorage for vessels of any draft, in depths of 32 to 42 feet, soft bottom, is in the western entrance of Fox Islands Thorofare, westward or northward of Sugar Loaves, and between Amesbury Point and **Crabtree Point Ledge,** 1.7 miles southwestward.

Anchorage can be found in **Seal Cove,** a large arm extending 1.5 miles southward from Fox Islands Thorofare southeastward of and on the opposite side of the channel from the village of North Haven. Large areas in the cove have depths of 8 to 12 feet, bottom soft in places, but shoaling has been reported in the middle of the cove. Good anchorage in depths of 19 to 23 feet, soft bottom, is in the middle of **Southern Harbor,** which makes northeastward between the **Dumpling Islands** and **Amesbury Point,** near the western end of the thorofare. The water shoals gradually toward the head.

Carver Cove, on the south shore of Fox Island Thorofare near its eastern end, is a secure anchorage, easy of access, and convenient for vessels windbound in East Penobscot Bay or passing through the thorofare. The anchorage, in depths of 16 to 20 feet, good holding ground, is about 0.5 mile from the head of the cove, and 197° from the cottage on Widow Island. When entering, the shores should be given a berth of about 300 yards. An unmarked 18-foot rocky patch is about in the middle of the eastern entrance.

Kent Cove, in the north shore of the thorofare north of Widow Island, is a secure anchorage with depths of 15 to 24 feet, good holding ground. Goose Rocks Light is the prominent guide for entering either day or night, the entrance being westward of the light. **Kent Ledge,** the only outlying danger, covered 5 feet, is 500 yards from the northwest shore of the cove off the entrance.

Waterman Cove, in the north shore of the thorofare west of Kent Cove, is a good anchorage for small vessels. The water shoals gradually from a depth of 18 feet at the entrance to 4 feet near the head, where a narrow channel leads into the **Cubby Hole,** a shallow cove. The better entrance to Waterman Cove is between the buoys off Fish Point Ledge and Waterman Ledge.

Dangers.-The principal dangers are marked by buoys or daybeacons which can be easily followed in the daytime with clear weather.

On the north side of the eastern entrance to Fox Islands Thorofare are **Babbidge Island,Calderwood Island,** and **Stimpsons Island.** North of these islands is unmarked Little Thorofare, which can be used by small craft with local knowledge. Ledges extend for over 0.4 mile south and southeast of these islands. A buoy, 0.6 mile southeast of Babbidge Island, is on the north side of the east entrance to Fox Islands Thorofare.

Of the several reefs south of these islands, the most important are **Black Ledge, Sunken Black Ledge,** and **Channel Rock.** A buoy is just southwestward of Sunken Black Ledge. Channel Rock is marked by a bell buoy and a daybeacon.

In the western approach to Fox Islands Thorofare, on the south side, are **Dogfish Ledges,** marked by a daybeacon; **Seal Ledge,** the north end of which is marked by a buoy; and **Inner Bay Ledges,** forming the westernmost danger in the western approach and marked by several buoys. The main entrance channel is north of these ledges and is well marked. The channel southeast, between these ledges, is also well buoyed for the guidance of those vessels going to Hurricane Sound and the southern part of Vinalhaven Island.

Drunkard Ledge, 0.5 mile westward of Fiddler Ledge Daybeacon, uncovers 7 feet and is marked by a daybeacon on the eastern side. Broken ground, which should be avoided, extends 0.2 mile southward of the line joining the daybeacons. A gong buoy is on the southern extremity of the broken ground.

Fish Point Ledge, which uncovers 4 feet and is marked at its southeast end by a buoy, is 400 to 600 yards southeastward of **Fish Point,** on the eastern side of Waterman Cove. Foul ground is between the point and the ledge. **Waterman Ledge,** covered 4 feet and marked by a buoy, is in the mouth of Waterman Cove 500 yards from the western shore.

Post Office Ledge, covered 8 feet, and **Lobster Ledge,** covered 2 feet, are two marked ledges off the town of North Haven.

Tides and currents.-The mean range of tide is 9.5 feet. The tidal currents in Fox Islands Thorofare are usually not strong. They meet at Iron Point in the middle of the thorofare; the flood sets in from both ends and the ebb sets out. However, during periods of strong winds from the eastward or westward, it is reported that strong currents with eddies are apt to be encountered in this vicinity.

The thorofare is sometimes closed by ice in winter.

Pilotage for these waters is discussed in this chapter under Pilotage, Penobscot Bay.

North Haven is an important yacht center on the north shore of Fox Islands Thorofare. Small craft can anchor on the north side of the channel, taking care to leave a clear channel to the town wharf and ferry slip. The town wharf has a depth of about 12 feet, and the other wharves less.

The yacht club and several wharves have float landings with depths of 4 to 8 feet alongside. All but the yacht club have gasoline, diesel fuel, water, ice, provisions, and marine supplies available at the float landings.

A boatyard, close eastward of the ferry slip, has marine railways that can handle craft up to 45 feet in length and 20 tons for hull and engine repairs; winter storage is available. The yard builds craft up to 50 feet in length.

State automobile, mail, and passenger ferry service to Rockland is maintained the year-round. Microwave telephone and telegraph communications are available to the mainland. There is an inn and restaurant in the village.

The north shore of Vinalhaven Island, across the thorofare from North Haven, has numerous summer residences with private landing floats.

Perry Creek, a long narrow arm making westward on the west shore of Seal Cove, is of no importance as an anchorage and should be avoided by strangers. Overhead power cables cross the creek in three places, as shown on the chart.

The western entrance to Fox Islands Thorofare and the off-lying dangers are described under the discussion of the thorofare.

Crockett Cove is just eastward of Crockett Point, the southeastern point at the western entrance to Fox Islands Thorofare. The cove is about 1 mile long and 200 yards wide near the entrance, is obstructed by ledges, and is suitable only for small craft with local knowledge.

Dogfish Island, 0.4 mile south of Crockett Point and northwestward of Leadbetter Narrows, has a stone wharf at its eastern end.

Leadbetter Narrows is a narrow passage between Vinalhaven Island on the north and **Leadbetter Island,** 0.3 mile southeast of Dogfish Island, on the south. Continuing south of the eastern side of Leadbetter Island, a passage leads into the northern end of Hurricane Sound. When passing through the narrows, favor the northern shore of Vinalhaven Island.

A small stone wharf is on Leadbetter Island at the narrows. There is also an inactive quarry and wharf on the shore of Vinalhaven Island eastward from the narrows. Leadbetter Narrows should not be attempted by strangers except in launches or small craft.

Bartlett Harbor, a small cove with deep water and good anchorage sheltered from all but westerly and northerly winds, is on the western shore of North Haven Island about 2 miles above **Stand-in Point,** the southwestern point of North Haven Island. A rock covered 9 feet is in the middle of the entrance; deep water is close-to around the rock.

Pulpit Harbor, on the northwest side of North Haven Island, is 4 miles northeastward of Stand-in Point and 2.5 miles southwestward of **Webster Head,** the high and partly wooded head at the north end of of North Haven Island. The entrance has a clear width of over 100 yards, and the harbor is a secure anchorage for small vessels of about 13-foot draft or less.

Pulpit Rock, 10 feet high and pointed, is near the end of the reef extending 250 yards northeastward from the western point at the entrance. The rock is a good mark. To enter, give the north side of Pulpit Rock and the eastern shore just northward of the entrance a berth of over 100 yards, and enter in midchannel eastward of Pulpit Rock. Keep in midchannel and anchor in its broad part in depths of 18 to 33 feet.

Another good all-weather anchorage for small craft is reported to be in the southwesterly prong, just inside the entrance, in 18 to 27 feet. More sheltered anchorage in 8 to 10 feet is toward the northeast end of the harbor, where there is a public float landing with 3 feet alongside. There is a telephone at the landing. Gasoline, provisions, and most supplies can be obtained by phoning North Haven from the landing.

Charts 13305 (310), 13306 (310-SC), 13303 (322).-Laireys Narrows, between Leadbetter Island on the north and Laireys and Cedar Islands on the south, is a part of the route between Carvers Har-

bor and Rockland. The principal dangers are buoyed. **Crotch Island, Crane Island,**and **Spectacle Island** lie southward of Laireys and Cedar Islands. A safe anchorage is reported to be had in 6 to 8 feet between Crotch Island and the northwestern end of Crane Island.

The Basin is a large irregular bight in the west side of Vinalhaven Island, about 2 miles southeast of Crockett Cove. **Barton Island** is in the middle of the entrance, leaving a narrow, crooked, foul, and shallow channel north of it. The depth in the basin varies from 10 to 111 feet.

Hurricane Sound is bounded on the east by Vinalhaven and Greens Islands and on the west by **Hurricane Island,** 0.7 mile west of Greens Island, and **White Islands,** a group of islands about 1.5 miles northwest of Greens Island and farther north by **Crane Island**and **Cedar Island.**The sound has deep water. Several passages lead into the sound, but there are no good anchorages.

It is reported that there is a good black pebble beach in the cove on the south side of Hurricane Island and that the old stone quarry pier on the northeast side of the island affords a good landing place in good weather. **Outward Bound School,** a summer sailing and survival school for youngsters, is on the island.

Along this part of West Penobscot Bay, numerous rocks and reefs extend over 2 miles offshore from Vinalhaven Island and the bottom of the bay is irregular with many spots of 10 to 18 feet for about 2 miles farther offshore. The better passes among the islands are buoyed. Great care must be used to avoid the numerous reefs.

The Reach is a narrow, much obstructed channel leading northwestward from the entrance of Carvers Harbor, between Greens Island and Vinalhaven Island. The passage is marked and used by vessels bound between Carvers Harbor and Rockland. The channel at its narrowest is only 100 feet wide between the northeastern edge of the ledge marked by Wreck Point Daybeacon and a rock covered 2 feet, about 200 feet northeastward of the daybeacon. Great care is required in passing this point.

Old Harbor is a small cove at the northern end of The Reach and on the opposite side of the channel from the northern end of Greens Island. Caution is necessary in using this harbor because of the many old fish stakes, and a ledge of drying rocks extending southward of the island in the entrance of the harbor.

Carvers Harbor is a secure haven in all weather for small vessels on the southwest side of Vinalhaven Island.

Prominent features.-Heron Neck Light (44°01.5'N., 68°51.7'W.), 92 feet above the water, is shown from a white tower connected to a dwelling on the southern extremity of **Greens Island,** on the eastern side of the entrance to Hurricane Sound. The light is obscured close-to between 312° and 318°; it has a white sector from 030° to 063° which marks the fairway of the approach to Carvers Harbor from the southwest; a fog signal is at the light.

Carvers Harbor Entrance Light 2 (44°02.1'N., 68°50.7'W.), 19 feet above the water and shown from an iron spindle with a red triangular daymark on the west end of Green Ledge, marks the entrance to the harbor. Ice seldom closes the harbor. A standpipe on the hill north of the harbor is very prominent.

Channels.-There are four channels in the approaches to Carvers Harbor. The entrance from southwestward is between Heron Neck Ledge and James and Willies Ledge; from the northwestward through The Reach; and from the eastward through the channel between Vinalhaven Island and the islands and ledges south of it. The controlling depth in the entrance channel is 19 feet between Potato Island and **Dodge Point** on the north side of the entrance to the harbor. A marked channel also leads from the southward, west of Colt Ledge and between Arey Ledges and The Breakers.

Indian Creek, just eastward of Carvers Harbor, has an entrance from the sea and also a connecting passage to Carvers Harbor. A fixed highway bridge crossing the passage has a clearance of 8 feet. The passage is not safe for strangers. **Lane Island** forms the west side of Indian Creek. The island is grassy with two prominent white houses visible from the southward. **Potato Island** and **Bar Island** are two small islets on the northwest side of Lane Island at the south side of the entrance to the harbor.

Anchorages.-The best anchorage for small craft is reported to be on the east and southeast side of the harbor; the western side is principally used by commercial craft and fishermen. In 1964, the harbor was dredged to a depth of 16 feet in the center, 10 feet on the south side and north side along the waterfront, and 6 feet in an access channel to an inner basin of the same depth off the town landing at the head of the harbor.

Dangers.-James and Willies Ledge, 5 feet high with rocks awash at the south end, is on the north side of the southwestern approach at its junction with Hurricane Sound. It is part of the extensive ledge area extending southward from Hurricane Island. A buoy is south of the area.

Heron Neck Ledge, 7 feet high, is on the southern edge of the western approach and is unmarked.

Folly Ledge is a bare unmarked ledge on the north side of the channel at its junction with The Reach. **Green Ledge** is on the south side of the channel in the inner approach to Carvers Harbor. It is marked by Carvers Harbor Entrance Light.

Point Ledge, covered 4 feet and marked by a daybeacon, is 0.7 mile east of Folly Ledge.

The dangers in the eastern approach have been described with Isle au Haut Bay and East Penobscot Bay.

Strangers should bear in mind that many unmarked dangers will of necessity have to be passed close-to, and should exercise extreme caution by giving strict attention to the chart and following the aids.

Tides.-The mean range of tide is 9.3 feet at Vinalhaven.

Routes.-The preceding paragraphs give the simplest directions by pointing out the difficulties and the dangers and especially, when necessary, the need for local knowledge. Vessels of 12-foot draft or less should experience no difficulty, in daytime and in clear weather, in approaching and entering.

Pilotage for these waters is discussed in this chapter under Pilotage, Penobscot Bay.

Harbor regulations.-There is a **harbormaster** who assigns the moorings in the anchorage. A **speed limit** of 5 miles per hour is enforced within the harbor.

Sand Cove, making northward from Carvers Harbor, is foul. There are several wharves and a boatyard at the head at which vessels lie aground at low water.

Vinalhaven is a town at the head of Carvers Harbor. There are churches, a library, bank, movies, inns, lodging houses, medical and nursing services, restaurants, picnic areas, and an excellent school system. The depths at the ferry wharf and float landings vary from 6 to 10 feet. Diesel fuel, gasoline, bottled gas, ice, water, provisions, and marine supplies are available at the landings. There are five boatyards on Vinalhaven Island, two on Indian Creek, one in Sand Cove, and two in Carvers Harbor. Craft up to 50 feet in length can be hauled out for hull or engine repairs or dry open or covered winter storage. Electric and electronic repairs can be made. There is microwave telephone communication with the mainland.

The State maintains mail, automobile, and freight service with Rockland the year-round. The island has good roads.

Charts 13305 (310), 13306 (310-SC).-North of North Haven Island are numerous islands and reefs extending to Cape Rosier (chart 13309 (311)). Most of these have been described previously. The most westerly of the islands and reefs is **Egg Rock,** which is small and grass covered, and 2 miles north of Pulpit Harbor. **Egg Rock Ledge,** 0.3 mile southwest of Egg Rock, is covered 2 feet. A buoy is northeast of the ledge.

Compass Island Ledge, 1.4 miles northeastward of Egg Rock, is covered 8 feet; a buoy is off the ledge. **Compass Island,** 42 feet high, is 0.7 mile northward of Compass Island Ledge. A ledge with a rock at its end, which uncovers 10 feet, extends about 300 yards northeastward from Compass Island; ledges also extend up to 0.3 mile eastward of the island. **Grass Ledge,** a group of rocks 15 feet high, and rocks awash and covered, is between Compass Island, **Scrag Island,** and **Little Spruce Head Island,** which is westward of **Great Spruce Head Island.**

Horse Head Island, 74 feet high, is about 0.6 mile northward of Little Spruce Head Island. **Colt Head Island,** and still another group of **Barred Islands,** are westward and northwestward, respectively, of 81-foot-high **Beach Island,** which is 0.9 mile northward of Great Spruce Head Island. Submerged rocks are reported in the passage between Beach Island and Barred Islands. **Resolution Island,** the northwesterly island of this group of islands between North Haven Island and Cape Rosier, is 93 feet high and wooded.

The passage through these islands, just north of North Haven Island, has been described previously with East Penobscot Bay.

Chart 13302 (1203).-Islesboro Island and the adjacent islands and shoals are about 15 miles long, and separate East and West Penobscot Bays near their heads. Islesboro Island is nearly divided in the middle. The island is an important summer resort and is frequented by many pleasure boats in summer. Dark Harbor, Islesboro, North Islesboro, and Pripet are villages on the island. A State automobile and passenger ferry is operated between Lincolnville, on the mainland, and Grindel Point.

The area in Penobscot Bay northwesterly of Islesboro Island within a circle having a 1-mile diameter with its center in 44°23′20″N., 68°55′00″W., has been designated as a vessel-to-vessel oil transfer area by the State of Maine Environmental Improvement Commission.

Charts 13305 (310), 13306 (310-SC).-A chain of islands and rocks, through which are several channels, extends for 5 miles southward from Islesboro Island. **McIntosh Ledge,** the most southerly of the dangers and about 0.7 mile southeastward of Robinson Rock, is awash at low water. A buoy is southeast of the ledge.

Robinson Rock, 15 feet high and grassy, is the most southerly visible danger; several smaller bare rocks are around it. Ledges extend for 0.6 mile north-northeast and south-southwest of the rock. There is a whistle buoy off the southern end of these ledges.

Mark Island, the most southerly wooded island, is high, rounded, and prominent. A daybeacon is on the reef, which extends southward from the island.

East Goose Rock, 0.5 mile northward of Mark Island, is 15 feet high and grassy. **Saddle Island,** 0.7 mile east-northeastward of Mark Island, is high and thickly wooded.

Lasell Island, 1.2 miles northeast of Mark Island, is high and wooded except at its north end. **Goose Island** and **Mouse Island,** eastward of Saddle and Lasell Islands, are rocky islets with grass on top. Several bare and covered rocks are between Goose and Mouse Islands. A buoy is 300 yards north of the ledge which uncovers 5 feet northward of Mouse Island, and a buoy is eastward of the bare rock east of Goose Island.

Lime Island, 0.2 mile northeastward of Lasell Island, is low and generally wooded. A bare rock is 0.2 mile northward of Lime Island. **Job Island,** 0.7 mile northeastward of Lime Island, is 104 feet high

and thickly wooded. The southerly of the **Ensign Islands,** 0.7 mile west of Job Island, is wooded, and the northerly is wooded in the center with a house on the west side. A landing is on the south end.

The channel between Mark, Lasell, and Lime Islands on the west and Saddle, Goose, and Mouse Islands on the east is used by some vessels bound from Rockland or westward to Eggemoggin Reach or points in the northern part of East Penobscot Bay. The channel is unmarked, and local knowledge is required.

Charts 13305 (310), 13306 (310-SC), 13309 (311), 13310 (311-SC).-Dark Harbor 13305 (310), 13309 (311) is a village, with many summer homes, on the southern part of Islesboro Island. There are grocery and hardware stores, a snack bar, and a gas station. **Dark Harbor Cove,** on the eastern side of the island, is crossed by a dam and footbridge just inside the entrance and is seldom used. Small craft visiting the resort tie up at the yacht club or other private floats in Gilkey Harbor.

Gilkey Harbor, on the western side of the southern part of Islesboro Island, is between the island and **Seven Hundred Acre Island, Warren Island,** and **Spruce Island,** a State park. The harbor is a secure anchorage with good holding ground, and is frequented by many yachts in summer. There are a number of private float landings for small craft, but no commercial wharves. The harbor frequently is closed by ice in winter.

The Tarratine Yacht Club is on the east side of **Ames Cove,** near Dark Harbor; the clubhouse has a float landing with a depth of 4 feet alongside. Some supplies can be obtained in the village, and water is available at the float.

Cradle Cove is a shallow indentation on the northeast side of Seven Hundred Acre Island. A boatyard, near the eastern entrance point of the cove, has a machine shop and a marine railway capable of hauling out craft up to 60 feet in length for hull and engine repairs, and dry covered or open winter storage. Electric and electronic repairs can be made, and the yard has a small crane and pile driver. Gasoline and diesel fuel are available at the 300-foot pier and float landing, which has 6 feet reported alongside. Water, provisions, marine supplies, and electricity are available, and the yard maintains guest moorings. Launch service to the ferry at Grindel Point is provided.

Channels.-The main entrance to Gilkey Harbor is from southwestward between Job Island and Ensign Islands; the controlling depth is about 27 feet in midchannel between Minot Island and Seven Hundred Acre Island. Unmarked rocks of less depth are near the sides. The channel is partially buoyed and easily entered. The entrance from the northward is marked by **Grindel Point Light,** 21 feet above the water, shown from a white skeleton tower with a white square daymark, close to an abandoned lighthouse on the north side of the entrance. The State ferry slip, and a municipal float landing with 12 feet reported alongside, are close southeastward of the light; a municipal small-craft launching ramp is close westward of the ferry slip. A lighted bell buoy is west of the entrance, and the channel into Gilkey Harbor is partially marked by buoys.

Provisions and some marine supplies can also be obtained from Islesboro.

Small craft can also enter Gilkey Harbor through narrow, crooked **Bracketts Channel,** westward of the south end of Islesboro Island and eastward of Job Island and **Minot Island.** The unmarked channel is said to have a controlling depth of about 6 feet. The best water favors the east side.

No difficulty should be experienced in entering Gilkey Harbor from the southward or northwestward with close attention to the chart and bearing in mind a number of unmarked 14- to 18-foot spots in the northern half of the harbor. Wooded **Thrumcap Island,** near the middle of the harbor, has a reef extending westward from it which is marked by a buoy. **Lobster Rock,** awash, just inside the northern entrance, is unmarked.

Charts 13309 (311), 13310 (311-SC).-Gooseberry Point, 0.6 mile northward of Grindel Point, is low and flat, with a clump of trees at its outer end. **Crow Cove,** 2.4 miles northeast of Grindel Point, is an anchorage for small craft only.

Seal Harbor, on the western side of Islesboro Island about 3 miles northward of Grindel Point, offers good anchorage sheltered from all but southwest winds. This harbor, easy of access, is used by vessels bound up or down the bay as an anchorage for the night. Vessels of any size can anchor with ample swinging room about 0.5 mile eastward of Flat Island, in depths of 54 to 60 feet. Anchorage can also be had in depths of 48 to 57 feet in the middle of the harbor, keeping the southern and eastern shores distant about 500 yards. The northern side of the harbor is foul. The wreck of a schooner, covered 5 feet, is about 0.2 mile from the head of the harbor.

The entrance to Seal Harbor from the southward is deep and clear. The entrance from westward is 400 yards wide, with depths of 22 to 29 feet between Seal Island and a shelving ledge which extends 500 yards northward from Flat Island.

The approach from the northward east of Seal and Ram Islands has a controlling midchannel depth of about 15 feet, but is unmarked and should not be used except with local knowledge because of the many unmarked shoal spots close to the channel edges.

Flat Island is a private bird sanctuary on the western side of the southern entrance to Seal Harbor. The island is grassy, with a few trees and scattered brush. **Seal Island,** 0.6 mile north of Flat Island, is wooded and has a brown house with a black roof on its western side. A private pier and float landing are on the east side of the island. **Ram Island,** 0.2 mile northward of Seal Island, is wooded. The ledge extending 0.3 mile northward from the island has three rocks awash.

Islesboro Harbor is an open bight in the east side of Islesboro Island, 2.7 miles westward and on the opposite side of East Penobscot Bay from Cape Rosier. The harbor affords good shelter in westerly winds and has depths of from 31 to 42 feet, rocky bottom. **Hewes Ledge,** off the southern point at the entrance and awash at low water, is marked by two buoys. Vessels can pass on either side of the ledge, being guided by the buoys. Foul ground extending over 0.2 mile from the western shore will be avoided by keeping the knoll northward of the harbor open from the north point of the harbor.

The village of **Islesboro** is on the south side of the harbor. There are several private float landings in the harbor. The village has a general store where marine supplies are available.

Sabbathday Harbor is a small cove in the eastern side of Islesboro Island, about 2 miles northward of **Hewes Point,** the high point on the south side at the entrance to Islesboro Harbor. **Ryder Cove,** the northern part of the harbor, dries at low water. Sabbathday Harbor is open southward and provides anchorage for small vessels in depths of 6 to 20 feet. A dangerous sunken rock is about 150 yards southward of the western entrance point, and stonecribs are reported on the east side of the harbor, about 300 yards above the entrance. The village of **North Islesboro,** on the west side of the harbor, has a general store, filling station, restaurant, and lodging.

Sprague Ledge, 0.5 mile northward of Ram Island and about 0.5 mile off the west shore of Islesboro Island, is covered 2 feet. **Barley Ledge,** 0.3 mile northeastward of Sprague Ledge, is awash at low water.

Marshall Point, near the north end of Islesboro Island, is marked by prominent yellowish bluffs. A lighted bell buoy is 0.8 mile west of the point.

Turtle Head Cove, a broad bight in the north end of Islesboro Island, is sheltered from southerly and easterly winds, and has good anchorage in depths of 18 to 37 feet, soft bottom. The anchorage has a clear width of about 700 yards and is in the eastern part of the cove. The eastern shore must be given a berth of 250 yards, and the south end of the cove 500 yards.

In the western half of the cove, a shoal awash in one spot at low water and covered 9 feet near its north edge extends 600 yards from shore. The north end of Turtle Head bearing anything eastward of **070°** clears the shoal.

Turtle Head, the north end of Islesboro Island, is a prominent wooded head joined to the island by a long, narrow, wooded neck. The village of **Pripet** is southward of Turtle Head. A crib wharf at Pripet is reported to have 12 feet alongside.

Parker Cove, on the east side of Islesboro Island 2.2 miles south of Turtle Head, is a shallow cove used only as an anchorage by small local craft. **Islesboro Ledge,** covered 8 feet, is eastward of the entrance; a buoy is off the east side of the ledge.

Chart13303 (322).-Two Bush Channel and Muscle Ridge Channel are entrances to West Penobscot Bay from westward, the former leading southward and the latter northward of an extensive group of islands and shoals.

Two Bush Channel is broad and deep, and the principal dangers are buoyed. This channel is used in preference to Muscle Ridge Channel by large vessels and tows, and is generally used at night by all except small local vessels.

Two Bush Island, the southeastern island of the group between the two channels, is marked by **Two Bush Island Light** (43°57.9'N.) 69°04.5'W.), 65 feet above the water, shown from a 42-foot white square tower on the north side of Two Bush Channel; a fog signal is at the light. The light is the principal guide to the channel.

Halibut Rock, awash at low water and marked by a buoy, is 1.6 miles northeastward of Two Bush Island Light. **False Halibut Ledge,** covered 6 feet and unmarked, is 0.3 mile northeastward. **Northeast Pond Ledge,** 0.6 mile northeastward of **Andrews Island,** is awash at low water, and **Sunken Pond Ledge,** covered 6 feet, is 500 yards southeastward; neither is marked.

The larger islands between Two Bush Channel and Muscle Ridge Channel are mostly wooded, and of little importance. The small islands are bare and grassy, and there are many bare and covered rocks. **Dix Island,** 2.7 miles north of Two Bush Island, is wooded. **High Island,** 0.2 mile northeastward of Dix Island, has an abandoned quarry on it. **Birch Island,** just east of Dix Island and south of High Island, is about 20 feet high. **Fisherman Island,** about 5 miles north-northeast of Two Bush Island, is 43 feet high and grassy. **Marblehead Island,** 0.3 mile south of Fisherman Island, is 46 feet high and bare. **Grindstone Ledge,** covered 2 feet, is 0.3 mile northwestward of Fisherman Island.

Muscle Ridge Channel is used in daylight and clear weather because it is sheltered and affords anchorage in case of bad weather. The channel is deep but narrow in places, especially between Sheep Island and Henderickson Point (chart 13305 (310)), where the channel is only 85 yards wide, but has a depth of 38 feet in midchannel. From the entrance at Whitehead Island, the channel extends in a northeasterly direction about 6 miles to Sheep Island, passing between numerous rocks and ledges. Shoal depths of 13 to 22 feet are close to the channel, but these dangers are well marked, and in daylight and clear weather no difficulty should be experienced. The controlling depth is 26 feet, but vessels drawing 30 feet have been taken through at high water.

Whitehead Island is on the west side of the southern entrance to Muscle Ridge channel. **Whitehead Light** (43°58.7'N., 69°07.5'W.), 75 feet above the water, is shown from a 41-foot gray

tower attached to a red brick shed on the east end of Whitehead Island; a fog signal is at the light.

There is a small wharf in the cove on the northeast side of the island 300 yards northward from the light. The narrow channel between Whitehead Island and **Norton Island,** 500 yards westward, is blocked by a reef which uncovers about 6 feet.

The following information is given to identify the dangers close to the sailing line through Muscle Ridge Channel. **South Breaker,** 0.4 mile southward and on the opposite side of the channel from Whitehead Light, is awash at low water and marked on the southwest end by a bell buoy. **Yellow Ledge,** on the opposite side of the channel from Whitehead Light, is awash at high water and marked by a daybeacon. **Yellow Ridge Islet,** close eastward, is 15 feet high and bare.

Lower Gangway Ledge, 0.4 mile north of Yellow Ledge, is covered 6 feet; a buoy is west of the ledge. **Hurricane Ledge,** 1 mile northeastward of Yellow Ledge, is awash at low water and marked on its northwest side by a buoy. **Garden Island,** about 2 miles northeastward of Whitehead Island, is 15 feet high and bare except for a little grass on top. **Garden Island Ledge,** 0.3 mile east-northeastward of Garden Island, uncovers about 5 feet; a daybeacon is on the ledge. **Sunken Ledge,** covered 4 feet, about 0.4 mile southward, is marked by a buoy off its south end.

Wiggins Rock, covered 9 feet, is about 750 yards north-northeastward of Garden Island Ledge, and there are two rock patches covered 10 and 12 feet, respectively, about 500 yards northwestward of Wiggins Rock. **High Clam Ledge,** 0.8 mile northeast of Hurricane Ledge, is bare and grassy at its south end and awash at low water at its north end. **Channel Rock,** 0.4 mile north of High Clam Ledge, uncovers 10 feet and is unmarked.

Otter Island, 0.5 mile north of Dix Island, is 31 feet high and wooded; a daybeacon is on the northwest end of the island. **Otter Island Ledge,** 0.3 mile northwestward on the opposite side of the channel from Otter Island, uncovers about 5 feet; a daybeacon is on the ledge. **Upper Gangway Ledge,** 0.6 mile north-northwest of Otter Island, is covered 5 feet and marked by a buoy. **Inner Grindstone Ledge,** awash at low water, is 0.3 mile east of Upper Gangway Ledge; a buoy is north of the ledge.

Seal Harbor, (see also chart 13305 (310)), an anchorage formerly much used by coasters, is on the western side of Muscle Ridge Channel between Whitehead Island and **Sprucehead Island,** 0.8 mile northward.

A causeway and highway bridge connecting **Elwell Point** with Sprucehead Island has a fixed span with a clearance of 7 feet. A town ramp is at the north end on the west side of the bridge. The harbor has depths of 15 to 39 feet, with soft bottom.

Spruce Head is a village on the north side of Seal Harbor. There are several private wharves in the harbor. A service wharf and float landing are on the east side of the cove in the south side of Sprucehead Island; depths of 7 feet are reported alongside the float. Gasoline, diesel fuel, water, ice, provisions, and some marine supplies are available.

A lobster wharf on the northeast side of Elwell Point has gasoline, but is dry at low water. The harbor is easy of access in daytime, and the principal dangers are buoyed.

Seal Island is about 500 yards northward of the light on Whitehead Island. **Seal Island Ledge,** which uncovers for almost 500 yards north of Seal Island, is the principal danger on the south side of the entrance. Buoys mark the east and northeast sides of the ledge. **Long Ledge,** 0.2 to 0.5 mile north of Whitehead Island, shows in two places at high water.

Burnt Island, connected to Sprucehead Island by a private bridge, has a summer home. Small craft use the passage between these two islands. The highway bridge has a fixed span with a clearance of 12 feet. **Burnt Island Ledge,** 150 yards south of Burnt Island and marked by a buoy, is covered 2 feet. The approach to Seal Harbor is reported to be clear. The chart is the guide.

Dix Island Harbor is an anchorage off the southeast side of Muscle Ridge Channel between Andrews, Birch, and Dix Islands. The harbor is entered from southwestward through a narrow and crooked channel leading between the ledges north of **Hewett Island,** 1.5 miles north of Two Bush Island. The channel and harbor are unsafe for strangers.

On the west side of **The Neck,** just westward of Andrews Island, is a wharf with 2 feet alongside. There is a stone wharf with good water reported alongside for small craft on the west side of **High Island.** Care must be exercised in approaching it to clear a rock covered 3 feet about 200 yards westward of the wharf. A good all-weather anchorage for small craft is reported between High Island, **Dix Island,** and **Little Green Island.**

Weskeag River empties into the western side of Muscle Ridge Channel at the head of the bight westward of **Ash Island,** a 54-foot-high wooded island, about 3 miles northeast of Sprucehead Island. The channel between Ash Island and Ash Point is shoal, foul, and obstructed by fishweirs. **Lark Ledges,** dangerous unmarked ledges with several rocks, sunken and awash; **Grace Rock,** covered 2 feet and also unmarked; and a number of other unmarked patches and ledges obstruct the approach to Weskeag River.

Spaulding Island, wooded, is about in the middle of the river entrance between **Otter Point** and **Thorndike Point.** There is a stone town wharf with 2 feet at the head on the west side just inside the

entrance abreast of Spaulding Island. There are no facilities. The river has a narrow, crooked unmarked channel south of Spaulding Island which is not safe for strangers.

The village of **South Thomaston** is at the head of navigation, 2 miles above its mouth; the greatest draft taken to the village is 9 feet at high water. Vessels seldom enter. Provisions and some marine supplies can be obtained at the village general store. There is a small boatyard and marine railway where craft up to 36 feet in length are hauled out for hull or engine repairs or dry open winter storage. There is a town wharf, which bares at low water, a small-craft launching ramp, and parking at the head of the harbor near the store. There are good roads to the interior. Local knowledge is advisable for entering and anchoring.

Fisherman Island Passage leads from Muscle Ridge Channel to Penobscot Bay, between Fisherman Island and Sheep Island. Several dangers are in this passage, but the principal ones are marked by buoys and can be easily avoided in the daytime in clear weather.

Sheep Island Shoals, which extend over 0.3 mile south of Sheep Island and uncover in places, are on the north side of the channel; the shoals are marked on the south end by a buoy. **Emery Ledge,** covered 6 feet, and **Northwest Ledge,** covered 4 feet, are on the south side; both are marked by buoys.

Charts 13307 (209), 13305 (310), 13306 (310-SC).-Owls Head Bay is between Sheep and Monroe Islands, about 6.5 miles north-northeastward of Two Bush Island, on the east and the mainland on the west. The bay is a continuation of Muscle Ridge Channel northward of Fisherman Island Passage. The channel through Owls Head Bay is very narrow on the western side of Sheep Island between Sheep Island Bar and **Hendrickson Point,** where the width is only 85 yards between the 5-fathom curves, and the depth 38 feet. It is marked by two buoys. Vessels caught by fog can anchor in the middle of the bay abreast Monroe Island in depths of 42 to 69 feet.

Small vessels can anchor in the entrance to **Owls Head Harbor,** on the west side of the bay, between **Dodge Point** and the bare ledge 0.2 mile southwestward, in depths of 9 to 24 feet. Anchorage in depths of about 6 feet can be found closer inshore. Two fish wharves in the harbor bare at low water. Gasoline and diesel fuel are available at both wharves. The town float landing with 6 feet reported alongside is at the end of the southerly wharf. Well water can be obtained nearby, and ice, provisions, and some supplies can be obtained at a general store in the village of **Owls Head.** There is a good firm beach where small boats may be launched from trailers at any stage of tide. There are good roads to the interior.

Owls Head is a prominent headland at the northeast entrance to Owls Head Bay and on the south side of the entrance to Rockland Harbor. **Owls Head Light** (44°05.5′N., 69°02.7′W.), 100 feet above the water, is shown from a white tower on the headland; a fog signal is at the light. The light is obscured from 324° to 354° by Monroe Island. **Storm warning signals are displayed.** See chart.

Emery Island is a small islet 0.8 mile west and on the opposite side of the channel from Sheep Island. A rock 350 yards eastward of Emery Island is awash at low water; a daybeacon marks the rock. **Dodge Point Ledge,** eastward of Dodge Point, uncovers about 5 feet and is marked by a daybeacon. **Owls Head Ledge,** southeastward of Owls Head and awash at low water, is marked by a buoy.

Monroe Island Light (44°04.8′N., 69°02.0′W.), 29 feet above the water, is shown from a white skeleton tower with a red and white checkered diamond daymark on the east side of Monroe Island. In West Penobscot Bay, eastward of Monroe Island, the tidal current has an average velocity of 0.3 knot at strength. See the Tidal Current Tables for predictions.

A Navy-maintained 000°32′-180°32′ measured nautical mile, and **standardization course,** 5 miles long, are eastward of Monroe Island. Shore markers, shown from orange slatted skeleton towers, mark the measured nautical mile, and West Penobscot Bay Entrance Lighted Gong Buoys A and B mark the south and north ends of the standardization course, respectively. Vessels must keep clear of the course while trials are in progress.

Rockland Harbor, one of the most important harbors in Penobscot Bay, is on the west shore of West Penobscot Bay between Owls Head on the south and **Jameson Point,** 2.1 miles northwestward, on the north. The harbor offers anchorage for large vessels, but is somewhat exposed to easterly winds. Northeasterly winds raise a heavy sea in the southwestern part of the harbor, but shelter may be found behind the breakwater.

The breakwater extends 0.7 mile southward from Jameson Point. **Rockland Breakwater Light** (44°06.2′N., 69°04.7′W.), 39 feet above the water, is shown from a white square tower on a granite pier at the outer end of the breakwater; a fog signal is at the light.

Rockland, a city on the western shore of the harbor, has some trade by water in gypsum, lime, fish, and petroleum products. State diesel-powered mail, freight, automobile, and passenger ferries leave the Rockland Port Terminal in **Lermond Cove** several times daily for North Haven and Vinalhaven, and a diesel-powered motorboat carries passengers, mail, and freight to Matinicus.

There are banks, hotels, motels, restaurants, a general hospital, library, shops, churches, and schools in Rockland. The city has many small metal, textile, and woodworking industries, and seafood processing and fruit packing plants.

Prominent features.-The most prominent objects in approaching Rockland Harbor are the radio tower of station WRKD, which is lighted at night, the aerolight at the Knox County Regional Airport, the high elevated tank on Jameson Point, and the radio tower and signal mast at the Coast Guard station on Crockett Point. The light on Owls Head and the light at the end of the breakwater are also conspicuous. The two high cement chimneys of the cement works between Rockland and Thomaston are very prominent off Rockland Harbor. A radio tower on Benner Hill, about 2 miles westward of Rockland Harbor, is also reported to be prominent.

Channels.-A federal project provides for an approach channel 18 feet deep and three branch channels 14 feet deep, each with a turning basin, leading to the northern, western, and southwestern parts of the waterfront; see latest editions of the charts for controlling depths. All channels are buoyed.

Anchorages.-Two general anchorages, one in the northern part of the harbor and the other in the southern part, and a small-craft anchorage in the western part are available in Rockland Harbor. See **110.130,** Chapter 2, for limits and regulations.

Dangers.-Standing westward in the harbor the water shoals gradually toward the wharves.

Several rocks and ledges are in the harbor. The visible ones are **Shag Rock,** on a cluster of bare rocks, marked by a daybeacon; **Lowell Ledge,** a cluster of rocks awash at low water on the south shore of the harbor opposite Jameson Point; and **Seal Ledge,** which uncovers about 5 feet, in the southwest end of the bay and marked by a daybeacon. A buoy marks **Spears Rock,** covered 5 feet, about 300 yards northeastward of Lowell Ledge. A dangerous wreck is about 200 yards south of Seal Ledge.

Tide.-The mean range of tide is 9.7 feet.

Routes.-Approaching Rockland Harbor, Rockland Breakwater Light may be steered for on any safe course, using the chart as a guide. Enter the harbor southward of the breakwater light, giving it a berth of 100 yards or more.

Pilotage for Rockland Harbor is discussed in this chapter under Pilotage, Penobscot Bay.

Towage.-Two small motor launches, used as tugs, are available at Rockland. Tugs up to 1,200 hp are available at all times at Belfast; see Towage, Penobscot Bay, this chapter for details.

Arrangements for customs, immigration, and quarantine inspections are generally made in advance through ships' agents; officials usually board vessels at their berths.

Rockland is a **customs port of entry.** The Coast Guard **vessel documentation** officer at Rockland also serves as the customs officer; see Appendix for address.

Immigration officers usually come from Portland.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1. The Public Health Service maintains a **contract physician's** office in Rockland.

Wharves.-The Rockland Port District Terminal Wharf, on the west side of Lermond Cove, is the ferry terminal. The wharf is 280 feet long and has a ferry slip, a lift bridge, and ramp; depths of 11 feet are reported alongside. In addition, there are several private and public wharves and piers on the west side of the harbor that are used by vessels and barges engaged in coastwise shipping. Depths at these facilities are reported to range from about 6 to 14 feet.

Supplies.-Gasoline, diesel fuel, water, ice, and marine supplies are available at several of the wharves. Provisions and most supplies are available in town.

Repairs.-A commercial fishing corporation has a repair yard with marine railways and cranes up to 50 tons on Atlantic Point. The largest railway can handle vessels up to 200 feet in length, 40-foot beam, 1,000-ton displacement, and 15-foot draft. Hull, engine, and electronic repairs can be made. The nearest port where vessels can be drydocked is Boston. Several boatyards, catering to small craft, are also available in the harbor. Hull, engine, and electronic repairs can be made. Marine railways up to 75 feet and lifts up to 25 tons are available.

Small-craft facilities.-A municipal marina with 6 feet reported alongside its float landing is on the west side of the harbor, about 0.3 mile northwestward of **Atlantic Point.** Water and electricity are available at the float, and guest moorings are maintained. Another marina, close northward, has depths of 5 feet reported alongside. Berths, gasoline, water, and some marine supplies are available.

Storm warning signals are displayed; see chart.

Communications.-The port has railway freight, bus, truck, and taxi service and microwave telephone communication with North Haven, Vinalhaven, and the inhabited islands off the entrance to Penobscot Bay.

Charter planes are available at two nearby airports for trips to several towns in the bay. The town is a terminus of the Maine Central Railroad which connects with the main line at Brunswick.

A Coast Guard station is on the west side of Crockett Point.

Clam Cove, on the west side of West Penobscot Bay, about 2 miles northward of Rockland Harbor, is shoal at the head, and is not a good anchorage. The ruins of a stone wharf are on the north side of **Brewster Point,** 1.2 miles north of Jameson Point. **Glen Cove** is a village near the head of the cove.

Brewster Point Ledge, extending over 700 yards southeastward from Brewster Point on the south side of the entrance, is awash at high water; a buoy is southeastward of the ledge.

Ram Islet is a grass-covered rock 400 yards northeastward of Brewster Point. The shoal that extends northeastward from the islet is marked by a buoy.

Rockport Harbor, on the west side of West Penobscot Bay about 4 miles northward of Rockland Harbor, is a good anchorage for vessels of any size, sheltered from all but southerly winds, and is easy of access. The harbor is about 0.7 mile wide at the entrance between Indian Island and the western shore, and gradually narrows to the head.

Rockport is a town at the head of the harbor at the entrance to Goose River. It has schools, churches, medical services, library, motels, restaurants, markets, and shops of all kinds.

Prominent features.-Lowell Rock Light (44°09.8'N., 69°03.6'W.), 25 feet above the water, is shown from a red spindle on the south end of **Lowell Rock.** A fairway bell buoy 0.4 mile southeast of the light marks the entrance to the harbor. A large screen of a drive-in movie back of the western shore at the entrance and a clock tower at the head of the harbor are conspicuous. **Beauchamp Point,** the eastern point of Rockport Harbor north of Indian Island, is prominent.

Channel.-The entrance is deep and clear with the exception of Porterfield Ledge in the middle of the entrance. The depths in the channel range from over 50 feet in the entrance to 13 feet near the head. Passage is sometimes made by local small craft at high water across the ledge between Indian Island and Beauchamp Point.

Anchorages.-Vessels can anchor anywhere between the entrance and a point 1 mile southward of the head, in depths of 42 to 63 feet, soft bottom. Small vessels and motorboats can find anchorage nearer the head. In 1970, considerable shoaling was reported off the mouth of Goose River.

Dangers.-Porterfield Ledge, in the middle of the entrance to Rockport Harbor, uncovers several feet at low water; a daybeacon is on the ledge. **Indian Island,** on the eastern side of the entrance, is grassy and marked at its south end by an abandoned lighthouse. An unmarked fishweir is on the west side of the harbor, about 0.3 mile southward of the entrance to Goose River.

Seal Ledge, uncovered at low water, on the east side of the harbor about 0.7 mile northward of the light, is marked by a daybeacon.

Routes.-Vessels can enter Rockport Harbor on either side of Porterfield Ledge Daybeacon, giving the daybeacon a berth of at least 150 yards. When in the harbor stand northward in midharbor until 0.3 mile from the head, then slightly favor the eastern side.

Supplies.-Gasoline, diesel fuel, ice, provisions, and some marine supplies can be obtained in Rockport.

Small-craft facilities.-A public float landing, maintained by the town of Rockport, is at the east side of the entrance to Goose River, at the head of the harbor. Depths of 3 feet are reported alongside the float; water is available. The Rockport Yacht Club, close westward, has a float landing with 3 feet reported alongside. There are a number of private wharves in the harbor.

A marina, close eastward of the public landing, has a 12-ton mobile hoist and facilities for open or covered winter storage. Depths of 8 to 10 feet are reported alongside the floats. Hull, engine, and electronic repairs can be made, and gasoline, diesel fuel, water, transient moorings, and electricity are available.

A boatyard, that builds boats up to 45 feet in length, is on the west side of the harbor near the mouth of Goose River.

There is a public park with picnic area and swimming beach on the west side of the harbor southward of the boatyard.

Communications.-Local taxi and bus service is available as is through bus service.

Deadman Point is about 0.4 mile northeast of Indian Island. **Hog Cove,** on the north side of Deadman Point, has two private piers with float landings. **Hog Cove Ledge** extends about 0.3 mile above Deadman Point and forms the eastern side of the cove. **Goose Rock** is a bare ledge about 0.2 mile north of Hog Cove Ledge.

The Graves, about 1 mile offshore, midway between the entrance to Rockport and Camden Harbors, is a ledge showing bare rocky heads at high water and a large area that uncovers at low water. **The Graves Light** (44°10.9' N., 69°02.1' W.), 26 feet above the water, is shown from a white skeleton tower with a black square daymark on the rocks. A gong buoy is just eastward of The Graves.

Camden Harbor, on the west side of West Penobscot Bay about 6 miles north of Rockland Harbor, is the approach to the town of Camden. The harbor is frequented by many yachts and small craft.

Camden, the town on the inner harbor, is an important yachting center. The nearest railway freight point is Rockland. There is a public park and picnic area. Swimming, boat rental, parking, country clubs, banks, churches, hospital, restaurant, and markets and shops of all kinds are available in the town.

Prominent features.-The most conspicuous feature seen in entering Camden Harbor is **Mount Battie** (44°13'22" N., 69°04'10" W.), 800 feet high. A small stone memorial tower on the summit shows as a long ridge from off the harbor.

Curtis Island, on the southern side of the entrance, is prominent. **Curtis Island Light** (44°12.1'N., 69°03.0'W.), 52 feet above the water, is shown from a white tower on the southeast end of the island.

Northeast Point, on the northeast side of the entrance, is marked off its south side by **Northeast Point Light** (44°12.5'N., 69°02.8'W.), 20 feet above

the water, shown from a white skeleton tower with a red triangular daymark.

Channels.-The main channel into the harbor is from southward and is deep and clear; it is marked by a bell buoy at the entrance, and by buoys and Curtis Island Light. The inner harbor, westward of Eaton Point, has depths of about 9 to 2 feet. **Northeast Passage,** with a depth of about 19 feet, is a narrow channel leading into Camden Harbor between Northeast Point and Inner Ledges. The deeper water favors the light off Northeast Point. A fairway bell buoy is 0.3 mile northeastward of the entrance to Northeast Passage. This channel is used by local vessels, but should be used with great caution by strangers. The passage between Curtis Island and **Dillingham Point** is shoal and foul. Rocks awash are about 110 yards southwest of the light and about 150 yards northwestward of the island.

Anchorages.-The outer harbor is easy of access and affords good anchorage in depths of 13 to 33 feet, soft bottom. The anchorage is eastward of a line from Eaton Point to the buoy northward of Curtis Island. The depths in the outer harbor shoal gradually northward to a depth of 12 feet about 500 yards from the head of **Sherman Cove,** in the northern part of Camden Harbor. Above the 12-foot curve the cove is shoal.

The greater part of the inner harbor west of **Eaton Point** is occupied by small pleasure and fishing craft. There are numerous private and some public moorings.

Dangers.-**Northeast Ledge,** consisting of **Inner Ledges** and **Outer Ledges,** is southward of Northeast Point, and constricts the main entrance to Camden Harbor to a width of about 400 yards. The higher parts of Inner and Outer Ledges uncover about 5 feet. **Dillingham Ledge,** having a buoy off its east side, is 0.5 mile offshore and 1.3 miles northeast of Camden Harbor.

A shoal extends 80 yards from the north shore off Eaton Point and the shipyard at the entrance of the inner harbor.

The mean range of **tide** is 9.6 feet.

Ice sometimes forms in the harbor from January to March, but is not dangerous for vessels in the outer harbor. Westerly winds clear the harbor of ice if it is broken up.

Routes.-Entering Camden Harbor by the main channel, vessels can steer for Curtis Island Light on any safe course, taking care to avoid The Graves, until close to the entrance bell buoy, thence select anchorage in the outer harbor, eastward of a line joining the toe Eaton Point and the buoy northward of Curtis Island. If going to the inner harbor, pass 100 yards northeastward of the buoy and steer for the entrance of the inner harbor, clearing the shoal on the north side off Eaton Point at the entrance to the inner harbor, and haul northward in midharbor.

To enter by Northeast Passage, from the fairway bell buoy, steer for the north end of Curtis Island until close to the buoy at the northerly end of Outer Ledges. Pass northward of this buoy and steer westward between Northeast Point Light and Inner Ledges Daybeacon, favoring the light.

Pilotage for Camden Harbor is discussed in this chapter under Pilotage, Penobscot Bay.

The town **harbormaster** supervises the moorings and enforces the local regulations; he can be contacted at the town wharf.

Wharves.-The town wharf, on the west side of the inner harbor near the head, has two float landings with depths of 8 feet reported alongside. The wharf is used by several excursion schooners which operate along the Maine coast from Camden during the summer. The Camden Yacht Club, about 150 yards southward of the town wharf, has several float landings with depths of 7 feet reported alongside. Water is available at the floats, and guest moorings are maintained by the club in the outer harbor.

Small-craft facilities.-There are several marinas and a boatyard, including a lock-marina, in the inner harbor at Camden. Depths at these facilities are reported to range from 6 to 8 feet. Hull, engine, electrical, and electronic repairs can be made. Most of these facilities can provide gasoline, diesel fuel, water, ice, berths with electricity, and marine supplies. The largest marine railway in the area can handle craft up to 110 feet in length. Lifts up to 20 tons, and open and covered storage facilities are also available.

Communications.-Bus, both local and coastal, and taxi service are available, and a number of coastal cruising schooners operate from the harbor on weekly schedules in the summer.

Chart 13305 (310).-Mount Megunticook (44°14.5'N., 69°04.1'W.), 1,385 feet high, is 2 miles northward from Camden. The mountain shows as a flat-topped peak with a steep shoulder on its southern side.

Charts 13309 (311), 13310 (311-SC).-Ducktrap Harbor, is a broad open bight in the west shore of West Penobscot Bay, 5 miles northeastward of Camden Harbor. Good anchorage, sheltered from northerly and westerly winds, is 600 yards from the north shore of the harbor, in depths of 31 to 43 feet, bottom soft in places. Haddock Ledge, the only outlying danger, is a rock covered 4 feet about 0.6 mile from the western shore and the same distance southwestward of Spruce Head, the northeast point of the harbor. A buoy is on the southwest side of the ledge. With this exception, danger will be avoided by giving the shore of the harbor a berth of about 500 yards. A bell buoy marks the southern approach to the harbor.

Lincolnville is a village at the southwest end of Ducktrap Harbor. A State automobile and passenger ferry operates between Lincolnville and Grindel Point, Islesboro Island. A public float landing, with 3 feet reported alongside, is on the north side of the ferry pier, and a small-craft

launching ramp is close northward. The village **harbormaster** can be contacted at the ferry terminal. The ferry pier and shed are prominent from offshore. A church with a white spire, 0.5 mile northward of Lincolnville, is conspicuous from the bay. The viaduct of the main coastal highway where it crosses the valley at the head of the harbor is conspicuous.

Great Spruce Head, 2 miles northward of Spruce Head, is bold.

Saturday Cove is a small cove on the west side of West Penobscot Bay, 9 miles northeastward of Camden harbor. The village of **Northport** is on the south side of the cove. Private float landings are usually maintained near the entrance.

Temple Heights is a small summer settlement on the western shore of the northern end of Penobscot Bay, about 0.5 mile north of Saturday Cove.

Bayside is a summer settlement on the west side of West Penobscot Bay, 2.5 miles northward of Temple Heights. A water tank on the hill back of the village is prominent. The wharf has a float landing maintained by the Northport Yacht Club. There is reported to be a depth of 16 feet of water at the head of the dock. Water is available at the wharf, and gasoline, oil, provisions, and some marine supplies are obtainable in the village. The **Maine Sailing School** is located here. A small-craft launching ramp is just northward of the wharf.

Chart 13311 (208).-Belfast Bay and **Passagassawakeag River** empty into the head of Penobscot Bay from northwestward and form the approach to the town of Belfast and village of City Point, about 2 miles above Belfast.

The area in Penobscot Bay southeastward of Belfast Bay within a circle having a 1-mile diameter with its center in 44°23'20"N., 68°55'00"W., has been designated as a vessel-to-vessel oil transfer area by the State of Maine Environmental Improvement Commission. (See chart 13309(311).)

Belfast, a city on the southwest side of Passagassawakeag River at the mouth, has several shoe and clothing factories, food canneries, a frozen foods processing plant, and fish and poultry packing plants. The city has banks, a hospital, library, markets, numerous shops of all kinds, a public park with a pool, motels, and restaurants.

Prominent features.-Steels Ledge Monument Light (44°25.2'N., 68°58.4'W.), shown from a white cylinder with a red triangular daymark attached to a square stone structure on the southern end of the ledge, marks the entrance to the bay; the light structure is a good radar target. The light is most brilliant on the bearing 332°, diminishing in candlepower around the remainder of the horizon. A bell buoy is southward of the light. A cupola on the north shore, several church spires, and the buildings of the plants along the waterfront are prominent.

Channels.-The main channel in Belfast Bay is wide and clear between Steels Ledge and the western shore with depths of 50 feet at the entrance gradually decreasing to 14 feet off the mouth of Goose River. The channel is partially marked by buoys to a point about 0.3 mile below the first bridge, a fixed footbridge. The channel above this point (chart 13309 (311)) requires local knowledge and is little used except by small craft. It is narrow, crooked, and unmarked, and bares in places at low water.

Anchorages.-The bay affords good anchorage, exposed to southeasterly winds, and is easy of access. Good anchorage can be had off the entrance to the river westward of Steels Ledge, in depths of 19 to 28 feet; also in the river south of Goose River in midchannel, or by favoring the western shore, in depths of 11 to 16 feet, soft bottom. Above this point, shoals extend halfway across the harbor from the northeast side and for a short distance below the bridge extend two-thirds of the distance across. Small vessels can anchor about 75 yards off the upper wharves of the city in depths of 10 to 22 feet.

Dangers.-Steel Ledge, on the north side of Belfast Bay, is an extensive ledge with a least depth of 1 foot, marked by a light. The passage between the ledge and the north shore should not be used because of shoals to the eastward.

Bridges.-The former highway swing bridge crossing the Passagassawakeag River has been converted to a footbridge which has a fixed span with a clearance of 9 feet. U.S. Route 1 highway bridge about 250 yards northwestward has a fixed span with a clearance of 68 feet. About 0.7 mile upstream a fixed bridge with the center span removed, restricts the channel to a width of about 100 feet. An overhead power cable at the bridge has a clearance of 30 feet. About 3 miles above the mouth, the river is crossed by two fixed bridges having clearances of 7 feet. The lower one is a railroad spur bridge, and the upper one a highway bridge.

Tides and currents.-The mean range of tide at Belfast is 10 feet. Ice obstructs navigation throughout the river and bay in severe winters. The bay has been frozen over to Islesboro Island.

Routes.-Vessels entering Belfast Bay can shape the course to pass anywhere between the bell buoy southward of Steels Ledge and the western shore, then head north-northwestward in midchannel.

Pilotage for Belfast is discussed in this chapter under Pilotage, Penobscot Bay.

Towage.-Four modern tugs up to 1,200 hp are available at Belfast. They berth at the Marshall Wharf. See Towage, Penobscot Bay, this chapter for details.

Quarantine officials are stationed in Belfast, and immigration and agriculture quarantine officials in Bangor; see Appendix for Addresses. Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Belfast is a **customs port of entry.**

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

The Coast Guard **vessel documentation office** at Rockland serves Belfast; see Appendix for address.

Wharves.-In 1970, only the Belfast Packing Company wharf and the Eastern Maine Towage Company Wharf, Marshall Wharf, were in general use at Belfast. The packing company wharf, used by fishing vessels, is on the south side of the river just below the footbridge; depths of 12 feet are reported along its northeasterly face. The towage company wharf, about 0.2 mile southeastward, is used primarily for mooring tugs; depths of 15 feet are reported alongside.

The town wharf and float landing, on the southeast side of the towage company wharf, has depths of 9 to 12 feet reported alongside. The remainder of the piers and wharves at Belfast are in ruins.

Supplies.-Gasoline and diesel fuel can be obtained on short notice by tank truck. Provisions and some marine supplies are available in town.

Repairs.-There are no marine railways, and only minor engine repairs can be made. There are machine shops in town.

Communications.-The Belfast and Moosehead Railroad has a freight terminal at Belfast. The main coastal highway, U.S. Route 1, passes through the town. Taxi and local and coastal bus services are available.

Chart 13309 (311)-Searsport Harbor, at the head of Penobscot Bay about 4 miles east of Belfast, is a broad bight open to the southward. The town of **Searsport** is at the head of the harbor. The commercial development of the harbor is at **Mack Point,** 1 mile east of Searsport. There is considerable traffic in oil, potatoes, fertilizers, paper, scrap iron, bauxite, sulfur, and salt.

Prominent features.-The coal transporters, the potato conveyor towers on the railroad pier, oil tanks on Mack Point, and an elevated water tank, 0.5 mile north of the railroad pier, are conspicuous.

Channels.-Natural depths in the main channel of West Penobscot Bay provide depths of over 40 feet to within a mile of the facilities at Mack Point, thence depths of about 35 feet to a dredged access channel which leads to a turning basin off the facilities. In 1964, the controlling depth in the access channel and turning basin was 34 feet.

Anchorages.-Good anchorage, used by all classes of vessels, may be had in depths of 18 to 32 feet, soft bottom, sheltered from northerly winds, within a mile southward of Mack Point.

Dangers.-Long Cove Ledge, awash near its southern end at lowest tides, is 400 to 800 yards south of the west end of Mack Point. A lighted bell buoy is off the southeast side of the ledge, and buoys are on the east and west sides of it. An unmarked rocky ledge covered 34 feet is about 2.5 miles south-southwestward of the railroad pier in the approach to the terminals at Mack Point through West Penobscot Bay.

Ledges make off 0.3 mile from the western shore of the southern half of Sears Island; one of these ledges, **Sears Island Ledge,** is bare at low water. A bell buoy is nearly 0.5 mile southwest of Sears Island and at the south end of the ledge. Two other buoys mark the limit of the ledge westward of the island.

Routes.-The approach to Mack Point piers is between Sears Island and the lighted bell buoy off the southeast side of Long Cove Ledge.

Pilotage for Searsport is discussed in this chapter under Pilotage, Penobscot Bay.

Towage.-Large vessels require tug assistance in docking at Searsport. Four modern tugs up to 1,200 hp are available at Belfast. See Towage, Penobscot Bay, this chapter for details.

Quarantine officials are stationed in Belfast, and **immigration** and **agriculture quarantine** officials in Bangor; see Appendix for addresses. Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Belfast is the **customs port of entry** for Searsport.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

The Coast Guard **vessel documentation office** at Rockland serves Searsport; see Appendix for address.

Wharves.-There are three usable commercial piers on Mack Point. These facilities have highway connections and are served by the Bangor and Aroostook Railroad. The controlling depths alongside these facilities are reported; for the latest controlling depths, contact the operator.

Bangor and Aroostook Railroad Company Pier, the largest, is on the southeast end of Mack Point. The pier has 600 feet of berthing space on both its east and west sides with depths of 32 feet alongside. The pier is equipped with belt conveyors and towers for handling bagged cargo. Two 8-ton cranes and two heavy traveling gantry cranes are available for other types of general cargo. Warehouses on the pier have a storage capacity of over 36,000 square feet.

C. H. Sprague and Son Company Pier, about 100 yards westward of the railroad pier, is 600 feet long and provides 850 feet of berthing space along its easterly side; depths of 32 feet are alongside. Dry bulk cargo and petroleum products are handled. Three movable towers with grab buckets are available for handling dry bulk cargo. Vessels can receive bunker C fuel oil at the pier.

Shell Oil Company Pier, on the west side of Long Cove and about 100 yards northward of the railroad pier, has 50 feet of berthing space with dolphins; depths of 12 feet are alongside. Petroleum products are received and shipped in small coastal tankers.

The ruins of a former fertilizer pier are about 0.25 mile westward of the railroad pier.

At Searsport, west of the entrance to **Mill Brook,** there is a town landing with 5 feet reported alongside the float. A small-craft launching ramp is adjacent to the landing.

Supplies.-Gasoline, diesel fuel, and diesel oil are available by tank truck; bunker C fuel oil is available at the Sprague pier. Provisions, water, ice, and some marine supplies can be obtained in Searsport.

Repairs.-Aboard ship repairs can be handled by a firm in Rockland. There are no marine railways, and the nearest drydocks for large vessels are at Boston.

Communications.-Searsport is the ocean terminus for the Bangor and Aroostook Railroad. It has connections with the Maine Central Railroad, and the Canadian Pacific and Canadian National Railways. Taxi service is available from Belfast and bus service at the main coastal highway, U.S. Route 1, about 0.7 mile from the terminals.

Long Cove is eastward of Searsport Harbor between the northwestern shore of Sears Island and Mack Point. The upper half of the cove is shoal, but good anchorage can be selected in the middle just inside the entrance in depths of 10 to 24 feet, sheltered from all but southwesterly winds.

Sears Island, eastward of Searsport Harbor and on the western side of Stockton Harbor, at the entrance, is high and thickly wooded. A small clearing is on the south end of the island. Sears Island is joined to the mainland by a sandbar which uncovers at low water.

Cape Jellison is 0.5 mile east of Sears Island and forms the eastern shore of Stockton Harbor. A ledge, the outer part of which uncovers about 5 feet, extends 0.4 mile southward from **Squaw Point** to the southern extremity of Cape Jellison. **Squaw Head** is a wooded islet in the middle of the ledge which is marked by a buoy off its southern end. A buoy is off the shoal making westward from Cape Jellison.

Stockton Harbor is between Cape Jellison and Sears Island, westward of the entrance to Penobscot River. It is a secure harbor for vessels of about 22-foot draft or less, and easy of access. The depths shoal gradually from about 22 feet at its southern end to 9 feet about 0.3 mile above the ruins of the old wharves on the east side. Above this the harbor is shoal.

Stockton Springs is a village at the head of the harbor. The old wharf is in ruins. The former extensive wharves on the western side of Cape Jellison are in ruins, and only piles remain.

On **Kidder Point,** on the western side of the harbor, is a chemical plant and wharf. In 1970, shipments to and from the plant were by rail, as the wharf, with 10 feet at the head, was in disrepair. The wreck of a barge lies off the east side of the pier some distance inshore from the head. The red brick stack, an elevated tank, and the buildings of the plant are conspicuous.

An offshore mooring facility, consisting of a platform with a mooring dolphin off the south and north ends and several mooring buoys, is in the entrance to Stockton Harbor, about 0.7 mile south-southeastward of Kidder Point. About 800 feet of berthing space is along the east side of the facility; depths of 34 feet are reported alongside. Vessels usually moor starboardside-to. Each of the dolphins is marked by a private light. Chemicals are received and transferred by submerged pipeline to the chemical plant on Kidder Point. In 1970, the offshore mooring facility was not being used.

To enter Stockton Harbor, make the lighted gong buoy about 0.7 mile southward of Sears Island, then head up to pass 300 yards eastward of the buoy off the southeast end of the island, thence pass in midchannel through the entrance and westward of the buoys off Cape Jellison.

Anchorage can be selected as desired and as charted depths indicate.

Bagaduce River empties into the eastern side of East Penobscot Bay near its head. The river is the approach to the town of Castine, on the north side just inside the entrance, and to several smaller settlements farther up.

Castine Harbor, at the entrance to the river, has ample depth and is easily entered.

Castine is an important summer resort 1 mile eastward of Dice Head Light. The locality is of historical interest, and there are many tablets about the town marking spots of special interest.

The **Maine Maritime Academy** is at Castine. There is no commerce by water except some fishing and much yachting. The town has a hospital, grocery store, restaurants, guest houses, a bank, and other conveniences.

Prominent features.-Dice Head Light (44°22.9′N., 68°49.2′W.), 27 feet above the water, is shown from a white skeleton tower on the point on the north side of the entrance to Bagaduce River. The white stone circular tower of the abandoned lighthouse, above Dice Head Light, is very conspicuous.

Channels.-The channel in the river for 5 miles above Castine Harbor is buoyed and is used by small craft. However, at the Narrows the channel is so constricted by rocks in places that navigation is possible at slack water only, on account of the current. It is unsafe for strangers above the Narrows. A fairway bell buoy marks the entrance to the river.

Anchorages.-Small craft anchor off the town eastward of the float landings, where there are a number of moorings, but the best anchorage is reported to be in **Smith Cove,** southeastward of Castine Harbor. The cove has depths of 19 to 58 feet, soft bottom, and shelter can be found there in all winds.

Another small-craft anchorage is in what is locally known as **Hospital Cove** between **Nautilus Island, Holbrook Island,** and **Ram Island** and the northern extremity of Cape Rosier. This cove can be entered from the westward through the channel between Nautilus Island and Holbrook Island. **Nautilus Rock,** in the middle of the entrance is marked by a buoy. The southwesterly channel, between Ram and Holbrook Islands and Cape Rosier, is unmarked and more difficult. Anchorage, secure in all weather, can be had in good holding ground in 13 to 37 feet in the westerly half of the cove. The holding ground in the channel southeastward of Castine is not good, and the general depth is about 72 feet.

Dangers.-**Henry Point** is on the east side of the approach to Smith Cove. Dangers to be avoided in the cove are the middle ground ledge, awash, about 0.5 mile south of Henry Point, and a rock covered 3 feet 300 yards west of **Sheep Island,** near the southern part of the cove. In addition, there are numerous unmarked bare and submerged rocks along the edges of the cove and caution should be exercised.

Otter Rock Shoal, awash at low water and marked by a buoy at its south end, extends 0.2 mile off the north shore at the entrance near Dice Head.

Hosmer Ledge, a drying ledge on the south side of the channel, extends 0.2 mile off the north end of Cape Rosier about 0.9 mile east of Dice Head Light. A daybeacon is on the ledge.

Middle Ground Ledge, which uncovers 2 feet and is marked on its west end by a buoy, is off the east side of the channel 1.4 miles above the entrance.

Trott Ledge, which uncovers 5 feet and is marked by a buoy, is on the west side of the channel about 1.8 miles above the entrance.

A rocky ledge, covered 4 feet and marked by a buoy, is on the west side of the channel 2.6 miles above the entrance and south of Negro Islands.

Numerous other rocks and ledges, mostly unmarked, are on both sides of the channel above the **Narrows,** a constricted part of the channel about 4.5 miles above the entrance.

Tides and currents.-The mean range of tide is 9.7 feet at Castine. The river is usually free from ice at Castine and for some distance above, but in very severe winters the river is entirely closed. Currents of almost 5 knots have been observed at Jones Point, about 4 miles above the entrance.

Routes.-Craft entering Castine Harbor will find the eastern shore northward and southward of the entrance is bold and can be followed at a distance of 0.3 mile. Pass close to the fairway bell buoy on either side and, keeping a reasonable distance offshore and south of the buoy marking Otter Rock Shoal, steer into the harbor on a midchannel course. By close attention to the chart, anchorage can be found in Smith Cove and 200 to 500 yards south of Henry Point, or for small craft south of Sheep Island near the head of the cove.

There are no commercial facilities in Castine Harbor. The Maine Maritime Academy, at the western end of the Castine waterfront, maintains an excellent wharf with 26 feet alongside at which the large training vessel moors.

Small-craft facilities.-The town wharf and float landing, just eastward of the Academy wharf, has 12 feet reported alongside. A marine service wharf and float landing, close eastward of the town wharf, has gasoline, diesel fuel, water, ice, provisions, and some marine supplies; depths of 10 feet are reported alongside the float landing. A boatyard is just eastward of the service wharf. Hull and engine repairs can be made, and open or covered storage facilities, diesel fuel, water, ice, and some marine supplies are available.

Castine Yacht Club, just eastward of the boatyard, has a depth of 8 feet reported alongside its float landing. The stone foundation of an old stone pier is between the shore and the northeast end of the yacht club float; care should be taken to avoid it in coming alongside.

West Brooksville is a village on the south side of the river 1.5 miles above Castine Harbor, and **North Castine** is a village on the west side 2 miles above Castine.

North Brooksville is a village on the southern branch of Bagaduce River, about 6 miles above Castine, At high water, small boats sometimes go to the bridge crossing the river at the village, but the channel is unmarked and unsafe for strangers.

Penobscot is a village on **Northern Bay** at the head of navigation on the north branch of the Bagaduce River, 6.5 miles above Castine. The approach to the village is bare at low water.

Penobscot River, emptying into the head of Penobscot Bay, forms the approach to the towns of Bucksport Winterport, and the cities of Bangor and Brewer; the last two are at the head of navigation about 24 miles above Fort Point Light at the entrance. The deepest draft ordinarily trading to Bangor is about 14 feet.

Channels.-In 1964-1968, the controlling depth in the marked channel in Penobscot River from Bucksport to Bangor was 19 feet to Winterport, thence 13 feet to Bangor. The channel is marked by buoys to a point about 1.5 miles below South Brewer.

Caution.-Deep-draft vessels bound for Bucksport should exercise caution above Fort Point as depths of 31 and 32 feet are in midchannel, about 0.5 mile eastward of Sandy Point, and a rocky ledge, covered 34 feet, also in midchannel, is reported about 0.2 mile southwestward of Odom Ledge Daybeacon.

The most difficult sections for vessels are off Lawrence and Luce Coves where it is difficult to mark the best water and off Frankfurt Flats where large vessels experience difficulty with the sharp turns.

The channel in Penobscot River is crooked and narrow in places, and frequent changes occur. Strangers should not attempt to carry drafts greater than 10 feet to Bangor at low water. With a deeper draft a pilot or towboat should be used; 14 or 15 feet is carried to Bangor and Brewer at high water, and deeper drafts occasionally to the oil berth at South Brewer. The safest time is on a rising tide. Navigation of the river at night is extremely dangerous due to lack of lighted navigational aids. After unusually high tides many logs, dangerous to small craft, are in the river. At times of maximum ebb currents, buoys are occasionally pulled under. The paragraphs describing the river give the simplest directions by pointing out the difficulties and the dangers and especially the need for local knowledge. The chart and the aids must be carefully followed.

Dangers.-Fort Point Ledge, 0.3 to 0.6 mile southward of Fort Point Light, uncovers about 5 feet. A daybeacon on a gray pyramidal stone pier is near the north end of the highest part of the ledge.

Odom Ledge, a drying ledge in the middle of the main channel 2.7 miles above Fort Point, is marked by a daybeacon on a square stone base on the highest point of the ledge, and a buoy off the southwest side.

Vessels drawing 30 feet or more should exercise caution when proceeding between Fort Point and Odom Ledge; see Caution, Penobscot River.

Anchorages.-The usual anchorage for vessels waiting at the river entrance for a towboat or favorable wind and tide is northward of Fort Point on the west side of the channel. Vessels bound up the river anchor anywhere in the channel where soft bottom is found. Vessels towing to Bangor, if the tide does not serve, often anchor off Winterport. On account of the strong ebb current, it is better for vessels going to Bangor, particularly large ones, to anchor off Fort Point and start up the river about 3 hours after low water.

Morse Cove, on the east side at the entrance to the river, is sometimes used by pleasure boats for temporary anchorage in depths of 8 to 18 feet, soft bottom.

Fort Point Cove, on the west side of the river northward of Fort Point, is used frequently as an anchorage. The depths are from 23 to 5 feet, shoaling gradually westward.

Tides and currents.-The mean range of tide varies from 10.3 feet at Fort Point to 13.1 feet at Bangor. For predictions for a number of places on the river, see the Tide Tables. Currents of 3 knots are not unusual from Odom Ledge to Orrington, and during spring runoff currents approaching 5 knots may be encountered. Because of these currents, larger vessels should use caution navigating the river. Passage up the river is more advisable during flood current.

Ice impedes but usually does not prevent navigation above Winterport for nearly 5 months each year, beginning about December. During extreme winters the river is closed to the mouth. The most difficult place below Winterport is abreast Fort Knox, where ice jams occur. If vessels can pass this point they usually can go to Winterport. The river is kept open by an ice breaker, which prevents much of the damage that might otherwise be caused by ice and freshets. However, in recent years, according to local information, there has been very little ice and the river has seldom frozen over below Bangor. The brackish water formed by tidal action and the river current no doubt have contributed to this.

Freshets occur in the river during March and April; at times they are dangerous to vessels.

Pilotage for Penobscot River is discussed in this chapter under Pilotage, Penobscot Bay.

Towage.-Large vessels bound upriver usually take a tug to assist in making the turns and in docking. Four tugs up to 1,200 hp are available at Belfast. (See Towage, Penobscot Bay, this chapter for details.)

Fort Point, on the west side at the entrance to Penobscot River, is partly wooded. **Fort Point Light** (44°28.0′N., 68°48.7′W.), 88 feet above the water, is shown from a white square tower connected to a dwelling on the point; a fog signal is at the light. There are several houses farther back on the north side of the point. A buoy marks the extremity of the shoal extending eastward from the point. Fort Point Light structure is reported to be a good radar target.

About 2.5 miles above Fort Point Light, Penobscot River is divided by **Verona Island** into two channels. The principal channel is on the west side of the island, and the **Eastern Channel (Eastern River)** is on the east side. The channels unite north of Verona Island at the town of Bucksport.

Orland River, flowing into Eastern Channel from a northeasterly direction, is a shallow stream navigable for small boats and fishermen at high water to the dam at the village of **Orland,** about 2.2 miles above the mouth. The channel is crooked, unmarked, and bare at low water a little below Orland.

Sandy Point (Sandypoint) is a village on the west bank of the river about 1 mile above **Sandy Point,** the northern entrance of Fort Point Cove. About 0.5 mile northward of Sandy Point there is a large fertilizer plant with a T-head pier built out to deep water. A large overhead conveyor on the pier is conspicuous. In 1970, it was reported that the plant was inactive and the pier in disrepair.

Verona Park is a small summer settlement on the west side of Verona Island about 1 mile below Bucksport.

The river is crossed by U.S. State Route 1 highway bridge, about 0.8 mile below the town of Bucksport. The bridge has a fixed span with a clearance of 135 feet. The overhead power cable that crosses the river just above Bucksport has a clearance of 145 feet. U.S. Route 1 highway bridge

crosses Eastern Channel eastward of the wharves at Bucksport. The fixed span has a clearance of 17 feet. Only small-boat traffic operates in Eastern Channel. An overhead power cable crossing the channel close eastward of the bridge has a clearance of 42 feet.

Bucksport, a town on the east bank of the river 6.5 miles above Fort Point, is the terminus of a branch line of the Maine Central Railroad. Paper manufacture and oil distribution are the principal industries. There are markets, banks, restaurants, a hotel, and other conveniences in town.

Quarantine officials are stationed in Belfast, and **immigration** and **agriculture quarantine** officials in Bangor; see Appendix for addresses. Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Bucksport is a **customs station.**

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

Wharves.-There are only two facilities at Bucksport in general use. Most of the other wharves are in ruins with only broken pilings and stone foundations remaining.

The papermill wharf (44°34.4′ N., 68°48.3′ W.), on the southeast side of the point just northwest of the town, has about 400 feet of berthing space with depths of 5 to 24 feet reported alongside. It is used principally to load small vessels and barges with paper. An occasional pulp shipment is discharged from oceangoing vessels. The pool formed by log booms close eastward of the wharf is no longer being used.

A petroleum handling berth, consisting of five concrete pile clusters supporting a handling platform, extends from a former railway wharf and provides a 700-foot berth with reported depths of 34 feet alongside. Bunker C fuel oil and diesel oil are available at this facility.

Fort Knox, a restored fort of imposing appearances across the river from Bucksport, is a State park. **Prospect Ferry** is just above Fort Knox. Nothing remains of the old ferry landing but the stone foundation which uncovers at low water.

Harriman Cove is on the east side of Penobscot River, 1.3 miles above Bucksport. A wharf with over 700 feet of berthing space and depths of 23 feet reported alongside is just south of the cove. Molten sulfur is discharged. It has a prominent crane and a white cylindrical molten sulfur-storage tank.

Frankfort Flats, marked by buoys, are 3 miles above Bucksport. The channel crosses from the east side of the river to the west side at this point, and it is difficult to carry the best water. Frequent changes occur here, and large steamers experience difficulty making the sharp turns without the aid of a tug.

Marsh River is a shallow stream flowing into the west side of Penobscot River from a southerly direction just westward of Frankfort Flats. A depth of about 2 feet can be carried to a marina on the west bank of South Branch of the river about 1 mile from the entrance. Some marine supplies, provisions, water, a launching ramp, and open or covered dry storage facilities are available. Hull and engine repairs can be made. **Frankfort** is a small village on North Branch of the river. The channel in North Branch is bare at low water and full of boulders a little below the village.

Winterport is a town on the west bank of Penobscot River about 12 miles above Fort Point. A marina and boatyard at the former upper potato wharf has a depth of 12 feet reported alongside. Berths with electricity, gasoline, diesel fuel, water, ice, marine supplies, and open or covered storage facilities are available. A 15-ton mobile hoist and a marine railway that can handle craft up to 45 feet in length are also available; hull and engine repairs can be made. The old potato wharf about 0.3 mile below the town is in ruins.

Hampden, a small town on the west bank of the river, is 19 miles above Fort Point. The village of **Orrington** is on the east bank opposite Hampden. **East Hampden,** on the west bank 2 miles below Bangor, has facilities for small tankers discharging oil.

A large papermill at **South Brewer,** on the east bank about a mile below Bangor, has a wharf with depths alongside of 13 feet at the upper end and 15 feet at the lower end; in 1970, the wharf was not being used. Two high bricks stacks are prominent from downriver. An oil wharf, about 0.5 mile south of South Brewer, has about 200 feet of berthing space with depths of 24 feet reported alongside; tankers discharge fuel oil here for the papermill after discharging part load at Bucksport. Shoals are reported in the river below this point.

Brewer, a city on the east bank of the river opposite Bangor, has three oil wharves which are used by small coastal tankers. The city has banks, markets, stores of all kinds, motels, restaurants, and other conveniences.

Bangor is an important city on the west bank of Penobscot River at the head of navigation. Two fixed highway bridges and a railroad swing bridge, just above the second highway bridge, connect Bangor with Brewer. The lower highway bridge has a clearance of 22 feet for a width of 152 feet in the center span. The river between the two highway bridges is used only to moor small craft. There is no navigation above the second highway bridge. A dam crosses the Penobscot River 1 mile above the railroad bridge.

The principal water traffic to Bangor is in petroleum and asphalt. Most of the river in front of the city has been dredged where necessary to obtain a depth of 14 feet. Considerable shoaling has been reported in some places in the Brewer side. The bottom is rocky with poor holding ground, and there are a few rocks with a little less than 14 feet over them. The city has banks, library, a general

hospital, markets, shops of all kinds, hotels, motels, restaurants, churches, schools, and public parks.

Quarantine, **immigration,** and **agriculture quarantine** officials are stationed in Bangor; see Appendix for addresses. Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Bangor is a **customs port of entry.**

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

The Coast Guard **vessel documentation office** at Rockland serves Bangor; see Appendix for address.

Wharves.-There are six oil wharves and an asphalt wharf on the west bank with depths of 8 to 14 feet reported alongside . One coal wharf is in operation for storage, but little used from the water.

A public float landing, on the west side of the entrance to Kenduskeag River, has a depth of 3 feet reported alongside, but no facilities are available. Gasoline, diesel fuel, provisions, and some marine supplies can be obtained in Bangor.

Communications.-The port is served by the freight lines of the Maine Central Railroad and the Bangor and Aroostook Railroad, and numerous trunklines. Bus service, both local and coastal, and taxi service are available. The Bangor International Airport is 2 miles west of the city.

Kenduskeag River empties into the Penobscot River from the westward at the north end of Bangor. A railroad swing bridge with a clearance of 6 feet crosses the river at the entrance; the swing span is inoperative. Just above the railroad bridge is a fixed highway bridge. There is no navigation on the river.

Chart 13301 (313).-The following is a description of the coast from Muscle Ridge Channel to Georges Islands. Muscle Ridge Channel and Seal Harbor have been described previously in this chapter.

Norton Island Ledges are 0.6 to 1.2 miles westward of Whitehead Island (43°58.8′ N., 69°07.8′ W.). A bare rock is near the southwest end of the ledge, and rocks awash at low water are 600 yards southeastward and southwestward of the bare rock.

Seavey Ledges, westward of Norton Island Ledges, have four rocks awash at high water. There is a depth of 5 feet north of the ledges marked by a buoy and another 5-foot depth, unmarked, at the southern end of the ledges, about 300 yards southwestward of the southerly group of three bare rocks.

Wheeler Bay and **Clark Cove 13301 (313),** northward of Seavey Ledges, are foul. There are several granite quarries in these coves, but none were operating in 1970. Depths at their wharves vary from 5 to 8 feet, but are little used. One at the head of Wheeler Bay has a float landing with 4 feet alongside. **Clark Island** is a village on the northwest side of Clark Cove, northward of **Clark Island.** There is an inactive granite quarry with stone wharf on Clark Island. The derricks are conspicuous. The island is joined to the mainland by a causeway.

Makertown Cove, as it is known locally, is on the east side of Wheeler Bay northeastward of **Calf Island.** It has four fish wharves and a float landing with 5 feet alongside. Gasoline and some provisions are available. The cove is difficult to enter without local knowledge.

Tenants Harbor, 3 miles westward of Whitehead Light, is an excellent anchorage frequently used as a harbor of refuge by small vessels, and is easy of access. **Southern Island,** on the southern side of the entrance, is marked on its east side by an abandoned lighthouse, a white tower connected to a dwelling. A lighted bell buoy is east of the island. **Northern Island,** is on the north side of the entrance. There are depths of 8 to 25 feet in the harbor.

The **anchorage** with most swinging room in Tenants Harbor is halfway from the western ends of Northern and Southern Islands to the stone pier on the north side. Small craft anchor more toward the head of the harbor. The bottom is mostly soft mud and good holding ground, and shoals gradually westward. The north side of the harbor eastward of the stone pier is clear, while westward of it are spots with depths of 4 to 9 feet. The south side of the harbor abreast the western entrance point of Long Cove should be given a berth of 200 yards because of a ledge covered 2 feet making out into the harbor from the south shore. The harbor is open eastward, and an easterly gale raises a choppy sea in the harbor, but vessels with good ground tackle can ride in safety. Ice often obstructs the harbor during February; during extremely cold weather it is sometimes frozen to Southern Island.

Vessels entering Tenants Harbor can pass midway between Southern and Northern Islands and steer **268°** into the harbor, slightly favoring the northern side.

The channel between Southern Island and Hart Neck is shoal and foul with rocks awash at its northwestern end.

The village of **Tenants Harbor** is on the northern shore near the head of the harbor. There are several service facilities and a boatyard along the northern side of the harbor with depths of 7 to 8 feet reported alongside their float landings. These facilities can provide gasoline, diesel fuel, water, ice, provisions, and marine supplies, and some maintain guest moorings. Charter sailboats operate from one of the facilities. The boatyard has a marine railway that can handle craft up to 50 feet in length for hull and engine repairs or dry covered or open winter storage. Mariners are advised to avoid taking a direct route from one facility to

another, inasmuch as partially bare ledges extend from the shore between the facilities. Lodging is available in the village, and a good road leads to Thomaston. In the summer, a fish-spotting seaplane operates from the harbor.

Long Cove, making northward from the entrance to Tenants Harbor, has several stone quarries which are not in operation. A lobster pound and fish pier are on the west side of the cove. Several private float landings are in the cove.

The entrance to the cove is about 150 yards west of the southwestern end of Northern Island between reefs partly bare at low water. A buoy marks the east side of the entrance to the cove. A bare rock is on the eastern end of the reef on the western side of the entrance.

Hart Ledge extends nearly 500 yards from shore 0.7 mile southward of Southern Island. A rock awash is near the northeast end of the ledge, and another rock awash at low water is near its southwest end. A buoy is off the northeast side of the ledge.

Mosquito Harbor, 1.8 miles northeastward of Marshall Point Light, is shoal and used by a few fishing boats. The landings bare at low water. **Martinsville** is a settlement at the head of the harbor. **Mosquito Head,** on the eastern side of the entrance, is high and wooded and looks like an island from a distance.

Mosquito Island, off the entrance to Mosquito Harbor, is 60 feet high and wooded. The islets southwestward of Mosquito Island, including **Hay Ledge,** 15 feet high high, **The Brothers,** 18 to 20 feet high, and **Gunning Rocks** are rocky with grass on top. The northerly of the Brothers has two trees on it. Three-foot-high **Black Rock,** 0.6 mile southwest of Gunning Rocks, is bare. **Hart Bar,** extending 0.5 mile northwestward of **Hart Island,** 1.8 miles west of Mosquito Island, is partly awash at low water. There are many unmarked submerged ledges in this vicinity.

The passage south of Mosquito Island and north of these rocks and islands is part of the inside route used by many vessels drawing 12 feet or less. The principal dangers are buoyed, but there are two unmarked rocks including **Barter Shoal** that are covered 14 and 19 feet.

Old Cilley Ledge, 1 mile southward of Hart Island, is about 0.5 mile long. The eastern end of the ledge is covered 2 feet, and its western end uncovers 9 feet. A bell buoy is 0.3 mile eastward of the eastern end.

Marshall Point is 7 miles southwestward of Whitehead Light and on the east side of the southern entrance to Port Clyde. **Marshall Point Light**(43°55.0′N., 69°15.7′W.), 30 feet above the water, is shown from a white tower connected to the dwelling by a bridge on the end of the point; a fog signal is at the light.

Port Clyde (Herring Gut) is a small but excellent harbor and anchorage between Marshall Point and Hooper Island, about 9 miles north-northeastward of Monhegan Island. Fishermen and coasters use it as a harbor of refuge. A bar, with boulders and covered 2 to 6 feet, obstructs the northern entrance. Vessels of 15-foot draft have been taken over this bar at high water by local pilots, but strangers should not attempt it.

The anchorage is anywhere in the channel inside of Marshall Point in depths of 23 to 35 feet, good holding ground; there is a clear width of 200 to 250 yards. Good anchorage is also found, in southerly weather, northward of Hooper Island eastward of a line between Blubber Island and Hooper Point in depths of 21 to 24 feet.

The mean range of **tide** is 8.9 feet.

Ice usually does not interfere with navigation. In very severe winters the harbor may be frozen over for a short time.

Vessels can approach the southern entrance to Port Clyde from eastward, between Mosquito Island and The Brothers, or from westward through Davis Strait (44°53.5′ N., 69°18.5′ W.). Entering from southward, vessels should pass eastward of the bell buoy eastward of Old Cilley Ledge and steer for Marshall Point Light, passing 0.3 mile eastward of Black Rock to a position over 200 yards westward of Gunning Rocks; then steer for the horizontally banded buoy marking the shoal off Marshall Point. Pass 300 to 400 yards westward of Marshall Point Light, leaving the horizontally banded buoy to the eastward, and enter the harbor in midchannel. Anchorage may also be had 125 yards off the wharves at Port Clyde in depths of 21 to 35 feet, soft bottom.

There are entrances from northward on either side of **Raspberry Island,** a small islet about 20 feet high about in the middle of the northern entrance. The passages on both sides of the island have depths of about 5 feet, but they are narrow and difficult and should not be attempted without local knowledge, except in small craft. The easterly channel is best for strangers in small craft. The best water follows the eastern shore at a distance of about 70 yards and passes eastward of a reef which makes eastward from a small islet.

The village of **Port Clyde,** the base of many fishing boats, is on the eastern side of the harbor. The village has no rail connections, but a highway runs to Thomaston. Fields Wharf, 0.5 mile northward of Marshall Point Light, is used by the ferry which maintains mail, passenger, and freight service with Monhegan Island; gasoline and diesel fuel are available at the wharf. The town float and a small-craft launching ramp are just northward of the wharf. A fish wharf with depths of 12 to 15 feet alongside is about 200 yards northward of Fields Wharf. A fish cannery, with a depth of 6 feet at its wharf, is about 300 yards southward of Fields Wharf; in 1970, the cannery was destroyed by fire. There are a number of other wharves in the harbor, some with float landings, with depths of 6 to 18 feet alongside. Numerous other wharves are

bare. Gasoline, diesel fuel, water, ice, and some marine supplies can be obtained at some of these facilities.

A general store, hotel, and snack bar are in the village. A small private boatyard, about 0.4 mile northwestward of Fields Wharf, has a machine shop and a marine railway that can handle craft up to 30 feet in length in an emergency only; gasoline is available at the yard.

St. George River entrance is about 9 miles southwestward of Whitehead Island and north-northeastward of Monhegan Island. Marshall Point Light marks the eastern approach, and Franklin Island Light the western. The Georges Islands extend 6 miles south-southwestward from the middle of the entrance, which also is obstructed by numerous ledges and rocks, the most prominent of which are marked. St. George River extends 10 miles in a northeasterly direction to the town of Thomaston, above which it is shallow and of no commercial importance.

The channel depths in the river up to Broad Cove range from about 22 feet to over 80 feet; above this, the depths gradually decrease and the channel narrows to a small stream through extensive flats that bare at low water. From a point about 1 mile below Thomaston, a narrow channel, subject to shoaling, was dredged to a depth of 16 feet. The channel in the upper river is marked by buoys, and the sharp bend in the dredged channel near Thomaston is marked by a daybeacon. In 1967, the controlling depth was 13 feet to the bend at Thomaston; 2 feet in the western half and 10 feet in the eastern half of the channel at the bend; thence 11 feet to the upper wharf just below the drawbridge. Local knowledge is required to carry the best water.

Good anchorage for large vessels is found eastward of Caldwell Island in depths of 33 to 53 feet, soft bottom; above this, vessels anchor anywhere in the channel where the depth is not too great, or in Turkey, Maple Juice, Otis, or Broad Coves.

The mean range of the tide at Thomaston is 9.4 feet. Ice closes the river to navigation from December to March in severe winters. In ordinary winters, it is not usually closed entirely for more than 1 month, although ice sufficient to interfere with navigation may be encountered at any time for a period of 3 months.

The approach to the entrance of St. George River has very broken and irregular bottom, with numerous ledges bare and submerged. Strangers should proceed with caution and avoid crossing broken areas where the charted depth does not greatly exceed the draft.

In approaching and entering St. George River no difficulty should be experienced by the navigator by closely following the chart and the aids, having due regard for the unmarked dangers some of which have been described in the preceding paragraphs. The anchorages in the lower river have been described previously. Above the Narrows at Bird Point, there is excellent anchorage near the middle of the river off Otis Cove. Passage in the river above the Narrows should be guided by the chart and the buoys. The safest time is at low water and on a rising tide when the flats are bare.

Georges Islands are a group of islands and rocks extending about 6.5 miles south-southwestward from the middle of the entrance to St. George River. The larger islands are in general wooded, and the smaller ones grassy or rocky; there are few prominent landmarks. Several channels lead between the islands; the most important are Davis Strait, the channel between McGee and Seavey Islands, and the channel northwestward of Caldwell Island.

Old Man Ledge, the most southerly of the dangers, is marked by a daybeacon. A lighted whistle buoy is about 0.3 mile south of the daybeacon. **Old Women Ledge,** 0.6 mile northward of Old Man Ledge, uncovers 3 feet.

Burnt Island, the eastern large island at the south end of Georges Islands, is about 160 feet high, wooded, and marked on its summit by a conspicuous lookout tower. An abandoned wharf and marine railway are on the west side of a small peninsula near the former Coast Guard station on the northwest shore of the island. At low water there is no passage between Burnt Island and **Little Burnt Island,** just north of the peninsula.

Georges Harbor is between **Allen Island,** 0.5 mile west of Burnt Island, and **Benner Island,** off the northwest side of Allen Island. There is a small settlement of fishermen, and small craft sometimes anchor there. The best water is midchannel in entering the thorofare from northeastward. Entering from southwestward favor the south side. In 1966, a submerged mooring cable, suspended above the bottom, was reported extending across Georges Harbor between Allen Island and Benner Island.

Davis Island, 0.9 mile northwestward of Burnt Island, is grassy and has two knolls with a saddle between. **Davis Strait** is the passage between Davis Island on the south and **Thompson Island** and other small islands on the north. The two southernmost islets on the north side of Davis Strait are grassy, and the others are wooded. The passage is part of the through route used by many vessels drawing 12 feet or less. It is reported that barges drawing 16 feet use this strait. It has ample depth, but **Griffin Ledge,** in midchannel, has a depth of 10 feet over it. On the south side of the ledge is a buoy, and the channel, which is southeastward of this buoy, is only 75 yards wide.

Between Thompson and Hooper Islands the bottom is very broken, and there are numerous dangers, most of which are marked or visible at some stage of the tide. **The Sisters,** 1.3 miles east of Thompson Island, are two small ledges awash at low water; a buoy is on the northwest side of the ledges. **Old Horse Ledge,** 0.4 mile northwestward of The Sisters, uncovers at low water and is marked by a daybeacon.

Outer Shag Ledge, 0.3 mile westward of Old Horse Ledge, uncovers about 5 feet, and **Inner Shag Ledge,** 0.3 mile west of Outer Shag Ledge, is awash at high water. **Kelp Ledges,** 300 yards west of Hooper Island, are awash at low water. **Gig Rock,** 0.6 mile southwest of The Sisters, is covered 7 feet; a bell buoy is off the northwest side of the rock.

Bar Island, 0.7 mile west of Hooper Island, is low and grassy. There is ample depth in the channel between Bar Island and **Seavey Island** on the northeast and larger McGee Island on the southwest. Some of the dangers are buoyed, but, there are unmarked dangers close to the channel. The passage is used by small boats. **Jenks Ledge,** the most westerly danger off the passage, is awash at lower water and is marked by a buoy. A submerged obstruction of unknown depth is about 0.3 mile southwestward of the ledge.

Deep Cove, on the eastern shore just north of the northern entrance to Port Clyde, has good anchorage in depths of 21 to 43 feet, soft bottom. **Caldwell Island** is at the northern end of Georges Islands and the middle of the entrance to St. Georges River.

Gay Cove is a shallow and unimportant cove in the eastern shore of Gay Island, the western point at the entrance of the river. It is reportedly sometimes used by yachts.

Pleasant Point Gut separates Gay Island from the mainland. Its western part is bare at low water. **Pleasant Point,** a village of fishermen, is along the shore of the mainland. There are several fish wharves, one of which has a depth of 4 feet alongside; the others are bare or have depths of less than 3 feet alongside. Gasoline, oil, and some supplies can be obtained at the float landing with 6 feet alongside. A private wharf is on **Gay Island** on the south side of the harbor. A machine shop where marine work is done is near the entrance to the harbor. Local small craft are reported to make passage through the western entrance to the gut about half tide. Strangers should not attempt it.

Turkey Cove, on the eastern shore of the river about 1.5 miles above Caldwell Island, has good anchorage in depths of 15 to 27 feet, soft bottom, about midway between the points at the entrance.

Maple Juice Cove is a long, shallow cove on the west shore about 2 miles above Caldwell Island. Good anchorage is found at the entrance in depths of 13 to 24 feet.

Otis Cove, broad but shallow at its head, is on the eastern shore about 1.7 miles above Turkey Cove. There is good anchorage off the entrance in depths of 20 to 27 feet. There are no wharves.

Broad Cove, on the western shore about 4.5 miles above Caldwell Island, is shallow. The village of **Cushing** is near the northern shore. There is a wharf which bares at low water. **Bailey Ledge,** off the southern entrance, is bare at low water and marked on the southeast side by a buoy.

Watts Cove is a shallow cove on the eastern shore opposite Broad Cove. The village of **St. George** is at the head of the north arm of the cove.

Abandoned **Fort St. George** is on the east side of the river about 1.5 miles above Broad Cove.

Thomaston is a town on the Maine Central Railroad near the head of navigation on the St. George River. There is no waterborne commerce. The Maine State Prison, an elevated tank, and a radio mast on the bluff in the west end of the town, a church spire, the twin stacks and silos of a cement mill, and a railroad bridge across the mouth of Mill Creek on the east end of the town are conspicuous.

There are three boatyards at Thomaston. Craft up to 100 feet can be built, and hull, engine, and electronic repairs can be made. Open and covered dry winter storage facilities are also available. The public landing has a float landing with 15 feet reported alongside and a small-craft launching ramp. Gasoline, ice, provisions, and some marine supplies are available in town. The harbormaster can be contacted through the Thomaston Police Department.

St. George River is crossed at Thomaston, above the wharves, by a bascule highway bridge with a clearance of 5 feet; the nearby overhead power and telephone cables have a clearance of 40 feet.

Two fixed bridges, a railroad and a highway bridge, cross the river about 2 miles above the bascule bridge; least clearance is 5 feet. The piers of a former wooden bridge just below the railroad bridge are covered at high water and form an obstruction in the channel. There is little traffic, except for small boats, in this part of the river. The fixed railroad bridge across the mouth of **Mill River,** east of Thomaston, has a clearance of 25 feet for a width of 28 feet.

8. MUSCONGUS BAY TO CAPE ELIZABETH, MAINE

Chart 13288 (1204).-This chapter describes Muscongus, Booth, Sheepscot, and Casco Bays; Medomak, Damariscotta, Sheepscot, Kennebec, and New Meadows Rivers; and the ports of Portland, Bath, Boothbay Harbor, and Wiscasset. This area has many islands, rocks, and long peninsulas. Many of the islands have been joined by fixed highway bridges; hence, so far as masted vessels are concerned, whole groups become additional peninsulas. In general, the outer islands and rocks rise from deep water and the lower parts of the rivers are deep.

Boundary lines of inland waters.-The lines established for this section of the New England coast are described in **82.5,** Chapter 2.

Chart 13301 (313).-Muscongus Bay, between the Georges Islands on the east and Pemaquid Neck on the west, forms the approach to Meduncook and Medomak Rivers and Muscongus Sound, the villages of Friendship, Round Pond, and Medomak, and the town of Waldoboro. The bay is frequented by small pleasure and fishing craft. It is obstructed by numerous islands and ledges and much foul ground. Many of the dangers are marked by buoys.

Moser Ledge, the outermost of the dangers with a cleared depth of 13 feet, marked by a buoy, lies about in the middle of the entrance to the bay, about on line between the north end of Monhegan Island and Pemaquid Point Light (43°50.2'N., 69°30.4'W.).

Franklin Island Light (43°53.5'N., 69°22.5'W.), 57 feet above the water shown from a white tower on the northwestern side of **Franklin Island,** is the principal aid to the approach and passage through the bay.

Access to the eastern side of the bay, between Allen Island and Franklin Island, is obstructed by an area of islands and mostly unmarked shoals and ledges. The area, about 3 miles long north and south and 2 miles east and west, is bounded on the west by **South Ledge,** an unmarked ledge covered 13 feet; **Eastern Egg Rock,** 23 feet high and bare and marked on its north side by a daybeacon; **Egg Rock North Ledge,** marked on its southeast side by a buoy; **Hough Ledge;Little Franklin Ledge;** and Franklin Island. Its eastern side is bounded by **Shark Island;** unmarked **Little Egg Rock Shoals;Seal Ledges** 13301 (313), marked on their north end by a buoy; and **The Kegs,** marked by a daybeacon. On the north end is **Gangway Ledge,** an unmarked bare rock and ledge area.

Three deep, natural, mostly unmarked channels, narrow in places, lead in a northerly and northeasterly direction past or through the area, and into the St. George River. South Channel leads west of Georges Islands. Western Passage leads westward of the area of islands, shoals, and ledges near the center of Muscongus Bay, and westward of Eastern Egg Rock and Franklin Island. **Old Hump Channel** leads through the center of the area.

A buoyed channel marked for a westerly crossing, known as **Davis Strait Passage,** is used mostly by small craft proceeding between Pemaquid Point and Port Clyde or Penobscot Bay, via Muscle Ridge Channel. From a fairway bell buoy off its western entrance between Eastern Egg Rock and Egg Rock North Ledge, this passage crosses Old Hump Channel, then passes between **Old Hump Ledge** and Seal Ledges; thence through Davis Strait; thence northeastward past Gig Rock; thence between Old Horse Ledge and The Sisters; thence southward of Hooper Island and northward of Allen Ledge to the entrance to Port Clyde. Craft proceeding farther eastward continue on, passing southward of Marshall Ledge; thence between Gunning Rocks and Mosquito Ledge; and thence southeastward around Mosquito Island and Barter Shoal before rounding up to the northeastward for Muscle Ridge Channel.

A group of islands in the middle of the bay, extending 3 miles southwestward from Friendship Long Island, separates the approaches of the St. George and Meduncook Rivers from the Medomak River. This group includes **Crane Island,Harbor Island, Hall Island,Black Island, Otter Island,Cranberry Island,** and **Morse Island.** Surrounding and interspersed between these islands are numerous rocks and ledges, such as **Harbor Island Rock** marked by a buoy on its west side. **Black Island Ledge, Otter Island Ledge,** and **Beyer Ship Ledge** are unmarked. **Morse Ledge** is marked by a daybeacon. The passages between these islands and ledges are mostly shoal, foul, and unmarked, and of interest only to local craft.

In the western part of the bay, islands and ledges extend 3 miles southward from Louds Island. **Bar Island,** close south of Louds Island, is grassy; **Haddock Island** is wooded, and **Ross Island** is grassy. **Haddock Island Kelp Ledge,** covered 8 feet, is marked on its south side by a buoy. **Webber Dry Ledge** uncovers at low water.

Webber Sunken Ledge, with a rock awash at low water and marked by a buoy, extends 0.3 mile south of it. **Browns Head Ledge** , covered 13 feet, is marked by a buoy. **Bar Island Ledge,** 0.2 mile long and awash at low water, is marked on its south end by a buoy.

The most southerly of these ledges are **New Harbor Sunken Ledges,** awash at low water at the north end and marked at their south end by a buoy.

The reef extending 0.3 mile eastward of grass-covered **Western Egg Rock,** the southeasternmost of this group of ledges, is covered 4 feet and marked by a buoy.

Devils Elbow, which uncovers 1 foot; **Devils Back,** which uncovers 8 feet; **Devils Limb;** bare **Wreck Island Ledges** and **Garden Island South Ledge,** awash, unmarked, and dangerous; **Wreck Island;** and 25-foot-high **Jones Garden Island** are all on a line about 1.5 miles eastward of Louds Island; Jones Garden Island is the northeasternmost of the group.

Haddock Island,Ross Island,Marsh Island, Killick Stone Island,Thief Island,andIndian Island are all part of the western group and lie southward and eastward of Louds Island.

Meduncook River is an estuary making in a general northeasterly direction, just westward of St. George River; the entrance forms one of the approaches to Friendship Harbor, and is a good anchorage in 24 to 30 feet. The approaches to the entrance are the same as for St. George River, and the anchorage is marked by buoys.

The river above the anchorage is unimportant, has a narrow, crooked channel, and is obstructed by numerous unmarked rocks and ledges, so that local knowledge is necessary for its navigation.

Friendship Harbor (43°58.0'N., 69°20.5'W.) is west of Meduncook River, from which it is separated by **Friendship Long Island** and **Garrison Island;** between these two islands a buoyed channel leads from the anchorage in Meduncook River into Friendship Harbor.

A passage, foul and dry at half tide, but used by some local fishermen, leads into the harbor between Garrison Island and the mainland. Overhead power and telephone cables over the passage have a clearance of 20 feet.

Friendship Harbor, about 1 mile long with good anchorage in 21 to 28 feet, is used extensively by fishermen and yachtsmen. Ice seldom closes the harbor.

A ledge extends 300 yards southwestward from **Jameson Point** to a rock, uncovered at low water, which is marked by a daybeacon. On the southern side of the entrance, opposite the daybeacon, an unmarked shoal with a cleared depth of 7 feet at its outer end extends about 300 yards into the channel from Friendship Long Island.

Above the wharves the northern and eastern side of the harbor should be given a berth of over 200 yards. The southeast side of the harbor should be given a berth of over 200 yards. **Murphy Ledge** is a rock which uncovers about 4 feet and is marked by a daybeacon, 200 yards from the southeast side of the harbor abreast Jameson Point. A shoal with a cleared depth of 14 feet, about 200 yards northward of the daybeacon on Murphy Ledge, is unmarked. In the eastern part of the harbor a shoal extends 350 yards northeastward from the northeast end of Friendship Long Island; a buoy marks the outer end.

The mean range of tide is 9.0 feet.

Friendship is a town on the north shore of Friendship Harbor. A church spire at the north end of town is conspicuous. There are numerous wharves and piers with float landings on the north side of the harbor on Jameson Point; depths of 2 to 12 feet are reported alongside. Gasoline, diesel fuel, and water are available at several of the landings, and marine supplies at some. Engine repairs can be made. The stone town wharf, one of the more northerly facilities, has a float landing on its northerly side with a reported depth of 2 feet alongside. Rocks, some sunken, extend northeasterly from the outer end of the town wharf; mariners are advised to use caution when approaching the town float landing. Provisions and lodging can be obtained in town. There is a boatyard with a machine shop in the unnamed cove making into the northeasterly side of Friendship Long Island.

Hatchet Cove is a shallow cove making northward at the western end of Friendship Harbor. A narrow unmarked channel with a least depth of 11 feet leads northeastward into the cove near the western point at its entrance. It is unimportant as an anchorage, and the landings bare at low water. A boatyard with a marine railway is on the east side at the head of the cove. The yard builds craft up to 100 feet in length, and the railway can handle craft up to 45 feet for repairs. Dry open winter storage is available. The town-owned small-craft launching ramp, usable at half tide or better, adjoins the boatyard.

Gull Rock, in the western entrance to Friendship Harbor, includes two rocks bare at high water. A ledge cleared to 20 feet at its southwestern end is about 0.4 mile eastward of Gull Rock.

Medomak River enters the head of Muscongus Bay westward of **Martin Point,** the western point at the entrance to Friendship Harbor. Strangers should take a local pilot on account of the many unmarked dangers, narrow and crooked channels, and strong tidal currents which require local knowledge.

The lower part of the river is about 2 miles wide, but is separated by several islands into two approaches; these have three narrow and crooked channels by which entrance is made to the upper river. The approaches to these channels are through Muscongus Bay or Muscongus Sound.

The eastern approach is 0.5 mile wide and comparatively clear of dangers. At its upper end are two passages leading into the river, one through **Back River Cove** and the other through **Flying Passage.** Both of these passages are narrow and unmarked, have shoal rocky areas near the middle and on their edges which, together with the strong tidal currents, make them difficult to navigate.

Hockomock Channel, the western approach, has much better water and is the preferred channel despite the fact that it is narrow in places and has strong tidal currents.

There are several fish wharves on **Keene (Hockomock) Neck,** on the west side of the channel, at which gasoline and some supplies can be obtained. One of these, behind **Oar Island,** has a lobster pound adjoining it and a float landing with 6 to 8 feet alongside. Some protection from east and southeast winds is afforded this landing by the hulk of the five-masted schooner CORA CRESSY, which has been hauled up on the reef between Oar Island and the neck. A limited supply of fresh water can be obtained at the landing, and provisions and some supplies can be obtained in the village of Medomak.

The channel in Medomak River has ample depth for 5 miles above the entrance. Some of the dangers are marked, but there are unmarked ones close to the channel. For the next 2.5 miles to within 1.6 miles of Waldoboro, the channel leads between flats nearly bare at low water, and shoals gradually to 5 feet.

The controlling depth to Waldoboro is about 3½ feet. In 1970 there was no commercial shipping and only limited fishing and small-boat activity on the river to Waldoboro. The channel can best be followed at low water when the flats are visible, or on a rising tide.

The mean range of **tide** is 9.1 feet at Jones Neck and 9.5 feet at Waldoboro. Tidal currents in **The Narrows,** between **Locust Island** and **Havener Ledge,** are reported to be very strong.

Medomak is a village on the western side of Hockomock Channel. There are a town wharf and float landing with 2 feet alongside and a fish wharf with a depth of 4 feet, about 0.5 mile southward of the village. Gasoline is piped to this wharf and water to the town landing.

Broad Cove, on the west side of Medomak River, is used by a few fishermen. The channel into the cove is unmarked.

Waldoboro, at the head of navigation on Medomak River, is a town on a freight branch of the Maine Central Railroad with markets, restaurants, motels, and a library. In 1970, there was no commercial waterborne commerce from the town. An old steamer wharf, in disrepair, is on the east side of the river, and a town landing is on the west side. There is little water alongside these wharves. Provisions, ice, and some marine supplies are available in town. Gasoline can be obtained from a filling station and diesel fuel by tank truck.

A lobster wharf with 5 feet reported alongside its float landing is on the east side of Medomak River, about 1.8 miles northward of Martin Point. Gasoline is available at the float landing.

Pemaquid Neck, a wooded peninsula, is on the west side of Muscongus Bay. **Pemaquid Point,** the south end, is marked by **Pemaquid Point Light** (43°50.2′ N., 69°30.4′ W.), 79 feet above the water, shown from a white pyramidal tower about 0.5 mile northeastward from the end of the point. The town of **Pemaquid Point** is on the southern end of the neck. A gong buoy is 500 yards south of the point.

Pemaquid Ledge, 1 mile south of the point, has a cleared depth of 10 feet and is marked by a buoy on its east side. An unmarked 23-foot patch is about 550 yards southward of the ledge.

A 1-mile radius naval test area is centered 7.9 miles 169° from Pemaquid Point Light; limits and regulations are given in **207.4,** chapter 2. Mariners are cautioned against proceeding through the area while operations are in progress.

An abandoned 1-mile radius naval test area centered 3 miles 162° from Pemaquid Point Light is known to be foul with unexploded ordnance. Caution should be exercised against dragging operations in the area; any material inadvertently picked up should be discarded immediately with a minimum of handling.

Pumpkin Cove Ledge, 1 mile east-northeastward of Pemaquid Point Light, is covered 19 feet and is unmarked. The sea breaks on it in heavy weather.

New Harbor Dry Ledges, 2 miles northeastward of Pemaquid Point Light, extend 0.3 mile from the shore. The ledges are 0.3 mile long with a bare rock near each end and no safe passage for strangers between them and the shore. An unmarked rock, covered 3 feet, is 200 yards offshore about 0.4 mile southwestward of the ledge. **Little Island,** showing a clump of trees, is 200 yards from the shore 0.2 mile southward of the entrance to New Harbor. It is the highest part of a ledge about 0.3 mile long.

New Harbor is on the western shore of Muscongus Bay, about 2.5 miles northeastward of Pemaquid Point Light. A lighted bell buoy is off the entrance to the harbor. A church spire in the village of **New Harbor** at the head is prominent. The cove offers anchorage to small craft only, and is open eastward. The channel is narrow between a shelving ledge extending northeastward from the south point at the entrance and a ledge just inside it which extends halfway across from the north side and is marked at its end by a buoy. A 100-foot-wide channel then leads northward of a daybeacon between ledges to dredged anchorage basins with depths in 1967 of 9 feet decreasing to 5 feet. Enter about 100 feet north of the daybeacon. The channel and basins are subject to shoaling, particularly along the edges. It is reported that ice does not prevent navigation in the winter.

There are two service wharves with float landings on the north side of the harbor at which gasoline, diesel fuel, water, ice, and marine supplies can be obtained. Depths of 4 to 6 feet are reported alongside the service landings. Several fish piers are throughout the harbor. A fleet of seiners operates from the harbor, and groundfish are

shipped from the port by truck. Markets, provisions, restaurants, and lodging are available in town. There is no marine railway, but local fishermen ground out their boats for repairs. A fish-spotting seaplane operates from the harbor during the summer.

Back Cove, a southwesterly arm of New Harbor, is used by local pleasure and fishing craft. A dredged channel leads to an anchorage basin that extends to near the head of the cove. The area above the basin is shoal and foul. In 1967, depths of 5 to 6 feet were in the basin. The channel and basin are subject to shoaling, particularly along the edges. There are a number of private and fish piers, but no facilities.

Long Cove, about 0.6 mile northward of New Harbor, is about 0.5 mile long and 250 yards wide at the entrance. It affords good anchorage in from 14 to 53 feet to within 400 yards of its head in all but southerly weather. It is used by local pleasure craft. The approach to the cove from the southward is clear from northward of **Salt Pond Ledge,** an unmarked ledge covered 8 feet about 0.4 mile south of the entrance. There are no facilities in the cove.

Louds Island is inhabited mostly by fishermen; there are also some farms on the island. **Loudville** is a village on the cove on the east side of the island northwestward of the northern end of Marsh Island. There is reported to be a wharf in the cove, which dries out at low water.

Marsh Harbor, on the southeast side of Louds Island between it and Marsh Island, is seldom used as an anchorage.

Muscongus Sound is on the western side of Muscongus Bay, between Louds and Hog Islands on the east and the mainland on the west. It is about 0.5 mile wide and 5 miles long, and has several rocks and ledges near its southern entrance, the most important of which are marked by buoys. Above the Poland Ledges to abreast Muscongus Harbor, the depths in the sound decrease gradually from 48 to 24 feet, and anchorage can be selected by the chart.

Webber Sunken Ledge, Webber Dry Ledge, Browns Head Ledge, Bar Island Ledge, all previously described and **Webber North Ledge,** covered 15 feet and unmarked, are dangers in the southern entrance to Muscongus Sound.

Poland South Ledge is covered 9 feet, but **Poland North Ledge** is awash at low water. Both are marked by buoys. The better channel leads eastward of them. An unmarked ledge cleared to 18 feet is about 350 yards southeastward of Poland North Ledge.

Round Pond is a small landlocked harbor with 10 to 17 feet in its middle on the west shore of Muscongus Sound, westward of the north end of Louds Island. It affords good anchorage for small vessels. The village of **Round Pond** is at the head of the harbor. The northeast and southwest ends of the harbor should be given a berth of 350 yards, and the west side 200 yards. The best water in entering favors the north side, northward of the buoy marking a 7-foot rock near the end of a reef making northward from the southern point of the entrance.

There is a town landing with 6 feet reported alongside its float in the northwest part of Round Pond. Submerged piles are about 90 yards southeastward of the landing. Two fish piers with float landings are near the town landing; depths of 5 to 6 feet are reported alongside. Gasoline, diesel fuel, and some marine supplies can be obtained at these landings. A boatyard, close southwestward of the town landing, has a marine railway that can handle craft up to 45 feet for hull and engine repairs. Guest moorings and open dry winter storage are available. There is a general store and restaurant in the village, and ice can sometimes be had. There is a ramp for launching small craft from trailers, and lodging and parking are available.

Tides and currents.-The mean range of tide is about 9 feet. Off the entrance to Round Pond there is practically no flood current; the ebb has a velocity of 0.5 knot at strength.

Muscongus Harbor is a small cove and village on the west shore of the sound about 1.5 miles above Round Pond. There are two float landings. During the summer fishing and pleasure boats anchor just inside the entrance in 5 to 8 feet of water.

Greenland Cove is the extreme northern end of the sound. It is shallow and of no importance. It is reportedly often used by yachts. **Bremen** is a small village at the head of the cove.

Lower Narrows, leading into the head of Muscongus Sound north of Hog Island, has a depth of about 13 feet. A rock awash is on the north side of the narrows, close westward of Buoy 7A. The principal dangers are marked, but local knowledge is necessary to carry the best water.

The Audubon Society of America maintains a camp on the northeast point of **Hog Island,** at which there are several buildings and a float landing.

Charts 13293 (314), 13294 (314-SC).-Johns Bay (43°50.0′ N., 69°32.0′ W.) is westward of Pemaquid Neck, between it and **Rutherford Island.** Its entrance is about 1.4 miles wide, and the length of the bay is 2 miles to Johns Island, above which Pemaquid River empties into the northeastern end. Johns River flows into the northwestern part. Depths in the bay are very irregular, and there are several ledges and rocks. A high square observatory tower on Rutherford Island and another tower 0.3 mile to the north are prominent.

Though not commercially important, the bay has summer resorts on its shores and is used as an anchorage by fishermen and yachtsmen. The holding ground is poor except in a few spots near the head of the bay and in the coves. Port Clyde, eastward, and Boothbay Harbor, westward, are preferable at all times.

Pemaquid Harbor (43°52.5′ N., 69°32.0′ W.) is at the entrance to Pemaquid River, northeastward of Johns Island. The bottom is rocky and irregular, but there is a fair anchorage for small vessels in 36 feet in the eastern part of the harbor between **Fish Point** and the entrance of Pemaquid River. The preferred anchorage for small craft is said to be north of the fort where the bottom is soft in places. The village of **Pemaquid Harbor** is on the north side of the entrance to the harbor. There are a number of private float landings and boatsheds.

Care should be taken to avoid the piling of an old wharf on the western side of the inner harbor.

Pemaquid River extends northeastward about 2 miles to the village of **Pemaquid.** The river is dry at low water near its head, and has a narrow, crooked, and unmarked channel. On the point marking the southern entrance to Pemaquid River there is a prominent stone tower marking the position of the former **Fort William Henry.**

The pier and float landing of a lobster wharf are on the north side of Pemaquid River about 0.5 mile northeastward of the old fort. Depths of 2 feet are reported alongside the float; gasoline and some marine supplies are available.

Pemaquid Beach is a village on the south side of Pemaquid River at the entrance. There is a private wharf with a float at the old fort. A pier and float landing are at a State park, close northeastward of the private wharf. Depths of 10 feet are reported alongside the float. Parking, restaurant, and a small-craft launching ramp are available at the State park. Groceries and lodging can be obtained in the village nearby.

A reef almost bare in places at low water extends offshore between the private wharf and the State park pier; a buoy is westward of it. Several small fish wharves are to the eastward on the south side of the river.

A ledge, partly bare at half tide, extends 225 yards north-northeastward from the north end of Johns Island, where it is marked by a spindle, and another shoal cleared to 13 feet is about 0.3 mile south of the island.

Thurston Ledges are mostly bare rocks extending 300 yards southward from **Thurston Point** on the north side at the entrance of Pemaquid Harbor, their south edge being 300 yards northward of Beaver Island.

Routes.-Pemaquid Harbor can be entered from westward by passing midchannel between **Beaver Island,** the high rounded islet with some trees located 300 yards northward of Johns Island, and Thurston Ledges. From the southward, when 0.5 mile or more southward of Johns Island, steer so as to pass 150 yards eastward of Johns Island, being careful to avoid the 13-foot shoal southward of the island, and then westward of the western bare rocks of **Knowles Rocks.**

McFarlands Cove is on the western side of Johns Bay, northward and westward of **Witch Island.** A steep 150-foot hill is on the west shore of the cove. There is good anchorage in 24 to 36 feet in the cove for a small vessel about 300 yards northward of Witch Island.

McFarlands Ledges, about 450 to 800 yards north-northeastward of Witch Island, have a rock which uncovers 6 feet near the north end, and one uncovers at low water near the south end. A buoy marks the south end of the ledges. **Corvette Ledge,** about 200 yards northeastward of Witch Island, is covered 3 feet; a buoy marks its north end. When entering the cove from eastward between the buoys marking these two ledges, take care to avoid the rock awash off the northwestern point of Witch Island.

The Gut, a thorofare connecting McFarlands Cove with Damariscotta River, is described under the description of that river.

Johns River extends northward about 2 miles above McFarlands Cove and separates into two branches. **Eastern Branch** is the eastern, and **North Branch** is the western. **Poorhouse Cove** makes into the western shore of Johns River above High Island. Good anchorage is available in depths of 18 to 24 feet southeastward and eastward of **Sproul Point.** The river is little used. Two boatyards which haul out and store yachts up to 35 feet in length are on Johns River, one on Sproul Point and the other at the head of **Bradstreet Cove,** a western arm of Poorhouse Cove.

Routes, Johns Bay.-Stand up the middle of the bay, heading for the eastern shoulder of High Island, and pass 400 yards westward of Johns Island, avoiding unmarked **Pollock Rock,** and pass about 300 yards off the eastern shore northward of Pemaquid Harbor. Then keep in midchannel until abreast of High Island, and then pass about 50 yards westward of the buoy marking a rock covered 10 feet, about 350 yards northeastward of High Island; anchor near midriver, about 400 yards northward of the buoy, in 18 to 24 feet.

Thread of Life is a narrow deep channel, lying between Thread of Life Ledges and Crow Island on the east, and the southern part of Rutherford Island and Turnip Island on the West. It is used by small local vessels entering Johns Bay from westward or from Damariscotta River. **Thrumcap Island** is partly wooded in its northern part and has a prominent house on it. **Thread of Life Ledges** are bare or grassy islets; **Turnip Island,** partly wooded, has a house on it. **Crow Island** is wooded. A shelving ledge awash at low water and marked by a buoy extends 300 yards southward from **Hay Island,** which is wooded. The channel westward of **Birch Island,** northward of Hay Island, has been dammed off to form lobster pounds. The hulk of an old tug, aground, rests against the southernmost dam; a fish pier with float landing is at the northernmost dam.

To pass through Thread of Life from westward, after clearing Fisherman Island Passage, steer for the north end of Thrumcap Island with Ram Island

Light astern. Pass 400 yards southward of The Bulldog, which uncovers 3 feet, and then 500 yards southward of the two rocks which uncover 6 feet about 350 yards eastward of Inner Heron Island. When about 400 yards from the north end of Thrumcap Island, round up to the northward keeping 200 yards off Thread of Life Ledges, and pass midway between them and Turnip Island. Continuing in midchannel to the north end of the passage, pass into Johns Bay between the buoy south of Hay Island and the buoy marking the ledge extending 200 yards northward of Crow Island.

Damariscotta River extends about 14 miles northward to the twin towns of Damariscotta and Newcastle, thence another 2 miles to **Damariscotta Mills** at the mouth of **Damariscotta Lake.**

The entrance to Damariscotta River is about 3.2 miles west-southwestward of Pemaquid Point Light and 1.3 miles northeastward of Ram Island Light. The tidal current is strong. Although some of the dangers are marked by buoys, strangers in anything but small craft should not pass through or above The Narrows at Fort Island, without a pilot.

The channel of the river is crooked. In many places it is very narrow because of the constricting islands and ledges. For a distance of 11 miles above the mouth of the river a least depth of 20 feet may be carried in the channel, although there are many unmarked 16- to 18-foot spots on each side of the channel. Above this point the water shoals to 10 feet just below the town of Damariscotta.

The channel had a controlling depth of 9 feet in 1958 and for 2 miles south of the Damariscotta-Newcastle Bridge is bordered with mudflats on both sides; care should be exercised in piloting. Above the bridge, navigation is impossible except at high-water slack and with local knowledge due to the rapids and falls at Damariscotta Mills.

The **White Islands,** about 1.5 miles south of the entrance to Damariscotta River, are prominent. The northern island is grassy with conspicuous standing trunks of dead trees. The southern island is partly wooded on the northern two-thirds and is bare rock on the southern third. There is a house on the island. The south end of the island should be given a berth of at least 300 yards because a sunken rock with 2 or 3 feet over it is reported to lie about 150 yards off the southern tip of the island.

Southward and southwestward of the White Islands, **Outer Heron Island,** wooded, and **Pumpkin Island,** together with their offlying ledges, extend about 2.5 miles. **Outer Heron Island Ledge,** covered 6 feet, about 0.9 mile east-southeastward of Outer Heron Island, is marked on its east side by a buoy. **Southeast Breaker,** covered 19 feet, about 0.7 mile southeastward, and **Pinkham Shoal,** covered 8 feet, about 0.5 mile southwestward of Pumpkin Island, are unmarked. An unmarked rocky area cleared to 10 feet is about 0.5 mile eastward of the southern tip of the island.

Anchorages.-Vessels bound into the river usually go as far as Meadow Cove, just above East Boothbay, where good anchorage is available in 30 to 48 feet, keeping 150 yards offshore. This is as far as a stranger should attempt to go, without local knowledge. Above The Narrows vessels can anchor anywhere in the channel where the bottom and depth are suitable.

Routes.-Extreme caution is necessary in this region where there are many rocks and ledges and very broken bottom.

With the aid of the chart, enter the river midway between the gong buoy off Little River and the buoy marking Inner Heron Ledge, keeping in midchannel for about 1.5 miles above Inner Heron Island.

There are unmarked 16-, 18-, and 23-foot spots in the channel between **Farnum Point** and Rutherford Island, and an 8-foot shoal marked by a buoy about 0.3 mile southeastward of the point. Favor **Jones Point** when passing the shoals eastward of **Montgomery Point** and, when clear, round up to the northwestward for the anchorage off **Meadow Cove.**

Small craft should have no trouble in going to the head of navigation with the aid of the chart. The best time is on a rising tide. It is reported that the buoy at the entrance to The Narrows tows under during strength of the current.

Tides and currents.-The mean range of tide is 8.9 feet at East Boothday and 9.3 feet at Newcastle.

The tidal current in the constricted sections attains an estimated velocity of 5 knots. The ebb lasts about 2 hours after low water in the upper part of the river, and is usually stronger than the flood. The currents follow the general direction of the channel. Off Cavis Point the velocity at strength of current is about 1 knot. See Tidal Current Tables for predictions.

Ice closes the river for a distance of 4 miles below Damariscotta during January, February, and March.

Pilots.-Fishermen at South Bristol or East Boothbay may be engaged as pilots.

Little River, a long narrow inlet in Linekin Neck on the west side of the entrance of Damariscotta River, has a number of private float landings and fish wharves. A junction gong buoy about 350 yards south of **Reeds Island** marks the entrance. The channel is narrow and constricted at the entrance, but the secure anchorage can be found in 5 to 12 feet in the outer section and 13 to 18 feet in the inner section of the inlet above the fish wharves on the east side. Small craft anchor near the head of the inlet above the narrows.

A ledge, locally known as **The Bull,** is in the middle of the entrance and is marked by a daybeacon on its east side. There is good water in midchannel on each side of this ledge, but in heavy

weather the western channel should not be attempted. The best approach from close aboard the junction gong buoy off the entrance is to head for the daybeacon, passing it close to on the east side; then heading for the middle of the end of the point on the west side of the entrance northwestward of the daybeacon on The Bull. When about 100 yards from the point, head up the inlet favoring the western shore.

Treasure Island, with a house on it and connected to the shore by a fixed trestle bridge, is on the northeast side of the entrance to the inner harbor.

There is a good holding ground in 13 to 18 feet, mud bottom, in midchannel from abreast the first fish wharf on the east side to the private pier with float landing just above the fish wharf on the west side, about 0.6 mile above the daybeacon. Above that point the harbor shoals rapidly. Local knowledge is advisable. Gasoline may be obtained at the first fish wharf on the east side.

Inner Heron Island (43°49.8′ N., 69°34.0′ W.), on the eastern side of the entrance to Damariscotta River, is thickly wooded. Two private float landings are on the northeast side; depths of about 12 feet are at their ends. Boats going to the landing must avoid the reef that uncovers about 5 feet extending northward from the island; it is marked by a buoy.

Inner Heron Island Ledge, 0.2 mile southwestward of the south end of Inner Heron Island, is covered 2 feet and marked on the southwest side by a buoy. **The Bulldog,** 300 yards southward of the island, uncovers 3 feet. The rock 350 yards eastward of the island uncovers 6 feet.

Other unmarked dangers exist between Inner Heron Island and the shore of Rutherford Island; this passage should not be used by strangers.

Christmas Cove (43°50.8′ N., 69°33.3′ W.) is an anchorage for small craft or a very small vessel on the eastern side of the river entrance, 0.7 mile north-northeastward of Inner Heron Island. The narrow entrance to the cove proper is midway between two bare rocks, the one on the southeast side being marked by a spindle daybeacon with two red triangular daymarks with the letters "ML". A spindle daybeacon with square white daymarks marks the north side of the channel, and another with a red triangular daymark marks the point of a ledge near the south side close westward of the town landing.

The anchorage with the best swinging room is in the middle of the cove off the landing in 22 feet. About a mile northeastward of the cove, a high square observatory tower, originally built as a summer home, is conspicuous.

To enter Christmas Cove, enter in midchannel and pass between the tripod daybeacon and the outer spindle, and northward of the inner spindle.

The summer resort of **Christmas Cove** is on the eastern side. The village residents maintain a private sport, social, and yachting club. The town landings with depths of 3 to 10 feet alongside are on the southeast side of the cove. There are several private float landings and moorings in the cove.

A boatyard is on the northeast side of Christmas Cove. The marine railway at the yard can handle craft up to 40 feet for hull and engine repairs; open and covered storage, and moorings are available. The **harbormaster** for the town of South Bristol is at the yard; telephone (207-644-8342).

A marina-motel with 12 feet reported alongside its float landing is on the west side of the cove opposite the boatyard. Berthing, gasoline, diesel fuel, water, ice, groceries, marine supplies, and a small-craft launching ramp are available. The marine railway at the marina can handle craft up to 40 feet for hull and engine repairs.

The Gut (43°51.7′ N., 69°33.4′ W.) is a thorofare connecting Damariscotta River at South Bristol with McFarlands Cove and Johns Bay. In October 1970, the controlling depth in the channel through The Gut was 6 feet from a point 0.5 mile west of the bridge to a point 0.5 mile east of the bridge, except for minor shoaling along the channel edges. A submerged rock ledge is reported on the south side of The Gut, about 300 yards eastward of the bridge. Route 129 highway bridge over The Gut has a swing span with a channel width of 26 feet and a clearance of 3 feet. Overhead power and telephone cables at the bridge have a least clearance of 55 feet. A daybeacon marks a ledge on the south side of the western entrance. The Gut east of the bridge is thickly congested with moorings and lobster pot buoys.

A shipyard, engaged in construction only, is on the north side of The Gut, west of the bridge. The yard has a marine railway and can build vessels up to 135 feet in length. The 500-foot shipyard pier has depths of 5 to 12 feet reported alongside. Water is available. Engine repairs can be obtained at a well-equipped machine shop with an 80-foot pier, with 7 feet at the head, 6 feet alongside, and 4½ feet at its float landing in the cove across The Gut from the shipyard. The shop carries a good supply of parts.

South Bristol is a village on The Gut, on the east side of Damariscotta River, 2.5 miles above the mouth. There are a number of wharves with float landings. Three on the north shore east of the bridge are lobster wharves with depths of 4 to 12 feet reported alongside their floats; gasoline is available at all, and diesel fuel at two of them. A general store is on the wharf by the bridge. Some marine supplies, ice, and provisions may be obtained. The town wharf on the south shore close west of the bridge has a reported depth of 3 feet alongside. The town **harbormaster** resides at the village of Christmas Cove; phone 207-644-8342.

The mean range of tide is 9 feet.

East Boothbay is a village on the west bank of Damariscotta River, about 3 miles above the mouth. The large buildings of three boatyards are prominent. Three wharves are in general use and have float landings and berthing space with electricity and 10 feet reported alongside. The yards maintain guest moorings in the anchorage off the wharves; the controlling depth is about 7 feet in the anchorage.

The yards can build craft up to 200 feet in length and 1,000 tons, and are equipped with complete facilities for hull and engine repairs. Machine, carpenter, and pipe shops, and two marine railways are available. The larger of the railways can handle craft up to 100 feet. Gasoline, diesel fuel, water, ice, provisions, marine supplies, and open, covered, wet and dry winter storage are available at the yards.

Taxi service, car rental, laundromat, and launching ramps are available at East Boothbay.

Kelp Ledge, just south of the approach to the boatyards, wharves and 150 feet from the shore, is awash at low water and is marked by a buoy north of the ledge.

At **The Narrows,** 1.3 miles above East Boothbay, the channel is contracted to a width of 100 yards, and the tidal currents are strong with swirls. **Western Ledge,** with a rock awash at low water 550 yards south of Fort Point, in midchannel, is marked by a buoy to the southeast; the buoy tows under at full current strength.

Eastern Ledge, extending 100 yards from the eastern shore, is a rock covered 2 feet. A buoy marks its west side. This buoy almost tows under during full strength of the current. On the west side of The Narrows is a ledge, mostly covered and with rocks awash on it, extending 250 yards southwestward and 75 yards eastward from Fort Point. There are other ledges, one covered 4 feet, in this vicinity.

At the **Back Narrows** leading westward of Fort Island the channel is foul with rocks and is crossed by an overhead power cable with a clearance of 40 feet. Fish wharves and private float landings are in the two coves westward of Fort Island.

Seal Cove and **Long Cove,** on the east side just above The Narrows, have many unmarked dangers and are seldom entered. An overhead power line having a clearance of 40 feet crosses Seal Cove about 400 yards south of **Hodgsons Island.**

Carlisle Island is a low island close off the east side of Carlisle Point about 2 miles above The Narrows. The channel between the island and the point is not recommended because of an unmarked 2-foot spot at its southern end.

Miller Island, a low wooded island in midchannel east of Carlisle Point, divides the river into two channels. The western channel is the more direct, but has an 18-foot spot at its northern end. The eastern channel is deep and passes close to Clark Cove.

Clark Cove, on the east side, 2.5 miles above The Narrows, is a broad bight, shoal near the shores.

Pleasant Cove is on the western shore of the river opposite Clark Cove, and makes in nearly 1.5 miles southwestward. Good anchorage can be had in the mouth of this cove just northwestward of **Carlisle Point,** in 15 to 30 feet, soft bottom. **Pleasant Cove Ledges,** extending northward of the cove, uncover 8 feet and are marked by a buoy at the north end. There is a private float landing in the cove.

Lowes Cove indents the east shore for about 800 yards between **McGuire Point** and **Wentworth Point,** but dries out for most of its length. It is only about 100 yards wide. Anchorage in 15 feet can be had in the entrance.

Anchorage can also be had behind Pleasant Cove Ledges on the west side in Wadsworth Cove.

Kelsey Point, about a mile north of Wentworth Point, is low, but the land behind it rises abruptly to about 160 feet. A rock off Kelsey Point is covered 2 feet and is marked by a buoy.

Salt Marsh Cove, on the west side southwest of Kelsey Point, dries out. **Merry Island,** off the western shore northwestward of Kelsey Point, is wooded. A daybeacon is on a bare rock off the island.

Mears Cove, eastward of Merry Island and between Kelsey Point and **Lower Fitch Point,** affords excellent anchorage in 20 to 25 feet.

Fitch Point is a low point making out from the east shore about 7 miles above the Narrows. Small **Baker Islet** is on Glidden Ledge, which extends about 350 yards from Fitch Point. A daybeacon is on the outer end of the ledge. The river channel is only about 100 yards wide at the point, and strong tidal currents are reported to sweep across the ledge and through the channel on the ebb.

Dodge Point is a high bluff headland 1.2 miles above Fitch Point. **Perkins Point,** 100 feet high and cleared, is on the west shore about a mile above Dodge Point. A buoy marks the channel off the point, and a daybeacon marks the shoal water 0.4 mile northward of the point.

About 0.8 mile above Perkins Point, the river is again narrowed to about 100 yards by **Goose Ledge,** which extends 0.3 mile southward of Hall Point on the east shore. **Hog Island,** a small wooded island, is in the middle of **Huston Cove,** eastward of **Hall Point.** The cove dries out.

Between Hall Point and **Little Point** on the west bank, the river is only about 250 yards wide and the channel less than 100 yards wide. A strong ebb tidal current is reported to run between the two points.

A midchannel drying bank is northeastward of Little Point. The channel leads eastward of the shoal and is marked on the western edge. The channel then trends northward to **Jacks Point** and to the anchorage off the towns of Damariscotta and Newcastle.

Damariscotta on the east bank and **Newcastle** on the west bank, about 14 miles above the mouth of the river, are connected by U.S. Route 1 highway bridge. The bridge has a fixed span with a clearance of 5 feet; a center pier in the bridge obstructs the channel. Old Indian shell mounds are on the west bank on **Glidden Point** a mile above the bridge. U.S. Bypass Route 1 highway bridge crosses the river at Glidden Point. The fixed span has a clearance of 31 feet. The river between the bridges is obstructed by rapids, and passage is possible at high water slack. The towns are on a freight branch of the Maine Central Railroad. There are banks, a hospital, motels, hotels, inns, restaurants, markets, laundromats, and shops of all kinds. Taxi and through coastal bus services are available.

There is little traffic by water except for yachts and small fishing boats.

A restaurant, on the east bank just below the bridge, has a float and float landings with 6 feet alongside. Gasoline, water, provisions, ice, and marine supplies are available at the landings. A small-craft launching ramp is also available. The town landing and municipal parking lot are adjacent to the launching ramp.

Small craft can pass under U.S. Route 1 highway bridge at high water slack. A marina on the east side of the river just above the bridge has moorings and marine supplies, and can repair outboard engines.

A boatyard, on the west bank in the cove below Jacks Point, has a marine railway that can haul out craft up to 35 feet in length at high water for hull and engine repairs, or dry or covered winter storage. Marine supplies are available; gasoline and diesel fuel can be obtained by truck. The float and the marine railway dry at low water.

Anchorage in 11 feet, soft bottom, is available off the landings.

Booth Bay and **Linekin Bay** are between Linekin Neck and Fisherman Island on the east and **Southport Island** on the west. They form the approach to the town of Boothbay Harbor and many summer resorts. They are frequented by many vessels and by a large number of fishing and pleasure craft in summer.

Islands and rocks extend 7 miles southward from the south end of Linekin Neck. The ground is very broken, rocks rising abruptly from deep water.

Bantam Rock Lighted Whistle Buoy 16BR is at the southwest end of the broken ground, and deep-draft vessels passing along the coast should pass outside of it.

Bantam Rock, awash at low water, the most southerly visible danger, is 1.3 miles southward of Damariscove Island. The wreck of the SS HARTWELSON, broken in two parts on Bantam Rock is no longer visible. It is marked by a buoy.

Damariscove Island, on the southeast side of the entrance to Booth Bay, is 1.7 miles long, bare, and nearly divided in the middle. **Damariscove Harbor,** at the south end, is used as a small-boat harbor by local fishermen. Conspicuous objects are two lookout towers and the buildings of a former Coast Guard station on the highest parts of the southerly section of the island.

A fairway gong buoy is 0.5 mile south of the entrance to the harbor. **The Motions,** a ledge extending 0.3 mile south-southwestward of the southwest end of Damariscove Island, is awash at lower water. An unmarked shoal cleared 32 feet is 0.8 mile southward of the southeast end of the island.

Poor Shoal, covered 33 feet and unmarked, is 1.7 miles south of the island.

Fisherman Island, northeastward of Damariscove Island, is bare. A large stone house on the highest part of the north section of the island is prominent.

Ram Island, on the south side of Fisherman Island Passage, is a grassy island marked on the northwest side by **Ram Island Light** (43°48.2′N., 69°36.0′W.), 36 feet above the water, shown from a tower with the bottom painted gray and the upper part white connected to the shore by a bridge; a fog signal is at the light. The light has two white sectors which cover two approaches to Fisherman Island Passage; the eastern from 256° to 263°, and the southwestern from 027° to 049°.

The Hypocrites is a long ledge with two low bare rocks eastward of Fisherman Island. A buoy marks the north end, and a daybeacon is at the south end. There is an unmarked channel between The Hypocrites and the ledges which extend 500 yards eastward of Fisherman Island. The southerly part of The Hypocrites was formerly known as **Smedrick Ledge.**

The Cuckolds are two bare islets off **Cape Newagen,** the southern extremity of Southport Island, on the west side of the entrance to Booth Bay. The westerly islet is 12 feet high and the easterly 10 feet high. The easterly islet is marked by **The Cuckolds Light** (43°46.8′N., 69°39.0′W.), 59 feet above the water, shown from a 48-foot white octagonal tower on a dwelling; a fog signal and a marker radiobeacon are at the light. When approaching The Cuckolds, the easterly islet is more prominent and appears to be the larger and higher of the two.

Cape Harbor, between Cape Island and Cape Newagen, accommodates small craft; yachts and fishermen use it mostly. **Cape Island** is wooded in the center. **Newagen** is a village on the harbor. There are two entrances to the harbor. The easterly one, leading between **The Ark** and Cape Newagen, reported to have a depth of 3 feet, is used by fishermen in good weather, but should not be attempted by strangers without local knowledge.

The main entrance from the westward, between Hunting Island Daybeacon and the shore, has a depth of about 10 feet. Pass north of Hunting Island Daybeacon because the passage between **Hunting Island** and Cape Island is foul.

Depths in the harbor are from 6 to 16 feet. There are a town wharf and float landing with 2 feet alongside, and a service pier with gasoline available that has 3 to 6 feet alongside. There is a large summer inn in the village, and there are also many summer homes. The inn also maintains a float landing to which water is piped in summer on the southwest side of the harbor.

Squirrel Island, in the middle of Booth Bay, is an important summer resort. It is wooded and has many large homes. Water pipelines, submarine power cables, and telephone cables extend to the north end of the island from the southern tip of Spruce Point. The ferry from Boothbay Harbor lands passengers, mail, and freight at a float in the northerly of the two coves on the west side of the island. A ledge extending northwestward from the island is marked by a lighted buoy.

Squirrel Cove, the southerly of the two coves on the west side, is sometimes used as an anchorage by small craft. A float landing in the cove has 8 to 10 feet alongside. A daybeacon marks the ledge at the south side of the entrance.

Linekin Bay,the northeasterly arm of Booth Bay, is northeastward of Squirrel Island and between Linekin Neck and Spruce Point. The principal dangers are buoyed. Good anchorage can be found, the depths being 40 to 75 feet in the lower part of the bay and 30 to 36 feet in the upper portion. There are several private float landings.

Spruce Point Ledges, awash at low water, are in the middle of the entrance; they are marked by two buoys at the south and north ends. The better and deeper entrance is between the southern buoy and **Negro Island.**

In the narrow channel between the northern buoy and Spruce Point, give the point a berth of over 150 yards. A **028°** course with the southeast point of Squirrel Island astern will lead through the southern channel, thence **024°** to the head of the bay.

Ocean Point, the point and village at the southern entrance to Linekin Bay, is marked by many summer homes and hotels. A depth of 3 feet is reported 275 yards westward of the point. A public wharf and float landing with 10 feet reported alongside is maintained in **Card Cove,** 700 yards north of the point. A ledge, which partially uncovers at low water, extends about 150 yards from shore just southward of the wharf; mariners are advised to use caution when approaching the wharf.

South and southwest of Ocean Point, **Card Ledge, Dictator Ledge,** and **Gangway Ledge,** the main dangers in Fisherman Island Passage, are buoyed. Passage through the area between the buoys and Ocean Point should not be attempted because of the numerous dangers with little water over them. Broken bottom extends southwestward of Dictator Ledge to **Wylie Rock.**

The principal dangers in Linekin Bay above Spruce Point Ledges, from south to north, include: **Tibbits Ledge,** covered 8 feet and marked on its southwestern side by a buoy; **Cabbage Island,** wooded and with a house in the center; **Holbrook Ledge,** which uncovers 3 feet and is marked on its west side by a buoy; a rock covered 12 feet 200 yards westward of the south end of Holbrook Ledge; **Seal Rock,** awash at low water and marked off the southeast side by a buoy; a depth of 19 feet about 150 yards east of the buoy; a rock awash at low water reported 120 yards northward of Seal Rock, which several boats have reported striking; and a ledge on the east side surrounding **Perch Island** marked by a buoy at the southwest end.

Fish Hawk Islet, about 0.4 mile northward of Seal Rock, has several trees and a ledge which uncovers about 4 feet extends southward of it. The narrow unmarked channel westward of Seal Rock should be used with caution. There are numerous unmarked rocks at the head of the bay. **Spruce Point,** the north entrance point to Linekin Bay, is wooded.

East of Tibbits Ledge is a yacht yard which builds craft up to 55 feet in length and manufactures marine hardware. The yard has a marine railway and a machine shop but does not solicit repair work. There is a depth of 7 feet at its float landing; the yard maintains guest moorings.

Capitol Island (43°49.4′N., 69°39.0′W.), on the west side of Booth Bay, is connected at its northern end by a footbridge to Southport Island. There is a private float landing at the bridge. Capitol Island, a summer colony, is on the island. Daybeacons mark the ledges off the south and east side of the island.

Pig Cove, between the island and Southport Island, has anchorage in 11 to 63 feet for three-fourths of its length, but is shoal and foul at its northern end above the narrows. Fish wharves, a lobster pound, and a number of private float landings are in the cove. There are no facilities.

Charts 13296 (230), 13294 (314-SC).-Boothbay Harbor, the western arm of Booth Bay, is one of the best anchorages on the Maine coast. The harbor is spacious and well sheltered, and has good holding ground. The town of **Boothbay Harbor,** at the head of the harbor, is an important summer resort and yachting center, with a hospital, hotels, and motels. Fishing, boatbuilding, and summer tourists are its main industries. A number of excursion, sightseeing, charter, and party fishing boats operate from the harbor to the outlying islands and surrounding waters in the summer.

Prominent features.-Burnt Island, partly wooded, is marked on the southeast side by **Burnt Island Light**(43°49.5′N., 69°38.5′W.), 61 feet above

the water, shown from a white conical tower with covered way to a dwelling; a fog signal is at the light. White sectors in the light from 307° to 316° cover the fairway in the approach eastward of Squirrel Island from Fisherman Island Passage, and from 355° to 008°, the approach westward of the island from the south and westward.

Mouse Island, northward of Burnt Island, is wooded; it has a private float landing on the north side with a depth of about 12 feet, and a pier and float landing on the east side. A flagstaff on the east side of the island and several homes are prominent.

The tower and buildings of the National Marine Fisheries Service fish hatchery and laboratory on **McKnown Point** and the footbridge across the head of the harbor are conspicuous.

Boundary lines of inland waters.-The line established for the waters off the entrance to Booth Bay are described in **82.5,** Chapter 2.

Channels.-Two deep natural channels lead into the harbor. The easterly and widest leads between Spruce Point on the east, and Squirrel, Burnt, and Mouse Islands on the west. The westerly one leads between those islands and Southport Island on the west, but is narrow in places. Most of the dangers are marked and have been described. The chart and the aids if carefully followed should be sufficient guidance for strangers to enter at any time.

Anchorage can be found in 24 to 42 feet for large vessels in the outer harbor northward of Tumbler Island and off McKown Point. The inner harbor has depths of 7 to 24 feet. The anchorage most used by small craft is on the northwest side of the inner harbor, northeastward of McFarland Island, where there are general depths of 10 to 12 feet, when clear of the ledge around the island.

Most craft anchor off the wharves, but there are numerous private moorings, guest moorings maintained by the yacht club, and those for hire by the various service facilities. However, it is sometimes difficult to secure adequate swinging room.

Dangers.-The approaches to the harbor are generally deep and clear with most of the dangers marked. **Tumbler Island Ledge,** off the west side of Spruce Point, covered 9 feet, is marked on its west side by a buoy. A lighted buoy, about 225 yards west-northwestward of **Tumbler Island,** marks the ledges extending westward and northwestward of the island. The wooded island has a house and a prominent flagpole on it, and a pier with float landing extending from its northeastern end.

The passage between Tumbler Island and Spruce Point should not be attempted by strangers as it is shoal and foul; strangers should not anchor there.

Clam Rock, about 700 yards northeastward of Tumbler Island, close to shore, is unmarked, as are 10- and 12-foot rocky ledges, 250 yards southwestward, and 150 yards westward, respectively, of the rock. A 14-foot rocky ledge, about 300 yards southwestward of McFarland Island is unmarked, but the ledges surrounding the island are marked on the south and east sides by buoys. In the inner harbor, a ledge extending from the eastern shore is marked by a buoy.

Caution.-In summer the inner harbor is nearly filled with all types of fishing and pleasure craft. At night, many of these are often unlighted, and great care should be exercised in approaching the anchorage to avoid fouling them or any of the numerous unoccupied moorings, which also are often unlighted. The footbridge across the head of the harbor has a small drawspan with a clearance of 4 feet.

Tides and currents.-The mean range of tide is 8.8 feet. Tidal currents have little velocity in the harbor.

Ice.-In severe winters, ice occasionally obstructs navigation above Tumbler Island during February and March. In normal winters the harbor is free of ice to the footbridge.

Storm warnings signals are displayed; see chart.

Pilotage is not compulsory, but pilots are available to take strangers through restricted or difficult passages such as the inside passage through Townsend Gut and Sasanoa River to the Kennebec River. A pilot for the area resides in West Southport. The pilot operates a 1,200 horsepower tug/pilot boat, the "ALICE M. WINSLOW", which is based at Boothbay Harbor. Advance notice of at least 24 hours is desirable for pilot and tug service. Arrangements for such services should be made through ships' agents or by calling the pilot by radiotelephone through the Boston marine operator; telephone, Boothbay Harbor 207-633-5307. The tug monitors 2182 kHz when working ships.

Bath is a **customs port of entry, Immigration** officials are stationed in Portland, and **quarantine** officials in Bath; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

The U.S. Public Health Service maintains a **contract physician's office** in town; see Appendix for address.

A Coast Guard station is on McKown Point.

Harbor regulations and moorings in the harbor are under the supervision of the **harbormaster,** who can be reached through the town office or any of the service facilities along the waterfront. A **speed limit** of 5 knots in the harbor is enforced.

Wharves.-There are service wharves and marinas, almost all with float landings, which have reported depths of 4 to 15 feet alongside. The town float landing with a reported depth of 6 feet alongside is at the draw of the swing footbridge at the northeastern end of the harbor. Piers and buildings of several seafood processing plants are along the easterly shore of the harbor.

The Boothbay Harbor Yacht Club operates from float landings on the south shore of the village of West Boothbay Harbor, northward of McKown

Point; depths of 12 feet are reported alongside the landings. The club maintains several guest moorings.

Small-craft facilities.-There are excellent shipbulding, boatbuilding, and small-craft repair facilities along the entire town waterfront in the eastern part of the harbor. Berthing, electricity, gasoline, diesel fuel, water, ice, provisions, marine supplies, storage facilities, and launching ramps are available at the various yards and marinas. Most of the facilities maintain guest moorings. The largest of several marine railways can handle craft up to 140 feet in length; lifts up to 70 tons are also available. Hull, engine, electrical, and electronic repairs can be made. Almost any service required by cruising craft is available in town.

Communications.-Bus and taxi service are available. Ferry service to the islands is maintained throughout the year.

The Inside Passage from Boothbay Harbor to Bath is about 11 miles long and leads between the islands located between Boothbay Harbor and Kennebec River. The protected route is used by excursion boats, yachts, and fishing boats.

The aids are colored and numbered for passage westward. In the vicinity of Cameron Point Light, on the north end of Southport Island, is one of the most difficult places to make in the thorofare; craft entering from the westward at this point should be careful to pass southward of the buoy marking the ledge extending southward from Indiantown Island.

The channel is very narrow in places, has strong tidal currents, and is much obstructed by rocks and shoals. Though most dangers are marked, strangers drawing 7 feet or more should not attempt it at low water. The passage leads through Townsend Gut, across Sheepscot River, and through Goose Rock Passage and Knubble Bay into Sasanoa River.

Goose Rock Passage is marked by a directional light. About midway through Sasanoa River the channel crosses the southern part of Hockomock Bay and then continues through Sasanoa River, coming out in the Kennebec River opposite the city of Bath. In 1958 the least depth in Sasanoa River was 7 feet at the southern end of **Hanson Bay** and near the northern entrance to the river. In the spring logs and driftwood may be present.

Two highway bridges cross the thorofare. State Route 27 highway bridge at Townsend Gut has a swing span with a clearance of 10 feet; drawbridge regulations and opening signals are given in **117.5**, Chapter 2. State Route 127 highway bridge over Sasanoa River near its junction with Kennebec River has a fixed span with a clearance of 51 feet.

Routes.-This passage is narrow and crooked, has strong tidal currents, and requires local knowledge to carry the best water. Strangers on larger vessels or yachts should pick up a pilot at Boothbay Harbor or Bath. With the aid of chart 13296 (230), strangers in small craft drawing 7 feet or less should be able to go through. The best time is on a rising tide. The channel is well marked but careful navigation is required.

Caution.-At strength of current in the narrow places the buoys are often run under for short periods.

The thorofare is usually closed by ice for about 2 months but in mild winters it has been known to remain open all winter. Several summer resorts and other landings are along the route.

Townsend Gut is a narrow, crooked thorofare connecting Boothbay Harbor with Sheepscot River. There are unmarked rocks with little depth close to the channel. A rock, covered 5 feet, is about 75 yards southeastward of the drawbridge. This rock can be cleared by keeping lined up with the draw, but avoid being set to the eastward while waiting for the draw to open.

Deckers Cove, on the east side of Townsend Gut about 0.4 mile above the southern entrance, is crossed by State Route 27 highway bridge which has a 15-foot fixed span with a clearance of 7 feet. East of the north end of the bridge is a former fish wharf with a depth of 17 feet alongside, at which large yachts are moored for winter storage. There are several boatsheds and float landings in the cove.

Southport is a village and summer resort on the west side of the gut near the western end. There are numerous float landings on both sides.

Hodgdon Cove, on the northeast side of the Gut opposite Southport, is shoal and foul at the head and around the edges with numerous sunken rocks, but affords good sheltered anchorage in from 12 to 27 feet, mud bottom, in the middle of the outer part of the cove.

Cameron Point Light (43°51.1'N., 69°40.1'W.), 21 feet above the water, shown from a white skeleton tower with a small white house, marks the ledge extending northward from **Cameron Point**, the northern extremity of Southport Island. The south end of the drying ledge extending southward from **Indiantown Island** is marked by a buoy.

Isle of Springs is a summer resort at the north end of Townsend Gut. The island is wooded and has an elevated tank at its summit. The ledge extending off the north end of the island is marked by a daybeacon. There is a wharf with float landing, with 10 feet alongside, on the northeastern side of the island from which, in summer, a private motorboat ferry runs to the southwest end of Sawyer Island.

Sawyer Island, northward of Isle of Springs, is connected to the mainland by a highway bridge at its southeast corner which has a fixed span with a clearance of about 2 feet. The current is strong in this locality. It is also connected at the northeast end to the south end of Hodgdon Island by a fixed highway bridge which has a 35-foot fixed span with a clearance of about 6 feet.

Goose Rock Passage leads from Sheepscot River into Sasanoa River northward of MacMahan Island, and forms a part of the inside route. It has ample depth, but is narrow in places; principal dangers are marked.

At the western end of the passage, **Goose Rock Passage Light** (43°50.9'N., 69°43.3'W.), 16 feet above the water and shown from a white triangular tower on a caisson, marks the best water through the passage and into Knubble Bay. **MacMahan Island Ledge,** a drying reef off **Northeastern Point on MacMahan Island,** is marked by a daybeacon. **Six-foot Rock,** off the northwest corner of the island, is marked by a buoy on its north side.

Boiler Rock, covered 3 feet and marked by a buoy on its southeast side, is at the western end of the passage. This buoy is reported to tow under during the strength of the current. **Goose Rock,** a bare rock on a ledge which uncovers and gives the passage its name, is about 150 yards northwestward of Boiler Rock. An intensified beam in Goose Rock Passage Light on the bearing **247°** marks the best water past these dangers. Another intensified beam in the light on the bearing **165°** leads from the western end of the passage into Knubble Bay and Sasanoa River.

Little Sheepscot River is a narrow passage westward of MacMahan Island leading from Sheepscot River into Sasanoa River. The channel is narrow, being less than 50 yards wide at its narrowest part. The best entrance from the southward is west of **Turnip Island.** Craft of more than 4-foot draft should avoid passing through the channel between Turnip Island and the southern end of MacMahan Island at low water.

Little Sheepscot River is marked by a buoy about midway through the passage, west of **MacMahan Ledge.** Another buoy at the northern end, marking Six-foot Rock, should be passed well to westward when entering Goose Rock Passage from Little Sheepscot River. There is an unmarked drying ledge, with two rocks which uncover 4 feet, on the west side of the channel, about 200 yards southwestward of the buoy marking MacMahan Ledge. Two float landings are on MacMahan Island eastward of it.

MacMahan is a summer resort on the west side of MacMahan Island.

Sasanoa River, part of the Inside Passage from Booth Bay to Bath, is an estuary leading from Sheepscot River to Kennebec River, north of Georgetown and Arrowsic Islands. It has numerous coves and bays, none of which are of commercial importance, making off northward and southward. The general trend of this river is northwest and southeast.

The principal coves and bays making southward are **Robinhood Cove, Riggs Cove,** and **Hall Bay.** Northward are **Heal Cove** and **Hockomock Bay. Montsweag Bay** and **Brookings Bay** lead northward from Hockomock Bay. Montsweag Bay separates Westport Island from the mainland and joins the Sheepscot River at Wiscasset through Back River.

Knubble Bay is the broadest part of the river after passing Robinhood Cove and the **Knubble,** before entering Hockomock Bay when coming from eastward.

Lower Hell Gate is the crooked passage from Knubble Bay into Hockomock Bay. **Upper Hell Gate** is about 2 miles from the western entrance to the river. This, the narrowest part, is only about 60 yards wide.

Halftide Ledge, about 400 yards southeastward of Upper Hell Gate, is marked by a daybeacon. In 1958, shoaling to 4 feet was reported about 50 yards south of the daybeacon. A rock awash at low water was also reported on the southern side of the channel about 150 yards 190° from the daybeacon. Extreme caution should be exercised in this area.

Tides and currents in Sasanoa River.-The mean range of tide is 8.8 feet at Robinhood and Mill Point, and 7.0 feet at Upper Hell Gate The velocity of the tidal current at strength is 1.8 knots off Lowe Point; 3.0 knots on the flood and 3.5 knots on the ebb at Lower Hell Gate; and about 1.0 knot at Upper Hell Gate. Velocities up to 9.0 knots have been observed in the vicinity of **The Boilers** at Lower Hell Gate causing dangerous eddies and whirlpools; navigation through this area should be attempted only at or near slack water. The current floods to the northward and ebbs southward generally. For predictions, see the Tidal Current Tables. It has been reported that the ebb current sometimes runs for 8 or 9 hours at Upper Hell Gate.

Robinhood is a village on the western side of the entrance to Robinhood Cove. There is a marina and yacht yard with a wharf and floats on the south side of Riggs Cove at the village. The yard has a 40-ton mobile lift and a 5-ton hoist, and can make hull, engine, electrical, and electronic repairs. Gasoline, diesel fuel, water, ice, berthing, marine supplies, and storage facilities are available. Depths of about 10 feet are reported alongside the wharf and floats.

There is good anchorage in 20 to 70 feet, blue clay bottom, northeastward of the wharf. The harbor is reported to be free of ice.

Charts 13296 (230), 13293 (314), 13294 (314-SC).-Back River, which also connects Sheepscot River to Kennebec River, crosses Sasanoa River at Hockomock Bay. This river has a general north-south direction. South of Hockomock Bay the river separates **Arrowsic Island** and **Georgetown Island,** is unmarked, and is crossed by a fixed highway bridge with a clearance of 8 feet. The river shoals between the bridge and Hockomock Bay.

North of Hockomock Bay an unmarked channel leads through Montsweag Bay, the upper part of the river, and Cowseagan Narrows, separating Westport Island from the mainland, and joins Sheepscot River just below Wiscasset.

It is reported that the incoming tide up Montsweag Bay meets the tide of Back River in the vicinity of **Young Point** (43°56.3'N., 69°42.6'W.).

Currents are strong and erratic through the river, and the ledges and shoals in **Cowseagan Narrows,** 1.6 miles south of Wiscasset, make the channel quite narrow at this point. A highway bridge and causeway crossing the narrows has a fixed span with a channel opening of only 20 feet at low water and a vertical clearance of 9 feet at high water.

Caution.-The narrow opening in the causeway has constricted the flow of the river and created a fall of as much as 2 to 3 feet, reducing the vertical clearance through the bridge a like amount. It has also been reported to have affected the tidal flow and created added turbulence as far south as Lower Hell Gate and west to Upper Hell Gate in Sasanoa River. Passage through the narrows should not be attempted without local knowledge, and then only by small boats at slack water.

Westport Island is 9 miles long, about 1.7 miles wide, and wooded. It has little commercial importance. There are a number of summer homes and camps on the island. A general store is on the main road about 1.5 miles south of the bridge across Cowseagan Narrows. Gasoline, provisions, and some supplies can be obtained there.

Old ferry landing ramps remain on both sides of Back River about a mile south of the bridge.

Charts 13293 (314), 13294 (314-SC).-Sheepscot River is the approach to several small villages in the lower end and to the city of Wiscasset, 14 miles above the entrance. The entrance is about 5 miles northeastward of Seguin Island, between The Cuckolds and Griffith Head (43°47.O'N., 69°43.4'W.).

Channels.-The channel in Sheepscot River is deep, and the principal dangers are marked. It is a region of rocks and ledges, many of them rising abruptly from deep water. The channel has a depth of over 30 feet to Wiscasset and is navigable for small craft at high water for about 4 miles above Wiscasset to the village of Sheepscot.

Large tankers drawing up to 31 feet occasionally carry oil to the powerplant on **Birch Point,** 0.6 mile below Wiscasset. There is a 25-foot shoal in midchannel in the bend below Wiscasset, about 270 yards south-southwestward of the tower of old **Fort Edgecomb** on the southwestern end of **Davis Island.**

Anchorages.-Ebenecook Harbor is the first anchorage available for vessels drawing up to 20 feet entering the river. Above **Stover Ledge,** anchorage can be had in the channel, the depths being usually 72 feet or less. **Colby Cove,** in the west bank about 2.2 miles above Cross River, affords anchorage in 48 to 60 feet; Merrill Ledge Daybeacon is northeastward of the anchorage. The anchorage at Wiscasset is below the bridge near the town wharves in 28 to 50 feet.

A special anchorage for small craft is off the town landing at Wiscasset; see **110.1 and 110.2,** Chapter 2, for limits and regulations.

Dangers.-There are several unmarked rocky areas with depths of 20 to 30 feet near the middle of the river southward of Bull Ledge. The river should be navigated with extreme caution. With the aid of the chart and by following the aids, little trouble should be experienced in reaching Wiscasset. Detailed information on the dangers in Sheepscot River is given with the description of the river.

Pilotage is not compulsory, but a pilot is available at West Southport. He will meet vessels at Mile Ledge Lighted Bell Buoy 20ML, off Seguin Light, or at Sheepscot River Entrance Lighted Bell Buoy 2SR off the entrance to the river, as requested. See Pilotage, Boothbay Harbor, for additional information concerning arrangements for pilot and tug services, and communications.

Tides and currents.-The mean range of tide varies from about 8.9 feet at the entrance to 9.4 feet at Wiscasset.

The tidal currents in the river generally set in the direction of the channel and have considerable velocity in the narrow parts. At the entrance of Cross River the flood sets onto **Quarry Point.** The ebb sets onto **Clough Point.** On the falling tide a strong set to westward is felt near Bull Ledge, and a strong set to the eastward near Middle Ledge. These sets are not noticeable on a rising tide. There is a strong ebb current near the entrance to Cross River. Off Barter Island the tidal current has an average velocity at strength of about 1 knot. See Tidal Current Tables for predictions.

Ice usually does not interfere with navigation below Wiscasset. The river above Wiscasset is usually closed in winter.

Customs and **immigration** officials are stationed in Portland, and **quarantine** officials in Bath; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Wharves.-The only deepwater wharf on the river is at the powerplant at Wiscasset. Wharves for small craft are at the small ports along the river, and information on them is given in the description of the river.

The Cuckolds Light and Cape Harbor, on the east side at the entrance, were described previously. Rocks, bare and covered, extend 0.5 mile westward of the point in this vicinity.

Chart 13295 (238).-Tom Rock, 2.4 miles northeastward of Seguin Island Light (43°42.5'N., 69°45.5'W.), awash at low water and marked by a buoy on the southwest side, is the outermost danger in the entrance to Sheepscot River.

The Sisters, 0.5 mile northward of Tom Rock and 1.5 miles from the northwestern shore at the en-

trance to Sheepscot River, are a number of small, bare rocks on an extensive ledge area. A buoy is 0.2 mile northwestward of the ledges.

The Black Rocks, 1 mile from the northwestern side of the entrance to Sheepscot Bay, are three groups of bare and covered rocks and ledges that extend over a distance of about 0.7 mile. The highest bare rock in the middle of the group is 15 feet high. The southern part of the ledge is reported to uncover just after the start of the ebb and should be given a wide berth. The islet on the northern group is 10 feet high.

The channel between The Black Rocks and the buoy marking **Sloop Ledge,** 0.4 mile northwestward, which is covered 5 feet, should be used with caution. The area between the buoy and the northern shore is very broken and should not be crossed because of **Little River Ledges,** which are awash in places.

Griffith Head, white and rocky, is on the west side of the entrance to Sheepscot River, about 5 miles northward of Seguin Island Light. **Outer Head,** a bare rocky islet, is 200 yards eastward. A buoy, 0.4 mile east of the islet, marks **Griffith Head Ledge,** which is covered 4 feet. Unmarked shoals, cleared to 35 and 25 feet, are on the western side of the main channel 0.8 mile and 1.3 miles northward of Griffith Head Ledge, respectively.

Griffith Head and a considerable amount of the surrounding area are included in **Reid State Park,** a public picnic area, open in the summer. There are swimming beaches, bath houses, showers, restrooms, and a snack bar. There are no landings. A dam and highway bridge crosses the mouth of the creek at the head of the cove on the north side of the head. The cove is foul.

Lower Mark Island, on the eastern side just inside the entrance to Sheepscot Bay, is 12 feet high, wooded, and is a good landmark. A ledge which uncovers 4 feet extends 400 yards eastward of the island. Broken ground with 19- and 23-foot spots extends about 0.6 mile northwestward of the island. The 23-foot spot is marked by a gong buoy. Unmarked **Cranberry Ledge,** covered 10 feet, is 0.4 mile southeastward of Lower Mark Island.

Cat Ledges and **Dry Ledge** are a group of islets and ledges extending 0.5 to 1 mile northward of Lower Mark Island. Dry Ledge, the northwesterly end, is 4 feet high, and the southeasterly end of Cat Ledges uncovers 3 feet. The coves in Southport Island eastward of these ledges are foul and of no importance.

Harmon Harbor is a long, narrow cove making northward on the western side of the river about 1.5 miles above Griffith Head. It has good anchorage, except during southerly gales, in 24 to 36 feet, but has a very narrow entrance between a bare ledge near the west shore and a dangerous reef, awash at low water, extending 275 yards southwestward from **Wood Island,** on the eastern side of the entrance, south of **Dry Point.** A buoy marks the southwest end of the reef. There are no public landings in the harbor. There is a prominent hotel on the west side near the middle of the harbor, and a small settlement at the head.

Five Islands Harbor, a narrow passage between Five Islands and the western shore, forms a secure harbor for small craft, with depths of 18 to 30 feet. The main entrance is northward of **Malden Island,** the largest wooded island, which is 30 feet high. A colony of summer homes is on the island, and a private float landing is on its northwestern side. Malden Island is connected to the island close westward of it by a bridge. In the middle of the entrance is a rock covered 11 feet and marked by a buoy. In entering, craft can pass the buoy close-to on either side, but the best water is reported to be on the north side.

Boats also can enter the harbor from the northwestward, following the western shore and passing inside of all islands and shoals. **Crow Island Ledge,** extending west from Crow Island at the northern entrance, is marked by a daybeacon. Northwestward of the daybeacon, an unmarked ledge makes out from the Georgetown Island shore. Care should be taken to avoid it by favoring the Crow Island side of the channel slightly and passing close westward of the daybeacon. The southern entrance, nearly blocked by rocks and ledges that uncover about 4 feet, should not be used without local knowledge. There is also a clear channel from the eastward south of Malden Island.

Five Islands is a village on Georgetown Island on the western side of the harbor. There are several float landings. The main wharf has 12 feet at the head and 2 to 4 feet at the float. Gasoline is available at the float. The town landing, close adjacent to the southward, has 12 feet alongside. Provisions and some supplies can be obtained at a store at the landings, and there is a snack bar.

Gotts Cove, close northwestward of Five Islands Harbor, has two float landings at a boatyard that has a marine railway capable of hauling out for winter open and covered storage, craft up to 35 feet in length. Gasoline is available at one of the floats. There is a private boatshed in the cove. Boat storage, slips, and moorings are available.

Cozy Harbor is a cove on the eastern side of Sheepscot River. The entrance is 0.4 mile southeastward of **Hendricks Head Light** (43°49.4′N., 69°41.4′W.), 43 feet above the water, shown from a 39-foot white square tower on the head.

The harbor is frequented by local pleasure and fishing craft, and in summer by many cruising yachts. The narrow entrance channel, marked by two daybeacons and a buoy, has depths of 15 to 8 feet. The harbor, though small, is secure with depths of 3 to 8 feet in the anchorage.

The Southport Yacht Club in the harbor has 4 feet alongside its float landing; moorings are maintained. A service wharf adjacent to the club land-

ing, with 2 feet alongside its float landing, has gasoline and water.

A general store, restaurant, bowling alley, and telephone are on the wharf. Provisions, bottled gas, lobsters, and some marine supplies can be obtained. There is a ramp; parking and picnic areas are in the vicinity.

The village of **West Southport** is at the harbor. There are fish wharves and private landings in the harbor. A causeway and fixed bridge with a clearance of about 3 feet connects Southport Island with **Pratts Island** at the south end of the harbor.

Hendricks Harbor, shoal and foul, is on the east side of Hendricks Head. There are no landings in the harbor.

Chart 13296 (230) -About 6 miles of Sheepscot River is shown on this large-scale chart of the inside passage from Boothbay Harbor to Bath. Chart 13293 (314) also shows this section, but its scale is smaller; chart 13296 (230) should be used if going into Ebenecook Harbor or any of the channels except the main river.

Ebenecook Harbor, making into the northwest end of Southport Island, is an excellent anchorage for vessels up to 20-foot draft. Its entrance, about 1 mile above Hendricks Head on the eastern side of Sheepscot River, leads between Dogfish Head on the south and the Green Islands on the north. It is the first large anchorage available for craft entering the river. The entrance is narrow.

The southern part of the harbor divides into three arms, the outer sections of which afford good sheltered anchorage; the inner sections to the heads are shoal and foul, and should be avoided.

Maddock Cove, the westerly arm, has a large marina and yacht yard on its eastern shore. The yard has a wharf with float landings that have 8 feet alongside. Gasoline, diesel fuel, and water are available at the floats; ice, provisions, bottled gas, and some marine supplies are obtainable. Overnight berthing is permitted, and the yard maintains guest moorings.

The yard has a 20-ton mobile hoist that can haul out craft up to 45 feet in length for open or covered dry winter storage. General hull, engine, electric, and electronic repairs can be made, and the yard has machine, paint, and carpentry shops. There is a telephone on the wharf. A fish wharf, restaurant, and picnic and parking areas adjoin the yard. Anchorage can be had in midchannel off and to the northwestward of the marina in from 8 to 16 feet.

Pierce Cove, the middle arm, has several private float landings.

Love Cove, the eastern arm, has excellent anchorages in 8 to 12 feet in midchannel southward of the submarine power and telephone cables crossing the entrance to the cove to Little Island, the smaller of the two islands on the western side of the entrance to the cove. Three private float landings are on the cove, and a guest mooring is maintained by the pilot for the area, who resides on the east shore of the cove. The head of the cove is shoal and foul.

Routes.-Entering Ebenecook Harbor, vessels should give the eastern shore of Sheepscot River a berth of 300 yards for 1 mile north of Hendericks Head Light until up with **Dogfish Head,** which is rocky and grass covered with a low neck behind it. Pass in midchannel between Dogfish Head and the southern extremity of Green Islands, avoiding a 7-foot rock patch marked by a buoy inside the entrance. Small craft may choose anchorage in any of the coves in the southern part of the harbor or, if preferred, anchor in the northern part where desirable. A rocky unmarked ledge, covered 14 feet, is about in the middle of the harbor.

Extending northward from Ebenecook Harbor to Sawyer Island is a channel, affording good anchorage in places, which is used by small pleasure craft in summer. The channel is a part of the Inside Passage used by local vessels between Boothbay Harbor and Bath. Navigation of its northern part, as well as the passages between the islands and ledges on its western side, requires some local knowledge.

The principal islands and rocks are: wooded **Green Islands;** a rock which uncovers at low water 200 yards northeastward of them and marked by a buoy southeastward of it; a ledge, with an islet 5 feet high in its middle, between Green Islands and Boston Island; and a rock covered 6 feet 250 yards westward of the ledge.

Boston Island is high and partly wooded, and has two houses and a boat landing. **Spectacle Islands** are partly wooded. A ledge awash at low water is 150 yards westward of their southwest end.

Townsend Gut, Isle of Springs, and Sawyer Island, on the eastern side of Sheepscot River, and Little Sheepscot River and Goose Rock Passage on the western side were described previously under the Inside Passage.

Bull Ledge, 1 mile northward of Hendricks Head, uncovers at the north end at low water and is marked at the south end by a buoy.

Middle Mark Island, a small, round, bare islet 12 feet high, is in the middle of a ledge 0.3 mile long located 0.3 mile from the western shore and 1.5 miles above Hendricks Head. **Mark Island Ledge,** covered 7 feet, is 250 yards southwestward of the island. The main channel leads eastward of the island.

Middle Ledge, 600 yards eastward of the southern side of the entrance to Goose Rock Passage, is covered 8 feet, but less depth has been reported on this ledge. A buoy marks its northern side.

Clous Ledge, 0.2 mile eastward from wooded **Whittum Island,** at the entrance to Goose Rock Passage, uncovers about 4 feet and is marked by a

daybeacon on the middle of the ledge and a bell buoy off its northern end.

Powderhorn Island, 25 feet high and grassy, is on the eastern side of the river 2 miles above Hendricks Head. It is reported that a house on the island is conspicuous. **Powderhorn South Ledge,** which uncovers 6 feet, extends 0.3 mile southward from the island and is marked at its south end by a buoy. A narrow channel is between the buoy and the north end of **Harding Ledge,** covered 5 feet and marked at its south end by a buoy.

Powderhorn Ledge, covered 3 feet, is 200 to 350 yards northward of Powderhorn Island, and is marked on its northwestern edge by a lighted buoy.

Fourfoot Rock, on the west side of the channel about 0.2 mile northward of Clous Ledge Daybeacon, is marked on its southern side by a buoy.

Ram Island Ledge, which uncovers 5 feet in spots, is on the east side of the channel and extends 0.3 mile in a north-northeasterly direction from **Ram Islands** to the entrance to Back River. A ledge which uncovers 6 feet, marked by a daybeacon and a buoy at its north end, is eastward of Ram Island Ledge. These aids also are guides to the narrow channel leading northward from Ebenecook Harbor.

Upper Mark Island, about 0.5 mile northwestward of Ram Islands, is a low grassy islet 8 feet high from which a shoal extends 600 yards northward.

Jewett Cove and **Long Cove** are unimportant coves on the west side of Sheepscot River westward of the entrance to Back River.

Back River is a shallow, narrow, and unmarked stream between **Barters Island** and the mainland. Its southern entrance is on the eastern side of the Sheepscot about 3 miles northward of Hendricks Head; its northern entrance is from Cross River. Only small craft use it; local knowledge is required for its navigation. The entrance to Back River is marked by a buoy 300 yards westward of the southern end of Barters Island and a buoy 300 yards northeastward of Ram Island Ledge. Buoys and a daybeacon mark the critical points in the channel between Barters Island on the northerly side and Sawyer, Hodgdon, and Merrow Islands on the southerly side.

There are several private float landings on the south end of Barters Island, just inside the entrance. A drawbridge across the river between Hodgdon Island and the south end of Barters Island has a swing span with a channel width of 40 feet and a clearance of 6 feet; the channel is through the east draw. Drawbridge regulations are given in **117.6,** Chapter 2. An overhead power cable at the bridge has a clearance of 50 feet.

Trevett is a small village at the Hodgdon Island end of the drawbridge. It has a general store. A highway bridge with a 14-foot fixed span and a clearance of 3 feet connects Hodgdon Island with the mainland.

Merrow Island, Miles Island,Tibbet Island, and **Gooseberry Island,** all wooded, are on the eastern side of the channel in Back River. Merrow and Tibbet Islands are connected with the mainland by fixed bridges having small clearances. There is no traffic through them as the water is shoal and foul.

Tarbox Landing is a small settlement just north of **Tarbox Cove** on the west side of the Sheepscot River. **Hodgdon Ledge,** 250 yards eastward of Tarbox Cove, uncovers 5 feet and is marked on the southeast end by a buoy.

Stover Ledge, on the east side of the river about 1 mile northward of the southern end of Barters Island, uncovers 5 feet and is marked by a buoy off its southwestern edge.

A 195°45′-015°45′ measured nautical mile is off the west side of Barters Island, about 1 and 2 miles, respectively, from the northern end of the island. Shore ranges on Barters Island mark the ends of the course.

Greenleaf Ledge, on the west side of Sheepscot River just south of the entrance to Cross River, uncovers 5 feet and is marked by a buoy. Unmarked shoals are in the bight in the western shore westward of the ledge.

Charts 13293 (314), 13294 (314-SC).-Cross River empties into the east side of Sheepscot River about 6 miles above Hendricks Head. Its entrance is marked by a lighted buoy. It has a deep channel for over 1 mile to Oven Mouth where the river is confined to a narrow channel between high cliffs.

Cross River southeast of **Oven Mouth** requires local knowledge to navigate. Burleigh Hill Yacht Club, a boys' camp on the east side of Cross River about 1 mile above Oven Mouth, has a float landing with 10 feet alongside. There are no facilities.

Merrill Ledge, on the east side of Sheepscot River 2.4 miles above the entrance to Cross River, uncovers about 4 feet in the middle. The south end is marked by a daybeacon, and a lighted buoy is on the west side. The channel leads westward of it.

An unmarked rock, covered 13 feet, is about 500 yards southward of **Clough Point,** the north end of Westport Island. The rock is on the west side of the channel, a little eastward of a line connecting the buoy off Clough Point and the buoy just above **Hilton Point.**

There is an unmarked 25-foot shoal in midchannel in the bend at Clough Point, about 270 yards south-southwestward of the tower, or blockhouse, of old Fort Edgecomb, on the southwestern end of Davis Island. **Seal Rock,** 550 yards westward of Clough Point, uncovers 6 feet and is marked on the north by a buoy. During times of strong currents the buoy is reported to tow under.

Montsweag Bay and Back River form a thorofare from Sasanoa River and Hockomock Bay to Sheepscot River near Wiscasset. They have been previously described under the Inside Passage. The thorofare is reported to be extremely

hazardous due to the causeway and fixed bridge at Cowseagan Narrows, damming the waters and creating a fall at the bridge opening which is reported to limit the vertical clearances to less than 7 feet. Passage should not be attempted without local knowledge.

Wiscasset is a town on the west side of Sheepscot River 14 miles above the entrance. It is on U.S. Highway No. 1 and on a freight branch of the Maine Central Railroad.

The wharves are in ruins, and there is virtually no commerce by water. The hulks of the two four-masted schooners HESPER and LUTHER P. LITTLE rest on the bottom alongside the wharf ruins.

The town landing and Wiscasset Yacht Club, both with float landings reported to have 15 feet alongside, are at the south end of town below the wharf ruins. Water is available at the yacht club float. Overnight berthing is permitted at both landings, and the yacht club maintains a guest mooring. A small-craft launching ramp is between the two landings.

Gasoline and diesel fuel can be obtained by tank truck at the landing, and ice, provisions, and marine supplies are available in town.

An outboard engine repair shop is on a wharf at the west end of the bridge at Wiscasset; the wharf dries out at low water. Hull and engine repairs can be made at a boatyard on the southeast side of Davis Island, across the bridge from Wiscasset. The marine railway at the yard can handle craft up to 40 feet in length; winter storage is available.

Berthage with electricity and gasoline are available at the float landing of a marina and lodge on the east side of Sheepscot River, about 0.8 mile southward of Davis Island. A small-craft launching ramp is also available here.

Wiscasset has hotels, motels, and restaurants, and bus and taxi service.

The Whites Island Swmming Club with a float landing is about 200 yards southwest of the yacht club.

Anchorage in 25 to 30 feet in muddy bottom can be had south and southwestward of the landings. There are ample parking facilities and picnic areas in the vicinity. A special small-craft anchorage is at Wiscasset; see **110.1** and **110.2**, Chapter 2 for limits and regulations.

The Central Maine Power Company operates a large electric plant and a good pier with coal crane on **Birch Point**, 0.7 mile southwestward of the bridge at Wiscasset. The pier has reported depths of 31 to 33 feet alongside for a length of 750 feet, rock and mud bottom. Large tankers and occasionally a collier discharge at the pier. Vessels dock at high water slack without the assistance of tugs, and normally portside-to using the starboard anchor; fishing boats assist with the mooring lines. Fresh water is available at the pier.

The U.S. Route 1 highway bridge over Sheepscot River at Wiscasset has a swing span with a channel width of 40 feet and clearance of 10 feet. The Maine Central railroad bridge 1 mile above Wiscasset has a 40-foot bascule span with a clearance of 8 feet. Drawbridge regulations for both bridges are given in **117.5a**, Chapter 2.

The depth is reported to be about 10 feet for 4 miles above Wiscasset to rapids in the river. Boats of about 4-foot draft can go through the rapids at high-water slack and for about 3 miles above. **Sheepscot** is a village just above the rapids. A highway bridge crossing the river at Sheepscot has a 48-foot fixed span with a clearance of 10 feet. The channel is unmarked above Wiscasset, and local knowledge is required for its navigation.

Marsh River, a tributary, enters the Sheepscot River about 2 miles above Wiscasset. Small craft are reported to go up the river for 3 or 4 miles for salmon fishing. The Maine Central railroad bridge about 2 miles above the mouth has a 33-foot fixed span with a clearance of 22 feet.

Charts 13293 (314), 13294 (314-SC), 13295 (238), 13298 (288), 13298 (289).-Kennebec River.-The mouth of the Kennebec River is northward of Seguin Island and 20 miles eastward of the entrance of Portland Harbor. It is the approach to the cities of Bath, Augusta, Richmond, and Gardiner and smaller river towns. In 1970, waterborne commerce on the river consisted of barge traffic to the shipyard at Bath, and vessels undergoing repairs at the yard; beyond Bath, there was little commercial traffic.

With the aid of the charts, small craft should have no trouble reaching Augusta, the head of navigation on the Kennebec River. Vessels with a draft approaching the depth of the channel should employ a pilot. The channel above Bath is reported to be subject to considerable changes annually caused by freshets.

Prominent features.-Seguin Light (43°42.5'N., 69°45.5'W.), 180 feet above the water, shown from a 53-foot white cylindrical tower connected to a dwelling, is on the summit of 145-foot, grassy **Seguin Island**; a fog signal is at the light. This light is the most prominent mark in the vicinity.

Cape Small is the wooded point about 4 miles westward of the mouth of the river. The distinguishing marks are an elevated tank 1.4 miles northward from the end and visible from eastward or westward; **Bald Head**, a bare round knob on the west side of the point; and **Bald Head Ledge**, bare at half tide and marked by a daybeacon and a bell buoy.

A **danger zone** of a naval aircraft practice mining range is close southeastward of Cape Small and westward of Seguin Island; see **204.1a**, Chapter 2, for limits and regulations.

Fuller Rock Light (43°41.7'N., 69°50.1'W.), 33 feet above the water, is shown from a white skeleton tower with a red and white checkered diamond daymark on a low bare islet of the same name, about 0.3 mile southward of Cape Small.

Pond Island, about 30 feet high, is a grassy island on the west side of the entrance to Kennebec River. **Pond Island Light** (43°44.4'N., 69°46.2'W.), 52 feet above the water, is shown from a white tower on the summit of the island; a fog signal is at the light.

Fort Popham Memorial is an unfinished and abandoned fort, now a State historical landmark, on Hunnewell Point. **Fort Popham Light** (43°45.3'N., 69°47.0'W.), 27 feet above the water, is shown from a cylindrical iron stand on the parapet of the old fort. The light is most brilliant on the bearings 323° and 173° and diminishing in intensity around the remainder of the horizon.

Channels.-There are two approaches to the entrance. The eastern, east of Seguin Island, which leads between Whaleback Rock and Pond Island, is the main channel. The western, west of Seguin Island, leads between Pond Island Shoal gong buoy and the shoals eastward. The eastern channel has a depth of 29 feet on a small spot easily avoided, and the western a least found depth of 24 to 30 feet on the sailing lines. Both are used, but vessels drawing more than 18 feet usually enter by the eastern channel. The entrance has strong tidal currents, and if the wind is opposed to the current an ugly chop sea is encountered which is at times dangerous for small craft.

The Federal project for Kennebec River includes three dredged sections above Bath and provides for a channel 27 feet deep from the mouth to a point about 0.6 mile above the bridge at Bath; thence 17 feet to Gardiner, and thence 11 feet to Augusta. In 1968, the controlling depth to the bridge at Bath was 20 feet (25 feet at midchannel); thence in 1961, 13 feet to Gardiner; thence in 1963, 5½ feet to Augusta.

Anchorages.-The holding ground is poor at the entrance below Fort Popham; vessels should not anchor here unless forced to do so. If obliged to anchor when inside Pond Island, it is advisable to come to with a long scope of chain in the channel abreast the wharf in ruins just above the Coast Guard station. If the wind is not blowing too strong, a moderate-sized vessel may ride here if care is taken to keep the anchor clear. Strong tidal currents will be experienced.

Anchorage can be had on the eastern side of the channel southward of Kennebec River Buoy 12, in 36 to 48 feet. On the eastern edge of the channel at the anchorage the depths shoal abruptly from 30 feet to a few feet. Drift ice coming down the river generally follows the western shore.

The best anchorage and the one most frequently used is on the western side of the channel off Parker Flats, about 4 miles above the entrance, in 24 to 36 feet. Large vessels sometimes anchor on the eastern side of this area. Above Parker Flats, vessels anchor wherever they find good holding ground and suitable depth, keeping out of the strength of the current.

Regulations defining anchorage grounds at Bath are given in **110.131,** Chapter 2. Special small-vessel anchorage are at Randolph and Augusta; limits and regulations are given in **110.1, 110.3, and 110.4,** Chapter 2.

Dangers.-This is a region of rock and very broken ground; therefore, strangers should proceed with extreme caution and avoid crossing broken ground where the charted depths do not substantially exceed the draft.

The principal dangers in the river are marked, but the channel is narrow in places. The narrowest place below Bath is between North Sugarloaf and Popham Beach, where the deep channel is only about 100 yards wide. Some sections of the dredged channel between the south end of Swan Island and Augusta are not marked well enough to help strangers keep in them.

The entrance to Kennebec River is somewhat obstructed by an area of islands and rocks and very broken ground, extending for a distance of 4.5 miles. The most southerly known danger is **Seguin SSW Ledge,** covered 33 feet; it is 2.6 miles southwest of Seguin Island Light. It is marked by Seguin Island Whistle Buoy 18SI, which is about 0.4 mile northwestward of the 33-foot spot.

During freshets, pulp logs are sometimes washed over the dam above Augusta and present a serious navigational hazard, especially to small craft. Log booms are maintained at Brown Island and on the east side of the river below Shepard Point to facilitate recovery of the drifting logs. The booms are not lighted, but are outside the navigation channel.

The presence of deadheads, known locally as **tide walkers,** are a constant hazard in the river, especially to small craft. These water-logged boom logs, weighted at one end by parts of mooring chains, with one end down and the other end at the surface or just under, shift position with the tidal or river currents and are hard to detect, especially at night. A sharp lookout for them should be kept.

The dangers outside of Seguin Island are **Mile Ledge,** covered 20 feet and marked by Mile Ledge Lighted Bell Buoy 20 ML, and **Camel Ground,** 1 mile west-southwestward of Seguin Island Light, which has been cleared to 23 feet. Camel Ground is unmarked, and the sea breaks on it in heavy weather.

Westward of Seguin Island, **Buttonwold Ledges,** covered 11 feet, and **Bill Wallace Ground,** covered 19 feet, lie between Fuller Rock and Bald Head Ledge and are unmarked. **Halibut Rocks,** an extensive ledge covered 24 feet about 0.6 mile eastward of Fuller Rock, are unmarked. There are rocks and very broken ground in the vicinity of Cape Small.

Ellingwood Rock, 400 yards northward of the north end of Seguin Island, is a bare islet about 6 feet high.

Local magnetic disturbance.-Differences of as much as 8° from the normal variation have been observed in an area around Ellingwood Rock for approximately 1 mile in all directions.

Seguin Ledges, 0.5 mile northeastward of Ellingwood Rock, have a bare islet about 5 feet high and have covered ledges extending 300 yards northeastward and 400 yards southward from the bare islet, all unmarked.

White Ledge is an unmarked 11-foot spot 0.4 mile northward of Seguin Ledges.

Jackknife Ledge, covered 8 feet, is about 1.3 miles northwestward of Seguin Light and is marked on the east by a buoy.

Pond Island Shoal is the rocky shoal southward and southeastward of Pond Island. It has depths of from 5 to 21 feet over it, and in heavy gales is covered with breakers. A gong buoy 0.7 mile south-southeastward of Pond Island Light marks the southeastern end of the shoal. Vessels should not pass between this buoy and Pond Island. Small craft entering the river from the westward often cut across this shoal, but it is not advisable to do so in southerly weather when a heavy chop is built up by the ebb tidal current from the river; this often causes heavy breakers to form on it.

The dangers eastward of the entrance, including Tom Rock and The Sisters, were included in the description of Sheepscot River. The dangers in Kennebec River are included in the description of the river.

Tides and currents.-The mean range of tide is 8.4 feet at Fort Popham in the entrance, 6.4 feet at Bath, 5 feet at Gardiner, and 4.1 feet at Augusta; see the Tide Tables for predictions for these and other places on the river.

Tidal currents between the entrance and Bath have average velocities at strength of 2 to 3 knots. Ebb velocities up to 4 knots have been observed, and considerably larger velocities may be expected during freshets. Above Bath similar velocities are believed to occur, but no definite information is available. The direction of the current at the entrance is influenced by strong winds, especially easterly gales. Current predictions for a number of locations may be obtained from the Tidal Current Tables.

Caution.-It has been reported that the current flows out of the Sasanoa River at Preble Point into the Kennebec with a violent surge that is felt across the river at the shipyard enough to endanger vessels docking there. Extreme caution should also be exercised by vessels when approaching and lining up to pass upriver through the lift span of the bridge at Bath.

Freshets occur in March and April, and also after heavy rains in the fall, but are not dangerous to shipping unless accompanied by ice. A height of 9 feet above high water usually occurs several times a year at Augusta, but the height diminishes rapidly southward.

Ice usually closes the river above Bath from December to April. Steamers are rarely delayed by ice below Bath, as the channel is kept clear by ice breakers.

Pilotage is not compulsory, but strangers in deep-draft vessels should take a pilot to Bath, and all vessels proceeding above Bath should take one. Coastwise vessels bound for Bath seldom take a pilot, but if drawing over 7 feet and proceeding above Bath usually take one aboard just above the bridge at Bath. Pilots are available at West Southport for the entrance to Bath and at Hallowell for the river above Bath. Vessels desiring a pilot should make arrangements with their agents for the pilot to meet them at Mile Ledge Lighted Bell Buoy 20 ML, off Seguin Island, or off Pond Island at the entrance to the river.

Pilots can be contacted directly by radiotelephone through the Boston Marine Operator. For the entrance and lower river at Bath, phone: Boothbay Harbor 207-633-5307; and the upper river above Bath, phone: Augusta 207-623-9165.

Ships bound for the shipyard at Bath usually obtain the services of the yard's pilot. The pilot uses either the yard tug or a lobster boat as a pilot boat. The tug has a black hull and red superstructure, and monitors 2182 kHz when working ships. Arrangements for pilot, tug, and boarding place should be made in advance through the shipyard; phone 207-443-3311.

Towage.-There are no commercial tugs available at Bath, except for the shipyard tug, which primarily handles shipyard traffic. If desired, commercial tugs can be obtained from Boothbay Harbor, Belfast, or Portland; arrangements for this service should be made in advance through ships' agents.

Customs and **immigration** officials are stationed in Portland, and **quarantine** officials in Bath; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Bath is **customs port of entry.** The U.S. Public Health Service maintains a **contract physician's office** in town, see Appendix for address.

The Coast Guard **vessel documentation office** at Portland serves Bath; see Appendix for address.

Harbor regulations.-Regulations for the ports along the river are under control of the various harbormasters.

Wharves.-In 1970, there were no usable deep-water commercial wharves at Bath. Wharves along the river are included in the description of the river ports.

Supplies.-Limited supplies are available at Bath, including marine supplies, fuel, and provisions. Detailed information is given later in the text.

Repairs.-The large shipyard at Bath has no drydocking facilities. Repair facilities are available at the boatyard at Bath and the few marinas on the river. Detailed information on the facilities is given later in the text.

Communications.-Taxi and coastal bus services are available at all the river ports, and the Maine

Central Railroad serves the area with freight service.

The following description of the river from the entrance to Augusta affords a means of navigating the river by acquainting the stranger with its various features, anchorages, dangers, important aids to navigation, and the facilities at the river ports.

Chart 13295 (238).-Sprague River and **Morse River** (chart 13293 (314)), between Cape Small and the entrance of Kennebec River, are nearly bare at low water at their entrances, and seldom entered even by local boats. **Heron Islands** and **Fox Islands** are groups of wooded islands off the mouth of Morse River.

Wood Island, 0.3 mile westward of Pond Island, is high and wooded. The channel between Wood and Pond Islands should not be used by strangers.

Whaleback Rock, 8 feet high and bare, is on the eastern side of the entrance to the river and 0.6 mile eastward of Pond Island. A shoal extends about 100 yards southward from it. **Salter Island,** northward of Whaleback, is wooded. **Stage Island,** 0.5 mile northwestward, is also wooded.

Stage Island Bay, Sagadahoc Bay, and **Heal Eddy,** on the east side of Kennebec River at the entrance, are shoal inside, have no wharves, and are of little importance.

North Sugarloaf and **South Sugarloaf** are high, rounded, bare, and rocky islets in the middle of Kennebec River just inside the entrance. A ledge extends 100 yards southward from South Sugarloaf. **Jack Rock,** near the end of a ledge extending 200 yards northeastward from South Sugarloaf, is awash at low water and is marked by a daybeacon. A rock awash is about 125 yards southeastward of the daybeacon. A ledge extends 250 yards southeastward of North Sugarloaf. Another ledge, covered 18 feet and marked by a buoy, extends 200 yards northwestward from North Sugarloaf; the narrowest part of the channel between the entrance and Bath is westward of this ledge.

Popham Beach is a summer resort on the west side of Kennebec River just inside the entrance. An abandoned Coast Guard station is on the beach; its L-shaped wharf is located close westward of Fort Popham and has 9 feet alongside. In 1970, only scattered piling remained of an old wharf in the bight southwestward of the fort; and the long Government pier extending northward from **Sabino Head** was also in ruins.

Old Fort Popham is now a State park, and Popham Beach is believed to be the site of the first settlement in New England. The ship VIRGINIA was built here in 1608. There is a park service float landing with 2 feet alongside, a ramp west of the Coast Guard wharf, a store, and a restaurant.

Atkins Bay, a large bay west of **Hunnewell Point,** dries out for most of its length.

Bay Point is a village on the east side of Kennebec River entrance, opposite Fort Popham. A lobster wharf has 4 feet alongside. Gasoline and diesel fuel are available at the wharf. Another private wharf close southward is in ruins. Provisions and some supplies may be obtained in the village; water is available from nearby wells. Craft approaching the wharf should avoid getting too far northward, as a bar which bares at half tide extends nearly all the way across the entrance to Long Island Narrows from Gilbert Head.

Gilbert Head, the southern extremity of Long Island, is high and wooded except near the south end, where there is a large white house. The house is very conspicuous and a good mark in hazy weather when surface aids are obscured, or not readily discernible.

Shag Rock, on the eastern side of the channel, southeastward of Cox Head, is 3 feet high. It is marked by a lighted buoy about 75 yards west of it. The wreck of a schooner stranded on Long Island, eastward of Shag Rock, is visible.

Cox Head is about 140 feet high and wooded. **Todd Bay,** on the east side of Kennebec River northeastward of Cox Head, is almost bare at low water.

Dix Island, 0.2 mile northward of Cox Head, has a ledge that uncovers, extending northward of it. A buoy is northward of the ledge.

Perkins Island, on the east side of the main channel 3 miles above the entrance, is wooded on the north end and bare on the south end. **Perkins Island Light** (43°47.2′N., 69°47.1′W.), 41 feet above the water, is shown from a white octagonal tower on the west side of island. A 5-foot shoal, about 350 yards westward of the light, is marked on its southeast side by a buoy. **Perkins Island Ledge,** covered 7 feet, is about 0.3 mile south-southwestward of the island; a buoy is about 200 yards southwestward of the ledge.

Parker Head is a village on the west side of the river westward of **Parker Head,** a prominent headland. The approach to the village is by a narrow channel, shoaling gradually from 3 feet to 1 foot. The channel is sometimes marked by bush stakes, and there are several old piling along its sides southeast of the former milldam. A buoy marks the easterly edge of shoal water extending about 0.6 mile north-northeastward of Parker Head.

Back River is a narrow, crooked, and unmarked thorofare connecting Kennebec River with Sasanoa River, Hockomock Bay, and Sheepscot River. It is described with the Inside Passage. **West Georgetown** is a village on the east side of Back River, just inside its southern entrance, which is marked by a buoy. A ledge extends about 350 yards southwestward of **Crow Islands,** which are in the middle of the entrance. A buoy is southwest of the ledge.

Seal Rocks, on the west side of the channel at the upper end of **Parker Flats,** is a ledge that uncovers 5 feet. A buoy is northeastward of a rock awash at the outer end of the ledge.

Phippsburg is a village on the west side of Kennebec River 5.5 miles above the entrance. A conspicuous white church spire in Phippsburg is a good leading mark for the reach from Bald Head to Squirrel Point.

Squirrel Point, the southwestern extremity of Arrowsic Island, is marked by **Squirrel Point Light** (43°49.0'N., 69°48.1'W.), 25 feet above the water and shown from a white octagonal tower; a fog signal is at the light.

Goat Island, 700 yards northwestward of Squirrel Point, is wooded, and the smaller islands near it are bare and grassy. The ledge extending southward of the island, which uncovers 4 feet, is marked by a buoy on its southeastern side. A ledge that uncovers 4 feet extends 300 yards northward of the island.

Pettis Rocks, in the middle of the river 6.5 miles above the entrance, are bare at the highest part and marked at the south end by a daybeacon. This is a dangerous part of the river, and vessels inbound, after passing the southern end of Lee Island, should cross over to and favor the east side of the river to avoid the shoals extending from Pettis Rocks and Ram Island.

Ram Island, just northward of Pettis Rocks, is low and bushy. Ledges that uncover 5 feet extend nearly 200 yards northward and 75 yards eastward of the island. **Ram Island Light,** 22 feet above the water and shown from a white skeleton tower, marks the eastern ledge.

Lee Island, 128 feet high and wooded, is on the west side of the river westward of Pettis Rocks and Ram Island. A rock awash off the southeastern shore of the island is marked by a buoy.

Chart 13296 (230).-Indian Point (43°50.6'N., 69°47.9'W.), on the west bank of Kennebec River, about 0.4 mile above Ram Island, is low. A ledge covered 7 feet, about 500 yards northward of Indian Point, is marked on its southeastern side by a buoy. At **Bluff Head,** 1 mile above Ram Island, the river narrows. The upper part of this section is marked by Doubling Point Lighted Range. The lights are shown from white octagonal towers on the bearing 359°.

This range passes very close to and eastward of **Lithgow Rock** and **Fiddler Ledge,** both of which are covered 27 feet and unmarked. It will be better to steer a little eastward of the range rather than take any chance of the vessel getting to the westward of it. An unmarked 25-foot rock ledge is close eastward of the range about midway between Lithgow Rock and Fiddler Ledge. Care should be taken in deep-draft vessels not to get too far eastward and foul this rock.

Just northward of Fiddler Ledge the channel takes a sharp turn to the west through **Fiddler Reach.** On the north side of the reach and 300 yards west of the range line is a seasonal fog signal, operated during daylight hours only. **Doubling Point** at the right angle turn from Fiddler Reach into **Long Reach** is marked by **Doubling Point Light** (43°53.0'N., 69°48.4'W.), 23 feet above the water, shown from a white octagonal tower on a square gray pier with a footbridge to the shore; a fog signal is at the light.

There are reported to be strong back eddies on both ends of this turn, and great care should be taken to keep the vessel well under control. Caution should be exercised by vessels bound downriver on a strong ebb when rounding Doubling Point from Long Reach into Fiddler Reach.

Winnegance is a village on **Winnegance Creek,** 0.5 mile from the main channel of Kennebec River. The channel is shoal and navigable only by small craft. Old piling extending across the creek northeast of the highway causeway and dam are partly covered at high water.

Bath is a city on the west side of Kennebec River 12 miles above the entrance. There is little waterborne traffic to Bath, except for barge traffic to the shipyard and vessels undergoing repairs. In 1970, the maximum draft carried to the shipyard was 26 feet.

Bath was formerly the most important U.S. shipbuilding center in the 19th century; the HENRY B. HYDE, three-masted full-rigged wooden ship, and the six-masted schooner WYOMING, the largest of their kind ever built in America, were constructed here. The Bath Marine Museum is close to the waterfront. There are many historical points of interest.

The city has churches, hospitals, a library, banks, hotels, motels, laundry, markets, and stores of all kinds.

U.S. Route 1 and Maine Central combination highway and railroad lift bridge crosses the Kennebec River at Bath. The vertical lift span has a clearance of 10 feet down and 135 feet up; drawbridge regulations and opening signals are given in **117.8,** Chapter 2.

Wharves.-In 1970, the pier and wharves at the Bath Iron Works shipyard were the only deepwater facilities at Bath.

The shipyard, just below the bridge, has building ways, extensive shipbuilding and above-the-water repair facilities, but no drydocks or marine railways. In addition to the fitting-out wharves, a 700-foot fitting-out pier, marked at its outer end by a private light, is at the south end of the yard; depths of 32 feet are reported along both sides of the pier.

A fish cannery with 10 feet reported alongside its wharf is on the west side of the river, about 1 mile north of the bridge.

An old coal wharf, in disrepair and not in use, in on the west side about 0.3 mile north of the bridge; depths of 26 feet are reported alongside. Rocky ledges, covered 14 and 20 feet, are on the north and south ends of this wharf, respectively.

A marina with a float landing is on the west side of the river, about 0.1 mile above the bridge at

Bath; gasoline, water, a small-craft launching ramp, and berthage with electricity are available. The town float landing just northward of the marina is used by a sightseeing cruise boat during the summer. A fuel float about 150 yards northward of the town landing, has gasoline and diesel fuel. Depths of 15 feet are reported alongside these float landings.

Supplies.-Provisions, gasoline, diesel fuel, ice, bottled gas, and some marine supplies are available in town.

Bath has bus and taxi service.

Repairs.-There are no drydocks or marine railways for large vessels at Bath. A boatyard, on the west side of the river about 1.3 miles below the bridge, has a marine railway that can handle craft up to 50 feet in length. Hull, engine, electrical, and electronic repairs can be made, and dry covered or open winter storage and marine supplies are available. Gasoline and water can be obtained at the yard's float landing; depths of 12 feet are reported alongside the float. The yard maintains guest moorings and permits overnight berthing at the float.

The Sasanoa River entering Kennebec River between **Preble Point,** the northern extremity of Arrowsic Island, and **Sasanoa Point,** the southern extremity of **Towesic Neck,** is described under the Inside Passage. See caution note contained in tidal current data for the Kennebec River in this chapter.

Woolwich is a village on Towesic Neck, opposite Bath. The asphalt pier there is reported to have 22 feet alongside. Only piling remains of the old coal wharf and ferry slips just below this pier. A marina, about 0.3 mile above the bridge, has a depth of 16 feet reported alongside its float landing. Gasoline, some marine supplies, and a small-craft launching ramp are available; outboard engines can be repaired. Groceries and lodging can be obtained closeby.

Chart 13298 (288).-About a mile above the bridge at Bath, Kennebec River is divided into two channels by an extensive area of rocks awash and covered ledges in midriver; the principal hazards on it are **Winslow Rocks** and **Stetson Rocks,** parts of which are awash at low water. Obstruction buoys mark the northern and southern ends of the area, and the eastern side is marked by channel buoys.

The main or eastern channel is deep and favors the eastern bank of the river. The western channel is not marked and is used only by small craft. Ledges south of **Days Ferry,** on the east bank of the river, north of Stetson Rocks, are marked by a buoy. The channel past **Thorne Head** is deep and clear.

Two miles above Bath, Kennebec River divides into three channels. The eastern, or **Burnt Jacket Channel,** is the most direct and has a depth of 14 feet. It is unmarked and extremely foul and difficult at its northern end, and is used mostly by small craft. Local knowledge is necessary to navigate it safely.

The main channel or **West Branch,** the widest, has a depth of about 22 feet, and is partly buoyed, clear, and easily followed by aid of the chart. **Thorne Island Ledge,** covered 4 feet and marked by a buoy near its southeast edge, **Thorne Island,** and **Lines Island** are all on the northeast side of the channel, and **Woods Island,Crawford Island,** and **Ram Island** are on the southwest. A ledge making out from the northeast side of Woods Island is buoyed. A rock bare at low water is 50 yards off the west side of Lines Island, and a rock awash is off the southwestern end of the island. Near the northern end of the channel, **Grace Rock,** covered 2 feet, is marked on its west side by a buoy.

The third channel trends to the southwestward between Woods, Crawford, and Ram Islands, and the mainland. It is unmarked, foul, and little used.

Chops is the narrow passage between two headlands, **Chops Point** and **West Chops Point,** about 4.5 miles above Bath. Two high steel transmission towers on the points are very prominent. The overhead power cables have a clearance of 145 feet.

Trotts Rock, with a least depth of 3 feet and marked on its west side by a buoy, is about 0.4 mile northward of Chops Point.

Chart 13293 (314).-Merrymeeting Bay is a shoal bay making westward from Kennebec River 17 miles above the entrance. The bay is the approach to the towns of **Brunswick** and **Topsham** on the **Androscoggin River,** and **Bowdoinham** on the **Cathance River,** 8 and 4 miles, respectively, above Kennebec River. Boats drawing up to 6 feet can go to Brunswick and 12 feet to Bowdoinham at high water, but there was no traffic in 1970. There are no landings. The channels are narrow and unmarked, and local knowledge is necessary. The mean range of tide is 3.8 feet at Brunswick.

The Maine Central Railroad bridge about 7.8 miles above the entrance to the bay, with a fixed span and a clearance of 20 feet, crosses Androscoggin River just below Brunswick. U.S. Route 201 highway bridge at Brunswick is the head of navigation, above which are a dam and falls.

Several overhead power cables about 1.5 miles below the railroad bridge have clearances of 44 feet in the west channel and 45 feet in the east channel. The power cable over Cathance River near the mouth has a clearance of 55 feet. The overhead power cable about 2 miles above Bowdoinham has a clearance of 40 feet.

It is reported that heavy storms and winter ice change the shoals and depths in Androscoggin River.

Brunswick is the site of Bowdoin College and a manufacturing center of some importance in shoes, textiles, and paper. There are a hospital,

banks, churches, hotels, restaurants, and shopping centers. It has railroad freight and bus connections, and taxi service.

Chart 13298 (288).-Abagadasset Point (44°00.3'N., 69°49.4'W.), on the west bank of the river about 1.6 miles above the Chops, should be given a wide berth to avoid the shoals extending from it to the northward. A buoy marks the northeastern extremity of the shoals.

Overhead power cables over Kennebec River at Abagadasset Point have a clearance of 145 feet. An 11-foot spot on the west side of the channel opposite Twing Point is marked by a buoy. **Ames Ledge,** on the east side of the river north of **Twing Point,** is marked by a buoy off its northwest side.

Swan Island, about 1.8 miles above Abagadasset Point, divides Kennebec River into two channels. The main channel, east of the island, is marked by buoys and by a daybeacon on **Beef Rock.** The channel leading westward of the island is not marked or maintained; a rock covered 4 feet is reported at the entrance in about 44°01.7'N., 69°49.1'W. East of the main channel, a riprap training wall extends from off **Carney Point 13298 (288)** to **Green Point.**

Eastern River enters Kennebec River between Carney Point (44°02.0'N., 69°48.0'W.) and the flats and training wall extending 1.4 miles southwestward of **Green Point.** The river follows the eastern shore to **South Dresden.** It is unmarked and crossed by three highway bridges. U.S. Route 128 bridge, about 2 miles above the mouth, has a fixed span with a clearance of 16 feet. Telephone and power cables on the south side of the bridge have a clearance of 22 feet.

The second highway bridge, State Route 197, about 2 miles farther upstream, has a fixed span with a clearance of 23 feet. An overhead power cable on the north side of the bridge has a clearance of 40 feet; telephone cables are about 10 feet below the power cable. About 0.6 mile upstream from the second bridge, overhead power cables crossing the river have clearances of 50 feet.

The third highway bridge, State Route 27 at **Dresden Mills,** about 2 miles above the second bridge, has a fixed span with a clearance of 4 feet.

In 1970, the river was reported navigable to Dresden Mills with a draft of 4 feet, and above that by small outboard craft for several miles through beautiful woodland. There are several private landings on the river, but no facilities. Remains of old wharves can be seen at Dresden Mills and other points.

Richmond, westward of Swan Island, is a town on the west bank of Kennebec River 23 miles above the entrance. There are several landings at the town. The town float landing, at the mill with a conspicuous stack, has 16 feet alongside. There are no facilities at the landing, but gasoline, diesel fuel, water, provisions, and some marine supplies can be obtained in town.

The submerged ruins of a jetty extends northeasterly from the northeastern tip of Swan Island to near channel Buoy 33.

State Route 197 highway bridge, with a swing span clearance of 15 feet, crosses the river at a point just north of Swan Island. See **117.10,** Chapter 2, for drawbridge regulations and opening signals.

Chart 13298 (289).-Cedar Grove (Dresden Landing) is a small settlement on the east bank of Kennebec River, 2 miles above the north end of Swan Island and 0.7 mile above **Courthouse Point** (44°06.4' N., 69°46.0' W.).

Hathorn Rock, covered 8 feet about 1.7 miles north of Courthouse Point, is marked on the east side by a buoy. A rocky area is reported on the west side of the river, about 0.5 mile northward of Hathorn Rock.

South Gardiner, about 4.5 miles above Courthouse Point, is a village on the west side of Kennebec River 30 miles above the entrance. The tall brick stack of an inactive pulpmill stand close to the river. There is a lumbermill, but its wharves are in ruins. A small-craft launching ramp is at the southern end of town, about 0.5 mile south of the brick stack.

A **special anchorage** for small craft is off the west side of the river at South Gardiner; see **110.1** and **110.3a,** Chapter 2, for limits and regulations.

Gardiner, about 3.5 miles above South Gardiner, is a town on the west side of the river 33.5 miles above the entrance. The town wharf and float landing just below the bridge has 12 feet alongside, but no facilities. A public parking lot is on the wharf. The old coal wharf above the bridge has 15 feet reported alongside, but is seldom used.

Randolph, a village on the east side of the river opposite Gardiner, has a wharf below the bridge with 12 feet alongside and oil connections, but is seldom used. Kennebec Boating Association has a float landing and ramp at the wharf. Ice and provisions are available. A hardware store adjoins the landing, and restaurants are in the vicinity.

A **special anchorage** for small craft is off the east side of the river on both sides of the bridge; see **110.1** and **110.3,** Chapter 2, for limits and regulations.

State Route 126 highway bridge connecting Randolph and Gardiner, has a swing span with a clearance of 20 feet; drawbridge regulations and opening signals are given in **117.10,** Chapter 2. The east draw should be used as the west draw has silted up.

The controlling depth from the bridge at Gardiner to Augusta was 5½ feet in 1963.

Farmingdale, on the west side of Kennebec River just above Gardiner, is the site of a powerplant with a tall white stack. An inactive grain elevator about 0.1 mile below the powerplant has a wharf with 15 feet alongside. The rock-filled cribs, remains of an old intake pier, extend over 100

yards off the powerplant. They are unmarked, and no attempt should be made by small craft to pass between them and the west bank as the area is extremely foul. The east bank should be favored.

A foul area, reported to be deadheads, is on the west side of the river off Farmingdale, about 0.6 mile northward of the bridge at Gardiner.

At **Browns Island,** about 1.5 miles above Gardiner, the river is crossed by two sets of power cables that have clearances of 140 feet. Log booms extend southwestward and northwestward from the island. They are unmarked and are used to catch drifting pulp logs which are washed over the dams above Augusta by spring floods and freshets. A shoal with a least depth of 3 feet makes out to the north and northwestward of the island.

Hallowell, about 3.5 miles above Gardiner, is a town on the west side of the river 37 miles above the entrance. An inactive oil berth with a depth of 10 feet alongside is on **Oil Cloth Point** (44°17.5′ N., 69°47.1′ W.), about 0.5 mile above Hallowell. A pilot for the river resides at Hallowell; see Pilotage for Kennebec River discussed previously in this chapter.

A pinnacle rock, covered 5 feet, is on the east side of the channel about 500 yards southwestward of the wharf on Oil Cloth Point. It is marked by a buoy on its northwest side. A submerged obstruction, reported in 1965, is in the channel about 300 yards southwestward of the pinnacle rock and about 50 yards offshore.

Augusta, the capital of Maine, is at the head of navigation on the Kennebec River 39 miles above the mouth. The city has hospitals, hotels, and other conveniences. The principal wharves are on the west side of the river between the two lower bridges. There are two float landings: the public landing on the west side just below the second bridge has 3 feet reported alongside, and the Augusta Yacht Club float landing on the east side has 4 feet reported alongside.

A private boatyard at the yacht club landing has a marine railway on which members' craft, up to 50 feet in length and 6 feet in draft, can be hauled out for repairs or open winter storage. There is a ramp at the club for launching small boats. There are no service facilities at either landing. A special small vessel anchorage is off the yacht club; see **110.1** and **110.4,** Chapter 2, for limits and regulations.

Bridges.-The four bridges at Augusta have fixed spans. The first, U.S. Routes 201-202 highway bridge about 125 yards above Youngs Point, has a clearance of 70 feet for a width of 67 feet; the second, a city highway bridge at the upper end of the turning basin, has a clearance of 27 feet. The head of navigation is at this bridge as the river is very shallow above it, and not even small craft venture there. The third bridge, now used only to carry the city water conduits, has a clearance of 23 feet. The Maine Central railroad bridge adjacent to and above the third bridge has a clearance of 23 feet.

The river is obstructed by a dam, 0.3 mile above the railroad bridge.

Gasoline, diesel fuel, lubricants, provisions, ice, and marine supplies can be obtained in Augusta. Bus, taxi, and railroad freight services are available.

Chart 13290 (315).-Casco Bay is a very extensive area between Cape Small and Cape Elizabeth, a distance of 17.8 miles. Between these two capes the bay extends up into the land an average distance of about 12 miles. The number of islands in Casco Bay is 136, and very many are fertile and under cultivation; and nearly all are inhabited. Nearly every large island extends northeast and southwest, which is the general course of the bay and of all rivers and coves contained within its limits.

The area in Casco Bay, about 3.5 mile northeastward of Portland, within a circle having a 1,800-yard diameter with its center in 43°42′40″N., 70°10′36″W., has been designated as a vessel-to-vessel oil transfer area by the State of Maine Environmental Improvement Commission. (See also chart 13290 (315).)

Anchorages.-In the eastern part of Casco Bay, the best anchorage for strangers is in New Meadows River. Local fishermen and yachtsmen frequently use Sebasco and Cundy Harbors. Potts Harbor, Harpswell Harbor, and Mackerel Cove are good anchorages in the middle of the bay for small vessels and yachts.

Merriconeag Sound and Harpswell Sound and the whole Casco Bay westward of Harpswell Neck afford good anchorage for large vessels, except in heavy northeast gales.

Vessels can enter through Broad Sound, Luckse Sound or Hussey Sound and select an anchorage under the lee of some of the many islands, a suitable depth and good holding ground being found in most places. Portland Harbor is a secure anchorage on the western side of the bay and is the one used mostly by larger vessels.

Most of the dangers are marked, and the waters are well charted, so that, with the aid of the chart, no difficulty should be experienced in navigating Casco Bay in clear weather.

Tides and currents.-The mean range of tide in the bay is about 9 feet. Daily predictions for Portland Harbor are given in the Tide Tables. The velocity of the tidal current at strength is about 1 knot in the entrance to Portland Harbor and in Hussey and Broad Sounds. In the open waters of the bay it is generally 0.5 knot or less. Current predictions for a number of locations may be obtained from the Tidal Current Tables.

Ice.-Considerable ice forms at the heads of the numerous arms extending northward in Casco Bay, but the principal anchorages are available at any season of the year.

The part of Casco Bay between Cape Small on the east and Halfway Rock Light and Harpswell Neck on the west is full of small islands, ledges, and rocks. Between them narrow but deep channels lead to the bays and sounds at the head. These arms afford good anchorage for small vessels, but are used only by local fishing and pleasure craft. There are several small villages in this part of the bay, but no towns.

Temple Ledge, about 1.8 miles southwestward of Cape Small and covered 25 feet, is unmarked. **Lumbo Ledge,** 2 miles west of Temple Ledge and 2.6 miles south of **Ragged Island,** is covered 17 feet and marked by a buoy on its south side.

Spoonbowl Ledge, about 0.3 mile westward of Cape Small and about 0.4 mile southwest of **Gooseberry Island,** is covered 5 feet and unmarked. Craft bound from Cape Small to Small Point Harbor should be careful to avoid it.

East Brown Cow, 1.6 miles west-northwestward of Cape Small, is 12 feet high and bare. **Mark Island,** 0.8 mile northward of East Brown Cow, is high and thickly wooded. **Mark Island Ledge,** 0.3 mile southwestward of Mark Island, uncovers 3 feet and is marked on its west side by a buoy. **Wyman Ledge,** 0.5 mile east of Mark Island, covered 4 feet, is marked on its eastern side by a buoy.

White Bull, 1 mile westward of Mark Island, is a high, round, and bare islet. **White Bull Lighted Gong Buoy WB,** about 0.4 mile southeastward of the island, marks the southwestern approach to New Meadows River. **Bold Dick,** an unmarked rock about 0.7 mile west-southwestward of White Bull, uncovers 7 feet.

Small Point Harbor, between Wood and Little Wood Islands on the west and **Hermit Island** on the east, is on the east side of Casco Bay 1.5 miles northward of Bald Head, the southwestern extremity of Cape Small. The harbor is an anchorage for local fishermen and yachts, but is open to southerly winds.

The principal dangers are: **Gooseberry Island Ledge,** extending about 0.3 mile southwestward of Gooseberry Island, awash at low water and marked by a buoy; **Wood Island South Ledge,** a rocky shoal covered 5 feet at the end and extending about 0.3 mile south of Wood Island, where it is marked by a buoy and a lighted bell buoy about 350 yards westward of the south end of the ledge; **Middle Ledge,** awash and marked by a buoy on its southwestern side; **Pitchpine Ledges,** covered 6 feet and marked on its western side by a buoy; and a 3-foot shoal, marked by a buoy, about 0.2 mile southwestward of Carrying Place Head.

There is good anchorage in the harbor for small craft and in the tributary harbors of Fish House Cove, West Point Harbor, and Cape Small Harbor, but the bottom shoals too rapidly in **Tottman Cove,** north of **Flat Point,** for good anchorage.

Small Point Harbor can be entered either southward of Wood Island or northward of Little Wood Island. **Wood Island** is rocky and partly wooded, and **Little Wood Island** is thickly wooded. **Small Point,** a village on the eastern side of the harbor, has an improved highway to Bath, the nearest city.

Cape Small Harbor, between Hermit Island and Cape Small, affords good anchorage for small craft, but its entrance, with 4 feet at low water, is narrow and difficult, and should be entered only with local knowledge or at high water. A private camping ground is on Hermit Island. A large white hotel northeastward of Goose Rock may be used as a mark to clear the rock when entering northward of it.

The passage between Goose Rock and **Mill Point** is sometimes used by local fishing craft, but is not recommended for strangers. The best water is reported to be obtained by entering northward of Goose Rock and then favoring the eastern shore until abeam of the northern extremity of Mill Point, then favoring the west side of the two islets eastward of Mill Point until southward of the fish pier at the lobster pound. The channel eastward of the islets should be used only at high water. There is reported to be 18 feet at the fish pier; gasoline is available. A marine railway at the pound can haul out craft up to 60 feet in length.

Anchorage is in midchannel southward of the pier where swinging room can be found in 8 to 10 feet.

A restaurant, open in the summer, is at **Head Beach** at the south end of the harbor, which joins Hermit Island to Small Point. A woodland road leads from the beach to the various camping sites on the island to the lobster pound. Restrooms and picnic area are available at the restaurant when open.

There are a number of private float landings and many moorings in the harbor, which is secure in all weather.

Carrying Place Cove is a narrow, partially bare thorofare on the north side of Small Point Harbor. The thorofare is entered just westward of **West Point** and leads northward between **Carrying Place Head** on the west and the village of West Point on the east. It is reported that 5 feet can be carried through the thorofare at high water; local knowledge is advised. There is a small islet with a house on it in the middle of the passage. Two overhead power cables crossing the thorofare have a minimum clearance of 30 feet. The southern part of Carrying Place Cove is also known locally as **West Point Harbor.**

There are numerous fish wharves and several service wharves along the east side of the thorofare at the fishing village of **West Point.** Two of the service wharves in the southern part of the thorofare, West Point Harbor, have gasoline available; depths of 4 to 5 feet are reported alongside. The more southerly of the two wharves is used to unload lobster boats, and also has diesel fuel available; groceries, ice, and some marine

supplies can be obtained at the other wharf. Good anchorage in 15 feet, muddy bottom, but exposed to southerly weather, can be found off these wharves. Another service wharf with 6 feet reported alongside is near the northern end of the thorofare; gasoline and diesel fuel can be obtained here. Good anchorage in 8 to 20 feet is available northwestward of this wharf.

The village of West Point has highway connections to Bath.

Fish House Cove, just westward of West Point, is used as an anchorage, but is exposed to southerly weather.

The thorofare leading eastward of **Burnt Coat Island,** northward of Carrying Place Head, is marked by buoys. Strangers in small craft should have no trouble navigating it.

Jamison Ledge, 0.5 mile westward of Burnt Coat Island, is 0.4 mile long, uncovers in one spot at its south end, and is marked by a daybeacon. **Flag Island Ledge,** between it and Flag Island, is awash at low water and unmarked.

Flag Island is high and thickly wooded. **Long Ledge,** 0.4 mile northwestward of Flag Island, has two islets 10 and 12 feet high, which are grassy. **Goudy Ledge,** 0.6 mile northward of Flag Island, uncovers 4 feet and is marked by a daybeacon. **Rogue Island,** on the west side at the entrance to New Meadows River, is low with scattered trees. The bottom in this vicinity is very broken. Two rocky areas cleared to 12 feet are almost in midchannel about 0.5 mile southeastward of Rogue Island.

Sebasco Harbor, a good anchorage for small vessels, is eastward and southward of Harbor Island, and 3.5 miles northward of Bald Head. **Dry Ledges** form a large, bare ledge in the entrance; the northern end should be given a berth of over 100 yards, and the broken ground extending 300 yards eastward from the ledge should be avoided.

The entrance, marked by a lighted buoy, is between Dry Ledges and the buoy about 200 yards southward of Harbor Island. Rocky ledges extending about 150 yards from both shores restrict the entrance to Sebasco Harbor. On the western side numerous bare rocks extend shoreward along the ledge in a northwesterly direction.

Anchorage can be selected in 30 to 36 feet, 250 to 300 yards off the cove on the eastern side, and also in midchannel off the landing at Sebasco Estates inside Harbor Island in 24 feet.

Sebasco Estates is a summer resort on the east side of Sebasco Harbor. A pier with a float landing has a depth of 8 feet. Gasoline and water are piped to the float in summer, and a dockmaster is in attendance. Provisions, ice, boat hire, lodging, restaurant, and laundromat are available. An octagonal house with cupola at the landing is very conspicuous.

The thorofare leading northward from Sebasco Harbor, inside Harbor Island, is bare at low water.

A boatyard with a marine railway is in the cove at the north end of the thorofare; the railway can handle craft up to 35 feet for hull and engine repairs or dry covered or open winter storage. The cove mostly dries out at low water.

The thorofare leading northward of **Harbor Island** and eastward of **Malaga Island,** marked by two buoys, is easily navigated by small craft. It is used considerably as an anchorage by small fishing craft.

Sebasco is a village of fishermen on the east side of the thorofare. The wharf of an inactive fish-packing plant with 6 feet reported alongside is at the village. Provisions can be obtained closeby. Gasoline and water are available at the float landing of a lobster wharf, about 0.5 mile northward of the fish-packing plant.

A ledge covered at high water extends 350 yards north-northeastward from Bear Island and is marked at its end by a buoy. The buoy also marks the northern entrance to the thorofare and the anchorage northward of Malaga Island.

New Meadows River, at the northeastern end of Casco Bay, is about 8.5 miles long from **Bear Island** at the entrance to the highway bridge on a dam at the head of navigation. A lighted buoy off **Fort Point** (43°46.8′ N., 69°53.6′ W.) marks the entrance to the river. It has a deep water channel for the first 6 miles, and a draft of about 12 feet can be carried to within 0.5 mile of the dam. The principal dangers are buoyed.

Above **Howard Point,** about 1.5 miles south of the dam, the channel is narrow and unmarked, and has a depth of about 7 feet to the dam. Local knowledge is necessary to carry the best water above **Foster Point,** 3 miles from the head.

The river is seldom used except by local fishing boats and small pleasure craft. Small craft can enter New Meadows River from westward 6 miles above its entrance through Gurnet Strait.

Cundy Harbor is a good anchorage for small vessels on the west side of New Meadows River, 1 mile above its mouth. The harbor is clear and has depths of 22 to 31 feet. A buoy marks the south end of the bare ledges on the northeast side of the harbor.

Cundys Harbor is a village on the western side of the harbor. A fish processing and shipping plant with a wharf and float landing is near the southwestern end of the harbor; depths of 10 feet are reported alongside the float. Gasoline is available by truck at the wharf. Two service wharves with float landings, one just southward of the fish wharf and the other about 0.2 mile to the northward, have reported depths of 8 feet alongside the floats. Gasoline is available at the floats, and groceries and some marine supplies can be obtained at the stores on the wharves. A rock awash is about 75 yards south of the more northerly wharf.

Dingley Island is on the west side of the river about 1 mile above Cundy Harbor.

The Basin, a cove on the east shore of New Meadows River about 1.3 miles northeastward of Cundy Harbor, has a narrow but clear entrance. It is a popular weekend anchorage for yachts and small craft. There are no landings. A rock awash is almost in the middle of the anchorage, and the basin shoals in its eastern half.

Winnegance Bay, on the east side of New Meadows River 3 miles north of the entrance, is a large bight with secure anchorage in 18 to 24 feet. There are a few private landings. The southeast side of the bay is foul. **Bushy Islet** and **Hen Islet** are near the edge of the foul ground; **Hen Island Ledge,** awash at its southwest end at low water, extends 500 yards west-southwestward from the south islet, where it is marked by a daybeacon. The north side of the bay is clear. There is considerable yachting activity in this bay, and good anchorage is available in **Brighams Cove** at the head of the bay.

A directional light on **Birch Point,** on the northwestern side of the entrance to the bay, shows an intensified beam on the bearing **009°** and marks the reach in the river from Sheep Island Ledge to the entrances to Winnegance Bay and the upper river. The light is the only lighted aid in the river northward of Bear Island.

Good anchorage can be found in the long coves on either side of **Rich Hill,** about 2 miles northward of Birch Point.

New Meadows and **Harding** are small villages on the highway on the dam crossing New Meadows River at the head of navigation. The remains of the piers of an old highway bridge are 0.3 mile below the dam; some are covered at high water. Extreme caution should be exercised in passing between them.

There is an inn on the east bank at the dam, and a motel is across the road. Lodging and a restaurant are at the inn. Gasoline and water are available at the float of a marina on the west bank at the dam; depths of 7 feet are reported alongside the float. Guest berths and marine supplies are available, and diesel fuel, provisions, and ice can be obtained on short notice. A trailer at the marina can haul out boats up to 30 feet in length for hull and engine repairs or winter storage; a 5-ton fixed lift is also available. Good anchorage in 10 feet is off the landings.

Ridley Cove is eastward of **Yarmouth Island** and just westward of the entrance to New Meadows River. The cove has good anchorage in 23 to 37 feet, but is exposed to southerly and southwesterly winds. It should be avoided by strangers because of the numerous unmarked ledges and rocks off the entrance. On the end of **West Cundy Point,** is a large white house, which is very conspicuous from Ragged Island to Small Point.

From the northern end a narrow, deep channel leads close westward of **George Island** into Hen Cove. Another narrow channel with a reported depth of 3 feet, obstructed and suitable only for small craft in the absence of local knowledge, leads in to Quahog Bay. **Hen Cove** has extensive shoals, but is a good anchorage for small craft.

Little Yarmouth Island, close westward of Yarmouth Island, has a private wharf with float landing on its north end. Gasoline is available at the float in an emergency.

Dangers off the entrance to Ridley Cove include: **Jenny Island,** 10 feet high and grassy; **North Jenny Ledge,** covered 2 feet and marked by a buoy at the south end; **Jenny Ledge,** which uncovers 5 feet; **Ballaststone Ledge,** with grassy **Duck Rock** 5 feet high on it; and numerous bare spots on **Yarmouth Ledges. Flash Island** is a small islet on the extensive ledge area southward of Yarmouth Island.

Quahog Bay is a narrow arm extending about 4 miles in a northeasterly direction. It offers good anchorage for small vessels. Numerous unmarked ledges and many small islands are off its entrance, which is between Yarmouth Island and Ledges on the east and **Long Point Island** on the west.

The buoyed channel from New Meadows River to Orrs and Bailey Islands leads across the entrance.

There is also a good channel between Saddleback Ledge, Ragged Island, Blacksnake Ledge, Yellow Rock, and Two Bush Island on the east and Round Rock, **Middle Ground Rock,** and Cedar Ledges on the west.

Saddleback Ledge uncovers 5 feet; **Ragged Island,** about 50 feet high and scantily wooded on top, has a house on it; **Blacksnake Ledge** uncovers; **Yellow Rocks,** 4 feet high, and **Two Bush Island** are grassy; **Round Rock** uncovers 7 feet; and **Cedar Ledges,** 2 feet high, are bare.

Several unmarked ledges and sunken rocks are in Quahog Bay. **South Ledges,** covered at high water and marked by a buoy on the west side, and **North Ledge,** awash, extends 0.4 mile southwestward and northeastward, respectively, from **Pole Island.**

Card Cove, on the west side of the bay and west of Pole Island, is used by small fishing boats, but the entrance is only 50 yards wide between ledges off **Pinkham Point** and the point on the south side.

There is a wharf at the general store on the west side of the cove with 2 feet at its float landing. Gasoline, provisions, and some supplies can be obtained at the store. Good anchorage in 29 feet is off the wharf.

On the east side of Pinkham Point in the channel between it and Pole Island there is a lobster wharf and float landing with 22 feet alongside. Gasoline is piped to the float, and ice, provisions, and some supplies are available. There is excellent anchorage off the wharf.

In **Dyer Cove,** about 1.7 miles above Pinkham Point, there is another lobster wharf. Gasoline and some provisions and supplies can be had at a store near the wharf. The upper end of Quahog Bay off Dyer Cove affords one of the best anchorages on

the coast for cruising craft, and the swimming in the warm water of **Mill Cove** northward of **Snow Island** is reported to be excellent.

Gun Point Cove, westward of Quahog Bay, is a narrow arm of no importance making northward on the east side of Orrs Island. There are no wharves. **Gun Point** on the east side is wooded and has a house on the end. **Hen Island** and **Oak Island** are islets on the ledge area southward of Gun Point and **Long Point Island.** A channel across this ledge area, marked by a buoy, is part of an inside passage for small craft from New Meadows River westward to Orrs and Bailey Islands. Oak Island has a stone cairn monument which is conspicuous.

A passage with a depth of 4 feet extends from the north end of Gun Point Cove into Harpswell Sound. This passage is crossed by State Route 24 highway bridge, which has a 45-foot fixed span with a clearance of 14 feet. The passage is difficult because of strong currents and unmarked ledges, and should not be attempted by strangers. There are several lobster wharves with float landings in the vicinity of the bridge.

Lowell Cove, in the south end of Orrs Island, is used as an anchorage by local fishermen. There are a number of fish and lobster wharves in the cove, most of which dry at low water. Gasoline is available at two of them, one near the head and the other on the east side near the entrance; water can be had in an emergency. At the latter lobster wharf there is reported to be a depth of 25 feet at its float. Ice can be obtained here, and provisions and some supplies can be had at a general store in the village of **Orrs Island,** at the head of the cove. The supply of water is very limited. There is a good road to the mainland.

Water Cove, southward of Lowell Cove, makes into the north end of **Bailey Island.** The cove is foul near its shores and is little used.

Ram Island and **Pond Island,** southeastward of Lowell Cove, are round and grassy. **Pond Island Ledges,** awash at high water, extend 0.6 mile southwestward of Pond Island, have many spots bare at low water, and are unmarked.

Halfway Rock, about in the middle of the southern part of Casco Bay, is a low, rocky islet marked by **Halfway Rock Light** (43° 39.4'N., 70°02.2'W.), 76 feet above the water, shown from a 77-foot white granite tower attached to a dwelling. A fog signal and a radiobeacon are at the light. Ledges extend 0.2 mile southwestward and northward from it. **Webster Rock,** covered 8 feet at the end of the ledge extending northward, is marked by a buoy.

Drunkers Ledges, 2 miles north-northeastward of Halfway Rock, consist of two ledges 0.3 mile apart. The southeast one, **Eastern Drunkers Ledge,** is covered 4 feet and is marked on its southwest end by a buoy. The northwest one uncovers about 4 feet and is marked by a daybeacon.

Between Drunkers Ledges and Jaquish Island is **Mark Island Ledge** covered 4 feet and marked at its north end by a buoy. An area of broken ground with depths of from 4 to 22 feet extends south-southwestward from Jaquish Island to Eastern Drunkers Ledge. In heavy weather the sea breaks on the shoalest places on it.

Little Mark Island, on the west side of Merriconeag Sound at the entrance, is 37 feet high and grassy. It is marked by **Little Mark Island Monument Light,** 74 feet above the water, shown from a black and white stone pyramidal monument. **Great Mark Island** is 24 feet high, bare, and grassy.

Whale Rock, 5 feet high, is 0.4 mile southwestward of Little Mark Island.

Merriconeag Sound and **Harpswell Sound** are of little commercial importance, but they form the approach to a good and convenient anchorage. Vessels of the deepest draft can enter and find anchorage in 21 to 60 feet, good holding ground.

The entrance is 3.5 miles north-northeastward of Halfway Rock Light and is marked on its western side by the light on Little Mark Island. The two sounds extend in a northeasterly direction for 10 miles to **Harpswell Cove,** and for the first 4 miles the important dangers are marked. Above this, strangers should not go without a pilot, as the channel is narrow, and flats make out some distance from the shore in several places.

Special small-vessel **anchorage** areas have been established in Harpswell Sound, at Harpswell Harbor, Beals Cove, and the yacht club anchorage off the southwestern end of Orrs Island; limits and regulations are given in **110.1** and **110.5,** Chapter 2.

Jaquish Island, 29 feet high and grassy, on the east side of the entrance to Merriconeag Sound, and **Turnip Island,** 17 feet high, grassy and marked by a pillar of stones, are conspicuous. **Turnip Island Ledge,** about 0.2 mile southwestward of Turnip Island, is awash at its southern end and is marked by a lighted gong buoy about 0.1 mile to the westward. **Jaquish Gut,** between Jaquish Island and Bailey Island to the northward, is reported to have a controlling depth of 7 feet; local knowledge is advised. A fairway bell buoy is about 0.6 mile southeastward of Jaquish Island.

Charity Ledge, eastward of Jaquish Island and covered 11 feet, is marked by a buoy.

Mackerel Cove, in the southwestern shore of Bailey Island on the eastern side of the entrance to Merriconeag Sound, is a good anchorage in 30 to 48 feet for small craft, which use it frequently; it is open southwestward, but a heavy sea seldom enters.

The village of **Bailey Island** is on Mackerel Cove. With the exception of the ledge extending southward from **Abner Point,** on the west side of the entrance, which is marked by a lighted buoy, there are no dangers in the channel, but dangerous ledges extend from the shores. The water shoals gradually toward the head. There are several fish wharves in the cove.

A commercial fish pier on the east side of the cove has diesel fuel and water available; depths of 15 feet are reported alongside the pier.

A wharf and marina on the west side near the head has gasoline, diesel fuel, and water available at the floats which have 6 to 10 feet reported alongside. There is a restaurant on the wharf. Overnight berthing is permitted, and guest moorings are maintained. Lodging and a store are in the village; ice, provisions, and some marine supplies can be obtained.

There is a good road to the interior. Ice seldom obstructs the cove in winter.

The southern point of Bailey Island is marked by two high observation towers and a house.

A boatyard is on the north side of the unnamed cove on the west side of the island, just northward of Mackerel Cove. The yard has a 1½-ton lift, and a marine railway that can handle craft up to 50 feet in length for hull and engine repairs, and dry, covered or open winter storage. Electric and electronic repairs can also be made, and some marine supplies can be obtained.

A marina in the cove has a small-craft launching ramp, gasoline, and water. Depths of 4 feet are reported alongside the floats.

Small boats can be launched from the hard beach at the head of the cove making into the north end of Bailey Island, west of the stone crib bridge over Wills Gut. The cove is protected on its westerly side by a spit. A lobster pound with wharf and float landing is on the end of the spit. Depths of 6 feet are reported alongside the float; gasoline and water are available. Parking and picnic areas adjoin the restaurant on the wharf.

A small-craft launching ramp, usable only at high water, is available at a small marina on the north end of Bailey Island just east of the bridge.

Wills Gut is a thorofare between the south end of Orrs Island and the north end of Bailey Island. It is used by local fishing boats, but the channel is very narrow and difficult. Strangers using the channel should await low water, when the flats bare enough on each side to indicate the channel course. Stone crib State Route 24 highway bridge over the gut has a fixed span with a clearance of 10 feet. An overhead power cable at the bridge has a clearance of 41 feet. The controlling depth through the gut is reported to be 5 feet.

A summer resort is on the southwest end of Orrs Island. Only a few piles remain of the old steamer wharf there. The Orrs-Bailey Yacht Club has a float with 15 feet alongside close northward of the ruins of the old steamer wharf. Gasoline and water are available at the float. A special small-vessel anchorage is off the club; limits and regulations are given in **110.1** and **110.5**, Chapter 2.

There are several wharves southward of the club landing toward the Wills Gut bridge, on one of which is a general store where ice, provisions, and some marine supplies may be obtained. There are a ramp, parking, and picnic areas at the store.

The approach to the wharves from Merriconeag and Harpswell Sounds is northward of a buoy and a daybeacon marking the end of **Cox Ledge,** which uncovers at low water and extends from the northwestern point of Bailey Island.

Pinkham Island, on the west side of Merriconeag Sound northward of the thorofare leading westward into Potts Harbor, has one house and is 31 feet high, bare, and grassy. Ledges, bare and covered, extend 500 yards southward of the island to a buoy. A channel northwestward of the of the island has a depth of at least 8 feet. It leads between shoals and should not be used by strangers.

Harpswell Harbor, on the west side of Harpswell Sound 3.5 miles above Little Mark Island, is a good anchorage in from 18 to 36 feet, shoaling gradually to the head. There are private float landings for small craft on the west side, and the small settlement of **West Harpswell** is on the main road back of the landing. The waters of Harpswell Harbor have been prescribed as a special small-craft anchorage; see **110.1** and **110.5,** Chapter 2, for limits and regulations.

Beals Cove, a shoal foul cove on the west side of Orrs Island, has also been prescribed as a special small-vessel anchorage; see **110.1** and **110.5,** Chapter 2, for limits and regulations.

Reed Cove, on the west side of Orrs Island, has a boatyard on the north side. Craft up to 42 feet in length can be hauled out for repairs or dry open or covered storage. Gasoline is piped to the float at the pier, which has 3 feet alongside.

There is a thorofare from the north end of Harpswell Sound through **Ewin Narrows,Prince Gurnet, Long Reach,** and **Gurnet Strait** to New Meadows River. It is occasionally used by local boats. The channel is narrow, has a depth of about 6 feet, and has many dangers; the tidal currents are strong, and the thorofare should not be used by strangers. It is sometimes marked by bush stakes.

In 1974, a fixed highway bridge with a design clearance of 30 feet was under construction across the southern part of Ewin Narrows.

Gurnet Strait is crossed by State Route 24 highway bridge which has a fixed span with a clearance of 7 feet. The horizontal clearance north of the center pier is 34 feet and 39 feet south of it. The depth at the bridge is about 6 feet. The southerly channel through the bridge is reported to be the clearest and deepest; the northerly one is shoal. This is reported to be the shoalest part of the route.

The **tidal current** through Gurnet Strait is very strong at strength-estimated at 7 to 8 knots at times-and boats go through only at slack water. The ebb current runs eastward. Low-water slack occurs a little before low water at Portland.

At the strength of the current, there is a difference of elevation of probably 3 feet in the level of the water on either side of the bridge. The flood currents meet in the reach between Prince Gurnet and Gurnet Strait.

Gurnet is a village on the shores of Gurnet Strait. There are several wharves with float landings. Restaurants and lodging are available on the wharves or nearby. Provisions can be obtained.

The part of Casco Bay westward of **Harpswell Neck** has numerous sounds, bays, and rivers, separated by islands mostly lying in a northeasterly and southwesterly direction. Portland Harbor, at the western end of the bay, is the principal port of Maine. Many summer resorts and landings are on the islands and shores of the bay, and small vessels from Portland run as far east as Bailey Island and call at the State piers on the islands.

There are broad channels into the bay through Broad, Luckse, and Hussey Sounds, and secure anchorage for vessels of any draft can be found. The bay is frequented by many yachts and small pleasure craft, and some fishing boats. The ferries running to the State piers are of 4 to 6 feet in draft.

Through **Hussey Sound,** 42 feet can be taken on either side of Soldier Ledge which has been cleared to a depth of 40 feet. The inshore channel extends from Peaks Island along the north shore of Long Island. A submerged obstruction is reported close westward of the lighted gong buoy on the south side of the eastern entrance to Hussey Sound.

From the fairway bell buoy in the entrance to **Broad Sound,** 42 feet can be carried to good anchorages in upper Broad Sound to Middle Bay, and to the vicinity of French Island and the north end of Great Chebeague Island.

Also, 42 feet can be taken through **Luckse Sound** to the vicinity of **Bangs Island.** There is a minimum effective cleared depth of 25 feet westward of the island to off the north point of Great Chebeague Island.

An inshore channel used by interisland ferries, yachts, and fishing craft extends from the south point of Great Chebeague Island around either side of Bangs Island, across Broad Sound, and through Potts Harbor to Merriconeag Sound.

Potts Harbor is a large irregular bight in the southern end of Harpswell Neck, between Potts Point on the east and Basin Point on the west, and **Haskell Island** and **Upper Flag Island** and the ledges between them on its southern side. The harbor affords good anchorage in depths of 24 to 33 feet.

South Harpswell is a village on the east side of Potts Harbor. A town wharf with float landing is on the east side of the harbor, about 0.4 mile above **Potts Point;** depths of 6 feet are reported alongside the float. A fish wharf with 5 feet reported alongside is on the west side of **Ash Point,** at the entrance to Basin Cove; gasoline and diesel fuel are available. A small-craft launching ramp, gasoline, diesel fuel, water, and ice are available at a marina on the west side of the harbor, about 0.1 mile above **Basin Point;** depths of 5 feet are reported alongside the float landing. A trailer at the marina can haul out craft up to 35 feet in length for open winter storage.

There are two entrances to the harbor. The eastern one, from Merriconeag Sound, is marked by buoys and a daybeacon. It has a depth of about 14 feet, but is narrow and crooked with strong tidal currents. It is suitable only for small craft or small vessels with local knowledge.

The western entrance, between Upper Flag Island and Horse Island, is straight and about 225 yards wide at its narrowest part, between Horse Island and the edge of the shoal between Upper Flag Island and **Thrumcap,** a grass-covered rock. **Upper Flag Island,** 59 feet high, **Little Birch Island,** 14 feet high, and **Horse Island,** 23 feet high, are grass covered.

A ledge extending southwestward from Little Birch Island is marked by a bell buoy, and a shoal covered 3 feet, about 0.2 mile west of Upper Flag Island, is marked on its southwestern end by a buoy.

Basin Cove has been designated a special small-vessel anchorage; limits and regulations are given in **110.1** and **110.5,** Chapter 2. The entrance to the cove is obstructed by the remains of an old dam which is covered at high water. Entry into this cove is dangerous at all times and should not be attempted without local knowledge.

Outer Green Island, 4 miles westward of Halfway Rock Light (43°39.4′ N., 70°02.2′ W.), is grassy. **Junk of Pork,** a high rock with surrounding bare ledges, is 250 yards southward of it. **Johnson Rock,** 0.2 mile northeastward of Outer Green Island, with foul ground between, is covered 8 feet and is marked on its north side by a buoy.

Green Island Reef, about 0.2 mile long and bare at low water, is 0.4 mile southwestward of Inner Green Island, with foul ground between. It is marked on its southwest end by a buoy. **Green Island Passage,** leading between the buoys marking Green Island Reef and Johnson Rock, has a width of 400 yards and a depth of 44 feet, and is used by small vessels. **Inner Green Island** is 15 feet high, low, and grassy.

Jewell Island and **Cliff Island,** northward of Inner Green Island, are partly wooded. Numerous homes and several private landings are on the northwest shore of Cliff Island; the State pier and public float landing are on the west shore of the island about 0.7 mile from the south end. There is 22 feet at the head of the pier. Gasoline is available at a pier and float landing with 6 feet alongside on the east shore of the island. Provisions can be obtained at a store near the pier. The old steamer wharf on the west shore of Jewell Island is reported to be in disrepair.

Johns Ledge, covered 3 feet in places, extends 0.4 mile southwestward from the southern end of Cliff Island. Its end, covered 16 feet, is marked by a buoy. There is no safe passage for vessels between the buoy and the island. A buoy marks the broken ground and shoals southeastward of the island.

Jewell Island has a cove with good anchorage for small craft on the northeast end. A landing for small craft is at the head of the cove. A prominent stone tower is on the south end of Jewell Island, and the ruins of two old wharves and a house are on the west side. There are no facilities.

Broken Cove, about 1 mile northeastward of Jewell Island is formed by a group of bare rocks and small islets connected by ledges extending 0.6 mile northeastward from **West Brown Cow,** a 36-foot-high grass-covered islet. The daybeacon on Stockman Island in range with or open eastward of the northeast point of Ministerial Island leads eastward of the ledges, which are marked on the northeast side by a buoy.

Eagle Island is 64 feet high, wooded, and prominent, and has a house and flagstaff on the northeast side. A ledge, which uncovers about 6 feet, extends 300 yards westward of the island; a buoy is on the southwest side of the ledge.

Eagle Island Ledge, awash at high water, is 300 yards southeastward of the southern end of Eagle Island. Ledges covered 4 to 5 feet extend 300 yards southeastward and 500 yards northeastward from Eagle Island Ledge. Partly bare ledges extend 350 yards northeastward from Eagle Island.

Bates Island, 29 feet high, and **Ministerial Island,** 24 feet high both westward of Eagle Island, are grassy. They are surrounded by extensive ledges. **Stave Island** is sparsely wooded. **Stave Island Ledge** uncovers 2 feet and is marked by a buoy at its northeast end.

Hope Island, in Luckse Sound, is 90 feet high and wooded except on the southwest end, which is marked by a large house and flagpole. **Rogues Island,** 16 feet high, and **Sand Island,** northeastward of Hope Island, are grassy. The channel between them is marked by buoys. **Crow Island,** 15 feet high, has one house in the center and is low and grassy.

Bangs Island, 66 feet high, and **Stockman Island,** 36 feet high, are bare and grassy. Stockman Island has a daybeacon at the southwest end. **Goose Nest** is a grassy islet about 4 feet high, and **Goose Nest Ledge** uncovers about 7 feet. A ledge extending 400 yards south of Goose Nest is marked by a buoy.

Whaleboat Island is 74 feet high and wooded on the north end, the highest part, and 56 feet high and grassy at the south end. A light shown from a white skeleton tower is near the southerly point. A 23-foot shoal, about 0.2 mile south of the light, is marked by a gong buoy, which also marks the junction of two deep channels leading to a naval fuel depot and wharf on the west shore of Harpswell Neck in Middle Bay, eastward of Goose Ledge, about 2.6 miles northeastward of Basin Point. The tanks and other features of the naval fuel depot are conspicuous. The T-head pier is reported to have 35 feet alongside.

Little Whaleboat Island is 35 feet high and wooded. Extensive ledges extend about 0.7 mile northward, westward, and southwestward of the island. **Little Whaleboat Ledge,** covered 3 feet and **Whaleboat Ledge,** covered 6 feet, are about 0.8 and 1 mile, respectively, southwestward of Little Whaleboat Island. Both are marked by buoys.

Middle Bay makes northeastward on the west side of Harpswell Neck. **Harpswell Center** is a village on the main road of Harpswell Neck. The bay has good anchorage, but is seldom used. **Lower Goose Island,** 73 feet high, and **Upper Goose Island,** 85 feet high, on the west side of the bay, are wooded.

The eastern channel leads between **Birch Island Ledge,** which uncovers 6 feet and is marked on its southwestern end by a buoy, and a buoyed 27-foot spot on the east, and Whaleboat Island on the west. The western channel leads between Whaleboat and Little Whaleboat Islands. It is buoyed.

Gasoline and diesel fuel can be obtained at the float landing of a lobster pier on Lookout Point, on the west side of Middle Bay opposite Upper Goose Island. Depths of 3 feet are reported alongside the float.

Merepoint Bay, shallow and obstructed by flats at its northern end, is between **Birch Island,** about 50 feet high, and **White Island** on the east, and **Merepoint Neck** on the west. It is the center of considerable yachting activity in the summer season. The Merepoint Yacht Club on the neck is an organization of summer residents without formal clubhouse or landing. Several private float landings of members are used. **Merepoint** is a village on the neck.

A marina with 2 feet reported alongside its float is on the east side of the neck, about 1 mile above **Mere Point.** A 1-ton fixed crane, gasoline, water, ice, berthage, and open winter storage are available. Limited hull and engine repairs can be made.

Maquoit Bay makes northeastward on the westward side of Merepoint Neck; the entrance is north of the Goose Islands. Most of the bay is shoal and is obstructed by flats covered 1 to 4 feet. Through the flats a channel with 19 to 24 feet leads for a distance of 2 miles northwestward from its entrance.

A boatyard is on the west side of Merepoint Neck, about 2 miles above Mere Point. The marine railway at the yard can handle craft up to 35 feet in length for hull engine repairs, and dry, covered or open winter storage. A small-craft launching ramp is at the yard.

Southward of Maquoit Bay, the chain of islands between **Sister Island** and **Bustins Island,** are wooded, and there are flats between and northward of them. **Sister Island Ledge,** northward of 41-foot-high Sister Island, is partly bare at high water. Bustins Island, 83 feet high, has numerous cottages. A public landing is on the southeast side of the island with a post office and store nearby. Gasoline is available.

Rocks, awash at low water, are 50 yards southeastward and 75 yards southwestward from the landing. Eastward of the landing is a house on a ledge about 100 yards offshore. **Little Bustins Island,** 15 feet high, is marked by a house and a clump of trees in the center.

Bustins Ledge, southeastward of Bustins Island, is about 4 feet high in one spot. **French Island,** 62 feet high, is wooded. **Little French Island,** also wooded, is on ledges which extend northward of the island.

Harraseeket River is west of Maquoit Bay. The approach is between Bustins Island on the east and **Moshier Island,** 91 feet high and wooded, on the west. The entrance to the river, between **Moore Point** and **Stockbridge Point,** is narrow. Except for a dangerous midchannel rock, covered 2 feet, reported to lie in the entrance about 100 yards southwest of Pound of Tea Island, it has a depth of 23 feet.

From the entrance the channel leads between flats, mostly bare at low water, in a northerly direction to **Weston Point.** Thence a shoal unmarked channel leads to **Porter Landing,** to which small craft drawing up to 6 feet or less are reported to go at high water with local knowledge.

A special small-vessel **anchorage** area is between Stockbridge Point and Weston Point; limits and regulations are given in **110.1** and **110.5,** Chapter 2.

South Freeport, on the west side of Harraseeket River, about 0.7 mile above the entrance, has a town wharf with a depth of 15 feet reported alongside its float landing. Gasoline, diesel fuel, water, ice, and marine supplies can be obtained at the float landings of two marinas, close southward of the town wharf; depths of 12 to 15 feet are reported alongside the floats. Lodging and restaurants are nearby. The more northerly marina has a 3-ton fixed lift and a marine railway that can handle craft up to 40 feet. Hull, engine, electrical, and electronic repairs can be made, and dry, covered or open winter storage is available. A small-craft launching ramp, and guest berths and moorings are available at the other marina.

The Harraseeket Yacht Club with 19 feet reported alongside its float landing is about 300 yards southward of the town wharf; guest moorings are maintained. A motorboat passenger ferry operates from the town wharf to Bustins Island during the summer.

Prominent landmarks include a large stone turreted tower at South Freeport, a tank and standpipe at Yarmouth, and the three stacks and green painted powerplant and oil tanks on Birch Point, the southwestern end of Cousins Island, which are visible from every section of Casco Bay.

Littlejohn Island and **Cousins Island,** northward of Great Chebeague Island, are connected by a wooden bridge. The passage between the islands dries at low water. An overhead telephone cable crosses the passage just north of the bridge. There is a wharf on the southeast side of Littlejohn Island which has a reported depth of 3 feet alongside and is seldom used.

There is a large powerplant on the north side of **Birch Point,** the southwestern end of Cousins Island; the three stacks and green painted powerplant and oil tanks are conspicuous throughout the bay. The plant's T-head pier with dolphins can accommodate vessels 715 feet in length and 32 feet in draft. In 1968, depths of 34 feet were reported alongside; bottom is mud and rock. The pier is used by tankers which re-supply the powerplant with fuel oil. Vessels normally moor starboardside-to and require tugs and a line boat to handle bow and stern lines. Pilots and tugs are available at Portland; see pilotage for Portland Harbor. Only fresh water is available; bunker fuel oil and diesel can be obtained in Portland.

There is a wharf and float landing on **Doyle Point** on the east side of Cousins Island. No facilities are available. A motorboat taxi service operates from the landing to a stone wharf on the northwest side of Great Chebeague Island throughout the year.

Cousins Island is connected to the mainland by a highway bridge. The fixed span over the main navigation channel has a clearance of 25 feet.

Overhead power cables with clearance of 68 feet over the main channel cross the waterway northeastward of the bridge. **Cousins Island Light (43°44.8′N., 70°09.2′W.), 24 feet above the water, is shown from a white skeleton tower on Spruce Point,** the southern extremity of the island.

Royal River is a narrow crooked stream southwestward of Harraseeket River. The river is entered northward of Cousins Island through a dredged channel which leads from the northwestern part of Casco Bay to the river entrance between **Parker Point** on the north and **Fogg Point** on the south, and thence to the head of river navigation at the turning basin, about 0.7 mile below the town of **Yarmouth.** The approach section of the channel is State maintained. In 1960-1963, the controlling depth was 9 feet in the approach channel, thence in October 1970, 7 feet to the turning basin and 5 feet in the basin. The channel is marked by buoys and leads between flats which bare at low water. The best time for strangers to enter is on a rising tide. Falls in the river are about 0.3 mile above the turning basin.

A boatyard, on the south side of the turning basin, has a 1½-ton fixed lift, and a marine railway that can handle craft up to 50 feet in length for hull and engine repairs, and dry, covered, or open winter storage. Depths of 8 feet are reported alongside the yard's float landing. Gasoline, diesel fuel, water, berthage, ice, provisions, marine supplies, and a small-craft launching ramp are available.

Picnic and parking areas are available, and lodging and restaurants are in the vicinity. Taxi and bus service are available. A fish cannery is just below the boatyard. The cannery wharf has a reported depth of 8 feet at the outer end.

Cousins River, a narrow shallow stream, empties into the mouth of Royal River from northward. U.S. Route 1 and Interstate 95 highway bridges crossing the river about a mile above its mouth have 46-foot fixed spans with clearances of 3 feet. A boatyard on the west side of the river about 0.9 mile above the mouth, builds boats up to 70 feet in length. The yard has a 3½-ton fixed crane, and a marine railway that can handle craft up to 45 feet for hull and engine repairs; guest moorings are maintained.

Great Chebeague Island is one of the largest islands in Casco Bay. **Indian Point,** a sandspit at the southwestern end of the island, has a house and a lone tree on it.

Chandler Cove is formed by a bight in the southwestern end of Great Chebeague Island and by Little Chebeague Island; it is a good anchorage with 30 to 60 feet, but is little used. There is passenger and freight service from Portland to the State pier and public float landing in Chandler Cove, at the south end of the island. The pier has a depth of 15 feet at the head. A water taxi service carries passengers from the wharf at Doyle Point on Cousins Island to the stone wharf on the northwest shore of Great Chebeague Island; there is 6 feet alongside the wharf.

Gasoline is available at a service wharf in Chandler Cove, close northward of the State pier, in summer. Some provisions and supplies are available at a store at the landing.

Chebeague Island is a village located in the north central part of the island.

Little Chebeague Island has a patch of woods in its center and a few houses. The old landing, on the east side, is in disrepair.

Long Island, southwestward of Great Chebeague Island, has several landings on its northwest side. **Mariner** and **Long Island** are villages near the northern and western ends, respectively. A passenger and freight ferry from Portland calls at Ponce Landing on the northwest shore.

Three government piers, the easterly two of which are in ruins, are northeastward of Ponce Landing.

The passage between **Crow Island,** 6 feet high, and the north point of Long Island, is closed by scuttled vessels with hulls showing above high water.

The islands southward of Long Island are described with Portland Harbor.

Broad Cove (43°46.0′ N., 70°11.0′ W.), in the northwestern part of Casco Bay, is shallow. Good anchorage is available in the middle of the cove, southwest of **Prince Point,** in 15 to 17 feet. It is open southward and eastward.

Falmouth Foreside, a yachting center 4.3 miles north of Portland, has a boatyard and marina with 20-ton and 6-ton mobile hoists, where craft up to 50 feet can be hauled out for hull and engine repairs, and covered, open dry winter storage. Electric and electronic repairs can be made. The marina has float landings with 6 to 10 feet reported alongside. Gasoline, diesel fuel, and water are piped to the floats, and electricity is available. There is a restaurant at the yard and lodging in the vicinity.

There are numerous private moorings, and the yard maintains guest moorings. Ice, provisions, marine supplies, and bus and taxi services are available.

The Portland Yacht Club, close northeastward of the yard, has a float landing with 14 feet reported alongside; water is available. The club has a restaurant and club facilities for members and guests.

The waters off Falmouth Foreside shore from Prince Point northeastward for 1.8 miles have been prescribed as a special small-vessel **anchorage;** limits and regulations are given in **110.1** and **110.5,** Chapter 2. The **harbormaster** supervises the moorings; he can be reached by phone: 207-781-5650.

In approaching the landings from the southward, care should be taken to pass eastward and northward of the buoy close eastward of **York Ledge,** before rounding up to the northwestward. A number of small craft cutting too close to the buoy have hung up on the ledge. A daybeacon is on the ledge.

Sturdivant Island, 51 feet high and covered with grass and bushes, is partly wooded and has a house on it. **Sturdivant Island Ledges,** extending around the island, uncover 7 feet in places and are marked on the southern, eastern, and western edges of buoys. **Underwood Ledge,** to the westward, is covered 3 feet and is marked on its southeastern side by a buoy. **Basket Island** is wooded.

Upper Basket Ledge is awash at low water; **Lower Basket Ledge** uncovers about 4 feet; both are marked by daybeacons. A 10-foot spot, about 700 yards westward of the daybeacon on Lower Basket Ledge, is marked by a buoy on its southwestern side. **Clapboard Island** is 50 feet high and wooded, and has a private landing on its west side. The island is surrounded by ledges, bare and covered.

Cow Island Ledge Light (43°42.2′N., 70°11.3′W.), 30 feet above the water, is shown from a white tower on a red caisson; the light marks the ledge between Clapboard Island and Cow Island.

Waites Landing is 1.5 miles southward of Falmouth Foreside. **The Brothers** are two low, flat islets, 6 and 11 feet high.

Mackworth Island is connected to **Mackworth Point,** the eastern entrance point of Presumpscot River, by a stone causeway and highway bridge on piles with a 17-foot fixed span and a clearance of 5 feet at the navigation channel through the bridge.

Presumpscot River, the entrance of which is between Mackworth Island and **Martin Point,** has a narrow crooked channel with a depth of 13 feet to the U.S. Route 1 highway bascule bridge at the en-

trance. The bridge has a bascule span with a clearance of 12 feet for 50 feet at the center; drawbridge regulations and opening signals are given in **117.15**, Chapter 2. For a mile above the bridge the channel has a depth of 6 feet.

Three fixed spans, Interstate 295 Highway bridge, a railroad bridge, and State Route 9 Highway bridge, cross the river about 2 miles above the bascule bridge; the minimum clearance is 9 feet. An overhead power cable between the railroad bridge and State Route 9 Highway bridge has a clearance of 42 feet. There is no waterborne commerce on the river and the channel is unmarked. On Martin Point the buildings and stack of the former marine hospital, part of which now houses the U.S. Public Service outpatient clinic, are conspicuous.

Chart 13292 (325).-Portland Harbor, at the western end of Casco Bay, is the most important port on the coast of Maine. The ice-free harbor offers secure anchorage to deep-draft vessels in all weather. There is considerable domestic and foreign commerce in petroleum products, flour, wood pulp, paper, china clay, seafood products, and general cargo. It is also the Atlantic terminus of pipeline shipments of petroleum products to Canada.

The **outer harbor** comprises the area westward of Cushing, Peaks, House, and Great and Little Diamond Islands from the entrance at Portland Head to the entrance of Fore River at **Fish Point,** including the three deepwater general anchorages and the oil discharging berth westward of **Spring Point.**

The inner harbor is considered to be in two sections; the outer part or **Main Harbor,** extending from the entrance of Fore River to the Portland Bridge; and the inner part, or **Fore River,** from Portland Bridge to head of deepwater navigation at the combined fixed railroad and highway bridge.

Portland, an important manufacturing, fishing, and industrial center, is on the north side of the inner harbor with all the railroad, bulk, and general cargo terminals and piers. **South Portland** is on the south side of the harbor with all of the petroleum handling terminals and pipeline facilities along its waterfront.

The main approaches to the harbor are from the southward from Portland Lightship, or from the eastward from Halfway Rock Light to the entrance of the harbor between Portland Head, and Ram and Cushing Islands; see chart 13290 (315).

A **dumping ground** is located in the Gulf of Maine in the approach to Portland Harbor, about 1 mile northeastward of Portland Lightship; see **205.80 (a) and (b) (1),** Chapter 2, for limits and regulations; see chart 13288 (1204).

A **Traffic Separation Scheme** has been established in the approaches to Portland Harbor. (See charts 13260 (1106) and 13286 (1205).)

The Scheme is composed basically of **directed traffic lanes** each with one-way inbound and outbound traffic lanes separated by **defined separation zones** and a **precautionary area.** The Scheme is recommended for use by vessels approaching or departing from Portland Harbor, but is not necessarily intended for tugs, tows, or other small vessels which traditionally operate outside of the usual steamer lanes or close inshore.

The Traffic Separation Scheme has been designed to aid in the prevention of collisions at the approaches to major harbors, but is not intended in any way to supersede or alter the applicable rules of the road. Separation zones are intended to separate inbound and outbound traffic lanes and to be free of ship traffic, and should not be used except for crossing purposes. Mariners should use extreme caution when crossing traffic lanes and separation zones.

The **precautionary area** in the approaches to Portland Harbor has a radius of 5.45 miles centered on the Portland Lightship (43°31′36″N., 70°05′32″W.), excluding that area of the circle bounded by an imaginary line extending between the outer limits of the inbound and outbound traffic lanes.

Portland Eastern Approach.

A 1-mile-wide **traffic separation zone** centered in the following positions: 43°30′11″N., 69°59′10″W., and (ii)43°24′17″N., 69°32′42″W.

Inbound traffic lane is a 2-mile-wide lane with a length of about 20 miles. Entering the traffic lane at a point in about 43°24′30″N., 69°32′30″W., a course of **287°** follows the centerline of the traffic lane to the junction with the precautionary area.

Outbound traffic lane is a 2-mile-wide lane with a length of about 20 miles. Entering the traffic lane at a point in about 43°28′45″N., 69°59′48″W., a course of **107°** follows the centerline of the traffic lane to its end; thence steer usual courses to destination.

Portland Southern Approach.

A 1-mile-wide **traffic separation zone** centered in the following positions: (i) 43°27′00″N., 70°03′29″W., and (ii) 43°07′49″N., 69°54′57″W.

Inbound traffic lane is a 2-mile-wide lane with a length of about 20 miles. Entering the traffic lane at a point in about 43°08′15″N., 69°53′00″W., a course of **342°** follows the centerline of the traffic lane to the junction with the precautionary area.

Outbound traffic lane is a 2-mile-wide lane with a length of about 20 miles. Entering the traffic lane at a point in about 43°26′31″N., 70°05′24″W., a course of **162°** follows the centerline of the traffic lane to its end; thence steer usual courses to destination.

The Traffic Separation Scheme is not buoyed.

The area in Casco Bay, about 3.5 mile northeastward of Portland, within a circle having a 1,800-yard diameter with its center in 43°42′40″N., 70°10′36″W., has been designated as a vessel-to-vessel oil transfer area by the State of Maine Environmental Improvement Commission.

Prominent features.-Portland Lightship(43°31.6'N., 70°05.5'W.), with red hull and the name PORTLAND in white on the sides, is 5.3 miles east-southeastward of Cape Elizabeth Light. The light is 55 feet above the water. A radiobeacon and a fog signal are at the lightship. The code flag signal and radio call are NNBT. **Storm warning signals are displayed** during the daytime.

Cape Elizabeth, the southern entrance point of Casco Bay, is marked by **Cape Elizabeth Light**(43°34.0'N., 70°12.0'W.), 129 feet above the water, shown from a 67-foot white conical tower; the fog signal is about 260 yards southeastward from the light. An abandoned lighthouse tower is about 300 yards to the southwest. Numerous houses are near the light.

Portland Head Light(43°37.4' N., 70°12.5' W.), 101 feet above the water, shown from an 80-foot white conical tower connected to a dwelling, marks the south side of the entrance. a fog signal is at the light. A directional light, 24 feet above the water, is shown from the same structure.

Ram Island Ledge Light (43°37.9'N., 70°11.2'W.), 77 feet above the water, shown from a light gray conical, granite tower, is on the ledge, awash at low water, about 400 yards south of 27-foot-high **Ram Island,** and marks the north side of the entrance; a fog signal is at the light.

Cushing Island, on the northeast side of the entrance, is mostly grass covered. **White Head** is a bluff at its northeastern end. A pier is in Spring Cove on the north side.

Two old observation towers on the island are conspicuous. One is on White Head at the northeast end of the island; another is 500 yards southwestward of it.

House Island, also on the east side of the main channel, northwestward of Cushing Island, is the site of the abandoned quarantine station. Old **Fort Scammel** on the southwest end is conspicuous, and the summit of the northeastern part of the island is marked by a house and flagpole. **House Island Light,** 23 feet above the water on a white skeleton tower with a small white house, is on the north end of the island, and **Fort Scammel Point Light,** 35 feet above the water on a skeleton tower with small white house, is on the south end.

Spring Point is on the west side of the channel about 1.8 miles northwest of Portland Head Light. The buildings at **Fort Preble** on and southward of the point are conspicuous. A breakwater on the ledge which extends about 300 yards northeastward of Spring Point is marked at the end by **Spring Point Ledge Light** (43°39.1'N., 70°13.5'W.), 54 feet above the water, shown from a white conical tower on a black cylindrical pier. A fog signal is at the light.

Fort Gorges, a conspicuous gray stone structure, is on **Diamond Island Ledge,** 0.8 mile northwestward of House Island. The ledge has a large area which uncovers, and a few spots bare at high water. **Diamond Island Ledge Light** marks the west end of the ledge. The south and east side of the ledge are marked by buoys. The wreck of a six-masted schooner about 700 yards 018° from Fort Gorges is no longer visible.

A stone tower about 0.5 mile southward of Portland Head Light is conspicuous as is **Chimney Rock** about 300 yards southeastward of the tower.

On the bluff above and westward of Fish Point on the north side of the entrance is the city of Portland. There are numerous conspicuous landmarks on the bluff and in the city, most of which are charted. One of the most conspicuous and historical is the old observatory tower which resembles a lighthouse. The microwave towers on the telephone building are very conspicuous.

Boundary lines of inland waters.-The lines established for the coast of Maine are described in **82.5,** Chapter 2.

Channels.-The main entrance is from the southward, between Ram and Cushing Islands on the north and Portland Head on the south. Depths of 40 feet or more can be taken well into the outer harbor to the pipeline berth west of Spring Point, or to the anchorage in Diamond Island Roads, or westward of Diamond Island Ledge.

In addition to the main entrance from the southward, there are several entrances and channels from eastward and northward between and westward of the islands, some of which have been described previously. These are seldom used except by local vessels familiar with them or by small craft.

A Federal project provides for a 45-foot channel from the sea to Fort Gorges, thence 35 feet in the Inner Harbor and Fore River to a turning basin at the head of the project near the combination railroad and highway bridge, a 45-foot anchorage in Diamond Island Roads, and a 30-foot anchorage off Fish Point. In 1972, the contolling depth from the sea to Fort Georges was 39 feet (45 feet at midchannel), thence 34 feet (35 feet at midchannel) to the Portland Bridge, about 2 miles above Fort Georges, and thence in 1969, 31 feet to the turning basin and 30 feet in the basin.

Whitehead Passage, between Cushing and Peaks Islands, has a depth of about 24 feet. It is sometimes used by smaller vessels approaching the harbor from the eastward. The principal dangers in it are marked, but the channel is narrow and strangers are advised to use the main channel.

A channel between Peaks Island and Little and Great Diamond Islands is marked only at its northeastern and southwestern ends, and is used by the smaller bay vessels and small craft. To carry the best water, pass 50 yards off the old and former Coast Guard buoy pier on Little Diamond Island and the wharf on the south end of Great Diamond Island.

A buoyed 22-foot channel westward of Great and Little Diamond Islands connects Hussey Sound with Portland Harbor.

A channel dredged to 15 feet and marked with daybeacons and buoys leads from the main channel in Fore River to the two mole-type piers of the Coast Guard base in South Portland, about 0.4 mile northeast of Portland Bridge.

Storm warning signals are displayed at the Coast Guard base; see chart.

Fore River constitutes the Inner Harbor of Portland. Two bridges cross the river. The Portland Bridge (highway) has a bascule span with a clearance of 31 feet; see **117.25**, Chapter 2, for drawbridge regulations and opening signals. The dual railroad and highway bridge at the head of deep water navigation on the river has a fixed span with a clearance of 10 feet.

Note: The city councils of Portland and South Portland request that mariners voluntarily refrain from requesting draw openings of the Portland Bridge during the peak hours of highway commuter traffic on Mondays through Fridays from 0700 to 0900 and from 1600 to 1800. It is also requested that mariners desiring draw openings of the Portland Bridge on Saturdays, Sundays, and holidays during June, July, and August, notify the bridgetender at the bridge by radiotelephone on VHF-FM channel 13 (156.65 MHz) and also their agents and tug companies of the expected time of arrival at the bridge; a minimum of 1 hour's notice is desired. The draw of the bridge will be opened for transit of vessels upon arrival at the bridge. The bridgetender maintains a continuous listening watch on VHF-FM channel 13. **These voluntary procedures in no way change, modify, or rescind the drawbridge regulations and opening signals prescribed for the Portland Bridge in 117.25, chapter 2.**

Anchorages.-Secure anchorage for any vessel is available at all times in Portland Harbor. Anchorage grounds have been prescribed for the harbor; limits and regulations are given in **110.132**, Chapter 2.

Diamond Island Roads, with depths of 34 to 45 feet, is the principal deepwater anchorage in the outer harbor. The anchorage eastward of Fish Point, called the **30-foot anchorage,** has depths of 25 to 60 feet, but is not as large as Diamond Island Roads anchorage.

A special small-vessel anchorage is between Little Diamond Island and Great Diamond Island; limits and regulations are given in **110.1** and **110.6**, Chapter 2.

Dangers.-There are numerous isolated dangers in the approaches to the harbor and the most important ones are marked. **West Cod Ledge** (chart 13290 (315)), a 6-mile-long area of broken ground and isolated shoals, sets across the entrance from northeastward and southwestward. These include **Bulwark Shoal, Bache Rock, West Cod Ledge Rock, Corwin Rock, Alden Rock, Old Anthony Rock, East Hue and Cry,** and **West Hue and Cry.** The most important and largest of the shoal areas are buoyed, and the deep natural channels between them afford a clear approach to the harbor in clear weather from several directions.

A second barrier of shoals extending from Ram Island Ledge to Cape Elizabeth includes **Witch Rock, Jordan Reef, Pine Tree Ledge, Willard Rock, Trundy Reef, Broad Cove Rock,** and **Mitchell Rock,** almost all of which are buoyed. Several deep clear channels between them afford approach and entry well into the harbor by deep-draft vessels.

Tides and currents.-The mean range of the tide is 9.0 feet. Daily predictions for Portland are given in the Tide Tables.

The velocity at strength of the tidal current in the channel is about 1 knot southwest of Cushing Island and southwest of Diamond Island Ledge; within the harbor it is about 0.5 knot. For predictions, see Tidal Current Tables.

Weather.-As a rule, Portland has very pleasant summers and falls, cold winters with frequent thaws, and disagreeable springs. Very few summer nights are too warm and humid for comfortable sleeping. Autumn has the greatest number of sunny days and the least cloudiness. Winters are quite severe, but begin late and then extend deeply into the normal springtime.

Heavy seasonal snowfalls, over 100 inches, normally occur about each 10 years. True blizzards are very rare. The White Mountains, to the northwest, keep considerable snow from reaching the Portland area and also moderate the temperature.

Normal monthly precipitation is remarkably uniform throughout the year.

Winds are generally quite light with the highest velocities being confined mostly to March and November. The prevailing winds are southerly during the summer and northerly during the winter. At all seasons the heaviest gales are usually from the northeastward or eastward. The occasional northeasterly gales have usually lost much of their severity before reaching the coast of Maine.

Fogs occur most frequently during June, July, and August. At the head of the bays and within rivers it is often comparatively clear when it is thick outside. Winds from the east to the southwest by way of south bring fog; westerly and northerly winds clear it away.

During August and September it is occasionally foggy or smoky in the harbor in early morning when it is clear outside.

Temperatures well below zero are recorded frequently each winter. Cold waves sometimes come in on strong winds, but extremely low temperatures are generally accompanied by light winds. The average freeze-free season at the airport station is 139 days. May 12 is the average date of the last freeze (32°) in spring, but this has been as early as April 22, and as late as May 31. The average date of the first freeze in fall is September 27, with the earliest and latest occurrences on September 17 and October 10.

Ice seldom obstructs navigation; when it does it is only for a limited time. Tugs keep a clear channel to the wharves.

The National Weather Service maintains an office in Portland; **barometers** can be compared there. See page T-1 for **Portland climatological table** and appendix for address of office. **Storm warning display** locations are listed on the NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade drawing over 9 feet. Pilotage is optional for coastwise or fishing vessels under enrollment or license who have on board a pilot licensed by the Federal government. Pilots board in the vicinity of Portland Lightship. The pilot boat, a 65-foot motorboat, has a black hull with white superstructure and the word PILOT on either side of the superstructure. The pilot office monitors VHF-FM channels 16 (156.80 MHz) and 11 (156.55 MHz) continuously. The pilot boat monitors both of the above frequencies when underway using the latter as a working frequency. Arrangements for pilots are made in advance through the ships' agents. Vessels are requested to give a 48-hour and a 24-hour advance notice of their time of arrival at the lightship to Portland Pilots, Portland, Maine, by telegraph, radio, or by radiotelephone through the Boston Marine Operator (phone: 207-774-5623).

Towage.-A fleet of modern tugs up to 3,500 hp is available at Portland. Tugs meet vessels off Spring Point and use VHF-FM channel 7 (156.30 MHz). Arrangements for tugs are made through ships' agents or direct by telephone or cable; phone: Portland 207-772-8319; cable address MORTOW. Most large vessels use tugs when docking.

Quarantine, and **immigration** and **agricultural quarantine officials** are stationed in Portland; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

The U.S. Public Health Service maintains an **outpatient clinic** in Portland. Two private hospitals are available in town.

Portland is a **customs port of entry.**

Coast Guard.-The Captain of the Port maintains an office at the Coast Guard base in South Portland. A Marine Inspection Office and a **vessel documentation** office are in Portland; see Appendix for addresses.

Harbor regulations.-The Board of Harbor Commissioners in Portland has jurisdiction over the piers to the pierhead line, checks on harbor pollution, establishes pilot rates , appoints harbor pilots, and establishes harbor regulations. The harbormaster, appointed by the City of Portland, enforces the regulations and maintains an office at the State pier.

The Maine Port Authority with offices on the State pier administers and fosters the development of maritime activities in the State of Maine.

Wharves.-Deepwater facilities at Portland include eight petroleum terminals, one general cargo terminal, one bulk china clay terminal, and one international ferry terminal. All have highway connections and all but Portland Pipe Line Corp. Pier No. 1 have railroad connections. The alongside depths are reported; for information on the latest depths contact the operator. The other active facilities in the port are used as repair berths, and by fishing vessels, small craft, barges, tugs, ferries, and other miscellaneous craft. For a complete description of the port facilities, refer to the Port Series, a Corps of Engineers publication.

Facilities on the north side of Fore River at Portland:

Maine State Pier: about 0.8 mile northeastward of Portland Bridge; 248-foot face, 35 feet alongside; northeast side 1,000 feet long, 35 feet alongside; southwest side in two sections, 445 feet and 560 feet long, 24 to 14 feet alongside; deck height, 16 feet; 187,000 square feet covered storage; cargo-handling equipment available as needed; water and electrical shore power connections; receipt and shipment of general cargo; owned and operated by Maine Port Authority.

International Ferry Terminal (formerly Portland Terminal Co. Wharf No. 1); immediately northeastward of Portland Bridge; 950-foot marginal type wharf, 30 feet alongside; deck height, 15 feet; trailer-truck marshalling area adjacent; passenger and vehicle ferry operates between this terminal and Yarmouth, Nova Scotia, Canada; roll-on/roll-off facility for trailer trucks; owned and operated by the City of Portland.

Portland Terminal Co. Wharf No. 3: about 0.2 mile southwestward of Portland Bridge; 1,400-foot marginal wharf, 30 feet alongside; deck height, 15 feet; storage capacity for 15,000 tons of china clay; gantry cranes up to 10-ton capacity; belt-conveyor system for unloading china clay; water and electrical shore power connections; receipt of china clay in bulk and sacks; owned by Portland Terminal Corp. and operated by Jarka Corp. of New England.

Facilities on the south side of Fore River at South Portland:

Bancroft and Martin L-Dock: (43°38′27″ N., 70°17′06″ W.); 114-foot face; 420 feet of berthing space with dolphins; 32 feet alongside; deck height, 15 feet; water connections; receipt and shipment of petroleum products; owned by Bancroft and Martin, Inc., and operated by various oil companies.

Bancroft and Martin T-Dock: immediately southeastward of L-Dock; 115-foot face; 150 feet of berthing space with dolphins; 25 to 20 feet alongside; deck height, 15 feet; water connections; receipt and shipment of petroleum products; owned by Bancroft and Martin, Inc., and operated by various oil companies.

Mobil Oil Co. Dock: about 1.1 miles westward of Portland Bridge; 220 feet with dolphins; 35 feet alongside; deck height, 14 feet; water connections; receipt and shipment of petroleum products and bunkering vessels; owned and operated by Mobil Oil Co.

American Oil Co. Wharf: about 0.9 mile southwestward of Portland Bridge; 230 feet with dolphins; 30 to 27 feet alongside; deck height, 14 feet; water connections; receipt and shipment of petroleum products and bunkering vessels; owned and operated by American Oil Co.

Texaco Warf: about 0.3 mile southwestward of Portland Bridge; 560 feet with dolphins; 30 feet alongside; deck height, 19 feet; water connections; receipt and shipment of petroleum products and bunkering vessels; owned and operated by Texaco, Inc.

Portland Pipe Line Corp. Pier No. 1: about 0.85 mile northeastward of Portland Bridge; southwest and northeast sides 415 feet long; 35 feet alongside; deck height, 16 feet; water connections; receipt of crude oil; owned and operated by Portland Pipe Line Corp.

Portland Chevron Terminal: about 0.95 mile northeastward of Portland Bridge; 280-foot offshore wharf; 32 feet alongside; deck height, 15 feet; water connections; receipt and shipment of petroleum products and bunkering vessels; owned and operated by Chevron Oil Co.

Portland Pipe Line Corp. Pier 2: (42°39.3′ N., 70°13.8′ W.); northwest and southeast sides; 910 feet long; 48 feet alongside; deck height, 20 feet; water connections; receipt of crude oil; owned and operated by Portland Pipe Line Corp.

Supplies.-All grades of fuel oil are available. Bunkers can be obtained at the oil terminals or at the piers from barges. Water is available at most of the piers. Marine supplies and provisions are available in any quantity.

Repairs.-There are no drydocking or major repair facilities for deep-draft vessels at Portland; the nearest such facilities are at Boston, Mass.

A boatyard at South Portland, about 0.7 mile northeastward of the Portland Bridge has three marine railways, the largest of which can handle craft up to 150 feet in length, 500 tons displacement, and 12-foot draft for practically any type of repair work. A machine shop and covered or open winter storage are available at the yard; rental mobile cranes can be obtained.

There are several ship repair firms in the port that have fully equipped machine, pipe, joiner, and welding shops and can handle above-the-water hull, and engine repairs. A 100-ton fixed derrick, floating cranes up to 17 tons, and a 65-ton mobile crane are available in the port.

Small-craft facilities.-There are ample facilities in the port where all services can be obtained either at the piers on the Portland side of the river, or at the facilities on the South Portland side. The Centerboard Yacht Club in South Portland is between the Coast Guard base and the boatyard. The yacht club has two float landings with depths of 3 to 5 feet reported alongside. Water is available at the floats. The public landing with 3½ feet alongside the float is adjacent to the yacht club.

A marina in South Portland is in the cove just northeastward of the Portland Bridge; depths of 2 to 6 feet are reported alongside the berths. A 30-ton mobile hoist at the marina can handle craft up to 45-feet in length for engine repairs or dry covered or open winter storage. A privately dredged and marked channel leads to the marina's service float at which gasoline and diesel fuel can be obtained. In 1969, the channel had a reported controlling depth of 6 feet.

There are marinas with service piers at the old buoy depot on Little Diamond Island, in Chandler Cove on Great Chebeague Island, and several on the Portland waterfront from the State pier to the combination railroad and highway bridge.

There are also public landings at the State pier in Portland and at most of the State piers on the islands in Casco Bay.

Gasoline, diesel fuel, and water can be obtained at the service piers of the marinas, or from fuel barges which serve vessels in the stream. Marine supplies, food, and ice can be obtained in any quantity in the port.

Communications.-Portland is served by the Boston and Maine Railroad, Maine Central Railroad, and the Grand Trunk (Canadian National) Railway. The Portland Terminal Railroad connects the port with the trunk railroads. Passenger and freight ferries serve the nearby islands. Interstate bus lines offer transportation to all sections of the United States and Canada. Portland International Jetport is on the southwest side of the city. Three scheduled airlines operate from the airport, and charter and air taxi service is available. a scheduled passenger and vehicular ferry operates between Portland and Yarmouth, Nova Scotia, Canada. Numerous truck lines serve the greater Portland area with interstate and intrastate service.

Ship Cove, Maiden Cove,Danford Cove, Broad Cove, and **Simonton Cove,** small coves on the west side of the main channel south of Spring Point, are important only as summer anchorages for local pleasure craft.

Peaks Island is the large island northeastward of Cushing Island. It has communications with Portland by automobile and passenger ferries. Several wharves are on the west side. The ferries land at **Forest City Landing** at the village of **Peaks Island** on the west side of the island. The Casco Bay boats dock at the State pier just south of Forest City Landing where there is a public float landing. **Trefethen** is a village at the north end of the island. **Pumpkin Nob,** 51 feet high, is about 150 yards north of the northern extremity of Peaks Island; a lighted bell buoy is off its eastern side.

Great Diamond Island and **Little Diamond Island,** northwestward of Peaks Island, are connected by a sand bar covered at high water. Little Diamond has many houses visible on it, and a former Coast Guard buoy pier on its east side. Casco Bay passenger ferries from Portland call at the landings at wharves on the south end of both islands.

Gasoline, water, some provisions, and supplies are available at the marina at the former buoy pier.

The red roofed community building on the State pier on Little Diamond Island is very conspicious.

Back Cove is on the north side of Portland. The cove is now of little commercial importance and mostly dries out. The wharf of a food and seafood processing plant on the north side of the entrance to the cove between the two bridges has 10 feet alongside. There is a oil-handling berth which has 10 feet alongside on the north side of the entrance to the cove outside the railroad bridge.

An approach channel to Back Cove, north of Fish Point, had a controlling depth of 17 feet in 1959 to Grand Trunk Bridge. Above this bridge, depths decrease from 13 feet to 7 feet in a channel along the east side of Back Cove.

The Grand Trunk Railway bridge crossing the entrance to Back Cove has a swing span with a clearance of 5 feet; see **117.20,** Chapter 2, for drawbridge regulations and opening signals. U.S. Route 1 highway bridge, about 500 yards above the railway bridge, has a fixed span with a clearance of 30 feet.

9. CAPE ELIZABETH, MAINE, TO CAPE ANN, MASSACHUSETTS

Charts 13286 (1205), 13278 (1206).-From Cape Elizabeth the coast of Maine continues southwestward for about 37 miles to the Piscataqua River and the deep-water port of Portsmouth, N.H. The few harbors along this part of Maine are suited mostly to fishing vessels, yachts, and small pleasure craft. This is a summer-resort area, and many of the buildings are large and prominent. A tall water tank southwestward of Wood Island Light is the most prominent object between Portland and Portsmouth.

Extending south-southwestward from Portsmouth Harbor is the 13-mile coast of New Hampshire; the Isles of Shoals are 6 miles southeast of the harbor. Southward and eastward from the New Hampshire line the extreme northern part of the Massachusetts coast extends about 23 miles to Cape Ann Light. The Merrimack River approach to Newburyport, Mass., is about 3 miles south of the New Hampshire boundary.

Boundary lines of inland waters.-The lines established for this part of the coast are described in **82.5**, Chapter 2.

Chart 13287 (231).-Cape Elizabeth Light and Portland Lightship were described in Chapter 8.

Seal Cove, on the southeast side of Cape Elizabeth and northeastward of Richmond Island, has numerous rocks and ledges. **The Sisters,** awash, and **Seal Rock,** which uncovers about 4 feet, are dangers near the center of the cove. The eastern extremity of the ledge extending eastward of Seal Rock is marked by a buoy that facilitates entrance to the anchorage north of the ledge. The holding ground in the cove is sand and poor, but some shelter is afforded in easterly weather north of a line between **McKenney Point** and Seal Rock. Care should be taken to stay clear of unmarked **Crowell Rock. Stevens Rock,** covered 6 feet, about 650 yards southward of Seal Rock is also unmarked. The several fish wharves in the cove dry at low water; no services are available. A bell buoy, about 0.5 mile southeastward of **Watts Ledge** off the eastern end of Richmond Island, marks the entrance to Seal Cove.

Richmond Island, about 0.5 mile south of Cape Elizabeth and connected to it by a breakwater, is partly wooded with a conspicuous barn on it. Parts of the breakwater are covered at high water, and caution should be exercised in the vicinity.

Richmond Island Harbor, westward of Richmond Island and the breakwater, is sheltered from northerly and westerly winds, but is exposed to southwesterly and southerly winds. Foul ground extends 0.4 mile from the northern side of the harbor. The depths shoal gradually from 45 feet at the entrance to 15 feet 350 yards from the breakwater at the head. The holding ground is good, sand and mud. The anchorage is used by yachts and small craft.

Chimney Rock, 0.3 mile from the north shore of Richmond Island Harbor, awash at low water, is marked by a buoy. Vessels must pass southward of the buoy. A rock covered 16 feet is 0.2 mile east-southeastward of Chimney Rock; an 18-foot spot 0.3 mile east-northeastward and a 12-foot spot about 0.5 mile east-southeastward are all unmarked.

An unmarked rocky ledge covered 16 feet near its southwest end is about 0.4 mile westward of **Ram Island,** low and grassy, which is 0.2 mile northwestward of Chimney Rock. **The Brothers,** a ledge that uncovers, is 300 yards north-northeastward of Chimney Rock.

Spurwink River, 1.6 miles northwestward of Richmond Island, can be entered only by small craft at half tide or higher with a smooth sea. **Higgins Beach,** on the west side at the entrance, has many visible cottages. The river is narrow and crooked, and there are no facilities. A bridge crossing the river about 1.7 miles above the mouth has a clearance of 5 feet. An obstruction, covered 8 feet, is about 500 yards off the entrance to the river.

Old Proprietor, a ledge which uncovers at low water, 0.9 mile from shore and 1.8 miles westward of Richmond Island, is marked on its south side by a buoy. A ledge covered 11 feet about 0.5 mile and a 17-foot spot about 0.7 mile north-northeastward of Old Proprietor are both unmarked.

Between Richmond Island and Wood Island Light, a distance of about 6 miles, the shore forms a large open bight, the southern part of which is **Saco Bay.**

Prouts Neck, a conspicuous point 3 miles westward of Richmond Island, is the northern point of Saco Bay. The neck is partly wooded and has many houses. A standpipe and an old observation tower on Prouts Neck and another standpipe on **Blue Point Hill** 2.3 miles northwestward are conspicuous.

The Prouts Neck Yacht Club and float landing are on the west side and close northward of a short stone breakwater. There is reported to be a depth of 4½ feet at the float; water is available at the float.

Scarboro River enters the sea about 0.6 mile northwestward of Prouts Neck. The river and its tributaries, the Libby and Nonesuch Rivers, are used by local fishing and pleasure craft in considerable number at half tide or higher. There are many fishing piers and private float landings on these rivers, most of which are dry at low water.

A dredged channel leads across the bar from Saco Bay, thence into Scarboro River to an anchorage basin about 0.3 mile above Pine Point. In August 1971, the channel had shoaled to less than a foot, but with local knowledge a depth of 6 feet could be carried to the anchorage basin; depths of 6 feet were available in the Southern Part. The entrance is marked by a lighted bell buoy and the channel by a daybeacon and buoys. A jetty extends in a southerly direction from Pine Point on the west side of the entrance. Following protracted spells of bad weather the positions of the buoys should not be relied upon as they often do not indicate the best water.

The town pier, on the south side of the anchorage basin, has a depth of 6 feet reported at the outer end. Gasoline, electricity, water, ice, and some marine supplies are available at the pier; guest moorings are maintained. A small-craft launching ramp, usable at or near high tide, is close eastward of the pier.

Provisions and lodging are obtainable in the village of **Pine Point** a short distance from the town pier.

Along the shore of Saco Bay from northward to southward are **Grand Beach, Old Orchard Beach,** and **Ferry Beach.** The large hotels, the pier, and the standpipe at Old Orchard Beach are prominent.

Bar Ledge, covered 11 feet, is 0.9 mile from shore off Grand Beach and is marked on its southern side by a buoy. About 0.6 mile westward of the buoy and 0.7 mile northeastward of the pier at Old Orchard Beach, **Little River Rock,** covered 2 feet and extending 0.5 mile from shore, is unmarked.

Goosefare Brook enters the sea at the south end of Old Orchard Beach. The brook is foul, and the piles of an old highway bridge block the river near the entrance. About 150 yards farther upstream is State Highway No. 9 bridge with little or no vertical clearance.

Stratton Island and **Bluff Island,** 20 feet high and grass-covered, are off the northern part of Saco Bay, 1 mile southward of Prouts Neck. Deep water is between the islands and Prouts Neck, but between the islands are numerous ledges. Ledges, awash at low water, are 0.3 mile off the eastern side of Stratton Island and 0.2 mile off the southwestern side.

Islands and ledges in the southern end of Saco Bay extend up to 1.5 miles from the shore. Inside of the islands are Wood Island Harbor and the entrance to Saco River.

Eagle Island, 2.5 miles southwest of Stratton Island, and **Ram Island,** 0.7 mile south of Eagle Island, are rocky and grass-covered; vessels should pass eastward of these islands, giving them a berth of at least 0.5 mile. There is a house on Ram Island.

Saco River, with its entrance in the south end of Saco Bay west-northwestward of Wood Island, is the approach to the cities of **Biddeford,** on the south bank, and **Saco** on the north bank. The cities are at the head of navigation 5 miles above the mouth of the river. In 1970, there was no commercial traffic on the Saco River. A party fishing boat operates from the pier at Camp Ellis, a settlement on the north bank of the river at its mouth. The **harbormaster** for the river resides there; telephone, 207-284-4834. The harbormaster is also a pilot for the river and is available upon request.

Prominent features.-Wood Island, 8.7 miles southwestward of Cape Elizabeth Light and eastward of the entrance to Saco River is wooded. **Wood Island Light** 43°27.4′N., 70°19.8′W.), 71 feet above the water, is shown from a white conical tower connected to a dwelling, on the east end of the island; a fog signal is at the light. A lighted fairway whistle buoy, about 1.7 miles eastward of the light, marks the outer approach to Saco River and Wood Island Harbor.

Negro Island, low and grassy on top, is just westward of Wood Island. **Stage Island,** 0.6 mile west of Wood Island, is 20 feet high and marked by a prominent stone monument.

Basket Island, 0.3 mile west of Stage Island, is 20 feet high and grassy, and has several cottages.

Channels.-Saco River is entered through a marked channel that leads over the bar between two jetties, thence to the head of river navigation at Biddeford and Saco. A fairway bell buoy, 0.3 mile eastward of Ram Island Ledge, marks the inner approach entrance from Saco Bay. The outer 0.3 mile of the southerly jetty and the outer 0.4 mile of the northerly jetty are covered at high water. The southerly jetty is marked by a buoy off its eastern end and by piers about 260 yards apart and about 10 feet above high water on the jetty; the northerly jetty is marked by a lighted buoy off its eastern end. In May 1973, shoaling to 4 feet was reported in the channel between the jetties; obstructions in the form of pilings were also reported just below Biddeford. The bar is subject to change; local knowledge is advised.

Small craft can enter the river with a smooth sea and on a rising tide by passing between Ram Island Ledge and Negro Island Ledge and following the buoyed channel over the bar.

The fairway buoy just inside the jetties is shifted as the channel changes.

The channel in the river is narrow and crooked, but picturesque. No attempt should be made by small craft to cross the bar in either direction on the ebb with an easterly wind. Several small craft have grounded in attempting to do so.

Dangers.-Ram Island Ledge, extending 0.5 mile east of Ram Island and covered 6 feet, is marked by a buoy on its eastern side. **Stage Island Shoal,** partly bare at low water, extends 300 yards east-northeastward from the island and is marked at its end by a buoy. Wood Island Harbor, southeastward of the island, is described following the discussion of Saco River.

Negro Island Ledge, 0.2 mile north of Wood Island, and covered 8 feet, is marked on its north side by a buoy. Ledges also extend nearly 200 yards northwestward and 300 yards southwestward from Negro Island; a buoy marks the southwest end of the ledges.

The mean range of **tide** is 8.7 feet. From March to May heavy freshets are liable to change the channel depths by as much as 8 feet above high water at Saco; this condition also causes dangerous currents.

Ice closes the river from January to April.

Wharves.-There are no active commercial wharves at Saco or at Biddeford. The old wharves at the cities are not kept in repair and are seldom used.

At Saco, a pier and float landing are on the north shore of the river just northeastward of the eastern end of Factory Island. Depths of 7 feet are reported alongside the float; gasoline and marine supplies are available, and outboard engine repairs can be made. Saco Yacht Club, about 100 yards to the eastward, has 7 feet reported alongside its float; a small-craft launching ramp is available at the club.

A boatyard is on the south side of the river at Biddeford, about 0.2 mile below the bridge to Factory Island. Depths of about 10 feet are reported alongside the floats. The yard can build craft up to 55 feet in length, and has a 15-ton mobile hoist that can handle craft up to 40 feet in length for hull and engine repairs and open or covered winter storage. Gasoline, diesel fuel by truck, water, ice, and marine supplies are available.

A marina with depths of 10 feet reported alongside its floats is on the north side of the river, about 3.5 miles upriver from the entrance, or 2 miles below Saco. Gasoline, water, and open winter storage facilities are available. Provisions and marine supplies can be obtained at Saco and Biddeford. Provisions can also be obtained at the pier at Camp Ellis.

On the south bank of the river about 2.5 miles below Saco is a State park; a large parking area for cars and trailers, and a small-craft launching ramp are available.

At Biddeford an overhead power cable crossing the river from Factory Island has a clearance of 123 feet.

Wood Island Harbor, south of Wood and Stage Islands, is an anchorage for small and moderate-sized vessels. Anchorage in depths of 18 to 36 feet is available south of Wood Island. Between Negro Island and Stage Island are depths of 17 feet or more in an area about 400 yards across; it is reported that larger yachts anchor in this area.

Small craft can proceed to the southwestern part of Wood Island Harbor and anchor in depths of 6 to 18 feet. In entering this part of the harbor it is well to give the eastern side a good berth. The bottom in this inner anchorage is reported to be soft mud.

The Pool is a shallow bay making southwestward from Wood Island Harbor inside **Fletcher Neck,** the south shore of Wood Island Harbor. The entrance is about 50 yards wide.

A dredged anchorage basin is southwestward of Fishermans Wharf just inside the entrance to The Pool. In January 1969, depths of 6 feet were available in the central part of the basin, with shoaling to bare in the northwest corner of the basin and additional shoaling to 3 feet along the entire perimeter of the basin. Three stone icebreakers are along the northeastern side of the basin. Care should be taken by strangers not to anchor too close to them. They are difficult to see at night at or near high water. Neither should they attempt to go between the northeasternmost breakwater and the fish wharf because a submerged breakwater between the breaker and the wharf is visible only at extreme low tide.

Small craft anchor just inside the inner end of the entrance, which is locally known as **The Gut,** if there is room. No attempt should be made to anchor in The Gut as the tidal currents have considerable velocity and holding ground is poor. Local fishing and pleasure craft usually occupy most of the moorings, but permission can usually be obtained to occupy one of the unoccupied ones.

Biddeford Pool is a village on the south side of Wood Island Harbor, extending from The Pool nearly to the eastern point of Fletcher Neck. There are small wharves on each side of the Gut. There is a **harbormaster** at Biddeford Pool; telephone, 207-282-0803.

The Biddeford Pool Yacht Club wharf with 20 feet reported alongside the floats is at the inner end of The Gut on the east side, with a private wharf just to the northeast. The Coast Guard patrol craft usually moors at the private wharf. A town small-craft launching ramp is on the north side of the private wharf at the foot of the main street. A fish wharf close eastward of the yacht club wharf has 2 feet reported alongside.

Water is available at the yacht club float, and the club maintains two plainly marked guest moorings in the outer harbor. Gasoline, provisions, and limited marine supplies can be obtained at a filling station and stores near the landings. Meals, lodging, and most services are obtainable in the village.

Routes.-To enter Wood Island Harbor from the northeast, keep about 0.5 mile north of Wood Island, until near the fairway bell buoy eastward of Ram Island Ledge. Pass about 100 yards southeastward of this buoy, heading for the monument on Stage Island until Negro Island is abeam, then select anchorage in the area midway between Negro and Stage Islands.

If proceeding to the southwestern or lower end of the harbor, pass about 100 yards eastward of the buoy 0.2 mile northeastward of Stage Island and from a position midway between Negro and Stage Islands head in a southwesterly direction for

The Gut, being careful to give the east side a good berth. Select anchorage northwestward of Halftide Rock Daybeacon 9.

If continuing on to the anchorage basin in The Pool, favor the northwesterly side until in The Gut, then in midchannel to the buoy at the inner end.

If anchorage is desired southward of Wood Island, the best approach from northward is to the eastward of Wood Island. From a position 300 yards due east of Wood Island Light, head for the end of the bluff on the eastern extremity of Fletcher Neck until the monument on Stage Island opens up south of Wood Island; then bear around to the westward and head for the daybeacon on Philip Rock. Select anchorage from 150 to 250 yards off the middle of the island eastward of the cable area.

If coming from the southeastward, head for the middle of Wood Island to pass midchannel between the daybeacon on Washman Rock and the buoy southward of Dansbury Reef. When about 200 to 250 yards off Wood Island on this leg bear sharp around to the westward and select anchorage from 150 to 250 yards off the middle of the island.

If coming from the southeastward and bound for Wood Island Harbor, continue as in the preceding paragraph to pass 50 to 100 yards south of the buoy, southwestward of Negro Island. Hold this course until The Gut opens up westward of the buoy and daybeacon marking Halftide Rock. Then bear around to the southwestward and select anchorage northwestward of Halftide Rock daybeacon; or, if desirable, continue on inward through The Gut into The Pool.

The chart must be the guide at all times. Proceed no farther until each aid to navigation is properly identified and passed correctly.

Washman Rock, which uncovers 9 feet, is near the end of a reef which extends 600 yards southeastward from the eastern point of Fletcher Neck; a daybeacon marks the reef.

Dansbury Reef, 0.5 mile southward of Wood Island Light, is a small ledge covered 2 feet and is marked on its southeast side by a buoy. There are several shoal spots between the reef and Wood Island, and strangers should not pass between them.

Numerous rocks and ledges extend 0.6 mile southeastward of Fletcher Neck. The cupola and signal towers of a former Coast Guard station, on the east side of Fletcher Neck, are conspicuous, as are the many large homes on the neck.

Chart 13286 (1205).-Hussey Rock (43°25.8′ N., 70°20.5′ W.), covered 5 feet, is about a mile south of Fletcher Neck and is marked by a buoy.

Goosefare Bay, 5.4 miles southwestward of Wood Island Light (43°27.4′ N., 70°19.8′ W.) is a shallow cove, full of rocks and ledges. The coast between Fletcher Neck and Goosefare Bay is lined with summer homes, some very large and prominent. A large stone mansion with four large stone chimneys on Hoyt Neck, about 2.5 miles southwest of Fletcher Neck, is very conspicuous.

Little River and **Batson River** empty into Goosefare Bay. Both are used by small fishing and pleasure craft. There are private float landings and several small fish piers but no facilities in Little River. Overhead power and telephone cables with clearances of 25 feet cross Little River about 0.5 mile above the mouth.

In 1970, only small craft were observed using Batson River. Navigation is terminated by a dam at the highway bridge about a mile above the mouth.

Stage Island Harbor, 6.7 miles southwestward of Wood Island Light, is a small slough used by small local craft. The entrance is about 75 yards wide between the reefs making northward from **Cape Island** and southward from **Little Stage Island;** it is not safe for strangers. The ruins of a house is on Little Stage Island, the southern half of Stage Island.

Cape Porpoise Harbor, about 7.5 miles southwestward of Wood Island Light, is a safe and protected harbor. It is ideal for the many fishing and pleasure craft that base there. It is midway between Portsmouth and Portland and is often a welcome haven for cruising craft caught in a blow on this stretch of coast.

Seiners sometimes enter for shelter, though the anchorage is somewhat restricted by size and depth for the larger vessels.

The village of **Cape Porpoise,** around **Porpoise Cove,** is at the head of the harbor. Lobstering, fishing, a small amount of boatbuilding, and summer tourists are the principal industries.

Prominent features.-The principal mark for approaching Cape Porpoise Harbor is **Goat Island Light**(43°21.5′N., 70°25.5′W.), 38 feet above the water, shown from a white cylindrical tower with a covered way to a dwelling, on the south end of Goat Island on the east side of the entrance; a fog signal is at the light.

A lighted whistle buoy, 1.85 miles southeastward of the light, and a bell buoy about 0.4 mile southeastward, mark the approach.

A water tank and a church spire are at the head of the harbor.

Channels.-Cape Porpoise Harbor is entered by a dredged channel that leads from the entrance to a combined channel and anchorage to the town wharf, and thence through Porpoise Cove to the head of the harbor. In February 1974, the controlling depth was 17 feet in the entrance channel, thence 6½ feet to 10 feet in the combined channel and anchorage to the town wharf, and thence 3 feet to the head of the harbor. The channel is marked by buoys and daybeacons.

Anchorage.-The anchorage basin is usually occupied by local fishing and pleasure craft. The holding ground is good, and a hole can usually be found to drop anchor in.

Dangers.-The Old Prince, a ledge that has a rock awash and extends from 400 to 500 yards southeastward of Goat Island Light, is marked by a bell buoy 250 yards south-southeastward of it and a buoy about 100 yards westward of it. Local craft sometimes cut between Old Prince and Goat Island in entering; this passage is not advisable for strangers.

Ledges extending up to 0.3 mile south of grassy**Folly Island** on the west side of the entrance, are unmarked, but a buoy about 400 yards southeastward of the island marks the west side of the approach to the bar channel. A daybeacon, a white and black diamond-shaped daymark on iron spindle, marks the ledges extending northeastward from the island. This daybeacon is 180 feet from the westerly edge of the entrance to the dredged bar channel and should be given a berth of at least 250 feet in entering.

Another daybeacon, a red triangular daymark on a spindle, is on the ledge bare at low water about 370 feet southwestward of Goat Island Light. The daybeacon is about 30 feet from the easterly edge of the bar channel, and should be given a berth of about 150 feet when entering.

The principal hazards in approaching and entering are the numerous lobster pot buoys, which are in the channel and outlying waters in the summer. Care should be taken to avoid these, especially at night or during periods of low visibility.

Wharves.-There are about 10 berths with 7 feet reported alongside at the town wharf which are available for overnight berthing on a space-available basis preference is given to commercial fishing craft to unload their catch. Gasoline and water are available at the wharf. A small crane is on the wharf; restaurants and lodging are close by.

Supplies.-Ice, provisions, and marine supplies can be obtained in or on order from the village. A telephone is on the dock. There are no marine railways or repair yards; the nearest is at Kennebunkport.

There is a **harbormaster** at the village of Cape Porpoise; telephone, 207-985-2101.

Good roads connect the landing with the village and nearby towns and cities. Taxi service is available.

Most of **Paddy Creek,** just west of Cape Porpoise Harbor, dries at low water.

Turbats Creek, westward of Paddy Creek, has several private landings and considerable small-craft activity, but no service facilities.

Southwestward of Goat Island Light is an area of broken ground, with depths of 17 to 33 feet, extending as much as 2 miles offshore in places.

On the point locally known as **Walkers Point,** 1.8 miles southwestward of Goat Island Light, a large mansion with four large stone chimneys is one of the most conspicuous landmarks in the area.

Near the head of the cove west of the point is a stone breakwater behind which is a town float landing. Local pleasure craft moor in the cove, and the reported depth at the landing is 8 feet. There are no facilities.

Kennebunk River, about 2.5 miles southwestward of Goat Island Light, is the approach to the popular summer resort and yachting center of **Kennebunkport.**

Prominent features.-The beach for 0.8 mile eastward and 1.7 miles westward of the entrance is lined with hotels and summer homes, the largest and most conspicuous of which is a large white hotel on the east side of the entrance to the river.

The entrance to the river is between two stone jetties, the outer end of the easterly one being marked by **Kennebunkport Breakwater Light** (43°20.8′ N., 70°28.6′ W.), 25 feet above the water, shown from a white skeleton tower with a red triangular daymark.

Channels.-A dredged channel leads from the sea to the highway bridge at Kennebunkport, about a mile above the jetties. In October 1971, the midchannel controlling depths were 5½ feet to Buoy 15, about 0.7 mile above the jetties, thence 2½ feet to the highway bridge. Buoys mark the channel. It is reported that the entrance channel between the jetties is subject to frequent change.

Anchorages.-There are two dredged 6-foot anchorages, one on each side of the river channel, 0.3 and 0.4 mile north of the town wharf. Many moorings are maintained on the river.

Dangers.-Fishing Rock, about 0.6 mile southward of Kennebunkport Breakwater Light, uncovers 4 feet and is marked by a daybeacon. **Oak Reef,** an extensive foul ledge area with a number of drying rocks and rocks awash, extends about 0.5 mile southward of Kennebunk Beach, where it is marked by a daybeacon.

A reef covered 7 feet extends 0.8 mile southward of Fishing Rock where it is marked by a lighted bell buoy. Ledges with rocks awash extending eastward of the rock are marked by a buoy.

State Route 9 highway bridge crossing the river at Kennebunkport has a swing span with a channel width of 39 feet and a clearance of 5 feet; see **117.28** Chapter 2, for drawbridge regulations.

The mean range of **tide** is 8.6 feet.

Routes.-The chart should be the guide keeping well clear of dangers and following the aids. In southerly weather with heavy seas running it is hazardous to enter through the jetties on the ebb.

The approach to the port is marked by two buoys and two spindle daybeacons, which also mark the principal dangers. The best approach is to the eastward of the buoys.

Some local craft prefer to approach the entrance through the passage between these two daybeacons, but strangers are advised against it.

The best time to make the passage upriver is just after low water on a rising tide when the mudflats are still visible.

Wharves.-There are numerous private piers and float landings on the river, most of which are along the east bank. There are also a number of fish wharves and shipping plants on the upper river near the bridge.

The town landing on the east bank about 700 feet inside the entrance has six berths with 6 feet reported alongside. Gasoline is available at the wharf.

Bait and tackle are available at a float landing in a small cove just above the town landing; a restaurant is nearby.

The Kennebunk River Yacht Club is about 150 yards above the town landing. Its basin, protected by a stone jetty reported covered at high water, has floats with 2 to 6 feet reported alongside. The upper and lower ends of the jetty are marked by stone pylons. Water is available at the floats.

The Arundel Yacht Club has a pier and float landing about 400 yards below the bridge.

Small pleasure and fishing craft secure to moorings placed wherever there are sufficient depth and swinging room in the river. The Kennebunkport **harbormaster** can be contacted through the local police department.

Small-craft facilities.-There are several marinas and boatyards on both sides of the Kennebunk River. Most of these facilities can provide gasoline, diesel fuel, water, ice, and marine supplies, and some can make hull, engine, and electrical repairs. The largest haul-out facilities are: marine railway, 40 feet; and mobile hoist, 15 tons. Storage facilities and small-craft launching ramps are also available.

Marine supplies and provisions can be obtained in Kennebunkport. The town has taxi service and bus service to other coastal and inland points.

Kennebunk Beach is a village extending 1 mile westward of Kennebunk River entrance. Ledges extend 0.8 mile from shore southward of the village. Conspicuous ruins of a large stone house are on the end of a point extending 0.2 mile off the beach. **Great Hill,** a prominent yellow bluff at the western end of Kennebunk Beach, marks the mouth of the Mousam River. Several of the houses on the bluff are conspicuous.

Mousam River is used by small craft with local knowledge. A fixed highway bridge, with a clearance of about 3 feet each side of the center pier, crosses the river about 0.3 mile above the mouth. There are private landings on the river, but no services.

From Mousam River, a beach extends southwestward about 1.3 miles to another inlet into which **Little River** and its tributaries, **Branch Brook** and **Merriland River,** flow. A large house with a brick chimney, on a jutting point about the middle of the beach, is discernible among the other summer homes that line the beach. The inlet does not appear to be passable except for very small craft.

Drakes Island Beach, extending from this inlet to the jettied entrance at Wells Harbor about a mile southwestward, is a resort of numerous summer homes. A foul area with many rocks awash is about 0.7 mile off Drakes Island Beach and is unmarked.

Wells Harbor, about 6 miles southwestward of Goat Island Light, is used by local fishing and pleasure craft. **Webhannet River,** which flows into Wells Harbor from the southward, has no services. The harbor is protected at the entrance by two jetties. The north jetty extends southeasterly from the south end of Drakes Island, and the south jetty extends southeasterly from near the north end of Wells Beach.

A dredged channel leads from the sea through the jetties to an anchorage basin about 0.5 mile above the jetties. In December 1972, the controlling depth was 4 feet to the basin, thence 2 feet in the basin. A light is on the seaward end of the north jetty, and the channel is marked by daybeacons and a buoy to the anchorage basin. It is reported that even during a moderate sea, swells break across the entrance and make entry hazardous: the south jetty should be favored.

There are town piers and small-craft launching ramps on both the east and west sides of the anchorage basin at Wells Harbor. The pier on the east side has a depth of about 6 feet reported alongside its float landing, but no services. The pier on the west side has a depth of about 10 feet reported alongside its float landing; gasoline, diesel fuel, and water are available, and engine repairs can be made. A restaurant is nearby. Daybeacon 6, close northward of this landing, is reported to be in about 2 feet of water and should be given a berth of about 35 yards when making the landing. The **harbormaster** maintains an office on the westerly pier; telephone, 207-646-2020.

Groceries and other services are available in the village of **Wells,** just westward of the harbor.

The principal outlying dangers off these beaches are an unmarked shoal and foul area that extends about 0.5 mile off Wells Beach and has a number of rocks which uncover 2 feet and rocks awash on it. **Bibb Rock,** which uncovers 2 feet, about 0.8 mile off the point at the north end of Moody Beach, is marked on its east side by a buoy.

The principal landmarks along this stretch of beach from Kennebunkport to Ogunquit are the large resort hotels at Bald Head Cliff; Ogunquit, Wells, and Kennebunk beaches; a church spire about 1.3 miles southward of Wells; and the standpipes at Ogunquit and Kennebunk. The numerous summer homes, some large mansions, also stand out.

Wells Beach extends about 2 miles southward from the entrance to Wells Harbor to a bluff on which are a number of prominent homes, one of which has a conspicuous pointed cupola.

Moody Beach extends southward 1.2 miles where it joins **Ogunquit Beach,** which extends 1.2 miles

farther to the entrance of **Ogunquit River** The river runs southward, draining the marshes behind these beaches, and enters the ocean at Ogunquit, 4.7 miles southward of Wells Harbor. Some small craft use the river above the highway bridge about 0.3 mile above the entrance, which has a 26-foot fixed span with a clearance of 6 feet.

The entrance to the river is not marked, and the swells break across it making it difficult and dangerous to enter even in calm weather. There are no services, but there are restaurants, parking lot, and picnic areas on the beach.

Ogunquit is a summer resort of historical importance, one of the beauty spots of New England. **Israels Head,** a prominent headland, overlooks the entrance to the river on the south.

Perkins Cove, at the mouth of **Josias River,** 1 mile southeastward of Ogunquit, is a small landlocked harbor, very popular with yachtsmen, at which a number of fishing, pleasure, and party fishing boats base.

The facilities of the harbor are controlled by the village corporation, and the moorings are under supervision of the **harbormaster,** who usually can be found at the town float landing on the north side of the harbor by the footbridge; telephone, 207-646-2667.

Perkins Cove is entered by a narrow entrance channel which leads to an anchorage basin at the head of the harbor, known as **Flat Pond.** In March 1974, except for shoaling along the edges of the channel and anchorage basin, the controlling depth was 3 feet in the entrance channel and 4 feet in the anchorage basin. The channel to the anchorage is unmarked, except for two buoys at the entrance and an approach fairway bell buoy about 0.8 mile northeastward of the entrance.

The harbor is a safe haven for small craft in this stretch of coast in a sudden blow, but no attempt should be made to enter once the sea has made up, as heavy swells break clear across the entrance during easterly weather, and for as long as 2 days after a heavy blow. Small craft may broach to in attempting to enter under such conditions.

The harbor is crossed, just above the town float, by a wooden double bascule footbridge, which is operated by the harbormaster on request. The bridge has a channel width of 20 feet and a clearance of 16 feet.

Gasoline, diesel fuel by truck, water, and guest moorings are available at the town float, which has 5 feet reported alongside. Stores, lodgings, and a restaurant are at the harbor. Ice, provisions, and marine supplies are also available at the harbor or can be obtained at or delivered from Ogunquit.

Taxi and other services are available, and the main coastal highway passes a short distance from the harbor.

A marine railway on which craft up to 50 feet in length can be hauled out is at the east bank at the town wharf. Open winter storage and use of the railway for repairs are on a do-it-yourself basis.

Bald Head Cliff, 11 miles southwestward of Cape Porpoise, is a prominent high point on which is a conspicuous large hotel with cupola and outbuildings.

Mount Agamenticus, 691 feet high, is the highest and southernmost of three hills on a ridge 5 miles westward of Bald Head Cliff. The hill is a prominent landmark for vessels cruising along this section of the coast.

Chart 13283 (211.-Weare Point (43°11.2′N., 70°35.9′W.), 2.3 miles southward of Bald Head Cliff, is a headland with several large houses on it.

Cape Neddick Harbor is a small open bight between Weare Point and **Barn Point** about 1 mile northwestward of Cape Neddick. The entrance is marked, but the dangers inside the entrance are not marked. There is good anchorage in 9 to 30 feet in the middle of the bight, which is protected by the reefs on each side of the entrance from all but southeasterly weather. Even then there is a hole on the southwestern side where smooth water is found in 7 to 10 feet.

The upper and western side is foul, and along with the Cape Neddick River, which flows into the head, dries out to about 350 yards below the fixed highway bridge. The bridge has a 40-foot fixed span with clearance of 11 feet.

There are no landings, but a hard beach is on the west side at the south end of the bridge, where small craft can be launched from trailers. There is a store where provisions can be obtained and a restaurant.

A picnic grove is on the east side at the south end of the bridge.

The entrance to the harbor is buoyed and not difficult to enter with the aid of the chart. From a position about 750 yards eastward of Cape Neddick Light, a course of **325°** carries through the entrance to an anchorage in 12 to 27 feet, about 200 yards westward of Weare Point. Use the lead if necessary to avoid getting too far up the harbor into the foul area at the head.

If coming from the northward and eastward give the buoy marking the reef southeastward of Weare Point a berth of at least 200 yards before hauling to the westward for the entrance. Pass about 100 yards south of the buoy and round up midchannel between the two entrance buoys on the course **325°** and select anchorage as given in the preceding paragraph.

If York Harbor is crowded, or it is getting late, or a quiet, peaceful mooring for the night is desired, Cape Neddick Harbor is a fair haven.

Cape Neddick, 14 miles southwestward of Cape Porpoise, is a prominent headland jutting out 1 mile from the coastline and terminates in a small rock islet called **Cape Neddick Nubble.**

Cape Neddick Light (43′09.9′N., 70°35.5′W.), 88 feet above the water, shown from a 41-foot white conical tower, is on the summit of the nubble; a fog signal is at the light.

An overhead power cable with a clearance of 21 feet crosses the channel between the nubble and the cape. It is foolhardy for even small craft to pass through this channel, though lobster pot buoys were observed there.

The cape is now almost completely covered with homes, guest houses, hotels, motels, and restaurants, but there are a few trees and brush on the summit.

York Beach is a large village and much-frequented summer resort in the bights northward and southward of the cape. There are no wharves.

York Harbor, 2.5 miles southwestward of Cape Neddick and 5.5 miles northeastward of Portsmouth Harbor entrance, is the approach to the town and summer resort of **York Harbor** on the north side just inside the entrance of the **York River,** flowing into the harbor from the westward. The harbor is used by many fishing boats and pleasure craft.

Prominent features.-The important landmarks approaching York Harbor are the large brick hotel on Stage Neck; an old wartime observation tower on the southern entrance point to **Godfreys Cove,** southwest of Seal Head Point; and a large stucco mansion with stone terraces on the north side of the cove. The large homes on the promontory from East Point to **Roaring Rock Point** and a white church spire at **York Village** are also prominent.

Stage Neck is the peninsula 0.3 mile long on the north side of the harbor just inside the entrance. **York Harbor Entrance Leading Light** (43°07.8′N., 70°38.6′W.), 40 feet above the water and shown from a white structure with a red triangular daymark on Stage Neck, and a fairway bell buoy, about 1.13 miles east of the light, mark the entrance to the harbor. The light shows an intensified beam on the bearing 270°.

Western Point, on the south side of the entrance, is bare and rocky, while **East Point,** on the north side, has houses built out to its end.

Channels.-The entrance to York Harbor is narrow and crooked, and leads between rocks, bare and submerged, on both sides of the channel. In January 1970, controlling depth was 10 feet to the anchorage off the wharves. In 1959, it was reported that the river was navigable for craft drawing up to 6 feet for 7 to 8 miles above the entrance. The channel is marked to Bragdon Island, and the harbor is readily entered with the aid of the chart in clear weather and at any stage of the tide.

Anchorages.-There are anchorage basins with depths of about 5 feet in the cove between Harris Island and Bragdon Island, and in the cove off the north side of Bragdon Island. There is also limited anchorage off the service wharves at the head of the harbor. Moorings under supervision of the harbormaster extend upriver as far as Sewells Bridge, about 0.8 above the wharves.

The town maintains guest moorings for visiting yachts in the reach below the wharves off the northwest side of Stage Neck. A town wharf is on the south bank just east of the first highway bridge. No facilities are at this landing.

Dangers.-The approach to the harbor from the fairway bell buoy about 0.6 mile eastward of the entrance is free of dangers, and all shoals close to the channel edge are marked.

In closing the port coming alongshore from either northeastward or southward, give the shore a berth of at least 0.4 mile and make the fairway bell buoy off the entrance. Shoal water extending about 400 yards off East Point is marked by a buoy about 500 yards southeastward of the point.

Stones Rock, about 1.2 miles south of the entrance, is awash and marked by a spindle; a buoy is east of the rocks. An unmarked rock, covered 11 feet, about 850 yards south-southeastward of Western Point breaks if any sea or swell is running and should be given a wide berth.

On the northern side of the entrance, **Millbury Ledge** with two rocks which uncover 5 feet is unmarked. **Black Rocks,** north of the entrance, are an unmarked bare rocky ledge which uncovers 7 feet. A rock covered 5 feet, said to be plainly visible if the water is clear, is south of Black Rocks and is marked by a buoy.

The ledge extending northeastward from Western Point is marked by a buoy about 200 yards northeastward of the point. These two buoys are the first pair in entering the harbor, and should be passed in midchannel, with York Harbor Entrance Leading Light dead ahead on a course of 270°.

A rock covered 3 feet, part of a ledge extending 100 yards southeastward of **Fort Point,** the eastern end of Stage Neck, is marked on its south side by a buoy.

Rocks Nose, a bare ledge extending 150 yards northeastward from the shore on the south side of the entrance channel, is marked by a buoy.

A buoy marks the ledge off the southwestern extremity of Stage Neck and the sharp turn from the entrance channel up into the inner harbor. In making this turn, sharp seamanship is needed, especially on the strength of ebb, to avoid setting over to the westward and bringing up on the rock ledge covered 2 feet which is eastward of **Harris Island;** a buoy is eastward of the ledge.

The ledge off the eastern end of **Bragdon Island,** the northeast end of which is covered 4 feet, is marked by a buoy that also marks the turn of the river to the northwestward off the wharves.

The mean range of **tide** is 8.6 feet. The **currents** are strong in the constricted sections of the channel, where the buoys are reported to tow under at times.

The **harbormaster** will, on request, meet visiting craft outside the harbor and pilot them in.

Bridges.-State Route 103 highway bridge about 1.15 miles above the entrance has a fixed span with a clearance of 15 feet. The second fixed highway bridge, **Sewells Bridge,** about 1.7 miles above the

entrance, was rebuilt in 1940 as a replica of the first pile drawbridge built on the site in the colonial days of 1761. The present bridge has an imitation bascule drawspan which is not operable and has a clearance of 3 feet.

About 3.5 miles above the entrance, the U.S. Highway No. 1 bridge has a fixed span with a clearance of 7 feet, and 300 yards farther upstream the twin bridges of the Maine Turnpike have fixed spans with a clearance of 7 feet.

Routes.-Craft entering York Harbor in daylight with the aid of the chart and following the aids should have no problems. The most difficult problem is making the sharp turn at the buoy at the southwestern end of Stage Neck.

After making the bell buoy off the entrance, it is well to bring the leading light ahead on the bearing **270°** and, if at night, to run in on the intensified beam.

It would be prudent, however, at night, if the sea and swell are not too heavy, to anchor in the hole eastward of Fort Point, just out of the channel in line with the two nun buoys, and wait for daylight before attempting the run into the harbor and negotiating the turn around Stage Neck.

Small-craft facilities.-The facilities for yachts and small craft in the harbor are full and complete. All services can be had, and ice, provisions, and supplies of all kinds are available or can be obtained on short notice. There are three service facilities along the waterfront with wharves and float landings with 8 to 12 feet reported alongside. Gasoline, diesel fuel, and water are available. Overnight berthing at the landings is permitted.

A well-equipped marina and boatyard is on Harris Island in the cove westward of Stage Neck. There is a reported depth of 9 feet at the floats, and gasoline, diesel fuel, water, and electricity are available. Its marine railways can haul out sail or motor craft up to 50 feet in length for hull and engine repairs, or dry winter storage. Lodging and parking are available. There is launch service between the marina and the yacht club float at the hotel on Stage Neck, and taxi and car rental service are available.

A town pier and float are at the south abutment of the former highway bridge about 75 yards east of State Route 103 highway bridge. The wharf has no services.

Chart 13286 (1205).-Vessels must observe caution to avoid the offshore dangers in the northern approach to Portsmouth. **Boon Island,** 5.7 miles southeastward of Cape Neddick, is a small, low, rocky islet, marked by **Boon Island Light**(43°07.3'N., 70°28.6°W.), 133 feet above the water, and shown from a gray granite conical tower connected to a dwelling. A fog signal is at the light.

Boon Island is surrounded by deep water, but there are numerous detached ledges in the vicinity. The easternmost is **Boon Island Ledge,** 2.8 miles eastward of the light, which is awash at low water and has a lighted whistle buoy off its southeast end.

Vessels should not pass between this buoy and Boon Island Light as there is a shoal area covered 16 feet between them. If passing westward of the light, give it a berth of 2 miles or more to assure staying in a depth of more than 30 feet as there is an unmarked rocky area covered 25 feet, about 1.6 miles west-southwestward of it. Depths of 26 feet are up to 1.3 miles southward of the light.

Pollock Rock, covered 17 feet, and **Southeast Shoal,** covered 21 feet, are 0.7 mile southwest and southeastward, respectively, from Boon Island Light. **Sanders Ledge,** covered 26 feet, is about 1.2 miles south of Boon Island.

Caution.-U.S. Naval vessels may be operating with submarines in the area lying south and eastward of Boon Island. Escorting naval surface vessels usually display a red flag, but may display the international code flag signal **NE 2,** meaning: **You should proceed with great caution; submarines are exercising in this area.**

All vessels should keep well clear of vessels displaying this signal and should obey promptly any orders that may be given by commanding officers of navy vessels.

Chart 13283 (211).-Between Cape Neddick and the entrance to Portsmouth Harbor, a distance of 8 miles, the shore is indented by York Harbor, already described; Godfreys Cove, a shallow bight seldom entered; and Brave Boat Harbor.

Charts 13283 (211), 13274 (613-SC).-Brave Boat Harbor, (43°06.0'N., 70°39.4'W.), 2 miles southwestward of York Harbor, has a few private landings, but no facilities. Some local small craft were observed there, but the surf is reported to break clear across the entrance with the least sign of weather. Two old railway trestles cross the streams entering into it about 0.2 mile above the entrance. A large mansion on **Raynes Neck,** the point about 0.35 mile northeastward of the entrance, is conspicuous.

Cutts Island, on the south of the entrance, is connected with Gerrish Island to the south of it by a natural seawall of stones and rock thrown up by winter gales. It is conspicuous. A public beach is at the north end of the seawall.

Moores Rock, covered 5 feet and unmarked, is about 0.5 mile eastward of the entrance to Brave Boat Harbor. A long reef which uncovers 4 feet is about 0.3 mile southeastward of the entrance.

Two dangerous ledges are 2.5 miles offshore. **York Ledge,** the northernmost, covered 3 feet and 2.9 miles southeastward of York River, is marked by a buoy. **Murray Rock,** 1.5 miles south-southwestward of York Ledge, is covered 6 feet, and has a buoy off its southern side. A lighted whistle buoy is 1.5 miles eastward of Murray Rock and southeastward of York Ledge. Between these

ledges and the shore, the bottom is very broken and vessels are advised to pass outside of the lighted whistle buoy. Broken ground, covered 32 to 39 feet, extends 2 miles south-southeastward of the buoy marking Murray Rock.

Portsmouth Harbor, 37 miles southwestward of Cape Elizabeth and about 25 miles northward of Cape Ann Light, is the only harbor or refuge for deep-draft vessels between Portland and Gloucester. No large vessel should proceed northward of Kitts Rocks Lighted Whistle Buoy 2KR (43°02.9′ N., 70°41.5′ W.) without a pilot, as the anchorage area is limited.

Portsmouth Harbor is at the mouth of Piscataqua River and is the approach to the cities of Portsmouth and Dover, and the towns of New Castle, Kittery, Newmarket, Durham, Newington, and Exeter.

The U.S. Naval base, including Portsmouth Naval shipyard, prison, and hospital, is on **Seavey Island** at Kittery, on the north side of the harbor opposite Portsmouth.

Portsmouth is a city on the south bank of Piscataqua River about 4 miles above the entrance to the harbor.

Foreign trade is in petroleum products, gypsum, frozen fish, fish products, and salt. Oil shipments in tankers, drawing as much as 35 feet, arrive frequently, except during the summer.

Coastwise trade is in seasonal arrivals of oil tankers drawing up to 35 feet. The shipment of cable from Newington is of major importance.

The harbor, of sufficient depth to accommodate large deep-draft ships, is open throughout the year, though vessels may be hampered somewhat in passing through the two lift bridges to deepwater berths above the city.

New Castle, a village on the south side of the harbor and the northern part of **New Castle Island,** is reached from Portsmouth by a highway connecting the islands on the south side of the harbor. The island is of considerable importance as a summer resort.

Kittery is a town on the north bank of Piscataqua River opposite Portsmouth.

Prominent features.-Gerrish Island, forming the east side of the harbor entrance, has many summer homes. A park and government reservation, with conspicuous buildings, are on the southwestern end. The old observation towers on the south and eastern sides of the island are most conspicuous. A long pier and the partially submerged ruins of another pier, about 100 yards northward, are at the southwestern end of the island. The area between the two piers is used as a bathing beach; boaters either beach their craft or anchor offshore. The park has picnic tables and other facilities.

For craft approaching Portsmouth, the large hotel at the west end of New Castle Island is prominent. Other landmarks are: the stone building of the naval prison on Seavey Island; Whaleback Light; the white buildings on Wood Island with conspicuous cupola; the four towers of the two Portsmouth-Kittery lift bridges; four observation towers, two on Gerrish Island and two inshore from Pulpit Rock; a standpipe on New Castle Island; and numerous standpipes, elevated tanks, church spires, and stacks in the area, most of which are charted. The old blockhouse and parapets of **Fort McClary,** on Kittery Point, just westward of the entrance channel range lights, are also conspicuous.

Whaleback Light (43°03.5′N., 70°41.8′W.), 59 feet above the water, is shown from a 75-foot gray conical tower on Whaleback Reef at the northeast side of the outer entrance. A fog signal is at the light.

Portsmouth Harbor (New Castle) Light (43°04.2′N., 70°42.5′W.), 52 feet above the water, is shown from a white conical tower on **Fort Point,** the northeast end of New Castle Island. A fog signal is at the light.

A Coast Guard station and lookout tower are on Fort Point.

Channels.-Depths of about 35 feet can be carried in the marked channel through Portsmouth Harbor to the Memorial (U.S. Route 1) Highway Bridge. From this point, a dredged marked channel leads for about 5 miles to a turning basin about 0.5 mile above Frankfort Island in Piscataqua River. In 1970-August 1972, the controlling depth in the dredged channel to and in the turning basin was 35 feet except for a depth of 34 feet on the westerly side of the channel in 43°05′13″N., 70°45′45″W.; also see chart 13285 (212).

Portsmouth Harbor Channel Lighted Range on Kittery Point leads into the harbor on the bearing **352°45′.**

Pierces Island Lighted Range marks the main channel to Portsmouth on bearing **266°**. The entrance is marked by a lighted whistle buoy, Whaleback Light, Portsmouth Harbor (New Castle) Light, and Portsmouth Harbor Channel Lighted Range; and the harbor channel is marked by lighted buoys, buoys, and daybeacons.

A small-boat channel, privately marked by seasonal buoys, leads northerly from the main ship channel about 100 yards below the combined Interstate Route 95 highway and Boston and Maine Railroad bridge and passes under a retractable span of the railroad bridge. In 1968, the reported controlling depth in the channel was 6 feet. Clearances for the retractable span are given under bridges for Portsmouth Harbor.

Back Channel, between Seavey Island and Kittery, is limited principally to small craft and is covered in geographical sequence in the description of the harbor features.

The channel in Piscataqua River above the bridges is covered in the description of the river.

Anchorages.-The anchorage for large vessels is anywhere on the east and north sides of the channel between Wood Island, north of Whaleback

Light, and Clark Island, the small island on the north side about 0.8 mile above Fort Point, in 48 to 66 feet. Space is limited, however, to one large vessel northward of Fort Point.

Strangers should not go above Kitts Rocks in deep-draft vessels without a pilot. Because of the strong currents and eddies in the bend around Fort Point, it is difficult for any large vessel to make the swing without the assistance of a tug. It is not advisable to proceed above Wood Island without a tug and pilot. Most large vessels awaiting tug and pilot, or favorable mooring or docking conditions, anchor temporarily between Gunboat Shoal and the lighted whistle buoy south of Kitts Rocks.

With southerly wind, the best anchorage is above Fort Point on the south side of the channel in 48 to 60 feet, bottom generally clay. There is swinging room there for only one medium-sized vessel without encroaching on the channel ranges, but one large vessel could anchor northward of Pierces Island range line. There is no room to anchor in the channel above Clark Island.

Yachts and smaller vessels usually anchor in Pepperrell Cove, or northward of New Castle Island, southward of the range line.

A special small-vessel **anchorage** is off the north side of New Castle Island; limits and regulations are given in **110.1** and **110.10**, Chapter 2.

Dangers.-The principal outlying dangers are marked so that no difficulty should be experienced when entering in clear weather day or night.

Gunboat Shoal, a rocky shoal covered 19 feet, on the west side of the entrance about 2.2 miles southward of Whaleback Light, is marked on its northeast end by a lighted bell buoy. An area of rocks and ledges, some of which uncover up to 5 feet, extends about 1.5 miles eastward of Whaleback Light and up to 0.6 mile offshore. They include: **West Sister** which uncovers 3 feet and is marked by a buoy off its southeast end; **East Sister,** an unmarked ledge which uncovers 2 feet about 0.5 mile northeastward of West Sister; **Phillips Rock,** unmarked and covered 3 feet, about 0.2 mile southwestward of West Sister; **Horn Island,** surrounded by a drying reef; and 4-foot-high **White Island** and **White Island Reef,** southeastward of which are a number of unmarked rocks.

Kitts Rocks, covered 11 feet, are on the east side of the channel, about 0.4 mile southward of Whaleback Light, and are marked by a lighted whistle buoy to the southward. **Wood Island Ledge,** extending 0.2 mile off **Wood Island,** is marked off its southwest end by a lighted buoy. **Stielman Rocks,** covered 2 feet, are on the west side of the entrance about 500 yards southward of Fort Point Light; they are marked by a daybeacon on the rocks and a buoy on the northeast end. **Cod Rock,** covered 18 feet, is 225 yards northwestward of Fort Point, The remaining dangers in the harbor are described in geographic sequence.

The waters of Clark Cove have been designated a prohibited area; see **207.6,** Chapter 2, for limits and regulations.

Bridges.-The principal bridges in Portsmouth Harbor are Memorial (U.S. Route 1) Highway Bridge, which has a lift span with clearances of 19 feet down and 150 feet up, and combined Interstate Route 95 highway and Boston and Maine railroad bridge, which also has a lift span, with clearances of 10 feet down and 135 feet up. Drawbridge regulations and opening signals for both bridges are given in **117.35,** Chapter 2.

A retractable span of the Boston and Maine Railroad bridge which crosses a small-boat channel is about 150 yards to the northeastward of the lift span of the combined highway and railroad bridge. The span has a clearance of 5 feet in the closed position and is limited to 36 feet in the open position because of the fixed highway span passing above. The span is kept open at all times except for about one train per day, Tuesday through Saturday, from April 1 to November 1 each year.

A fixed highway bridge with a clearance of 135 feet crosses Piscataqua River about 900 yards above the combined Interstate Route 95 highway and Boston and Maine Railroad bridge; see chart 13285 (212).

Note.-The Memorial Highway Bridge and the combined Interstate Route 95 highway and Boston and Maine railroad bridge have radiotelephone communication on VHF-FM channel 13 (156.65 MHz) and can be contacted by ships on that frequency.

All other bridges are described in geographic sequence.

Tides and currents.-The mean range of tide is 8.1 feet at Portsmouth and 6.4 feet at Dover Point. For predictions, see the Tide Tables.

The tidal currents are strong, and special care is required especially in the restricted sections of the channel above and below the bridges. Daily predictions are given in the Tidal Current Tables.

Storm warning signals are displayed; see chart.

Pilotage is compulsory for all foreign vessels and United States vessels under register in the foreign trade. Pilotage is optional for coastwise vessels under enrollment or license who have on board a pilot licensed by the Federal government.

The pilots available are licensed for the harbor and Piscataqua River and are also in command of the harbor tugs, which are also used as pilot boats. The tugs have black hulls, dark red superstructures, and the white letter "P" on their stacks. Pilots usually board vessels in the main channel between Kitts Rocks Lighted Whistle Buoy 2KR and Whaleback Light. Arrangements for pilots are generally made in advance through ships' agents or by telegraph or radio to the Portsmouth Navigation Corporation, or by radiotelephone through the Boston marine operator; telephone, Portsmouth 603-436-1209. Pilots and tugs monitor 2182 kHz and VHF-FM channel 13 (156.65 MHz) when working ships.

As all commercial wharves now in use, except fish piers, are above the first bridge, Memorial

Highway Bridge, all large vessels, including coastal tankers, take a pilot and tug from the outer anchorage.

The strong currents in the narrow channel make the approach to and passage through the bridges very difficult. The largest vessels usually require two tugs and are taken through at or near high water slack.

A pilot to the outer anchorage is not necessary in clear weather when the aids are seen, but strangers should not go beyond Kitts Rocks at any time. In fog or low visibility no vessel of any size should proceed northward of Wood Island.

The larger vessels awaiting a pilot or tide usually anchor between Kitts Rocks Lighted Whistle Buoy 2KR and Gunboat Shoal.

Towage.-There are three tugs up to 1,600 hp available at Portsmouth. They have limited firefighting capabilities and are also used as pilot boats; see Pilotage, Portsmouth Harbor, this chapter for a description of the tugs and radio frequencies used. Naval and other vessels docking at Seavey Island usually require a tug.

Immigration, quarantine, and **agriculture quarantine** officials are stationed in Boston; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Portsmouth is a **customs port of entry.**

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

The nearest U.S. Public Health Service hospital is in Boston. Portsmouth has several public and private hospitals.

Immigration.-The local customs officials handle immigration matters pertaining to alien seamen; other immigration matters are handled by the Boston immigration office.

Coast Guard.-A **vessel documentation office** is in Portsmouth; see Appendix for address.

Harbor Regulations.-Regulations for Portsmouth Harbor are established by the New Hampshire State Port Authority and are enforced by the **harbormaster.** The Authority maintains offices at the New Hampshire State Port Authority Marine Terminal; the harbormaster can be contacted through the Authority.

Wharves.-All of the commercial deep-draft facilities in use are on the south bank of the Piscataqua River between the first bridge, Memorial Highway Bridge, and Dover Point. All of the facilities have highway connections, and all except the New England Tank Industries Oil Wharf have rail connections. The alongside depths given for each facility described are reported; for information on the latest depths, contact the operator. Only the major facilities are described; for a complete description of port facilities, refer to the Port Series, a Corps of Engineers publication.

Salt Dock: about 0.3 mile above the Memorial Highway Bridge; 300-foot marginal wharf; 35 feet alongside (reported being dredged to 50 feet in 1970); deck heights, 18 and 14 feet; 3 acres of open storage; two crawler cranes with 2½-cubic yard clamshell buckets for combined lifting capacity of 20 tons; 2½-cubic yard front-end loader; water and electrical shore power connections; receipt and shipment of dry bulk cargoes and lumber; owned and operated by Granite State Minerals Corp.

New Hampshire State Port Authority Marine Terminal Dock; about 0.45 mile above the Memorial Highway Bridge and immediately southeastward of the second bridge; 304-foot offshore wharf; 35 feet alongside; deck height, 14 feet; transit shed and open storage area; forklift trucks and mobile cranes; receipt and shipment of general cargo and receipt of dry bulk cargoes, owned and operated by New Hampshire State Port Authority.

National Gypsum Co. Wharf; about 0.9 mile above the Memorial Highway Bridge; 300-foot marginal wharf; 40 feet alongside; deck height, 14 feet; hopper conveyor-belt system for handling gypsum rock; receipt of gypsum rock by self-unloading vessels and receipt of petroleum products; owned by National Gypsum Co. and operated by National Gypsum Co., and Humble Refining Co.

Mobil Oil Co. Wharf: about 1.75 miles above the Memorial Highway Bridge; offshore wharf, 300 feet with dolphins; 36 feet alongside; deck height, 10 feet; water and electrical shore power connections; receipt of petroleum products; owned by Public Service Co. of New Hampshire and operated by Mobil Oil Co.

C. H. Sprague Wharf: immediately northward of Mobil Oil Co. Wharf; 405-foot offshore wharf; 35 feet alongside; deck height, 11 feet; open storage area; two unloading towers with 3-ton clamshell buckets serve conveyor-belt system; water connections; receipt of pumice, salt, and petroleum products; owned by Public Service Co. of New Hampshire and operated by C. L. Sprague and Son Co., Inc.

Simplex Wire and Cable Co. Wharf: about 2.3 miles above the Memorial Highway Bridge; 130-foot offshore wharf, 690 feet with dolphins; 27 feet alongside; deck height, 15 feet; special equipment for loading cable; water connections; shipment of wire and cable; owned and operated by Simplex Wire and Cable Co.

New England Tank Industries Oil Wharf: about 2.8 miles above the Memorial Highway Bridge; 344-foot offshore wharf; 38 feet alongside; deck height, 15 feet; receipt of petroleum products; owned and operated by New England Tank Industries of New Hampshire, Inc.

Atlantic Terminal Sales Corp. Oil Wharf: about 3.5 miles above Memorial Highway Bridge; offshore wharf, 225 feet with dolphins; 35 feet alongside; deck height, 14 feet; receipt of petroleum products; owned and operated by C. H. Sprague and Son Co., Inc.

Supplies.-Portsmouth has no provision for bunkering ships. Fresh water is of good quality but high in lime and magnesia content. Provisions and marine supplies are available.

Repairs.-There are no facilities for drydocking deep-draft vessels in Portsmouth Harbor. The nearest for large vessels is at Boston. Several machine shops can make minor repairs to machinery. The several boatyards are capable of hauling out boats up to 60 feet in length.

Communications.-The port is served by a freight branch of the Boston and Maine Railroad, by bus service, both local and interstate, and taxi service. Charter and excursion boats operate from the harbor, and there is ferry service in summer to the Isles of Shoals.

Small-craft facilities.-There are wharves, boatyards, marine railway services, and marinas in the harbor, which are described in geographic sequence with the description of the harbor that follows.

Little Harbor is on the west side of the entrance to Portsmouth Harbor, 0.8 mile westward of Whaleback Light. Vessels should not attempt to enter in bad southeasterly weather when the sea breaks across the entrance. The entrance is between two breakwaters, the northern of which is marked by **Jaffrey Point Light**(43°03.3'N., 70°42.8'W.), 22 feet above the water and shown from a pole with a red triangular daymark on the outer end. A marked channel leads from outside the breakwaters to an anchorage area inside the harbor. In 1966, depths of 3 to 12 feet were available in the anchorage; it is marked by buoys on the north side. A limited anchorage only for very small craft is in the channel above the inner buoy.

A highway bridge across Little Harbor has a 29-foot bascule span, manually operated, with a clearance of 12 feet. Drawbridge regulations are given in **117.48,** Chapter 2.

The Wentworth is a large and conspicuous white hotel on the north side of the harbor. The hotel maintains a wharf and float landing near the bridge. A charter fishing boat operates from the float in summer.

A narrow thorofare, partially dredged and marked by buoys, connects the northwestern end of Little Harbor with Portsmouth Harbor. The dredged section of the thorofare extends from just below the highway bridge across Little Harbor to a point about 0.8 mile above the bridge. Above this point, the thorofare leads between Shapleigh Island and Goat Island into Portsmouth Harbor. In December 1970 to March 1971, the midchannel controlling depth in the dredged section was 6 feet. The thorofare has a number of private float landings. A fixed highway bridge with a clearance of 14 feet crosses the thorofare between Shapleigh Island and Goat Island.

Portsmouth Harbor can also be reached through another part of the thorofare which leads westward of **Shapleigh Island** and **Pierces Island**, from above the dredged section. Two fixed highway bridges cross it. State Route 1B highway bridge from Shapleigh Island to **Frame Point** has a clearance of 10 feet. The other bridge from Pierces Island to the Portsmouth mainland has a clearance of 16 feet. Depths through this part of the thorofare are about 1 foot. A bare spot and a dangerous rock, which uncovers, are in midchannel about 0.3 mile and 0.2 mile southward of the first bridge, respectively; the chart is the guide.

Sagamore Creek empties into Little Harbor from the westward, about 0.2 mile above the highway bridge across the harbor. The creek is entered by a marked dredged channel which leads to a highway bridge about 1 mile above the entrance; an anchorage basin is about 0.3 mile above the entrance. In December 1970 to March 1971, the controlling depth in the channel and basin was 6 feet. The creek has considerable small-craft activity.

A marina is on the south side of Sagamore Creek, about 0.5 mile above the mouth. Depths of 4 to 6 feet are alongside the floats. Berths with electricity, gasoline, guest moorings, and a small-craft launching ramp are available. A 15-ton mobile hoist at the marina can handle craft up to 35 feet in length for hull and engine repairs and open and covered winter storage. Ice, provisions, and marine supplies can be obtained. Party fishing boats operate from the marina daily in the summer. A restaurant is on a pier close eastward.

The fixed highway bridge crossing the creek about 1 mile above the entrance has a clearance of 7 feet and a center pier about midchannel. An overhead power cable with a reported clearance of 16 feet crosses the creek about 750 yards above the bridge. There are several private landings on the creek.

Pepperrell Cove is on the eastern side of the harbor, northeastward of Portsmouth Harbor Light, and on the north side of Fishing Island, which is grassy. The cove is subject to shoaling and has depths of about 7 to 11 feet. It is mainly used by fishing vessels, yachts, and small craft. A buoy northwestward of Fishing Island marks the entrance to the cove.

Kittery Point, a village on the north side of the cove, has a public wharf and float landings with 8 feet reported alongside. Gasoline and water are available at the float, and ice, provisions, and marine supplies are available at the wharf. A small-craft launching ramp is alongside the wharf. The Kittery Point Yacht Club, also at the wharf, has a float landing on the east side of the wharf and maintains guest moorings.

Moorings in the cove are under the supervision of the **harbormaster,** who can be found at the landing or contacted through the yacht club, market, or local police.

Chauncey Creek, which empties into the east side of Pepperrell Cove, has its entrance between Gooseberry Island and Kittery Point and extends

about 1.2 miles eastward between Gerrish Island and the mainland. The creek is crossed by an overhead power cable with a reported clearance of 40 feet and a fixed bridge. There is considerable small-craft activity in the creek, which dries in its upper half. Gasoline, water, provisions, and seafood can be obtained at the float landings of two of the several lobster wharves on the north bank of the creek.

Clark Island, close southeastward of Seavey Island, is joined with Seavey Island by a rock-fill causeway. A mooring facility is at the south end of the cove formed by Seavey Island, Clark Island, and Jamaica Island. A dredged channel marked by buoys, with a controlling depth of 27 feet in September 1969, leads to the facility. The cove is a restricted area; see **207.6,** Chapter 2, for limits and regulations.

Hicks Rocks, a drying ledge with sections that uncover 11 and 7 feet, extends 350 yards from the southwest end of Kittery Point and is marked by a daybeacon on the ledge and by a buoy at its southern end.

Back Channel, with its eastern entrance between Clark Island and Hick Rocks, extends westward between Seavey Island and the Kittery mainland. It rejoins Piscataqua River westward of Badgers Island. There are landings for small craft and several wharves with depths of 8 to 9 feet which are no longer used commercially except for some fishing. A town wharf and float landing are about 125 yards westward of the westernmost bridge to Seavey Island.

The approach, with local knowledge, is between Badgers Island and Squash Island on the northwest, and Seavey Island on the southeast, or, for small craft, northward of Seavey Island through Back Channel if coming from eastward. This approach is restricted by the clearance under the two bridges to the naval shipyard on Seavey Island. The easterly one, a highway bridge, has a fixed span with a clearance of 8 feet, at the center; and the westerly one, a combined highway and railroad bridge, has a fixed span with a clearance of 7 feet. The navigation channel through the east bridge is reported to be northward of the center pier, and through the west one under the second span from the south end of the bridge.

Back Channel has several dangers and is used principally by small craft and fishermen. It is marked in the easterly half by buoys.

Spruce Creek empties into the north side of Portsmouth Harbor at the eastern end of Back Channel. The creek has a narrow unmarked channel with a least depth of 12 feet for about 1.2 miles above the entrance, and lesser depths shoaling gradually to 1 foot or less to a point about 0.8 mile farther upstream. The creek dries out about 0.2 mile below the dam about 2 miles above the entrance at the fixed highway bridge of the main coastal highway, U.S. Route 1. Extensive mudflats border the channel for most of its length.

Just above the entrance, State Route 103 highway bridge, a fixed span with a clearance of 6 feet, crosses the creek and joins Kittery Point with Kittery. About 0.2 mile above this bridge, the remains of an old railway trestle cross the creek; some of the trestle and its piling have been removed from the channel; horizontal clearance at the bridge is 24 feet. The creek has private landings, but no services.

Small-craft facilities in Portsmouth Harbor.-Portsmouth Yacht Club is on the north side of New Castle Island close westward of Salamander Point. Reported depths of 9 feet are at its float landings at which gasoline, diesel fuel, water, and electricity are available. Guest moorings are maintained by the club, and other moorings in the special small-vessel anchorage are available for hire.

A boatyard in the cove westward of the club has a marine railway that can haul out craft up to 30 feet in length for repairs or winter storage. The **harbormaster** for Portsmouth and New Castle can be reached through the yacht club or local police.

Prescott Park Wharf is a public facility on the south bank of Piscataqua River, about 100 yards eastward of the Memorial Highway Bridge. Depths of 5 to 15 feet are reported alongside the float landings. Berthing for periods not to exceed 24 hours is available to small craft.

There is a boat repair, storage, and building yard in Kittery at the eastern end of Back Channel northeastward of **Jamaica Island.** Its marine railway can haul out craft up to 60 feet in length. Water, ice, provisions, and most marine supplies can be obtained. Another yard with a machine shop is on the south side of Badgers Island west of the bridge. Water is available at its 100-foot pier, which has a depth of 11 feet reported alongside. Two marine railways can handle craft up to 65 feet in length for repairs or storage. The yard maintains guest moorings and permits overnight berthing. Ice, provisions, electricity, diesel fuel by truck, and most marine supplies can be provided.

The Kittery Point Yacht Club and the facilities in Pepperrell Cove, Chauncey Creek, and Sagamore Creek were covered in the description of those places. The small-craft facilities on Piscataqua River above Portsmouth are covered in geographic sequence with the description of the river which follows.

Chart 13285 (212).-The **Piscataqua River,** above Portsmouth, forms the approach to Salmon Falls, Cocheco, Bellamy, Oyster, Lamprey, and Swampscott Rivers. It is also the approach to the towns of Newington, Durham, Newmarket, and Exeter, and the city of Dover; all have rail freight service.

The river has ample depth for large vessels for about 3.5 miles above the second lift bridge at Portsmouth to its confluence with its western branch at the fork at Dover Point. Most of the dangers in this section of the river are marked.

The main river continues northward for 3.5 miles to the confluence of the Salmon Falls and Cocheco Rivers, both of which are described later.

The Piscataqua River is buoyed to a point about 2.5 miles above Dover Point, and its western branch in Little Bay is marked for about 4.8 miles above Dover Point to a point in Great Bay, about 1 mile above Adams Point in Furber Strait. The western branch, Little and Great Bays and their tributaries are also described later in the text.

The channels in all the tributary rivers are narrow, crooked, shoal at the heads, and unmarked; local knowledge is necessary to navigate them.

Some of the buoys in the river are reported to tow under sometimes in the strong currents, and, in particular, Buoys 13 and 16, which mark extensive shoals extending from the west and east banks, respectively, in the vicinity of Dover Point. A number of wooden pile dolphins marking the southern and western edges of the shoal extending from the east bank are reported to be covered at high water and dangerous to small craft.

Currents.-General navigation throughout the entire length of the Piscataqua River system is severely hampered by rapid tidal currents. The velocities of these currents differ at various locations because of the irregularities in the width and depth of the river and its tributaries.

The maximum average velocity in the river occurs off Nobles Island and off Dover Point at the entrance to Little Bay, and amounts to over 4 knots on the ebb. For predictions, see the Tidal Current Tables.

The irregularities of width and depth plus the abrupt directional changes of course result in changes in the direction of the currents which at some locations do not coincide with the direction of the channel and cause hazardous cross-currents.

As a result of the combination of rapid tidal currents and hazardous cross-currents, navigation of deep-draft vessels is limited to the 3-hour period consisting of 1.5 hours before and 1.5 hours after slack water during the daylight.

In 1970, the harbor pilots reported that deep-draft vessels proceeding to the wharves above the lift bridges usually require more than one tug.

Pilots and tugs can be obtained at Portsmouth. Traffic above Dover Point is confined to yachts, fishing boats, and other small craft.

Spinney Creek, about 0.5 mile above the second lift bridge, is crossed by a causeway dam, with culvert, about 300 yards above its entrance. The cove thus formed, marked on the south side of the entrance by a lighted buoy, is a snug haven for small craft out of the strong currents of the river.

The east bank has several private float landings. A boatyard and marina on the northwest bank of the cove has a marine railway that can haul out craft up to 60 feet in length for hull and engine repairs, or dry open winter storage. Gasoline, electricity, and water are available at the floats which have 12 to 25 feet reported alongside. Diesel fuel can be obtained by truck. The pier has a snack bar, and ice, provisions, and some marine supplies can be obtained. There is good anchorage in the cove in up to 25 feet, soft mud bottom. The yard has a small-craft launching ramp.

On the west bank of the river, about 0.7 mile westward of the entrance to Spinney Creek, are two wharves. The lower one is the Mobil Oil Co. Wharf, and the upper one is the C. H. Sprague Co. Wharf. These wharves were described earlier in this chapter under Wharves, Portsmouth Harbor.

Caution.-Mariners are advised to exercise caution when approaching these wharves as strong currents tend to sweep toward them. Also, the channel at this point may be reduced in width when large tankers drawing up to 35 feet are alongside these wharves.

All vessels except the smaller tankers usually have the assistance of more than one tug when maneuvering the area.

Vessels should exercise caution and pass this area with very little headway to avoid interference with or damage to the moored vessels or installations when unloading operations are in progress.

An overhead power cable with a clearance of 165 feet crosses the river about 0.8 mile west-northwestward of the entrance to Spinney Creek.

The Simplex Wire and Cable Co. Wharf, about 0.5 mile upstream of the C. H. Sprague Co. Wharf, and the other deepwater wharves farther upstream were described earlier in this chapter under Wharves, Portsmouth Harbor.

Prominent on this section of the river are the elevated tanks at the cable and gypsum plants, the coal transporter on the C. H. Sprague Co. Wharf, the oil storage tanks, the towers of the overhead power cable, and the U.S. Route 4 highway bridges crossing at Dover Point.

From **Dover Point** the river extends 3.5 miles to the confluence of Salmon Falls and Cocheco Rivers.

On the east side of Dover Point, **Hilton State Park** has a pier, float landing, gravel-surfaced ramp for launching small craft from trailers, special parking facilities for cars and boat trailers, picnic areas, snack bar, bathhouses, and a swimming beach. Water is available at the float; and restaurants, lodging, and telephones are nearby.

About 1.1 miles northward of Dover Point, on the west bank, is a boatyard that builds sail craft up to 50 feet in length. A marine railway at the yard can handle craft up to 40 feet in length for open winter storage. In 1970, the yard had no other services available.

Sturgeon Creek, on the east bank about 2 miles north of Dover Point, dries out at low water and is foul. Small craft have been known to moor in the narrow crooked channel. There are some private landings on the creek, but no service facilities. A fixed bridge crosses the creek about 0.5 mile from the entrance.

Piscataqua River is buoyed to about 2.4 miles north of Dover Point and has a fairly deep and clear channel for 1.8 miles in midriver. Above that point the river is unmarked and shoals gradually. About 3.2 miles north of Dover Point, overhead power cables crossing the river have a clearance of 65 feet.

About 4 miles above Dover Point, Piscataqua River divides at a confluence known locally as **Three Rivers,** the north fork continuing northward as Salmon Falls River and the northwest fork as Cocheco River.

Salmon Falls River is said to be navigable for small craft for about 3 miles to just below **South Berwick,** Maine. The channel is narrow, crooked, and unmarked. About 0.9 mile above its mouth, it is crossed by a highway bridge which has a 36-foot fixed span with a clearance of 5 feet. In 1970, no small-craft activity was observed on the river.

Cocheco River has a crooked channel from Piscataqua River to the head of navigation at a dam at the city of **Dover,** about 10 miles above Portsmouth. In 1968, the controlling depth was 3½ feet to a point about 0.5 mile below the dam, thence shoaling to bare to the dam. The channel is privately marked with stakes. Local knowledge is advised to pass up the river through **Lower Narrows** and **Upper Narrows.**

There is no commercial traffic on the river, but there is small-craft activity. A marina is on the north bank of the river, about 0.5 mile below the dam; hull and outboard engine repairs can be made; and gasoline, water, ice, and marine supplies are available. Depths of 6 feet are reported alongside the marina's float. Meals and lodgings are available nearby.

A number of overhead power cables cross Cocheco River; minimum clearance is 34 feet.

Little Bay, the lower section of the western branch of Piscataqua River, is crossed at **Dover Point** by U.S. Route 4 twin highway bridges, which have fixed spans with a clearance of 46 feet for a middle width of 100 feet and 33 feet for a channel width of 200 feet.

Little Bay extends about 1.7 miles westward from its confluence with the main river, as far as **Fox Point.** It then trends southward to a junction off Adams Point in **Furber Strait** with **Great Bay,** the upper section of the western branch, about 3.8 miles above U.S. Route 4 highway bridges.

Most of the important dangers in Little and Great Bays are marked, and a buoyed channel can be followed from the mouth to a point in Great Bay about 1 mile above Furber Strait.

Little Bay is deep and generally clear in the middle as far as **Goat Island,** but there are several unmarked shoal spots up to that point, and the edges are shoal with drying flats extending 200 to 300 yards offshore in places.

Just inside the entrance to Little Bay on the west side of Dover Point, there is a marina where gasoline, water, storage facilities, a small-craft launching ramp, and a 1½-ton forklift are available.

A large marina, protected on its westerly side by a stone breakwater, is on the south bank of Little Bay, about 0.4 mile westward of U.S. Route 4 highway bridges. Depths of 5 to 8 feet are reported alongside the floats. Berths with electricity, gasoline, diesel fuel by truck, ice, water, marine supplies, a small-craft launching ramp, storage facilities, and a snack bar are available. An 80-foot marine railway and a 25-ton mobile hoist are also available; hull engine repairs can be made.

Bellamy River, flowing into Little Bay from northward, has a reported depth of less than 4 feet in a narrow, crooked, and unmarked channel for about 1.4 miles above the U.S. Route 4 highway bridge across the mouth which has a 40-foot bascule span with a clearance of 9 feet; drawbridge regulations are given in **117.40,** Chapter 2.

Local knowledge is necessary to keep in the narrow unmarked channel, which is seldom used except by small craft. An overhead power cable crosses the river about 2.4 miles above the bridge with a clearance of 52 feet.

Oyster River, which flows into Little Bay westward of Fox Point, has a narrow, crooked, and unmarked channel, bare in places at low water, to the village of Durham, 8.2 miles above Portsmouth.

Durham, site of the University of New Hampshire, has many historical colonial connections. There are several private landings, including the University of New Hampshire Sailing Club, but no service facilities. Local knowledge of the river is essential to its passage.

Great Bay, a large expanse mostly of mudflats about 2 miles long and 3 miles wide, is the upper section of the western branch of the Piscataqua River. Into it flow the Lamprey and Squamscott Rivers. There is a deep buoyed channel in the middle of the bay for about a mile above **Adams Point** in Furber Strait.

From that point a crooked, unmarked, and somewhat foul channel leads to the mouths of the two rivers. Some small-craft activity was noted about the shores of the bay in 1970, but there were no service facilities.

The University of New Hampshire's Jackson Estuarine Laboratory is on Adams Point. The two-story red brick laboratory building is prominent. The float landing at the facility has a depth of 6 feet reported alongside, but no services. A rock, covered 3 feet, about 70 yards east of the landing, should be avoided.

A public small-craft launching ramp is about 0.3 mile northward of Adams Point.

Lamprey River has a depth of about 2 feet in a narrow, crooked, and unmarked channel to the village of **New-Market,** 12 miles above Portsmouth. Small craft navigate the river, and local knowledge is necessary to its passage. Much of the river is reported to dry at low water, but there is always a narrow channel in which small craft can, and do, get through.

There is a private pier and two floats at the head of navigation in a cove eastward of the dam and mill which straddle the river at the village. There are no service facilities on the waterfront, but gasoline, provisions, and other essentials may be obtained in the village.

There is room and depth for small craft to anchor off the mill wharf, which was in disuse in 1964.

An overhead power cable crossing the river at the Lower Narrows has a clearance of 54 feet.

Squamscott River, which flows into the western end of the head of Great Bay, has a depth of about 4 feet to **Oxbow Cut.** From there to the town of Exeter, about 16.5 miles above Portsmouth, the channel is reported to dry in places. Local knowledge is advisable to navigate the river to the head of navigation at the dam at Exeter.

Exeter is the site of Phillips Exeter Academy and a town of antiquity and colonial historical importance. The buildings of the academy and public buildings of the town are impressive. There is a public landing at the town.

Three bridges cross the river northward of Exeter. The Boston and Maine Railroad bridge at the mouth has a 30-foot fixed span with a clearance of 5 feet. State Route 108 highway bridge, 1.1 miles above the mouth, has a fixed span with a clearance of 9 feet. State Route Bypass 101 highway bridge just south of Oxbow Cut has a fixed span with a clearance of 14 feet.

Overhead power cables crossing the river about 0.7 mile and 3 miles, respectively, south of the railroad bridge have a minimum clearance of 50 feet. In 1970, some fishing and pleasure craft activity was noted on the river at the second bridge where there is a ramp for launching small craft from trailers at the east end, north side of the bridge.

Charts 13283 (211), 13274 (613-SC).-From Portsmouth Harbor entrance for 5 miles to Rye Ledge, the coast has a general southwesterly trend with no marked indentations. It presents the appearance of a succession of sand beaches separated by ledges extending out about 0.5 mile with occasional hotels and many summer homes back of the high-water line.

Odiornes Point (43°02.5′N., 70°42.8′W.), is about 0.8 mile south of Jaffrey Point on Newcastle Island. About 0.7 mile southward of Odiornes Point is a round concrete observation tower with a square target painted in alternate red and white triangles on top. This is an outstanding landmark for vessels approaching Portsmouth or Little Harbors from the southward.

Seal Rocks, which uncover 3 feet, are part of a foul area extending about 0.4 mile offshore southward of Odiornes Point. They are unmarked.

Cruising small craft approaching Little Harbor or Portsmouth from the southward, when passing inside Gunboat Shoal, should keep at least 0.7 mile offshore in order to avoid this area, before coming up to Portsmouth Harbor Channel Range.

Concord Point is about 3 miles southwestward of Whaleback Light. **Foss Ledges,** which uncover 3 feet, extend 0.5 mile offshore from the point and are marked by a buoy at the outer end.

Rye Harbor, 4.2 miles southwestward of Whaleback Light, is a small cove used by pleasure and fishing boats. A stone breakwater extending southward from **Ragged Neck Point** is marked at the end by a daybeacon. Another breakwater extends northeastward from the point at the south side of the entrance to Rye Harbor. These breakwaters are about 6 feet above high water. A buoy marks the south side of the entrance channel near a rocky ledge covered 5 feet. The harbor has general depths of 5 to 7 feet, with lesser depths along the edges.

About 500 yards westward of the north breakwater, a stone jetty extends about 150 yards in a southwesterly direction from the north side of the harbor. Rye State Park includes Ragged Neck, the north side of the harbor, and the head which has been diked and backfilled to form a public landing. Two State piers, the southerly one for commercial vessels and the northerly for pleasure craft, are at the landing. There are reported depths of 7 to 8 feet at the piers. The northerly pier has float landings with over 200 feet of berthing space. Both piers and floats are floodlighted at night, and water and electricity are available. The landing has a parking area.

Water is available at the floats of a service wharf on the south side of the harbor; depths of 6 feet are reported alongside the floats. Party fishing boats and a charter fishing boat are available for hire at the wharf.

The **harbormaster,** who can be contacted through the Rye Police Department, controls and assigns the moorings in the harbor. Occasionally some guest moorings become available. The harbor is small and congested, but safe for strangers attempting to enter during heavy easterly weather.

Straw Point, 0.5 mile south of Rye Harbor, is marked by a prominent white flagpole. **Rye Ledge** is 1.2 miles southward of Straw Point. The ledge, partly bare at high water, extends 0.4 mile from shore and is unmarked. The buildings and control tower of an Air Force installation on shore northwestward of the ledge, and the cupola of a large summer hotel close southward of the installation, are very conspicuous.

Isles of Shoals, about 5 to 6 miles offshore and about the same distance southeastward of Portsmouth Harbor entrance, consist of a group of eight main islands and a number of islets, rocks, and ledges. They extend about 3 miles in a northeast-southwest direction, and on a clear day can be seen for 10 miles. The islands first drew attention in 1614 when Captain John Smith on one of his voyages of exploration northward from the Jamestown Colony drew a chart of the New England Coast and named the islands the Smith Isles.

However, the group has been known as the Isles of Shoals sometime before his arrival.

Earlier, fishermen, mostly from England, had found it profitable to sail from home in early spring and return in the fall with rich cargoes of fish caught and cured at the isles. The isles are now frequented by fishermen and summer visitors, but, except for the Coast Guard personnel at the light, are uninhabited in winter. Three of the islands, Star, Lunging, and White, are within the political jurisdiction of the town of Rye, New Hampshire; the others, Cedar, Smuttynose, Malaga, Appledore, and Duck, are in the town of Kittery, Maine. The State boundary line passes through the center of Gosport Harbor and between Star and Cedar Islands.

A **dumping ground** is located in the Gulf of Maine in the approach to Portsmouth Harbor, about 1 mile eastward of the Isles of Shoals; see **205.80(a)** and **(b)(2),** Chapter 2, for limits and regulations.

Gosport Harbor, formed by breakwaters joining Star, Cedar, Smuttynose, and Malaga Islands of the group, is used as an anchorage by local fishermen, yachts, and sometimes by small coasting vessels seeking shelter. It offers protection from all but westerly winds. The breakwater between Smuttynose and Malaga Islands, and the breakwater between Cedar and Star Islands are reported to be in ruins. A diesel-powered ferry carries passengers, mail, and supplies from Portsmouth to the 200-foot stone wharf on the north side of Star Island. There is 12 feet at the float landing at the wharf, but no services; meals are served to visitors at the hotel in summer.

Prominent features.-Isles of Shoals Light (42°58.0′N., 70°37.4′W.), 82 feet above the water, is shown from a 58-foot white conical tower with covered way to a dwelling on the south end of **White Island,** the southernmost island of the group. A fog signal is at the light. The light covers the entire horizon, but is obscured by the houses on the island to the northward of it.

The more prominent landmarks are the large white hotel and other buildings around it, and a flagpole on Star Island; a former Coast Guard station with cupola, an old tall concrete observation tower, three radio masts, and five old abandoned stone houses on Appledore Island; and a house and a flagpole on Lunging Island.

Channels.-Several channels between the islands lead into Gosport Harbor and are mostly deep and clear. The narrow channel between Appledore and Smuttynose Islands has a depth of 20 feet, though there is an unmarked 12-foot spot in its eastern approach. A fairway bell buoy marks the western approach to Gosport Harbor.

Dangers.-Ledges surround most of the islands, but most of the detached shoals are marked. **Cedar Island Ledge,** 0.4 mile southeastward of Cedar Island, uncovers 4 feet but is unmarked. It should be given a berth of at least 0.5 mile.

Anderson Ledge, which uncovers 4 feet and is marked by a buoy, is about a mile east-southeastward of Isles of Shoals Light. The ledge, the outermost danger, is about 200 yards in diameter and has deep water around it.

Halfway Rocks, a ledge which uncovers 2 feet, marked on its west side by a buoy, is in midchannel between Star and Lunging Islands. An unmarked rock, covered 6 feet, is midway between the ledge and Star Island.

Bare **Square Rock** and a ledge which uncovers 3 feet, both unmarked, are off the west shore of Lunging Island.

Appledore Ledge, covered 7 feet and marked on its west wide by a buoy, is off the northwest end of Appledore Island. An unmarked 27-foot spot is about 500 yards off the north end of the island, and a 12-foot spot is off the southeast shore.

Southwest Ledge and **Jimmies Ledge,** both drying ledges, and bare **Mingo Rock** and **Eastern Rocks** are off the 18-foot-high bare **Duck Island.** A **danger zone** of a naval target area is centered on **Shag Rock** off the east side of the island; see **204.2,** Chapter 2, for limits and regulations.

All dangers surrounding Isles of Shoals can be avoided by passing 0.5 mile to westward and 1.5 miles to eastward.

Star Island, the most important of the group, is the site of many religious conventions and seminars held in the hotel. There are many points of historical interest on the island. An old stone church, a graveyard, a 40-foot memorial obelisk, and a monument to Captain John Smith are near the south central part of the island. In clear weather Boon Island, Mount Agamenticus on the mainland, and even Cape Ann, 20 miles to the southward, can be seen from the island.

Appledore Island, the largest of the group, has a former Coast Guard station, an old concrete observation tower on the highest part of the island, three radio towers, and five abandoned stone houses on the west side. There are no usable wharves, the old government wharf on the west side having been destroyed by storms in the winter of 1946; however, a landing can be made in Babbs Cove on the west side at the old Coast Guard boathouse.

Cedar Island with four houses on it and **Smuttynose Island** with three are northward of Star Island. **Haley Cove,** formed by a stone breakwater joining the island to **Malaga Island,** is used by fishermen in summer. The boats lie aground at low water.

Lunging Island, a bare low rocky islet about 0.5 mile west of Star Island, has a refuge hut on it.

Charts 13278 (1206, 13274 (613-SC).-From **Fox Hill Point** (42°57.9′N., 70°46.2′W.) to Merrimack River entrance, there are about 9 miles of sandy beaches, several rocky headlands, and offlying reefs and ledges up to 1 mile from shore. A large house with three chimneys on Fox Hill Point is

very prominent. Summer resorts line the beaches, and hotels and prominent summer homes are on the headlands. Salt marshes between the beaches and the coastal ridge about 2 to 2.5 miles westward are drained by small rivers, most of which flow into the inlet at Hampton Harbor.

Little Boars Head is a yellow bluff 7 miles southwestward of Whaleback Light. A summer resort of the same name extends over 0.5 mile northeastward from the bluff; a large green-roofed mansion on the head is conspicuous. A ledge, awash at low water, is about 0.4 mile eastward of the head. A buoy, about 1 mile east-southeastward of the head, marks the ledge and the broken and foul ground off it.

The cupola, buildings, and signal tower of the abandoned Hampton Beach Coast Guard station are conspicuous about 1 mile southwestward of Little Boars Head.

Great Boars Head (42°55.1'N., 70°47.7'W.) is a bluff point making out 0.3 mile between North Beach and Hampton Beach, and 9.5 miles southwestward of Whaleback Light. The summer resort of **Hampton Beach** extends southward from the point.

Hampton Harbor, about 10 miles southwestward of Portsmouth Harbor and 1.5 miles southward of Great Boars Head, is an inlet formed by the confluence of **Hampton River** and **Blackwater River** and other rivers, sloughs, and creeks that drain the extensive area of salt marsh to the westward of Hampton, Seabrook, and Salisbury Beaches

The harbor is principally an anchorage for numerous pleasure craft and a considerable number of party and charter hire fishing boats which operate from the harbor from late spring to early fall. There is also some year-round fishing activity.

The entrance to the inlet is between two rock jetties, each marked on the outer end of a daybeacon.

Prominent features.-The most prominent landmarks approaching the harbor are the pavilion and bath houses of Hampton Beach State Park on the north side of the entrance, the operating tower of the bridge crossing the inlet, and the numerous buildings along the beaches north and south of the entrance.

Channels.-Hampton Harbor is entered by a dredged entrance channel which leads southwestward of the shoals off the north side of the entrance to a highway bridge, thence to two privately dredged harbor channels, one leading northward to an anchorage basin off the marina and the other leading southward to a turning basin off the pier at Seabrook. In June 1971, the controlling depth to the bridge was 8 feet, thence in 1965, 6 feet in both harbor channels and basins. A lighted bell buoy and a gong buoy mark the approach to the entrance channel, and buoys mark the channel to the bridge.

Anchorages are available in the basins or in the narrow channels of the Hampton and Blackwater Rivers and other rivers and creeks northward and southward of the inlet.

Dangers.-Extensive rocky ledges obstruct the approaches to the entrance to the inlet. **Hampton Shoal Ledge,** covered 19 feet, about 2.8 miles eastward of the entrance, is unmarked.

About 0.5 mile off the entrance is an extensive area of drying and covered rocky ledges consisting of **Old Cellar Rocks, Inner Sunk Rocks, Outer Sunk Rocks, and other rocks between Inner and Outer Sunk Rocks; a buoy is northeastward of the area.**

State Route 1A highway bridge crosses the inner end of the inlet. It has a 40-foot bascule span with a clearance of 18 feet; drawbridge regulations and opening signals are given in **117.50,** Chapter 2. It is reported that the flood velocity under the bridge is 1.5 to 2.2 knots and the ebb velocity 2 to 3.2 knots.

Routes.-For craft entering or leaving, the chart should be the guide; follow the aids with due attention to existing conditions. In heavy weather, the harbor may be closed because of heavy breakers across the entrance.

Small-craft facilities.-Several party fishing boats operate from the float landing of the State park inside the harbor, close northward of the bridge, and from a sport fishing pier and a service landing in the cove close to the northwestward of the park float. Water is available at the float, and a restaurant is on the pier.

A marina is in a privately dredged basin protected by wooden jetties, about 0.4 mile northward of the bridge. There are slips with floats for 100 boats with 4 to 15 feet alongside. Gasoline, diesel fuel, and water are available at the service float on the south side of the entrance to the basin. Water and electricity are available at all of the berths. The marina has a 20-ton mobile hoist that can haul out craft up to 50 feet long for hull or engine repairs, or dry covered or open winter storage. Ice, provisions, and marine supplies are available. Motels, hotels, restaurants, markets, and many other conveniences are nearby. There is a small-craft launching ramp north of the basin.

A State park is across the road. Motels, restaurants, lodging, markets, and other conveniences are available at the village at Hampton Beach.

Taxi and bus services are available.

There are a town wharf and two service wharves with 3 feet reported alongside at Seabrook at the southern end of the harbor from which a number of party and charter fishing boats operate. Water is available at the floats of the service wharves. A snack bar and refreshments are on the wharves, and a restaurant is nearby. A narrow dredged channel leads southward to it from the inlet. Numerous small craft are usually found moored in the channel.

From Hampton Harbor, **Seabrook Beach** and **Salisbury Beach** extend 4.3 miles in a southerly direction to the entrance of Merrimack River. Unmarked ledges and foul and broken ground extend

up to 0.8 mile offshore and among them a number of rocks awash, including **Thomas Rock** and **Round Rock** . **Breaking Rocks,** a ledge covered 3 feet, is 0.7 mile offshore and nearly 2 miles south of Hampton River. It is marked at its northeast end by a buoy.

The amusement park with its roller coaster at Salisbury Beach is most conspicuous. The large bathing pavilion and bathhouses of Salisbury Beach State Park near the southern end of the beach are also conspicuous.

Charts 13282 (213), 13274 (613-SC).-Merrimack River is the largest river in the eastern part of Massachusetts. It is the approach to the cities of Newburyport and Haverhill, and to the towns of Amesbury, Merrimacport, Groveland, and Bradford. The river is used by vessels of 6-foot draft at high water up to Haverhill and about 12-foot draft at high water to Newburyport. The head of navigation is at the dam just above Broadway Bridge in Lawrence, 25.7 miles above the mouth. The river is seldom entered for refuge and has virtually no commercial traffic.

The shifting bar at the entrance is usually dangerous to cross in heavy weather. The whole entrance breaks in easterly gales. A lighted whistle buoy, about 1 mile off the jetties, marks the approach.

Newburyport is a city on the south bank of the river, 3 miles above the entrance. It had no trade by water in 1970, except some fishing.

Prominent features.-In the approach to the entrance of Merrimack River, the most important objects are: the cottages on the south side at the entrance; the large hotels and roller coaster at **Cushing,** 1.5 miles north of the entrance; and the large bathing pavilion and bath houses of the State park near the southern end of Salisbury Beach, just north of the entrance. A large water tank, standpipe, the bridges, church spires, several stacks, and a cupola, all in Newburyport, are conspicuous.

The towers of the overhead power cables crossing the river at Newburyport, which have a clearance of 105 feet, are very conspicuous, as well as the powerhouse on the south bank at the eastern end of Newburyport. The Coast Guard lookout station and steel signal tower near the inner end of the south jetty are also conspicuous.

Newburyport Harbor Light (42°48.9'.N., 70°49.1'W.), 50 feet above the water, is shown from a 35-foot white conical tower near the western end of **Plum Island Point,** the southern point of the entrance. The light is obscured in several sectors by shore structures.

Merrimack River Entrance Leading Light (42°49.5'N., 70°49.4'W.), 56 feet above the water, is shown from a skeleton tower with a white daymark on the north side of the entrance. The light shows on a 3° sector covering the channel through the bar. It has a red sector of 6° covering the shoal and foul ground southwestward of the entrance channel. It is obscured elsewhere.

Channels.-Merrimack River is entered by a dredged channel which leads through the bar between two jetties at the entrance. In December 1971, the controlling depths were 8½ feet in the bar channel, thence in 1968 to November 1970, 6 feet at midchannel in the marked channel to the highway bridge at Newburyport, about 3 miles above the jetties. From Newburyport to Haverhill, about 18 miles above the entrance, the controlling depth in the marked channel was reported to be 3 feet in 1964.

The jetties extend from both points at the entrance out to the bar and are difficult to see at high water, particularly at night and in periods of low visibility. About 240 yards of the outer end of the north jetty is submerged at high water.

Anchorages.-At Newburyport the usual and best anchorage is in the channel about 400 yards below the highway bridge, favoring the north side of the channel and keeping clear of the two charted cable areas. The current is reported to run strongest along the south shore here. The holding ground is good.

A special small-vessel anchorage is in the river eastward of the American Yacht Club and southward of **Half Tide Rocks;** limits and regulations are given in **110.1** and **110.15,** Chapter 2.

The yacht club maintains guest moorings as do many of the service facilities and marinas. Numerous private moorings are maintained off Newburyport and in the upper river as far as Haverhill. They are under control of the harbormasters at Newburyport, Amesbury, and Haverhill.

Bridges.-Merrimack River from the entrance to Haverhill is crossed by 10 bridges, 8 of which are highway and 2 are railroad. U.S. Route 1 highway bridge and the Boston and Maine Railroad bridge that cross the river at Newburyport have swing spans with a minimum clearance of 13 feet. The channel is through the north draws.

In 1973, a bascule bridge with a design clearance of 35 feet was under construction immediately westward of U.S. Route 1 highway bridge. Upon completion it will replace the existing U. S. Route 1 highway bridge.

Drawbridge regulations and opening signals for the bridges on Merrimack River from Newburyport to Haverhill are given **117.55,** Chapter 2.

About 1.5 miles above the Newburyport bridges, the river is divided into a main or north channel, and a south channel by **Eagle Island** and **Deer Island,** and the shoals west of it.

About 2 miles above Newburyport, a suspension highway bridge with a clearance of 28 feet crosses the south channel from Belleville to Deer Island. This bridge was originally built in 1810 with chain suspension. The highway then crosses to **Salisbury Point** from Deer Island on a swing bridge which has a clearance of 15 feet.

About 300 yards westward of the swing bridge, the Interstate Route 95 (New Hampshire-Massachusetts Turnpike) bridge crosses the river from

Salisbury Point to Belleville. The fixed span over the north channel (main passage) has a clearance of 55 feet, and that over the south channel, 32 feet. An overhead power cable with a clearance of 76 feet crosses the river about 4 miles above the Interstate Route 95 bridge.

At **Rocks Village** on the north bank, about 8 miles above Newburyport, a highway bridge which has a hand-operated swing span with a clearance of 17 feet, crosses the river to **West Newbury.** An overhead power cable crossing the river about 0.1 mile downstream from Rocks Bridge has a clearance of 76 feet.

At **Groveland,** about 11 miles above Newburyport, State Route 113 highway bridge, which has a bascule span with a clearance of 13 feet, crosses the river to **Riverside** on the north bank.

At Haverhill three bridges cross the river; the lowest one, the Bradford Highway Bridge, has a 34-foot fixed span with a clearance of 29 feet.

The Boston and Maine Railroad bridge about 0.5 mile above Bradford Bridge has a 40-foot fixed span with a clearance of 36 feet, and the County highway bridge, close above the railroad bridge, has a 35-foot fixed span with a clearance of 30 feet. Overhead power cables crossing the river above the bridge have minimum clearances of about 30 feet.

Routes.-A lighted whistle buoy is about 1 mile outside the bar at the entrance to Merrimack River, a bell buoy is at the bar, and the channel across the bar is marked by an entrance leading light and by buoys. The chart should be the guide following the aids. Considerable chop is experienced on the bar with the wind against the tide.

Small craft may enter when the sea is smooth and on a rising tide, following the buoys. The river cannot be entered during a heavy sea. The outer ends of the jetties are awash at high water.

After the bar is crossed, the channel is well marked and easily followed to Newburyport. The channel leads between the light marking **North Pier** and a buoy marking **South Pier,** which bares at half tide. Westward of South Pier, for the best water favor the Newburyport, or south, shore until up with the overhead power cables, and the buoy under them, then head up for the north draw of the highway swing bridge, still favoring the south side of the channel, and select anchorage or obtain a mooring off one of the service facilities or marinas.

The channel between Newburyport and Haverhill is marked by buoys at the most difficult points, but is narrow and crooked, and leads close to rocks in places. Local knowledge is required to keep in it.

Several of the buoys in the narrows at Merrimack Park and just below Rock Bridge have been reported to tow under during the strength of ebb.

In 1971, the Coast Guard provided the following information to assist the mariner in crossing the bar when outbound from the Merrimack River.

The bar area between the beach and Bell Buoy 2, both north and south of each jetty, is subject to breaking seas, particularly on an ebb tide with easterly winds. The ebb tide runs out of Merrimack River from 1 to 3 knots. Boats should proceed slowly out the channel, evaluating the bar well inside of the two breakwaters. If decision is made to cross, proceed all the way out beyond the breakers and do not attempt to turn around if the bar is breaking.

The area southward of the outer 240 yards of the submerged north jetty and the channel is a shoaling sand bar subject to constant change in depth. This area and a portion of the channel just south are extremely hazardous. Avoid crossing the sunken jetty or sand bar, and use caution in the channel to the south of it.

Ocean swells meeting an outgoing tide in the river mouth result in breaking seas. The most dangerous period is from about 1 hour before low water and 1 hour after low water. Even on the calmest days the tidal conditions may be such that small boats will be endangered at this period. Boatmen should learn the stages of the tide when local conditions are the most favorable for bar crossing.

Due to the sandy nature of the river bottom, one can expect unannounced changes in the bar shoals depending upon prevailing winds and currents. These changing bars and shallow areas may not be marked on the charts.

In addition to the above, and to further assist the outbound mariner, the Coast Guard, State of Massachusetts, and the City of Newburyport have established a **bar guide advisory sign** at the former Merrimack River Coast Guard Station boathouse. The sign, a diamond-shaped white daymark with an orange reflective border, has a quick flashing white light and the words "Rough Bar" in its center. This light will be flashing when the bar is breaking 2 feet or more. The light will be extinguished when a lesser sea condition exists. The Coast Guard does not guarantee that the bar is safe if the light is not flashing. The bar can be dangerous at any time. When the warning sign light flashes, none but experienced boatman should attempt a bar crossing. This bar guide advisory sign will be maintained from May 1 to October 31.

Tides and currents.-The mean range of tide is 8.3 feet at the entrance and 7.8 feet at Newburyport. Currents are strong in the river, and yachts sometimes drag when anchored off the American Yacht Club. Strangers should use a mooring, if available. Current predictions for the entrance and at Newburyport are given in the Tidal Current Tables.

Freshets occur in the spring, but do not interfere with navigation, as a rule.

Ice seldom obstructs navigation below the bridge at Newburyport. Westerly winds carry the drift ice out to sea and, during their continuance, the flood current has no effect upon the local formation of drift ice. With the wind from any other direction, the flood current will prevent the drift ice from leaving the river.

Above the Newburyport bridges the river is liable to be closed by ice from January to March.

Storm warning signals are displayed; see chart.

Pilotage.-A pilot for the river resides in Groveland (phone: 617-372-3420). Information on the river can be obtained from the local boatmen at Plum Island Point or any of the service facilities or marinas at Newburyport.

Towage.-There are no tugs at Newburyport, but there are three at Portsmouth.

A contract physician's office of the U.S. Public Health Service is in Newburyport; see Appendix for address. There is a hospital at Newburyport.

Supplies.-Gasoline, diesel fuel, water, ice, provisions, bottled gas, and marine supplies can be obtained.

Small-craft facilities.-The port has a number of service landings for small craft with depths of 8 to 18 feet reported alongside. These facilities are along the Newburyport waterfront both below and above the highway bridges. Most have berthing with electricity, gasoline, diesel fuel, water, ice, marine supplies, guest moorings, and storage facilities; hull, engine, electrical, and electronic repairs can be made. Lifts up to 20 tons and a 70-foot marine railway are also available.

A town wharf and float landing are on the north bank east of the highway bridge.

The American Yacht Club at the east end of town has 14 feet alongside its float landing. Gasoline and water are available at the float. Guest moorings and club facilities are available to visiting yachtsmen. The North End Yacht Club, open to members only, is at the west end of town above the bridge.

Communications.-The Boston and Maine Railroad, and bus and truck lines serve the port; there is taxi service.

Amesbury is a city on the **Powwow River,** a mile above its confluence with the Merrimack. Three highway bridges cross the river between the mouth and Amesbury. The one at the mouth has a 36-foot span with a clearance of 8 feet, one 0.6 mile above the mouth has a 34-foot fixed span with a clearance of 8 feet, and one at Amesbury has an 11-foot bascule span with a clearance of 4 feet. An overhead power cable crossing the river 0.5 mile below the bascule bridge has a clearance of 30 feet.

On the west side of the mouth of the Powwow River is a large marina and boatyard that has two marine railways. Craft up to 60 feet in length can be hauled out for hull repairs or dry open or covered winter storage. Gasoline and water are available at the float landings, which have a reported 12 feet alongside. Ice, provisions, bottled gas, and marine supplies can be furnished. There is a launching ramp. Overnight berthing is permitted, and several guest moorings are maintained. Good restaurants, hotels, markets, and stores are in Amesbury. Taxi service is available.

The **harbormaster** can be contacted through the Amesbury Police Department.

A boat repair and building yard with marine railway close westward of the marina can build or haul out for hull repair or dry open storage craft up to 30 feet.

About 0.7 mile westward of the Powwow, on the north bank, is another marina. Gasoline, water, and electricity are available at the floats, which have a reported 10 feet alongside. A marine railway at the marina can haul out craft up to 50 feet in length for hull and engine repairs, or dry covered or open winter storage. There is a gravel small-boat launching ramp and parking. Marine supplies are available.

Merrimacport is a village on the north bank of Merrimack River about 10 miles above the entrance. Two natural ramps for launching small craft from trailers and a float landing with 2 to 3 feet alongside are on the north bank at the town.

Groveland is a town on the south bank of the river, 15 miles above the entrance.

Haverhill is a city on the north bank, at the usual head of navigation of the Merrimack River, 18 miles above the entrance. The wharves are in disrepair. There has been no commerce by water for many years.

There is a marina and boatyard at Riverside on the north bank 0.3 mile eastward of the highway bridge. The yard has two float landings with 9 feet alongside and a marine railway that can haul out craft up to 70 feet in length for hull or engine repairs or dry open winter storage.

Diesel fuel and water are available at the floats. Ice, provisions, marine supplies, and bottled gas can be obtained. Haverhill Riverside Airport with an 1,800-foot landing strip is near the marina; a seaplane, landplane, and helicopter are available. The yard has a 20-ton crane. The owner and manager of the marina is also pilot for the river. There are two ramps at the facility, one of which is hard surfaced.

Another marina and boatyard, about 0.7 mile below the bridge on the north bank, has two float landings with a reported 4 feet alongside. Gasoline, water, and electricity are available at the floats. There is a hard-surfaced ramp and a 3½-ton crane. Hull and engine repairs can be made, and dry open or covered storage is available. Guest moorings are maintained.

Bradford, a town on the south bank of the river, is connected by two highway bridges and a railroad bridge with Haverhill. The Haverhill (Crescent) Yacht Club, on the south bank east of the lower bridge, has 6 feet at its float landing. Guest moorings are maintained. Small craft anchor or secure to moorings off the club. Fuel, provisions, and supplies can be obtained.

At **Mitchells Falls,** about 2 miles above the upper highway (County) bridge at Haverhill, the river becomes foul and full of rocks, virtually impassable at low water, but at high water small craft

are reported to navigate the river to the dam at Lawrence.

Charts 13282 (213), 13274 (613-SC).-Plum Island River forms a thorofare for small craft between Merrimack River, just inside its entrance, and Plum Island Sound. It is bare in places at low water and is said to have a depth of 7 feet at high water, but the deepest draft that is taken through at high water with local knowledge is reported to be about 6 feet. The channel is narrow and generally marked by State-maintained seasonal buoys but does not always lead in midchannel, and local knowledge is necessary for its navigation. It is crossed by a highway bridge which has a swing span 30 feet wide with a clearance of 7 feet in the west draw; drawbridge regulations and opening signals are given in **117.60**, Chapter 2. In 1973, a highway bridge with a design 40-foot bascule span and a clearance of 13 feet was under construction immediately northward of the existing bridge. Upon completion it will replace the existing bridge.

The approach to the north end of the thorofare is between the east side of **Woodbridge Island** and the west end of the breakwater, which uncovers about 3 feet and is marked on the end of a buoy. The buoys in Plum Island River are maintained by the Commonwealth of Massachusetts from May 15 to October 15.

From Merrimack River entrance the seacoast, formed by **Plum Island,** is sand dunes, and trends southward for about 7.5 miles to the entrance of Plum Island Sound and Ipswich River. There are many cottages in the town of Plum Island on the north end of the island at Merrimack River entrance and scattered cottages southward along the beach for about 0.5 mile. The remainder of the island southward to Ipswich Bay is a Federal wildlife sanctuary for the most part.

Camp Sea Haven, for crippled children, is located at the conspicuous white buildings of the former Coast Guard station, 4.8 miles southward of the north end of the island.

Charts 13282 (213), 13279 (243), 13274 (613-SC).-Ipswich Bay is the bight between the northern point of Cape Ann and the south end of Plum Island. Between these points it is about 6 miles wide and makes in about 3 miles. The bay is the approach to Plum Island Sound and to the Essex and Annisquam Rivers. It has depths of 20 to 70 feet, except in its southern and southwestern sides where the shore should be given a berth of a little over 1 mile to avoid the shoals off the river entrances. Several rocks covered 2 to 5 feet and one that uncovers 4 feet are in the southern part of the bay about 0.9 mile westward of Annisquam Harbor Light and about 0.3 to 0.5 mile offshore.

Ipswich Light (42°41.1'N., 70°46.0'W.), 50 feet above the water, shown from a white skeleton tower with a white rectangular daymark, is on Castle Neck at the south side of the entrance to Plum Island Sound. A lighted bell buoy 1.6 miles eastward of the light marks the approach to Ipswich River and Plum Island Sound.

The Crane mansion known as **The Castle,** on **Castle Hill,** is the most prominent landmark on this stretch of coast and can be seen for a great distance. The bathing pavilion and bath houses on Ipswich Beach at Ipswich Light are also conspicuous.

Charts 13282 (213), 13274 (613-SC).-Plum Island Sound, the approach to several small rivers, is frequented by many small craft. The bar channel at the entrance to the sound is subject to continual changes. The entrance is marked by a lighted bell buoy. The buoys on the bar are not charted because they are frequently shifted in position.

In 1964, local boatmen reported that with local knowledge 6 feet could be taken over the bar and through the entrance into Plum Island Sound, except in heavy easterly weather.

Bass Rock, a stone ledge southward of Plum Island, is marked by a daybeacon. In June 1958, shoaling was reported to extend from Plum Island to a point 200 yards southward of the daybeacon on Bass Rock, constricting the entrance channel at this point to a width of less than 100 yards.

A number of the buoys in Plum Island Sound are reported to tow under during the strength of tide, and too great reliance should not be placed on them as marking the best water. Local knowledge is recommended for strangers attempting passage through the sound for the first time.

Ipswich River, emptying into the south end of Plum Island Sound from the westward, leads to the town of **Ipswich** about 2.5 miles above the entrance to the river at Little Neck.

The channel is buoyed to a point southwestward of Little Neck and by stakes above that point in summer.

In 1964, local boatmen reported that with local knowledge a 4-foot draft could be carried from Plum Island Sound across the bar at the entrance to the river at Little Neck to the town landing at Ipswich where there are five floats with 2 to 4 feet reported alongside, but no services. Meals and lodging as well as other services are available in the town.

The launching ramp of the Ipswich Boat Club and two floats with 2 feet alongside are on the north bank at the town.

The town of Ipswich is of great colonial antiquity and importance historically. It has railroad, bus, and taxi services, and markets.

Little Neck, a summer settlement on a prominent hill on Plum Island Sound on the north side of the entrance to Ipswich River, has a landing on the west end of the neck, with 2 feet reported alongside its float. There are no services at the float.

Great Neck is a distinctive headland on the west side of the south end of Plum Island Sound. It has

two high hills, **North Ridge** and **Plover Hill, that are very conspicuous.**

The Ipswich Bay Yacht Club is on the east side of North Ridge on the neck. Gasoline and water are available at the float landing, which has 4 feet alongside. The club has a restaurant and limited accommodations for visiting yachtsmen. Ice, provisions, and marine supplies can be obtained from Ipswich.

During the summer many yachts moor off the landing in 10 to 15 feet, sand and mud bottom. The club maintains moorings.

A special small-vessel anchorage area has been established off the northeastern end of Great Neck; limits and regulations are given in **110.1** and **110.22,** in Chapter 2.

Rowley River, which empties into Plum Island Sound at **Hog Island Point,** about 1 mile north of Great Neck, dries in many places and is marked, during the summer, by stakes that are topped with red or black cans. Several landings are on the river. A town landing and a yacht club are about 250 yards above the Boston and Maine trestle bridge; clearance at the bridge is 11 feet. Little water is reported alongside the town landing and yacht club, and no services are available. The railroad station is only a short distance from the town landing. The town of **Rowley** is about 0.5 mile from the station.

Parker River, emptying into the north end of Plum Island Sound from westward, has a depth of about 4 feet in a very narrow channel to State Route 1 highway bridge at **Newbury Old Town,** 1.6 miles above the entrance. The bridge has a fixed span with a clearance of 11 feet. The town is principally a summer settlement.

The channel is only partially marked by buoys and is difficult to follow. In 1964, local boatmen reported that 3½ feet could be taken to Newbury Old Town with local knowledge.

Numerous pleasure craft of all sizes frequent the river. A special small-vessel anchorage extends downstream from the bridge; limits and regulations are given in **110.1** and **110.20,** Chapter 2.

There are two marinas on the south bank at the bridge. The one on the east side services and repairs outboards and has a ramp, gasoline, water, and marine supplies. It maintains guest moorings and has a snack bar.

The large marina on the west side of the bridge has a marine railway, a 14-ton mobile hoist, and a small-craft launching ramp. Craft up to 45 feet in length can be hauled out for hull or engine repair, or dry covered winter storage. The yard also builds craft up to 24 feet in length. Gasoline, diesel fuel, water, electricity, and berthage for 50 boats are at the floats, which have 7 feet reported alongside. Overnight berthing is permitted, and guest moorings are maintained. Bottled gas, ice, provisions, marine supplies, and taxi service are available.

A town wharf and a float landing with 2 feet reported alongside are on the north bank just eastward of the bridge. The Old Town Yacht and Country Club is on the south bank about 0.3 mile below the bridge. The depth alongside the club float is 5 feet.

Above Newbury Old Town, the river is reported to be navigable for several miles, but is seldom used. This section of the river is crossed by three fixed bridges, one railroad and two highway, at 2.7, 4.4, and 5.2 miles, respectively, above the entrance. All have 25-foot fixed spans with clearances of 7 feet.

Storm warning signals are displayed, see chart.

Charts 13279 (243), 13274 (613-SC).-Essex BayandEssex River are about midway between Ipswich and Annisquam Harbor Lights. The entrance is through a shifting bar over which, with local knowledge, 5 feet can usually be carried. With onshore winds on an ebb tide, a heavy chop builds up and during heavy weather the bar is often impassable. Caution is always indicated, especially for small craft.

The river is navigable to the town of **Essex,** about 5 miles above the entrance. Local fishermen and numerous pleasure craft use the river.

The bay channel is marked from the bar to about 2 miles above the entrance, but, as it is subject to continual changes, the buoys are frequently shifted in position and are not shown on the chart, with the exception of the entrance buoy.

In 1967, a midchannel depth of 3 feet could be carried from a point about 3 miles above the entrance to State Route 133 highway bridge at the town of Essex. Mariners should obtain local knowledge before navigating the river. The bridge has a 30-foot fixed span with a clearance of 5 feet. Above **Conomo Point,** the town of Essex maintains midchannel spar buoys from April 1 to October 1. The channel is narrow and difficult to follow.

Storm warning signals are displayed; see chart.

There are several small-craft facilities just below the bridge at Essex. Depths of about 5 feet are reported alongside the floats. Berths with electricity, gasoline, water, ice, some marine supplies, launching ramps, lifts up to 16 tons, and two marine railways, 38-foot and 42-foot, are available. Hull and engine repairs can be made.

Restaurants, lodging, and motels are on or near the waterfront; the town has markets, bank, and taxi services.

A private residential yacht club is at Conomo Point.

Charts 13281 (233), 13274 (613-SC).-The Annisquam River and Blynman Canal form a thorofare leading from the eastern part of Ipswich Bay, northwest of Cape Ann, to Gloucester Harbor, on the south side of the cape.

Annisquam is a village and summer resort on the east side of Annisquam River just inside its north

end. **Lobster Cove,** on the southeast side of the town, is the scene of much small pleasure-boat activity during the summer.

Boundary lines of inland waters established for these waters are described in **82.5,** Chapter 2.

Prominent features-Annisquam Harbor Light (**42**°39.7′ N., 70°40.9′ W.), 45 feet above the water, is shown from a 41-foot white cylindrical tower with elevated walk to a dwelling on **Wigwam Point** at the east side at the northern entrance to Annisquam River. A red sector in the light from 180° to 217° covers the shoals on the eastern side of the approach to the bar channel from the north. A lighted bell buoy marks the approach.

Local magnetic disturbance.-Differences of as much as 3° from the normal variation have been observed in the vicinity of Annisquam.

Channels.-A marked channel with dredged sections across the bar at the northern entrance to Annisquam River and in the river and Blynman Canal leads from Ipswich Bay to Western Harbor at the north end of Gloucester Harbor. In April 1969 to July 1970, the controlling depths were 7 feet from Ipswich Bay to Buoy 21, thence 7 feet for a midwidth of 50 feet to the Boston and Maine Railroad Bridge, thence 5 feet for a midwidth of 30 feet to Western Harbor.

This thorofare is narrow, but is adequately marked by lights, daybeacons, and buoys and is extensively used by small craft. Strangers should have no trouble getting through with a smooth sea and by the use of the chart. The bar at the northern entrance is difficult to cross in a heavy sea. The best time is on a rising tide.

Anchorages.-Craft anchor in the coves, creeks, or estuaries of the waterway or moor at the marinas. **Lobster Cove,** near the north end of the waterway east of Annisquam, has been dredged to a depth of 8 feet as far as the bridge. Buoys mark the anchorage limits.

Dangers.-No special directions are necessary. The chart is the best guide. In passing from north to south in the Annisquam River and Blynman Canal, take care to avoid the unmarked rocky area covered 4 feet on the east side of the channel about 775 yards north of the Annisquam Harbor Light and 100 yards southeast of buoy C3; a rock awash on the east side of the river channel about 60 yards southwestward of Annisquam River Light; the drying reef marked by a daybeacon on the east side of the channel about 0.2 mile southward of Annisquam Harbor Light; a 5-foot depth, marked by a buoy, on the east channel edge about 140 yards northward of Annisquam Channel Light 25; an unmarked 2-foot depth on the east channel edge about 120 yards northward of Annisquam Channel Light 46; and an unmarked rock which uncovers 1 foot on the southwest side of the southern entrance to Blynman.

Bridges.-About 2.5 miles south of Annisquam Harbor Light, State Route 128 crosses the waterway on a fixed span which has a clearance of 65 feet for a center width of 100 feet. About 0.7 mile southward of it, the Boston and Maine Railroad Bridge has a 38-foot bascule span with a clearance of 16 feet. At the southern end of the waterway, State Route 127 highway bridge has a 39-foot bascule span with a clearance of 7 feet.

Tides and currents.-The mean range of the tide is 8.5 feet. Currents at Annisquam Harbor Light average 1.2 knots at strength.

Harbor regulations.-The Gloucester Chief of Police is also **harbormaster** for Annisquam River and Blynman Canal. The deputy harbormaster supervises the moorings and anchorages. A speed limit of 4 knots is enforced on the river and in Lobster Cove.

Small-craft facilities.-There are a marina on the west bank of Lobster Cove and several private float landings around the cove. Gasoline, diesel fuel, and water are available at the floats of the marina. Ice, provisions, marine supplies, and bottled gas are available. Overnight berthing is permitted, and guest moorings are maintained.

A fixed wooden highway bridge with a clearance of 3 feet crosses the cove about 400 yards above the entrance. A town float landing is on the south side of the bridge.

A private marine railway that can haul out craft up to 40 feet in length in an emergency is on the west side of the cove near the entrance.

The Annisquam Yacht Club is on the point on the west side of the entrance. The usual courtesies are extended by the club to visiting members of accredited yacht clubs. Showers, restrooms, and limited guest accommodations are available to visiting yachtsmen. Water is available at the float, ice is obtainable, and guest moorings are maintained by the club. A daybeacon and a buoy mark dangerous ledges south of the yacht club.

Mill River is a tributary of Annisquam River, on the east side, 0.4 mile southward of Annisquam. A rock awash is near the middle of the entrance to Mill River. There are numerous summer homes and float landings on the river, which is used by many small craft in the summer. There is a boatyard with marine railway on the west side of **Wheeler Point,** which can haul out craft up to 35 feet for hull or engine repairs or dry open winter storage.

On the east side of Annisquam River, just north of the fixed highway bridge at **Ferry Hill,** is a boatyard that can build or haul out craft up to 35 feet long for repairs or winter open or covered storage.

On **Rust Island** and **Little River,** just in from **Biskie Head,** there is a marina with 6 feet reported alongside its float landings. Gasoline, water, ice, provisions, a small-craft launching ramp, marine supplies, and a restaurant are available.

On the west bank of the waterway at the north end of Blynman Canal there is a marina with 6 feet reported at the floats. Water, berthage, storage, and a 15-ton mobile hoist are available. On the east

bank opposite it are the town ramps and float landing. No services are available.

Charts 13279 (243), 13274 (613–SC).–Cape Ann is very rocky and broken, 235 feet high at **Pool Hill,** its highest point, with numerous summer homes, and has several abandoned granite quarries. Communication is by railroad to Gloucester and Rockport, and by highway entirely around the cape.

Bay View is a village on **Hodgins Cove** on the west shore of Cape Ann, 0.8 mile northeastward of Annisquam Harbor Light. On the east side of the cove is a long stone pier having a depth of 12 feet on the outer half of the southwest side, in a channel about 70 feet wide. The cove at the inner end of the pier on the northeast side has a depth of about 2 feet at the entrance and mostly dry inside. Unmarked rocks are at the entrance.

Lanes Cove, 1.4 miles northeastward of Annisquam Harbor Light, is a small cove protected by stone breakwaters at the entrance, forming a harbor for small craft. It has a depth of 12 feet at the entrance and 10 feet in the middle inside. **Lanesville** is a village on the cove. Many fishing and pleasure craft moor in the harbor. Gasoline can be obtained from a service station near the head of the cove, and provisions, ice, and some supplies are available from a market in the village.

Folly Cove, on the north side of Cape Ann, 2.4 miles northeastward of Annisquam Harbor Light, has a stone wharf on the east side with about 16 feet alongside. A 3-foot spot is about 100 yards westward of the wharf. A restaurant is on the wharf and a motel at the head of the cove, both open only in summer. **Halibut Point** forms the northern extremity of Cape Ann.

Ocean View is a summer resort on **Andrews Point** at the north end of Sandy Bay. There are no wharves. A lighted gong guoy is 0.5 mile offshore north of the cape.

Sandy Bay is a large bight in the northeastern shore of Cape Ann between Straitsmouth Island on the east and Andrews Point on the west. The bay is 2 miles wide between these points, and about 1.5 miles long to its head.

A breakwater has been partially completed to form a harbor of refuge. It extends 1,200 yards northward from Avery Ledge, then 830 yards northwestward toward Andrews Point. In 1964, it was awash at low water except for a distance of about 300 yards near the middle where it was above high water. About 400 yards of each end of the breakwater are covered at low water. A lighted gong buoy is off the northwest end, and a bell buoy is off the south end. It is reported that several boats have grounded on the breakwater. This can be avoided by keeping on the correct sides of the buoys marking the ends.

Depths inside the breakwater are 31 to 86 feet, with several rocky spots of less depths in the southern part. **Ninefoot Rock** on the south side of the bay is marked on its northern side by a buoy. The bay is sometimes used as an anchorage, but is exposed to north and northeasterly weather, and at such times Gloucester or Salem Harbors are generally used.

The entrance to Sandy Bay between Straitsmouth Island and the bell buoy marking **Avery Ledge** has broken bottom and a rocky spot covered 22 feet in the middle. Strangers may be unable to avoid this and should not use this channel when drawing more than 18 feet.

On the south side of this channel, a ledge which uncovers in places and covered 11 feet near the end extends 300 yards northeastward from the northeast end of Straitsmouth Island. The northern entrance to the bay westward of the lighted gong buoy at the northwest end of the breakwater is deep and clear.

Pigeon Cove, 0.8 mile south of Andrews Point, is a small cove protected by a breakwater and having depths of 3 to 10 feet inside. The entrance channel is buoyed. The most prominent features of Pigeon Cove are the high concrete stack of the foundry and the tank on **Pigeon Hill,** There are bulkhead wharves around the harbor, a public float landing with 6 feet reported alongside, and a small-craft launching ramp.

The best water is on the northeast side. **Pigeon Rock,** 50 yards south of the east point outside the jetty, is nearly uncovered at extreme low water. A 5-foot spot is near the entrance about 80 yards southward of Pigeon Rock.

Gasoline can be obtained from a service station near the head of the cove, and provisions and some supplies can be obtained at a market. A number of fishing and pleasure craft lay at moorings in the cove.

Two old stone quarry breakwaters are built out from the shore 0.3 and 0.5 mile southward of Pigeon Cove. The southerly one forms a harbor that is used by fishing and pleasure craft. Posted notices inform all craft to moor bow or stern out from the stone bulkhead wharf on the east side.

A small basin at **Rowe Point,** about 0.7 mile southward of Pigeon Cove, is now a lobster pound.

Dodge Rock, Bartlett Rock, and **Mitchell Rock** are in a cluster of rocks about 300 yards from the western shore of Sandy Bay. Dodge Rock, awash at low water, is marked by a daybeacon. The western end of the rock is 100 yards offshore, and the southern rock, covered 14 feet, is 250 yards southeastward of the daybeacon.

Mitchell Rock, covered 4 feet, and another rock, covered 18 feet, are 280 and 400 yards, respectively, northward of the daybeacon. **Bartlett Rock,** awash at low water, is about 125 yards north of the daybeacon. With the exception of Dodge Rock, all are unmarked.

Sandy Bay Ledge is partly bare at high water and extends 200 yards from the western shore of Sandy Bay at Rowe Point.

Rockport Harbor at the southwest end of Sandy Bay is reported secure in all weather and can be entered at any time. The harbor is protected by two breakwaters, one of which extends eastward from **Bearskin Neck** on the northwest side of the harbor.

The other breakwater extending in a northerly direction from **Norwoods Head** is a short one.

The harbor consists of an outer basin and two inner basins which are separated by the town wharf. The central part of the outer basin has depths from 6 to 13 feet.

Rockport, the town, has communication by railroad, bus, and taxi service. Banks, churches, restaurants, hotels and guest houses, hospitals, and markets are available.

Prominent features.-Straitsmouth Island, low and grassy, is marked on its eastern end by **Straitsmouth Light** (42°39.7'N., 70°35.3'W.), 46 feet above the water and shown from a 37-foot white cylindrical tower, near the northeast end of the island. A fog signal is at the light. The lookout tower, the radio and signal towers, the buildings of a former Coast Guard station, and a hotel are conspicuous on **Gap Head,** the peninsula westward of Straitsmouth Island. A standpipe on the summit of a hill south of the harbor is also prominent. Passage should not be attempted between Straitsmouth Island and Gap Head at low water without local knowledge.

Rockport Breakwater Light (42°39.6'N., 70°36.8'W.), 32 feet above the water, is shown from a red skeleton tower on a white house on the end of the north breakwater.

Channels.-The entrance channel between the breakwaters is about 50 yards wide, in depths of from 10 to 14 feet, with the best water favoring the light on the north side. It is not advisable, however, to enter with drafts greater than 7 feet without local knowledge.

Anchorages-Moorings and berths in the harbor are under control of the harbormaster, who has an office on the town wharf. A **speed limit** of 4 miles per hour is enforced within harbor limits. There are no guest moorings, but one can usually be arranged for through the harbormaster.

The basin on the southeast side of the town wharf is used to moor small sail craft. In 1967, there was reported to be 7 feet in this basin, but the head and edges were shoal and foul.

The northwesterly basin, or commercial basin, in 1967 reported to have a depth of 7 feet with head and edges shoal, is used by fishing and lobster boats. A town ramp, dry at low water and with 3 feet at high water, is at the head of the basin.

Dangers.-Flat Ground, a dangerous ledge 0.5 mile long covered 2 to 12 feet, is 1 to 1.5 miles north-northeastward of Straitsmouth Light. The ledge is marked by a buoy at its south end and a bell buoy at the north end.

The engine block of the liberty ship CHARLES S. HAIGHT is reported to still be visible on the reef at low water.

Dry Salvages is a bare ledge about 15 feet high near the middle of a reef about 500 yards long in a northerly direction. A lighted bell buoy is 0.5 mile northeastward of the ledge.

Little Salvages is a ledge showing well bare at low water and with parts awash at high water. It is about 500 yards westward of Dry Salvages. Shoal water extends out a little more than 200 yards from the western side of the bare part of the ledge, and a rock bare at lowest tides and a sunken wreck are between it and Dry Salvages.

Harbor Rock, covered 2 feet, is 150 yards northeastward of the end of the north breakwater at the entrance of Rockport Harbor; it is marked on its south side by a buoy. Inshore of the rock, a shelving unmarked ledge extends 75 yards northeastward from the end of the north breakwater.

The edges of the harbor are shoal and foul, with ledges near the shores, particularly on the north side northward of a line between the end of the north breakwater and the end of the first wharf on the north side. All except light-draft craft should stay out of that area.

Wharves.-The first wharf, in the northwest part of the harbor known locally as New Wharf, has a float landing with 3 feet alongside. Gasoline and water are available at the float, Ice, provisions, and some supplies can be obtained at this landing. Diesel oil can be obtained from tank truck. Bait and tackle can be obtained, and rowboats and outboards can be rented.

The town float landing, with 6 feet reported alongside, is at the head of the town wharf. On the inner wharf on the northwest side of the harbor is a 10-ton crane that is used to lift out small craft for repairs. Party fishing boats operate from the landing in the summer. Parking is available on the town wharf.

On the southeast side of the head of the town landing is the Sandy Bay Yacht Club, which has float landings with 6 feet alongside. The club has restrooms available to visiting yachtsmen. Water is available at the floats.

Cape Ann Light (42°38.2'N., 70°34.5'W.), 166 feet above the water, is shown from the southerly of two identical 124-foot gray stone towers on the east side of **Thacher Island,** 1.3 miles south-southeast of Straitsmouth Island. The northerly tower is not lighted. The fog signal is at the light. A lighted whistle buoy is 2.5 miles eastward of the light. **Oak Rock,** marked on its east side by a buoy, lies between Thacher Island and **Emerson Point.**

Londoner, a ledge about 0.4 mile long in a northeasterly direction, covered 1 to 11 feet, is 0.5 mile eastsoutheastward of Cape Ann Light. Near the center of the ledge, on a cluster of rocks that uncover at low water, is a daybeacon. Between

Londoner and Thacher Island is a passage with 16- to 28efoot depths. This passage should not be attempted by a stranger.

Milk Island,about 0.4 mile southward of Emerson Point, is connected with that point and Thacher Island by two bars covered 2 to 7 feet. **Salt Island Ledge,** 1.3 miles southwestward of Milk Island, is awash at extreme low water.

There are numerous reddish brown bare bluffs along the coast between **Cape Hedge** and Eastern Point. The most prominent of these are on Cape Hedge, 50-foot **Salt Island,** the points to the north and west of Salt Island, the points on both sides of the entrance to **Brace Cove,** and on the southern part of Eastern Point.

10. CAPE ANN TO BOSTON HARBOR, MASSACHUSETTS

This chapter describes the Massachusetts coast along the northwestern shore of Massachusetts Bay from Cape Ann southwestward to but not including Boston Harbor. The harbors of Gloucester, Manchester, Beverly, Salem, Marblehead, Swampscott, and Lynn are discussed as are most of the islands and dangers off the entrances to these harbors.

Chart 13267 (1207).-Massachusetts Bay is the body of water lying westward of a line connecting Cape Ann Light on Thacher Island with Race Point Light on the northwestern extremity of Cape Cod, about 38 miles south-southeastward. It includes Boston Harbor, described in Chapter 11, and Cape Cod Bay, described in Chapter 12. Between Cape Ann Light and Boston Harbor, 24 miles to the southwestward, the principal harbors are Gloucester, Beverly, Salem, Marblehead, and Lynn, all available to vessels of moderate draft. The coast is rocky and generally bold with numerous detached islands, rocks, and sunken dangers.

Boundary lines of inland waters.-The lines established for Massachusetts Bay and the waters covered by this chapter are described in **82.10**, Chapter 2.

Charts 13281 (233), 13274 (613-SC).-Gloucester Harbor is one of the most important fishing ports in the United States and an important harbor of refuge. It is 5 miles southwestward of Emerson Point, the easternmost point of Cape Ann, 26 miles from Boston and 234 miles from New York. The entrance is marked on its eastern side by Eastern Point Light. There is an outer and inner harbor, the former having depths generally of 18 to 52 feet and the latter, depths of 15 to 24 feet.

Gloucester Inner Harbor limits begin at a line between Black Rock Daybeacon and **Fort Point.**

Gloucester is a city of great historical interest, the first permanent settlement having been established in 1623. The city limits cover the greater part of Cape Ann and part of the mainland as far west as Magnolia Harbor. Its principal industries are directly or indirectly connected with the fishing or related industries in the processing, freezing, canning, or shipment of fish and lobsters.

The principal imports are seafood and petroleum products. Limited amounts of canned meats, produce, and consumer goods are the principal exports.

Prominent features.-Eastern Point Light (42°34.8'N., 70°39.9'W.), 57 feet above the water, is shown from a 36-foot white conical tower with a covered way to a dwelling; a fog signal is at the light. A radiobeacon and a radio direction calibration station are at the light; see Light List for details. **Storm warning signals are displayed.**

Storm warning display locations are listed on the NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

A breakwater extends 750 yards northwestward from the shore near Eastern Point Light and is marked at its outer end by **Gloucester Breakwater Light** (42°34.9'N., 70°40.4'W.), 45 feet above the water and shown from a 37-foot white house and tower on a brown square skeleton framework structure; a fog signal is at the light.

Normans Woe, on the west side at the entrance to Gloucester Harbor, is a rocky headland split by a deep cleft, known as **Rafes Chasm,** into which the sea enters during heavy weather. **Normans Woe Rock,** 0.3 mile northeastward of Normans Woe and over 0.1 mile offshore, is a rounded rocky islet 45 feet high, surrounded by extensive ledges. A bell buoy is about 0.2 mile southeastward of Normans Woe Rock. The stone building and double tower of the John Hays Hammond Museum, about 0.3 mile northward of the rock, are conspicuous from seaward.

A **025**°-205° measured nautical mile is on the west side of the entrance to Gloucester Harbor. The front marker of the southerly range is a white target painted on Normans Woe Rock and is sometimes difficult to distinguish from the guano. All other markers are white wooden tripods. The southerly rear range marker is on the bluff west-northwestward of the rock. The northerly range is near the north end of Dolliver Neck.

The Gloucester Coast Guard station is on the west side of Gloucester Harbor entrance in **Oldhouse Cove** on **Dolliver Neck,** about 0.7 mile northward of Normans Woe Rock. A dredged channel, marked in the entrance by a lighted buoy, leads to the Coast Guard basin and pier on the northwest side of Dolliver Neck. In 1965, the channel had a reported controlling depth of 8½ feet.

Tenpound Island Light (42°36.1'N., 70°40.0'W.), 52 feet above the water is shown from a skeleton tower on top of a concrete house on the west side of Tenpound Island off the entrance to Inner Harbor; a fog signal is at the light. The ruins of several piers are on the north side of the island. The island is owned by the city of Gloucester.

Channels.-The entrance westward of the breakwater between Dog Bar and **Mussel Point** is about 0.6 mile wide. About 500 yards westward of Round Rock Shoal is an unmarked rocky ledge covered 23 feet. This leaves only a channel about 400 yards wide with depths of 38 to 47 feet into the outer harbor.

The channel between the end of Dog Bar and the eastern edge of Round Rock Shoal is only about 150 yards wide with depths of 20 to 22 feet.

During heavy southeasterly gales, the sea at times breaks nearly the whole distance across the entrance. Strangers should enter by the deepest channel westward of Round Rock Shoal, where there is reported to be a space known not to break.

A dredged channel leads from the northeasterly part of Gloucester Harbor into Inner Harbor and connects with north and south access channels which lead on either side of the Gloucester State Fish Pier to the head of the harbor. Dredged access channels also lead from the Inner Harbor entrance channel into Harbor Cove and Smith Cove, on the northwestern and southeastern sides of Inner Harbor, respectively. In January 1969, the controlling depths were 20 feet in the Inner Harbor entrance channel; thence 19 feet in the north and south access channels to the head of the harbor; thence 18 feet in the Harbor Cove channel, and 15 feet in the Smith Cove channel. The channels are marked by buoys.

The southern entrance to **Blynman Canal** and Annisquam River is through Blynman Bridge at the head of Western Harbor. This is the inside route to Ipswich Bay on the north side of Cape Ann, described in Chapter 9. The school tower 500 yards north of the bridge is prominent. A rock which uncovers 1 foot is close southward of the channel entrance.

Anchorages.-The best anchorage in the outer harbor for vessels coming in for shelter or bound to Gloucester is **Southeast Harbor**, the cove in the eastern part of Gloucester Harbor northward of **Black Bess Point** and southward of Tenpound Island, known locally as **Pancake Ground.** This is the one most frequently used. It has good anchorage, soft mud and clay bottom in about 23 to 30 feet, and is also used by vessels taking shelter.

In **Western Harbor,** the semicircular cove northwestward of Tenpound Island in the northern part of Gloucester Harbor, there is also good anchorage, soft mud and clay bottom in 24 to 30 feet. Give the shore a berth of 300 yards. There are no wharves. The city of Gloucester maintains a parkway along the shore of Western Harbor to **Stage Head.** The Gloucester Fisherman statue faces the harbor from this parkway about 200 yards eastward of the entrance to Blynman Canal.

Two dredged anchorages are available in Inner Harbor; one is on the northeast side of the entrance to Harbor Cove, and the other is about 300 yards southwestward of the Gloucester State Fish Pier. In January 1969, depths of 15 feet were available in the Harbor Cove anchorage and 16 feet in the anchorage off the State Fish Pier. Both anchorages are marked by buoys. Mooring permits for the Inner Harbor are issued by the deputy harbormaster, who patrols the harbor in a police/fire boat; the patrol boat monitors 2182 kHz when underway.

Smith Cove provides good anchorage for small craft in 6 to 15 feet, but is somewhat congested with moorings. **Harbor Cove,** on the northeast side of the entrance to Inner Harbor, has depths of 15 to 18 feet.

Dangers.-Gloucester Harbor and approaches have very broken ground and many rocks and ledges, some of them unmarked; careful navigation is necessary, especially in thick weather.

The principal dangers are marked for vessels of 24-foot draft or less to an anchorage in Southeast Harbor, and for 18-foot draft or less into the inner harbor. Strangers are advised not to bring in greater drafts without a pilot.

Dog Bar, on which the breakwater is built, extends 100 yards westward of the end of the breakwater where it is marked by a buoy.

Round Rock Shoal, a rocky ledge about 400 yards in extent northeast to southwest and covered 13 feet, extends from 0.15 to 0.3 mile westward of the breakwater light. It is marked on its northeastern edge by a buoy and on its southwestern edge by a lighted buoy.

Green Rock, 175 yards eastward of Tenpound Island, is marked by a daybeacon. The passage between Tenpound Island and Rocky Neck is shoal and foul, and should not be attempted, especially by strangers.

Tenpound Island Ledge and **Mayflower Ledge,** on the eastern side of the approaches to the Inner Harbor, are covered 18 and 17 feet, respectively; a buoy is off the northwest side of Mayflower Ledge. Two shoal spots, covered 16 and 18 feet and marked by a buoy, are about 220 yards southwestward of Tenpound Ledge. There are also unmarked 17-foot and 19-foot spots about 230 yards north-northwestward of Tenpound Island Light. **Prairie Ledge,** on the western side of the approach, is covered 4 feet and marked on its eastern end by a lighted buoy. **Babson Ledge,** also on the western side, is covered 12 feet and marked on its south side by a buoy.

Rocky Neck, a high and partly wooded island on the east side at the entrance to Inner Harbor, is connected with the easterly shore by a causeway. **Black Rock,** about 100 yards off the western end of Rocky Neck, is marked by a daybeacon.

Tides and Currents.-The mean range of tide is 8.7 feet. The tidal currents in Gloucester Harbor do not greatly interfere with the movements of vessels, as they set directly in and out of the harbor and their velocity is comparatively small. However, the tidal currents in the entrance to Blynman Canal average over 3 knots at strength.

Ice seldom extends outside Tenpound Island at the entrance to the inner harbor. The movement of boats generally keeps the inner harbor open.

Pilotage is compulsory for all foreign vessels and U.S. vessels under register in the foreign trade drawing over 7 feet. Pilotage is optional for coastwide vessels which have on board a pilot licensed by the Federal government. Fishing vessels are ex-

empt. The pilot usually boards in the vicinity of Eastern Point Lighted Whistle Buoy 2 (42°34.2′ N., 70°39.9′ W.). Arrangements are made through ships' agents. The pilot station continuously monitors VHF-FM channel 16 (156.80 MHz). The pilot boat stands by 2 hours before the estimated time of arrival on VHF-FM channel 16 (156.80 MHz) and 2182 kHz, and uses VHF-FM channel 12 (156.60 MHz) as a working frequency. The pilot boat has a gray hull, white superstructure, and an orange pilothouse.

Towage.-The pilot boat is usually used as a tug, since the nearest tugs are based at Boston.

Immigration, quarantine, and **agricultural quarantine** officials are stationed in Boston. See Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1. The Public Health Service maintains a **contract physician's office** in Gloucester; see Appendix for address.

Gloucester is a **customs port of entry.**

Coast Guard.-The Coast Guard maintains a vessel documentation office in Gloucester; see Appendix for address. The Gloucester Coast Guard station is on the west side of Gloucester Harbor entrance in Oldhouse Cove on Dolliver Neck.

Harbor regulations.-The Chief of Police is the **harbormaster.** The deputy harbormaster patrols the harbor in the police and fire boat, supervises the moorings in the anchorages, and issues permits for them; the patrol boat monitors 2182 kHz when underway. A **speed limit** of 10 miles per hour is enforced in Inner Harbor.

Wharves.-There are many wharves along the Inner Harbor at Gloucester. Most of these facilities are used by the fishing industry. A description of several of the principal wharves follows.

Gloucester State Fish Pier, at the head of Inner Harbor, has 1,000 feet of berthing space along its north side with reported depths of 15 to 22 feet alongside. Several piers with shoal depths alongside extend from the south side of the pier. The State Fish Pier is used to tranship and process seafood. Water is available, and diesel fuel can be obtained by lighter.

The Quincy Market Cold Storage and Warehouse Company operates three wharves at Gloucester. The wharves are used to unload imported frozen seafood products. Cold storage facilities with a combined capacity of 4 million cubic feet are available. Mobile cranes and forklifts are available, and diesel fuel can be obtained by lighter. A description of the wharves follows.

Rogers Street Wharf (42°36′45″ N., 70°39′28″ W.), on the north side of Inner Harbor, has a 300-foot face with depths of 25 feet reported alongside.

Rowe Square Wharf, about 100 yards northeastward of the Rogers Street Wharf, has a 450-foot face with depths of 22 feet reported alongside.

East Main Street Wharf, on the south side of Inner Harbor and on the north side of the entrance to Smith Cove, has a 360-foot face with depths of 21 feet reported alongside.

Supplies.-Fuel oil is not available in bunker quantities, but diesel fuel can be had as desired from tank trucks and lighters. Marine and most other supplies are obtainable in town. Water is available at most of the wharves.

Repairs.-Gloucester has ship repair plants on Rocky Neck and on the northwest side of the harbor. The two plants have machine and other shops, and can carry out all repairs to wood and steel vessels. The shipyard pier on Rocky Neck is 250 feet long with 14 feet alongside. The yard has a 10-ton crane. The largest marine railway can haul out craft up to 130 feet in length and up to 600 tons in weight. Radio and electronic repairs can be made.

Boston is the nearest port where large vessels can be drydocked for extensive repairs to hull and machinery.

Small-craft facilities.-Gloucester has a considerable number of well equipped boat and yacht yards with marine railways, travel lifts or heavy cranes, and storage facilities. Craft up to 55 feet can be hauled out for hull or engine repairs, or dry, covered or open winter storage. Most all have float landings with 5 to 20 feet alongside.

There is a large marina in Smith Cove which has 10 feet at its floats. Its marine railway can haul out craft up to 55 feet in length. Gasoline, diesel fuel, and water are available at the floats, and most services can be provided.

Several of the boatyards are equipped as marinas with restrooms, some with showers, snack bars, and overnight accommodations.

Most of the small-craft facilities are located from Smith Cove along the east shore of the harbor to the head where there is a large marina with 20 feet at the floats; gasoline, diesel fuel, water, electricity, and telephone are available. Its marine railway can haul out craft up to 40 feet in length. There are other service facilities along the northwestern side of the harbor at which gasoline, water, and other services can be obtained. There are two town ramps at the northwestern end of Blynman Canal, near the high school, where small craft can be launched from trailers. A town float landing, with a reported 6 feet alongside, is at the head of Harbor Cove.

Ice, provisions, sails, marine supplies, bottled gas, and most other essentials can be obtained.

Party fishing boats operate from several points in the harbor during the summer, and charter boats, rowboats, and outboards can be hired.

Eastern Point Yacht Club is on the north side of the entrance to the cove at the inner end of Gloucester Breakwater. There is a depth of 8 feet at its float landing, to which water is piped. The club maintains guest moorings and restrooms, showers, and dining room, and provides certain services for visiting members of yacht clubs.

Communications.-Gloucester has rail and highway connections, and taxi and bus service. Schools, churches, banks, restaurants, lodging, library, and a hospital are in the city.

Charts 13279 (243), 13274 (613-SC).-Magnolia Harbor is a cove about 1.5 miles westward of the entrance to Gloucester Harbor and just north of **Kettle Island.** The summer resort of **Magnolia** is conspicuous on the eastern side. It has a public pier and float with 3 feet reported alongside. A rock which uncovers is just southward of the outer end of this pier, and the partial submerged ruins of two piers are about 150 yards farther southward. The harbor, used by many small craft, does not have very good holding ground and is exposed to southerly weather.

There are no facilities at the public pier, but gasoline can be obtained in cans from garages at the head of the harbor. Magnolia has hotels, restaurants, markets, and stores, and provisions and marine supplies can be obtained.

Prominent features are: the large summer homes on **Magnolia Point,** an old wartime white concrete observation tower on **Coolidge Point,** and a large pavilion and several bathhouses on the beach at the head of the harbor. The edges and head of the harbor are shoal and foul, and none of the dangers are marked. The harbor at best is temporary anchorage for small craft in foul weather or offshore winds.

Kettle Cove, next west from Magnolia Harbor, is shoal and foul at the head. There is one private landing on the east side of the entrance, but no facilities. Large private homes on Coolidge Point and Crow Island are conspicuous. There are several rocks awash in the entrance to the cove.

Charts 13275 (240), 13274 (613-SC).-Off the shore eastward of Manchester Harbor entrance, between Gloucester entrance and House Island, are many islands, rocks, and ledges extending about 0.8 mile offshore. The farthest outlying ones, named in order from eastward are: **Great Egg Rock,** 34 feet high and bare; **Boohoo Ledge,** covered ½ foot;**Salt Rock,** showing at high water; **Pickett Ledge,** awash at low water; **Gales Ledge,** covered 5 feet; a ledge, covered 17 feet and marked by a buoy, about 350 yards south of Gales Ledge; and **Pilgrim Ledge,** covered 18 feet. Of the several coves, only Manchester Harbor is of interest to navigation.

The shoreline of this section of the coast is lined with summer homes, many of which are large and conspicuous. The beach at **Eagle Head** is conspicuous.

Manchester Harbor, about 5 miles westward of Gloucester Harbor, is an arm of **Manchester Bay** extending in a northeasterly direction for 1 mile west of Gales Point to the town of **Manchester.** The entrance to Manchester Bay is northward of Bakers Island Light, between **House Island,** partly wooded, on the east, and **Great Misery Island** on the west. The ruins of two stone houses, one in the center and another on the west end, are on Great Misery Island.

Manchester Harbor is principally a yachting center, with only a small amount of local commercial fishing. The harbor above **Proctor Point** is practically landlocked and secure in all weather.

Prominent features.-Conspicuous objects include a white square observation tower on Gales Point, a large standpipe on **Moses Hill** north of the town, the bascule span of the railroad bridge, and the fishing pavilion at the end of the town wharf next to the yacht club at **Tucks Point.**

Channels.-The approach channel to Manchester Bay from the eastward, between Whaleback Ledge and House Island, is clear and about 250 yards wide; the approach from southward, westward of Whaleback Ledge, is 500 yards wide.

Manchester Channel, a marked dredged channel, leads from Manchester Bay to an anchorage basin at the head of Manchester Harbor. In 1969, the channel had a controlling depth of 10 feet; lesser depths are in the approach. Depths of 7 to 11 feet were available in the anchorage basin. The Boston and Maine railroad bridge, about 1 mile above the entrance and just above the anchorage basin, has a 48-foot bascule span with a clearance of 6 feet; drawbridge regulations are given in **117.64,** Chapter 2. A mooring basin with depths of about 7 feet is above the bridge.

Anchorages.-By local regulations, vessels over 55 feet in length must anchor in Manchester Bay. The anchorage is northward of a line between Great Misery and House Islands as far as the entrance fairway buoy. Those desiring to anchor only overnight, or from head winds, may find fair holding ground and good shelter except in southerly gales.

The anchorage basin at the head of Manchester Harbor is restricted to craft not over 55 feet in length. This regulation is strictly enforced. Some of the coves on each side of the channel north of Proctor Point have depths of 6 to 10 feet.

Dangers.-There is a bad ledge locally known as **Bow Bell,** with a rock awash on it, on the east side of the channel opposite the yacht club and public landing on Tucks Point, just above Proctor Point. A buoy marks the northwestern edge of the ledge. It is usually covered, and the only indication of it is a hole, or clear spot, amidst the craft moored or anchored in the vicinity. Care should be taken to avoid anchoring on the ledge.

Whaleback, a dangerous ledge in the entrance to Manchester Bay, is about 400 yards long east and west, and 200 yards wide. Near the middle of its northern side is a rock awash at low water, marked by a daybeacon.

Sauli Rock, which uncovers 4½ feet, is 300 to 400 yards eastward of the northeast end of Great Misery Island, and is marked on its south side by a buoy.

White Ledge, awash at low water, is 300 yards northwestward of House Island and is marked by a buoy on its west side. **Halftide Rocks,** which uncover, are 250 yards northward of White Ledge, and are marked by a buoy off the west side.

Chubb Islet,, bare and rocky, is 300 yards from the north shore of Manchester Bay and should be given a berth of more than 200 yards.

The mean range of **tide** is about 8.8 feet.

Harbor regulations.-In addition to the local regulations restricting the size of craft using the anchorage basin in Manchester Harbor, a **speed limit** of 5 miles per hour is enforced within the harbor.

The **harbormaster** and deputies supervise the moorings and on application will usually find a vacant one for a visitor or advise where best to anchor. The yacht yards maintain guest moorings.

Wharves.-A small commercial fish pier and float landing is on the east side of the harbor, about 0.5 mile above Proctor Point; depths of 3 feet are reported alongside the float; water and electricity are available. An old coal dock in ruins is at the head of the basin above the bridge.

Small-craft facilities.-There are commercial and private float landings in the harbor. Four public landings and two small-craft launching ramps are available; depths of 5 to 10 feet are reported alongside the landings.

Two yacht yards with 50-foot and 70-foot marine railways are on the west side of the harbor just below the bridge. Hull, engine, electrical, and electronic repairs can be made. The yard can provide gasoline, diesel fuel, water, ice, provisions, marine supplies, and dry covered or open winter storage; lifts up to 10 tons are also available. An outboard marina is on the west side of the harbor just above the bridge. The Manchester Yacht Club, at Tucks Point, has depths of 10 feet alongside its floats; water is available.

Manchester has rail, bus, and taxi services.

Charts 13275 (240), 13276 (241), 13274 (613-SC).-Salem Harbor, Beverly Harbor, and **Marblehead Harbor,** each of which in turn will be described in detail, form a large irregular indentation in the shore of Massachusetts Bay, 11 miles southwestward of Cape Ann and 12 miles northeastward of Boston Harbor entrance. Gales Point is the northern end and Marblehead Neck the southern point at the entrance to this large indentation, which includes within its limits the harbors of Manchester, Beverly, Salem, and Marblehead, the distance between the two points being 4 miles. This wide space is studded with islands, bare rocks, and sunken ledges, through which are several channels leading into the harbors.

Salem and Beverly have some commercial shipping with the importation of petroleum products. Chemicals are also shipped to Beverly. Marblehead is principally a yachting center.

Prominent features.-The most conspicuous landmarks approaching the harbor are: Bakers, Great Misery, and Cat Islands, and Marblehead Neck; a white square observation tower 90 feet high on Gales Point; a large standpipe on Moses Hill back of Manchester Harbor; the church spires in Beverly; the large powerplant with four stacks on Salem Neck; a radio tower near Naugus Head; Abbott Hall and three standpipes, one with conical top on Marblehead; and the light, large mansions and homes, and a tall skeleton tower on Marblehead Neck. Two large mansions on the estate along the north shore westward of Manchester Harbor also stand out. **Bowditch Ledge Daybeacon,** about 1.9 miles southwest of Gales Point, is 30 feet high with red and white checkered diamond daymark on a conical granite monument and is readily discernible to anyone approaching the harbor.

Bakers Island Light (42°32.2'N., 70°47.2'W.), 111 feet above the water, is shown from a white conical tower on the north end of Bakers Island; a fog signal is at the light. Many summer homes are on the island, and there is a ferry landing on the west side.

Marblehead light (42°30.3'N., 70°50.0'W.), 130 feet above the water, is shown from a 105-foot brown square skeleton tower on the northern extremity of **Marblehead Neck,** a high, rocky promontory connected with the mainland by a sandbar and causeway.

Marblehead Rock, 500 yards eastward of the northern end of Marblehead Neck, is a high bare rock. A tower on the rock is prominent.

Halfway Rock, 2 miles southward of Bakers Island, about 60 feet high and resembling a sugarloaf, has deep water around it. It is one of the most distinctive marks in the approach to the harbor.

North Gooseberry Island and **South Gooseberry Island** are rocky islets on the extensive ledges southward of Bakers Island. **Dry Breakers,** the southerly part of the ledges, show at high water as a low bare ledge. An unmarked 13-foot spot is about 0.3 mile southwestward of South Gooseberry Island.

Cat Island, about 0.8 mile northeastward of Marblehead Neck, is privately owned, bare, and more than 0.3 mile long. The island has several houses toward its center and is used by the Marblehead YMCA as a summer day camp. There is a pier and float landing on the southwest side. Extensive ledges, bare and submerged, surround the island.

Eagle Island, 0.7 mile north-northeastward of the north end of Cat Island, is small, grassy, and rocky.

Coney Island, northward of Marblehead, is a low grassy islet.

Channels.-Three main channels leading through the islands and rocks at the entrance are known as Salem Channel, Cat Island Channel, and Marblehead Channel. Several other channels of less importance are used only by local boats. Most of

the dangers adjacent to, or on the channel edges, are marked.

Salem Channel, the deep-draft and most northerly channel, leads westward between Bakers and Great Misery Islands and through **Salem Sound** for about 3 miles, thence southwestward through a dredged section to a turning basin at the Salem Terminal Wharf on the west side of Salem Harbor. The entrance is marked by **Hospital Point Lighted Range** on bearing **276°16′**. Several buoyed dangers, described later under dangers are close to the sailing line. In April 1973, the dredged section of Salem Channel had a controlling depth of 27 feet (32 feet at midchannel), thence 30 feet in the turning basin. Salem Channel is well marked.

Cat Island Channel' the middle one, has its entrance near Halfway Rock. It leads in a northwesterly direction between Cat Island on the west and Satan Rock, Brimbles, and Eagle Island on the east. The least depth in Cat Island Channel, about 26 feet, is between Eagle and Cat Islands.

Eagle Island (Popes Head) Channel, deep, clear, sheltered, and buoyed, leads from Salem Channel in a southwesterly direction between Hardy Rocks and Eagle Island on the northwest and Bakers Island, Popes Head Shoal, and Brimbles on the southeast. It is used by most craft bound to Marblehead Harbor from the northeastward.

Marblehead Channel, the westerly one, leads in a northerly direction between Cat Island and Marblehead Neck, thence westerly along the northern shore of the peninsula between Marblehead and Salem Harbors, and southward of the numerous rocks and ledges on the east side of the entrance to Salem Harbor. The lower section of Marblehead Channel has several shoals with depths of 10 to 24 feet close to the channel. The sea breaks on these shoals in easterly gales. Other shoals with depths of 17 feet or more are unmarked. The principal dangers in the upper section of the channel, northwestward of the entrance to Marblehead Harbor, are marked, but the channel is less than 100 yards wide in its narrowest part. This section of the channel is not recommended for strangers drawing more than 10 feet.

Anchorages.-Salem Harbor is sometimes used as a harbor of refuge, especially during the autumn. Good anchorage is available in what is known as the outer anchorage southward of the main channel and northward and eastward of Little Haste.

Special small-vessel anchorage areas have been established in Salem Harbor, off Palmer Cove; in Beverly Harbor, off the northwest end of Salem Neck; in Bass River; and in Marblehead Harbor; limits and regulations are given in **110.1, 110.25, and 110.26,** Chapter 2.

Small craft moor in these special anchorages, on Monument Bar, north of Salem Neck, off Juniper Cove, or off the yacht club and yacht yard in the southwest end of the harbor off Palmer Cove. Some isolated moorings are in the east side of the harbor southward of Naugus Head.

In Beverly Harbor, a good anchorage in about 19 to 24 feet is just northward of the mouth of Collins Cove and westward of Rams Horn Rock Daybeacon. Small craft usually anchor on the south side of Beverly Channel between Lobster Rocks Daybeacon and the highway bridge, in depths of about 12 feet.

Marblehead Harbor is usually very congested with moorings southwestward of a line between **Jack Point** and **Fort Sewall.** The best anchorage for small craft is southward of a line between **Boden Point** and **Skinner Head.**

Dangers.-The approaches to Salem, Beverly, and Marblehead Harbors have very broken ground, and all of the channels lead between islands and rocks, bare and submerged. Caution is necessary at all times. Strangers should not attempt to enter or leave in thick weather.

An extensive area of rocky patches and reefs, marked by buoys on its northeasterly, easterly, and southerly sides, extends about 2 miles southeastward of Bakers Island, ending with **Newcomb Ledge** which is covered 18 feet. A lighted whistle buoy is about 0.7 mile east-southeastward of of the ledge. In this area are **Searle Rock, Middle Breakers,Southeast Breakers, Inner Breakers,** and **Davis Ledge,** all unmarked. Middle and Inner Breakers are partly bare at low water, and all break in heavy weather.

Hardy Shoal, of which **Hardy Rocks** uncovers 4 1/2 feet and**Rising Ledge,** covered 8 feet, are a part, extends from 0.6 to 0.8 mile westward of Bakers Island Light. The shoal is marked on its eastern side by a buoy.

Bowditch Ledge, 1.2 miles west-northwestward of Bakers Island Light and 300 yards southward of Salem Channel, is marked by a daybeacon 30 feet high with red and white checkered diamond daymark on a conical granite monument; the daybeacon is very conspicuous when approaching the harbor. The extension of the ledge northeastward is marked by a lighted buoy. **House Ledge,** covered 10 feet, and a ledge, covered 15 feet, both unmarked, are 0.4 mile eastward and 0.2 mile southeastward of Bowditch Ledge, respectively. **Powers Rock,** covered 17 feet and marked by a lighted bell buoy, is on the northern end of Bakers Island Shoals. These dangers are all south of the Salem Channel range line.

North of Salem Channel, a ledge covered 12 feet and marked by a buoy extends southwestward from Little Misery Island. **Misery Ledge,** covered 17 feet and unmarked, is about 0.5 mile westward of Little Misery Island. **John Ledge,** covered 12 feet and about 0.1 mile westward of Misery Ledge, is marked close to the southward by a lighted buoy..

Great Haste is a bare rock surrounded by ledges on the south side of Salem Channel, 2.4 miles westward of Bakers Island. **Little Haste,** close northwestward of Great Haste, is awash at low water and marked by a daybeacon. A 17-foot spot

on the northwest end of **Haste Shoal,** about 650 yards northward of the daybeacon, is marked on the north side by a lighted buoy.

Popes Head (42°31.7′ N., 70°47.8′ W.), 300 yards northwestward of North Gooseberry, is a rugged, bare rock surrounded by ledges to a distance of 150 yards. A buoy marks **Popes Head Shoal,** the western extremity of the ledges around the islet.

Satan Rock, 0.5 mile east-southeastward of Cat Island, is a small bare rock marked by a daybeacon. The rock should be given a berth of over 200 yards.

Brimbles is a rock awash at low water 0.3 mile south-southeastward of Eagle Island. It is marked by a red and white checkered daymark on an iron spindle. The daybeacon should be given a berth of over 200 yards.

Eagle Bar, an extensive foul ledge and shoal area extending from Eagle Island to the northward, eastward, and westward and terminating with **Cutthroat Shoal,** covered 6 feet, on the northeast and**Midchannel Rock** covered 17 feet, on the southwest is marked on its eastern, southern, and western extremities by buoys.

Grays Rock, 0.7 mile northwestward of Cat Island, is 10 feet high. **Chappel Ledge,** covered 14 feet, about 350 yards eastward of Grays Rock, is marked to the eastward by a lighted buoy. **Coney Ledge,** an extensive ledge extending southeastward from Coney Island, is marked at its easterly end by a buoy.

Islands and rocks, sunken and bare, extend 2 miles southward and southwestward from the south end of Marblehead Neck. Some of these dangers are marked by buoys, and the channels between them are used by local boats, but the area should be avoided by strangers. A lighted bell buoy marks **Outer Breakers,** covered 8 feet, the southeastern end of the broken ground.

Dangers showing above water are: **Great Pig Rocks,** bare at high water and having rocks awash at low water southward of them; **Sammy Rock,** awash at low water; **Ram Islet,** high, rocky, and grassy; **Little Pig Rocks,** awash at high water; **Roaring Bull,** bare at low water and marked by a daybeacon; and **Tinkers Island,** marked by several houses.

A bar with little depth connects Tinkers Island with **Flying Point,** the southern end of Marblehead Neck.

Tom Moore Rock, at the eastern end of a reef extending 500 yards eastward from the middle of Marblehead Neck, uncovers 6 feet and is marked by a daybeacon.

No attempt has been made to describe all of the dangers, shoals, rocks, and ledges, as all those known are charted. Most of those in or near the fairways, or near the channel edges, are marked. The chart should be the guide and due caution exercised. Important dangers within the limits of the three harbors will be described where necessary under the description of each individual harbor and its facilities.

Tides and currents.-The mean range of tide is 9.0 feet at Beverly, 8.8 feet at Salem, and 9.1 feet at Marblehead. The tidal current in Salem and Marblehead Harbors has little velocity. In Beverly Harbor it has considerable velocity and sets across the channel in places. During the first half of the ebb the current sets across the shoal extending northeastward from Monument Bar.

Ice.-The head of Salem Harbor on the flats usually is closed by ice every winter during January and February, but the formations rarely extend beyond the coal pier except in unusually severe winters, when they have been known to reach as far out as Great Haste and occasionally as far as Eagle Island. Northerly and northwesterly winds are most favorable to local formation in Salem Harbor.

Winds from southward and westward, during light formation, have a tendency to carry the ice off to sea, while those from eastward usually break up the formation both in the harbor and its approaches.

Ice rarely obstructs Marblehead Harbor to such an extent as to hinder navigation. Fishermen have made it a refuge when it was impossible to get into Gloucester, Salem, or Lynn Harbors. The formation of ice in Marblehead is entirely local, and it remains only a short time.

Pilotage is compulsory for all foreign vessels and for U.S. vessels under register in the foreign trade which draw over 7 feet. Pilotage is optional for coastwise vessels who have on board a pilot licensed by the Federal government, but most deep-draft vessels take a pilot. The pilot usually boards in the vicinity of Eastern Point Lighted Whistle Buoy 2 (42°34.2′ N., 70°39.9′ W.). See Pilotage, Gloucester Harbor, for additional information.

Towage.-The pilot boat is usually used as a tug, since the nearest tugs are based at Boston.

At Salem, Beverly, and Marblehead Harbors, quarantine, **agricultural quarantine,** and**immigration** matters are handled by officials from Boston; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1.

Salem is the **customs port of entry** for Manchester, Salem, Beverly, Danversport, Marblehead, Peabody, and Lynn.

Primary **immigration** inspection is usually made by the Customs officer; more extensive inspections, if required, are made by officials from Boston.

The **Coast Guard** maintains a **vessel documentation** office in Gloucester; see Appendix for address.

Harbor regulations.-Moorings in the three harbors are under supervision of their respective har-

bormasters. A **speed limit** of 5 miles per hour is enforced within the limits of the harbors by police patrol boats.

Wharves.-Oil storage terminals are in operation at Tuck Point at Beverly, South River, Salem, and at the head of navigation on the Crane River at Danversport. Other wharves are in ruins or in various stages of disrepair and disuse. Several fish wharves in Beverly and Salem are in operation.

Supplies.-Fuel, water, provisions, ice, and marine supplies can be obtained at the ports.

Repairs.-There are machine shops at Beverly and Salem that can carry out repairs. There are no drydocks; the nearest is at Boston. There are numerous yachts and boatyards which do repairs, haul out, and store. The largest of the marine railways in the harbors, located at Salem, can haul out craft up to 100 feet in length. Dry covered and open winter storage is available.

Communications.-All three ports have railway, bus, and taxi service.

Chart 13276 (241).-Beverly Harbor is north of Salem Neck at the western end of Salem Sound and is formed by the confluence of Danvers River, Bass River, and North River. It forms the approach to the city of Beverly, a manufacturing and resort city on the north side of the harbor just inside the entrance. Waterborne traffic includes petroleum products, caustic soda, chemicals, and seafood products.

Channels.-Beverly Channel with general depths of 20 to 24 feet in 1968, leads from Salem Sound to the oil storage and chemical plant at **Tuck Point,** the fish wharf, service wharf, and marinas on the north side below the highway bridge. The channel is buoyed, and most of the dangers are marked. Monument Bar and Lobster Rocks, both on the south side of the channel, are marked by daybeacons.

A partially buoyed channel, known as **Rams Horn Channel,** is entered just westward of Monument Bar Daybeacon. The channel leads southward from Beverly Channel to an anchorage area and **Collins Cove.** Shoaling of unknown extent has been reported just inside the channel entrance. Collins Cove is mostly bare and seldom used.

Anchorages.-The harbor is used principally by small pleasure craft and some fishermen which lay to moorings either in the special anchorage on Monument Bar, or south of the channel below and westward to the highway bridge. The harbor is patrolled, and a **speed limit** of 5 miles per hour is enforced.

Wharves.-The chemical and oil-handling wharf on Tuck Point has about 400 feet of berthing space with a depth of 22 feet reported alongside. The seafood processing plant wharf, about 250 yards east of the highway bridge, has 22 feet alongside. The other wharves are now occupied by marinas, which are described under small-craft facilities.

Small-craft facilities.-Jubilee Yacht Club at Tuck Point has 8 feet reported alongside its float landing. Gasoline and water are available at the club's floats. A marine railway that can handle craft up to 40 feet in length for repairs and storage is available. A small-craft launching ramp is on Tuck Point, and a public landing is on the waterfront between Tuck Point and the highway bridge.

Several marinas with depths of 10 to 20 feet alongside their floats are on the north bank east of the highway bridge. These facilities can provide gasoline, diesel fuel, water, ice, marine supplies, provisions, and guest moorings. There are a 20-ton mobile hoist and a 3-ton marine hoist that can haul out craft up to 45 feet in length for hull or engine repairs or dry open or covered winter storage; electronic repairs can be made.

State Route 1A highway bridge and the Boston and Maine railroad bridge crossing the mouth of Danvers River from Beverly to Salem have swing spans with a channel width of 40 feet and a minimum clearance of 3 feet; drawbridge regulations are given in **117.65,** Chapter 2. An overhead power cable on the east side of the railroad bridge has a clearance of 85 feet.

Chart 13275 (240).-Danvers River, the continuation of Beverly Harbor northwestward, has a depth of about 7 feet for 2 miles above Beverly to the town of **Danversport.** The channel, buoyed for about 1.5 miles to the mouth of Waters River, is narrow and leads between flats which uncover at low water. A highway bridge crossing the river about 0.5 mile west of the railroad bridge has a swing span with a clearance of 8 feet. A municipal marina with a pier and float landing is on the south bank of the river just east of the highway bridge; depths of 8 feet are alongside the floats. A small-craft launching ramp and water are available.

In 1970, coastal oil tankers drawing up to 14 feet went upriver at high water to an oil terminal in Danversport on the north bank of **Waters River** at State Route 35 highway bridge. The bridge has a fixed span and is the head of navigation on Waters River, which is shoal above the bridge.

A marina with depths of 10 feet reported alongside its floats is just eastward of the oil terminal. The marine railway at the marina can handle craft up to 45 feet in length for hull and engine repairs or open or covered storage. Gasoline, diesel fuel, ice, provisions, marine supplies, overnight berthing with electricity, and most other services are available.

Crane River empties into the west side of Danvers River, about 0.3 mile above the entrance to Waters River. A privately dredged channel leads from the entrance to a mooring basin at the head. In 1970, the controlling depth in the channel and basin was 5 feet.

Porter River, a northwesterly tributary of the Danvers River, has its entrance just eastward of the entrance to Crane River. A privately dredged

channel leads from the entrance for about 0.4 mile to a mooring basin just below the State Route 35 fixed highway bridge, the head of navigation. In 1970, the controlling depth to and in the basin was 4 feet.

There are several small-craft facilities on Porter River. Marine railways to 15 tons, lifts to 20 tons, marine supplies, storage facilities, and other services are available; hull and engine repairs can be made. The Danvers Yacht Club at the entrance and west side of the river has depths of 4½ to 7 feet reported alongside its floats; water is available.

The **harbormaster** for Danvers River maintains an office on the west side of Porter River, about 0.3 mile below the highway bridge; all public moorings are under his control.

Chart 13276 (241).-North River, a tributary of Danvers River entering from southward just above the bridges, is nearly bare at low water in a narrow, unmarked channel which is seldom used. A boatyard with a marine railway that can haul out craft up to 40 feet in length for repairs or winter storage is on the west side of the river just below State Route 114 highway bridge at the head of navigation. Overhead power cables crossing the mouth of North River have clearances of 75 feet, and where they cross Collins Cove they have a clearance of 50 feet. The towers are conspicuous from seaward.

Bass River empties into the north side of Danvers River opposite the entrance to North River. A depth of about 6 feet can be carried to the highway swing bridge, about 0.7 mile above the entrance, thence about 4 feet to the yacht club 0.3 mile above the bridge. The channel leads between flats bare at low water and is most easily followed at that stage. Buoys mark the channel to a point about 300 yards below the bridge. The bridge has a swing span with a width of 40 feet and a clearance of 5 feet. An overhead power cable on the south side of the bridge has a clearance of 48 feet. It has been reported that the swing span is hand-cranked, and that it would be opened only upon 24-hour advance notice.

A boatbuilding and repair yard about 0.3 mile below the bridge and a yacht club 0.3 mile above the bridge, both with marine railways, and a ramp, the latter just above the bridge, are all on the east bank of the river. There are no services, except a service station near the ramp. The boatyard builds or hauls out for repairs or storage craft up to 35 feet in length. The yacht club is a private facility.

Chart 13276 (241), 13274 (613-SC).-Salem Harbor is about 1.5 miles in length in a southwesterly direction. **Salem,** an industrial city, is on the western side of the harbor. The principal industries are leather, electronic products, and games manufacturing. The city has many points of historical interest, including museums devoted to maritime subjects. Waterborne commerce is principally in petroleum and seafood products.

Salem Harbor is approached from the northward through a dredged section of Salem Channel. An obstruction, cleared to a depth of 27 feet and marked by a lighted buoy, is close to the westerly edge of the channel entrance.

On the western side of the dredged approach is Salem Neck. **Salem Willows Park,** the Salem Willows Yacht Club, and a 400-foot public pier are on the northeastern extremity of Salem Neck. Excursion and party fishing boats operate from the three landings in the summer. Rowboats can also be hired. Depths of 3 feet are reported alongside the yacht club floats; gasoline and water are available. Reported depths of 10 feet are at the head of the public pier and 4 to 8 feet at the floats on each side of it. There are an amusement park and restaurant at the Salem Willows Park.

Juniper Point, the eastern extremity of the neck, has many summer homes.

Juniper Cove, a shallow foul cove which is mostly dry at low water, lies between Salem Neck and **Winter Island.** A boat and yacht yard with marine railways that can haul craft up to 50 feet in length for hull or engine repairs or dry open storage is at the head of the cove. In summer, small craft moor in the entrance to the cove between **Abbot Rock,** marked by a daybeacon, and Juniper Point. The cove is open to easterly weather, but the holding ground in the entrance is reported to be good.

The red conical tower and concrete foundation of the discontinued Fort Pickering Light are prominent on the southeastern point of Winter Island. The hangars, buildings, and seaplane ramps of an inactive Coast Guard base on the southern half of Winter Island are conspicuous. The seaplane ramps should be given a wide berth, since numerous submerged pilings are nearby.

Great Aquavitae Shoal, on the east side of the dredged section of Salem Channel, is marked by a daybeacon.

Conspicuous on Salem Neck are the inactive coal transporters and oil tanks of the Salem Terminal and the four stacks of the powerplant adjacent to the north.

About 300 yards southwestward of Salem Terminal Wharf, are the pier and floats of the Witch City Yacht Club. Depths of 6 feet are reported alongside the floats; water is available.

Derby Wharf, on the west side of Salem Harbor about 0.4 mile southwestward of Salem Wharf, is a long stone jetty about 0.3 mile long. The wharf is marked on its outer end by Derby Wharf Light, 25 feet above the water, and shown from a white square tower. The wharf and the old customhouse on its shore end are now a national monument under the Department of the Interior.

A dredged channel leads along the east and west sides of Derby Wharf. The northerly channel leads to an anchorage basin on the east side of the wharf. In April 1973, the channel and basin had depths of 7 ½ feet. Two public floats are midway

along the wharf; moorings are available in the basin. The southerly channel, on the west side of the wharf, leads to South River.

South River, a short estuary extending into the city of Salem, has its entrance through a dredged channel leading along the west side of Derby Wharf. In April 1973, the section of the channel leading along the west side of the wharf had a controlling depth of 8 feet except for a 4-foot spot on the eastern edge of the channel about 400 yards above the entrance to the channel, thence 6 feet to a point about 100 yards below the swing bridge over South River.

On the west side of South River, large industrial buildings and warehouses and a brick stack are conspicuous.

At high water, coastal tankers and oil barges drawing up to 14 feet go up to an oil storage plant on Pickering Wharf on the north side of the channel. In 1970, it was reported that local small craft could carry 6 feet as far as the public float landing and a marina on the east side of the Congress Street Bridge, about 0.2 mile above Derby Wharf. The bridge has a swing span with a channel width of 43 feet and a clearance of 4 feet. A public float landing is on the south side of the draw. Gasoline, diesel fuel, fresh water, and most services are available at the floats of the marina on the north bank. It has been reported that navigation through the Congress Street Bridge is hazardous during periods of maximum flood and ebb.

The southwestern part of Salem Harbor is shoal and at the head particularly foul, southward of Pickering Point. A privately dredged channel, reported shoaled to 5 feet in 1968, leads to an anchorage basin in **Palmer Cove** at the Palmer Cove Yacht Club. Water is piped to the floats, which have 3 to 8 feet alongside. A hard-surfaced ramp is at the yacht club. No gasoline is available.

South of **Palmer Point,** a large yacht yard with marina has a marine railway, the largest in the area, that can haul out craft up to 100 feet in length. A privately dredged 8-foot channel leads to an anchorage basin off the yard. Water, open and covered winter storage, overnight berthage with electricity, and most services are available at the yard. The yard maintains guest moorings.

Marblehead Harbor, a mile long and 700 yards wide, is formed on the east and south by Marblehead Neck and **Back Beach,** a narrow strip beach on the south side of the causeway and seawall connecting the south end of Marblehead Neck with the mainland. Marblehead Light marks the easterly point of the entrance. Marblehead Harbor is an excellent anchorage used mostly by yachts during the summer. The anchorage is reported uncomfortable for small yachts when the wind is northeast.

The depths in the harbor up to **Skinner Head** are from 21 to 30 feet, with the exception on the east side, northerly of **Boden Point,** where **Boden Rocks** are covered 9 feet.

Southward of Skinner Head, the depths shoal gradually with 8 feet available to within about 300 yards of the head and east side. It is reported that this part of the harbor is extremely uncomfortable for small craft during a northeaster.

The harbor, often referred to as the "yachting capital of the world," is somewhat congested during the summer. The harbormaster estimates that on an average 1,000 moorings usually are occupied, with a peak of 2,000 craft of all sizes and types in the harbor during race week in August.

The moorings are under the supervision and control of the **harbormaster,** who issues permits for them. The harbor is patrolled by a police boat, and a **speed limit** of 5 miles per hour is enforced. The harbormaster may be contacted through any of the yacht clubs, yacht yards, or service facilities and may, on request, direct a stranger to a mooring or a quiet spot for anchoring. Guest moorings are maintained by most of the yacht clubs, yards, and service facilities.

No directions are deemed necessary for entering. The chart should be the guide. All known dangers are charted, and most of them are marked. Some difficulty may be experienced, once in the harbor, in finding a mooring or good swinging room, if the harbor is congested. In that case, the harbormaster may be of help.

Marblehead, a combined business and residential community on the west side, and **Marblehead Neck,** all residential, on the east side of the harbor, are important summer resorts.

Storm warning signals are displayed; see chart.

There are numerous float landings on both sides of the harbor at which there are depths of 6 to 25 feet. Overnight berthing, as a rule, is not permitted at any of the service or yacht club floats.

There are six yacht clubs on the harbor: Eastern, Corinthian, and Pleon on the east side; and Boston, Dolphin, and Marblehead along the west side. All have facilities to a varying degree, either private or available to visiting yachtsmen.

There are three service facilities with float landings on the west side at which gasoline, diesel fuel, water, ice, provisions, and most marine supplies can be furnished or obtained.

There are six yacht yards, three on the west side, and three in Little Harbor, northwestward of **Fort Sewall,** that have marine railways, the largest of which can haul out craft up to 100 feet in length. Complete hull or engine repairs can be made, and dry open or covered winter storage is available at all of the yards. Electric or electronic repairs can also be made. Two of the yards have sail lofts. There is a 50-ton locomotive crane, a 10-ton mobile crane, and several smaller cranes capable of handling craft up to 5 tons available at the yards.

Wood and steel sail or motor craft up to 38 feet in length can be built at Marblehead. There are two public float landings and two small-craft launching ramps usable at half tide or better.

Lodging, restaurants, markets, hospital, and churches are in Marblehead; bus and taxi services are available.

Charts 13275 (240), 13274 (613-SC).-Phillips Point, 3.5 miles southwestward of Marblehead Light, is 50 feet high and rocky with woods and large homes along its shore. A rock ledge covered 12 feet is 600 yards eastward of Littles Point, the eastern part of Phillips Point. A fishing net extends eastward from Littles Point during the summer. A reef with bare heads extends 350 yards southward from Phillips Point. **Dread Ledge,** 500 yards southward of the point, uncovers 5 feet and is marked by a daybeacon.

Nahant Bay is 2 miles wide between Phillips Point and Nahant. Temporary anchorage, exposed to easterly and southerly winds, can be had in the bay in 18 to 36 feet, but is seldom used. The usual anchorage is off Swampscott, northwestward of Lincoln House Point. Several mooring buoys, used by local craft, are in the cove westward of the point, off **Fishermans Beach.** A 440-foot pier with 50 feet of floats at the end extends off the beach; there are depths of 5 feet at the floats, but no services. The Swampscott Yacht Club is at the shore end of the pier. A **harbormaster,** who maintains an office at the yacht club, supervises the moorings.

There is a public small-boat ramp with parking space adjoining the pier. Gasoline can be obtained in cans from a nearby service station. Ice, provisions, and marine supplies are available from the nearby markets and stores. Rowboats and outboards can be hired, and bait and tackle can be obtained.

Nahant Bay is mostly clear. **Lincoln House (Fishing) Point, Blaney Rock,** and **Red Rock** are rocky points on the northern side of Nahant Bay. A dangerous sunken rock, marked on its south side by a buoy, is about 125 yards south of Lincoln House Point. Two other rocks, covered 16 feet and 18 feet, are about 400 yards southward and about 700 yards south-southwestward of Lincoln House Point, respectively.

The town of **Swampscott** is on the northern shore of Nahant Bay. A large standpipe and the high school cupola are conspicuous. A church spire, lighted at night, on the shore drive at Red Rock, and an observatory, about 0.9 mile northwestward of Red Rock, are also prominent.

Nahant (Lynn) Beach is a narrow strip of sand about 1 mile long in a southerly direction separating Nahant Bay from Lynn Harbor. **Little Nahant,** a high grassy head with many houses, is joined to Nahant by **Little Nahant Beach,** a strip of beach 0.4 mile long. The white buildings and signal tower of the former Coast Guard station on Little Nahant Beach are just southward of Little Nahant.

Egg Rock, 60 feet high and bare, is on the southern side of the entrance to Nahant Bay. It is a bird sanctuary.

Nahant is a high peninsula about 1.5 miles long with bluff seaward faces. The town of Nahant is connected to Lynn by a highway. Among the most prominent objects are four nearly identical concrete observation towers; two are on the outer end of the peninsula just north of **Pea Island;** one is about 0.4 mile to the northward; and the fourth is on the west side of the harbor. It is reported that the southerly of the two towers just north of Pea Island is painted orange and is especially prominent. A former military installation, now used by Northeastern University as a marine research facility, is on **East Point,** the easternmost point of the peninsula.

Nahant Harbor is the bight on the south side of Nahant. On entering between **Joe Beach Ledge,** covered 2 feet and marked by a buoy, and **Bass Rock,** awash and marked by a daybeacon, select temporary anchorage off the wharf in 18 to 24 feet, hard bottom. The town wharf on the east shore at the head has about 6 feet alongside the float landing; a hard-surface launching ramp for small boats is on the north side of the shore end of the wharf. Water is available at the float. There is a sailing club on the wharf, and a **harbormaster** controls the moorings. The Boston pilot boats land and pick up pilots at this wharf and maintain a mooring off the wharf.

Shag Rocks are bare rocks extending 300 yards southward from the southeast end of Nahant. A ledge, awash at lowest tides, extends 100 yards southward from the southernmost Shag Rock. A lighted buoy is south of the ledge.

Broad Sound, about 4 miles wide between Nahant on the northeast and Deer Island on the southwest, forms the approach to Nahant and the city of Lynn at its north end, and the northern approach to Boston Harbor at its south end. It has depths of 18 to 48 feet in the entrance, but is shoal near the shores. A foul area with sunken rocks, some covered ½ foot, is offshore on the west side of the sound, about 1.9 miles east-northeast of the tower at Revere Beach. Piling, awash and unmarked, about 300 yards northeastward of the foul area, are in 42°25′09″ N., 70°57′48″W.

Lynn Harbor, the northerly end of Broad Sound, is mostly sand and mudflats which largely bare at low water and through which a channel has been dredged to the city of Lynn, an industrial community of major importance. In 1970, it had little waterborne commerce. Of over 100 diversified industries, shoemaking is the most important, and there is a large General Electric plant, which manufactures airplane engines and electronic products. Depths at the wharves vary from 5 to 20 feet. In 1970, several of the wharves were being used as marinas, and the remainder were not in general use or were in ruins or disrepair.

Prominent features.-Landmarks in approaching Lynn Harbor are the standpipe on Winthrop Head, the observation towers at Nahant, the scenic rail-

way and ferris wheels at Revere Beach, the large storage tanks and twin chimneys of the powerplant, several stacks at the head of the harbor, a tall brick stack at the General Electric plant, and the radio tower of station WRYT on the Pines River.

Channels.-A dredged channel leads from Broad Sound, at a point about 0.8 mile westward of Bass Point, to a turning basin at the head of Lynn Harbor. A subsidiary channel leads from the basin in a southwesterly direction to the wharf of a powerplant. In 1970, the controlling depths were 18 feet for a midwidth of 150 feet to the turning basin, thence 15 to 17 feet in the basin, and thence 13 feet in the subsidiary channel to the powerplant wharf.

Black Rock Channel, a branch channel leading along the western side of Nahant, is unmarked and suitable only for small craft. Sand flats, bare or nearly bare at low water, are on each side. In 1970, it was reported locally that the channel had silted and could be used only by very small craft.

Western Channel, westward of the main channel to Lynn Harbor, leads from Broad Sound to the General Edwards Bridge and the **Saugus River. Pines River** is entered from Saugus River just westward of the bridge. In 1970, the controlling depth in Western Channel and in Saugus River to the Fox Hill Bridge, about 0.7 mile above the General Edwards Bridge, was 7 feet. From Fox Hill Bridge, a depth of about 4 feet could be carried in Saugus River to a turning basin off the Saugus River Yacht Club, about 0.75 mile upstream. In Pines River, a depth of about 6 feet could be carried for about a mile with local knowledge.

Western Channel is marked by buoys to just below the General Edwards Bridge. Dangerous rocks awash, on the northern side of the channel, extend about 200 yards south-southeastward from a point on the north shore about 200 yards below the General Edwards Bridge; the southern extremity of the rocks is marked by a buoy. Above the bridge, the channel is unmarked and local knowledge is advised.

Anchorages.-Small craft moor off the marina and boatyard north of Bass Point, in the turning basin at the head of Lynn Harbor, and in the special small-vessel anchorage eastward of it; limits and regulations are given in **110.1 and 110.30,** Chapter 2. In Saugus River, some moor off the yacht club close eastward of General Edwards Bridge. Above the bridge they moor on the west side of the channel and above Fox Hill Bridge in the channel wherever space permits. In Pines River they moor in the narrow channel. Moorings are under control and supervision of the harbormaster, who can be contacted through the local police department. Depths in the anchorages are off Bass Point from 5 to 30 feet; at the head of Lynn Harbor from 7 to 17 feet; and in Saugus and Pines Rivers from 3 to 9 feet.

Some local knowledge or assistance will be needed in finding swinging room or a vacant mooring off the yacht clubs at the head of Lynn Harbor, as this area is usually heavily congested with small craft.

Many small craft moor on the east side of the harbor near Bass Point, and the boatyard there maintains about 150 moorings, with usually a few vacant.

Dangers.-The principal dangers in the approach to Lynn Harbor are **Flip Rock,** covered 12 feet and marked by a gong buoy, 0.6 mile south of Bass Rock;**Nahant Rock,** covered 18 feet and marked by a buoy, 0.8 mile southwest of Bass Point; and two unmarked shoals, covered 14 and 16 feet, about 0.7 mile northward of Nahant Rock.

Bridges.-No bridges cross the main channel to Lynn. Three bridges cross Saugus River between the mouth and a fixed highway bridge at East Saugus, about 2.5 miles above the mouth. The first, General Edwards (State Route 1A) highway bridge, has a bascule span with a clearance of 27 feet. An overhead power cable about 0.2 mile westward of the bridge has a clearance of 85 feet.

The second, the Boston and Maine Railroad bridge, has a bascule span with a clearance of 7 feet; and the third, Fox Hill highway bridge at Western Avenue, has a 40-foot bascule span with a clearance of 6 feet. The fixed highway bridge at East Saugus has a clearance of about 4 feet, but a water main crossing under the bridge obstructs the channel at low water and prevents navigation through it. Small craft are reported to go above the bridge for some distance at high water.

The drawspan of a former narrow gage railroad bridge, just above General Edwards Bridge, has been removed to the approach piers for a channel width of 200 feet.

Tides and currents.-The mean range of tide is 9.2 feet at Lynn. The average velocity at strength of the tidal current at Lynn Harbor entrance is 0.5 knot.

Harbormasters.-There is a harbormaster at Lynn and one at Saugus. The former can be contacted through the Volunteer Yacht Club at Lynn; the latter through the Saugus Police Department. They supervise and control the moorings.

Wharves.-In 1970, the only wharves in periodic use were those of the oil-handling terminals of Lynn Gas and Electric Company on the west side of Lynn Harbor and the General Electric plant on Saugus River. The former had reported depths of 20 to 22 feet alongside, and only an occasional oil barge unloaded there. The General Electric Company wharf had a reported 9 feet alongside and was used only occasionally.

Supplies and repairs.-There are no bunkering facilities, drydocks, or major repair facilities for large vessels at Lynn. The nearest drydocks or repair facilities for large vessels are at Boston. Marine supplies, provisions, and machine shops are available in the city.

Small-craft facilities.-There are several marinas, boatyards, and private yacht clubs at Lynn and on

the Saugus and Pines Rivers. Most of these facilities have gasoline, marine supplies, storage and berthing facilities, water, ice, and launching ramps. The facilities on Pines River can make hull and engine repairs; an 18-ton mobile hoist and a 50-foot marine railway are available.

The yacht clubs include the Bass Point Boat Club, on Bass Point; the Lynn and Volunteer Yacht Clubs at the head of the harbor; the Point of Pines Yacht Club, on the south side of Saugus River, just eastward of the General Edwards Bridge; the Fox Hill Yacht Club, near the Fox Hill Bridge; and the Saugus River Yacht Club, about 0.7 mile above the Fox Hill Bridge. The clubs all have berthing facilities, guest moorings, and other services available to members and guests.

Lynn has railroad and bus services, a hospital, hotels, banks, churches, and many other conveniences.

Revere is a city and summer beach resort on the west side of Broad Sound. At the southern end of **Revere Beach,** a breakwater extends out from the shore on **Cherry Island Bar,** forming an anchorage for small craft in 3 to 4 feet of water, but it is exposed. Parts of the breakwater are covered at high water.

Westward of the breakwater a 600-foot long pier with a float landing at the end with 2 feet alongside makes out from the shore in a northeasterly direction. Outboards and rowboats can be hired and small amounts of gasoline are available. There is a snack bar on the pier. There are sunken piles off the landing. A shorter pier to the eastward dries at low water.

Winthrop Highlands, about 0.8 mile southward of Cherry Island Bar, has three conspicuous radar domes on it.

11. BOSTON HARBOR, MASSACHUSETTS

This chapter describes Boston Harbor, its approaches and tributaries, and the major commercial facilities in the port of Boston. The more important tributaries include Charles, Chelsea, Mystic, and Weymouth Fore Rivers, and Dorchester and Hingham Bays.

Chart 13270 (246).-Boston Harbor, the largest seaport in New England, includes all the tidewater lying within a line from the southern extremity of Deer Island to Point Allerton, about 4 miles to the southeastward. Numerous dangers lie in the approaches to the harbor. The northeastern approach is obstructed by islands and shoals which extend 4 miles from the entrance; between them are the dredged channels which lead into the harbor. In the southeastern approach, broken ground extends as much as 3 miles from shore. The approaches are marked by a number of powerful lights, and the principal dangers are buoyed.

A **dumping ground** is located in Massachusetts Bay in the approach to Boston Harbor, about 8.5 miles southeastward of Boston Lightship; see **205.80(a) and (b)(3),** Chapter 2, for limits and regulations.

A **Traffic Separation Scheme** has been established in the approach to Boston Harbor, (See charts 13270 (246), 13267 (1207), 13246 (1208), 13260 (1106), and 13200 (1107).)

The Scheme is composed basically of **directed traffic lanes** each with one-way inbound and outbound traffic lanes separated by a **defined separation zone** and a **precautionary area.** The Scheme is recommended for use by vessels approaching or departing from Boston Harbor, but is not necessarily intended for tugs, tows or other small vessels which traditionally operate outside of the usual steamer lanes or close inshore.

The Traffic Separation Scheme has been designed to aid in the prevention of collisions at the approaches to major harbors, but is not intended in any way to supersede or alter the applicable rules of the road. Separation zones are intended to separate inbound and outbound traffic lanes and to be free of ship traffic, and should not be used except for crossing purposes. Mariners should use extreme caution when crossing traffic lanes and separation zones.

The **precautionary area** in the approach to Boston Harbor has a radius of 5 miles centered on Boston Lightship (42°22′42″N., 70°47′00″W.), excluding that area of the circle bounded by an imaginary line extending between the outer limits of the inbound and outbound traffic lanes.

The **separation zone** is a 1-mile zone centered in the following positions: (i) 42°21′13″N., 70°41′31″W., (ii) 42°08′16″N., 69°53′36″W., and (iii) 40°49′09″N., 69°00′00″W.

Inbound traffic lane is a 2-mile-wide lane with a length of about 127.5 miles. Entering the traffic lane at a point in about 40°50′00″N., 68°58′00″W., a course of **333°** for about 89 miles, thence a course of **290°** for about 38.5 miles follows the centerline of the traffic lane to the junction with the precautionary area.

Outbound traffic lane is a 2-mile-wide lane with a length of about 124.5 miles. Entering the traffic lane at a point in about 42°19′30″N., 70°42′00″W., a course of **110°** for about 37 miles, thence a course of **153°** for about 87.5 miles follows the center line of the traffic lane to its end; thence steer usual courses to destination.

The Traffic Separation Scheme is buoyed.

Prominent features.-Boston Lightship (42°22′42″N., 70°47′00″W.) is moored about 7.8 miles east-northeastward of Deer Island. The vessel has a red hull with the name BOSTON in large white letters on the sides. A light, 53 feet above the water, is shown from a single mast. A radiobeacon and fog signal are at the lightship. The code flag signal and radio call is NNBC. **Storm warning signals are displayed during the daytime.**

Conspicuous to a vessel approaching Boston Harbor from northeastward is the tall red-orange standpipe on Winthrop Head. From eastward, the most prominent island in the entrance is Great Brewster. On the south side of the entrance, a turreted tower is conspicuous on Point Allerton; also prominent are the tank and standpipe on Strawberry Hill. Two miles south of Point Allerton are two radio towers which are illuminated at night.

The outstanding landmarks in the city are the John Hancock Building, the Prudential Building, the bridge over Mystic River, the tower of the customhouse, and a large gas tank in Chelsea. Also prominent are the John F. Kennedy Federal Building in Boston and a water tank and spire at Squantum.

Boundary lines of inland waters.-The lines established for Massachusetts Bay are described in **82.10,** Chapter 2.

Northeastern approach.-Deer Island, on the northwest side of the entrance to Boston Harbor, is about a mile long and is joined to the mainland by a fill. There is a prison on the northern part of island and a sewage pumping station with a prominent stack on the southwest side.

Deer Island Light (42°20.4′N., 70°57.3′W.), 53 feet above the water, is shown from a brown conical tower, on black cylindrical pier, on the outer end of a ledge that extends 0.3 mile southward from the island. A fog signal is sounded from the light station.

Winthrop Head, about a mile northward of the northwestern end of Deer Island, is a 100-foot hill covered with buildings and a tall red standpipe on top which is the most prominent mark in the vicinity. The town of **Winthrop Beach** lies along the shore just northward of Winthrop Head. About 0.2 mile off and parallel to Winthrop Beach is a breakwater about 0.4 mile long which is bare several feet at the highest tides and is fairly prominent. Small craft moor behind the breakwater; there are no landings or facilities.

Great Faun Bar, the inner part of the shoal ground extending from the northeastern side of Deer Island, is a partly drying flat, marked on its outer part by a daybeacon which is about a mile northeastward of Deer Island Light and 0.3 mile northwestward of Boston North Channel. **Little Faun Bar,** which uncovers on its inner part, extends 0.5 mile eastward from the southern end of Deer Island.

Finns Ledge, covered 25 feet, lies on the western side of the entrance to Boston North Channel, the principal approach to the harbor. The ledge, marked by a lighted bell buoy, is at the outer end of shoal ground covered less than 36 feet. The shoal ground extends about 2 miles northeastward from Deer Island. Careful navigation is required in the channel entrance, especially when incoming and outgoing vessels meet.

The Graves, a group of bare rocks and ledges about 4 miles east-northeastward of the southern point of Deer Island, extend 0.35 mile north-northeastward and 0.1 mile south-southwestward from The Graves Light. **Northeast Grave,** the northernmost of these rocks, uncovers 3 feet, and from it shoal ground extends about 0.3 mile northeastward; a lighted whistle buoy is moored 0.5 mile northeast of Northeast Grave. **The Graves Light** (42°21.9′N., 70°52.2′W.), 98 feet above the water, is shown from a light gray conical granite tower; a fog signal is sounded from the light station.

Roaring Bulls, which partly uncover, are a group of rocks which lie from 0.5 to 0.9 mile southwestward of The Graves Light; the highest rocks uncover 8 feet.

Green Island, 44 feet high, is 1.2 miles southwestward of The Graves Light and 0.4 mile west-southwestward of the Roaring Bulls. The island is on a drying reef, with several other islets on it, which extends 0.3 mile southwestward from the island.

Commissioners Ledge, Devils Back, and **Aldridge Ledge** lie 0.5 to 1 mile westward of Green Island and close southeastward of Boston South Channel; Devils Back is covered 1 foot over its northeast end. Between these ledges and Green Island are **Maffitt Ledge,** covered 17 feet, and **Halftide Rocks,** which uncover 4 feet. A dangerous wreck and a reported submerged obstruction are 250 yards northeastward and about 300 yards eastward, respectively, of Maffitt Ledge.

Between Boston South Channel and Boston North Channel is a large area of shoal ground. The shoalest spot in this area is covered 8 feet and lies 1.3 miles east-northeastward of Deer Island Light.

Southeastern approach.-Point Allerton, on the southeast side of the entrance to Boston Harbor, is 3.7 miles from the southern end of Deer Island. On the point is a 100-foot hill covered with buildings; a seawall protects the seaward base of the hill. A turreted tower on the hill is conspicuous.

From Point Allerton the shore extends westward for 2 miles to **Windmill Point,** which is marked by a light and fog signal. The Coast Guard has a boathouse on the southern side of Windmill Point and another about 0.3 mile eastward of the point at the Point Allerton Coast Guard Station. **Telegraph (Nantasket) Hill,** a mile west of Point Allerton, is about 100 feet high and is marked by a stone tower with a conical top; the town of **Hull** is on the western slopes of the hill. Excursion vessels from Boston call at the town wharf in summer and stop at Georges Island on the way.

Nantasket Beach, extending about 3 miles south-southeastward from Point Allerton, is covered with buildings. Grassy **Strawberry Hill,** 1.2 miles southward of Point Allerton, is about 100 feet high and is marked by a tank and a standpipe. Two other grassy hills, **White Head** and **Sagamore Hill,** are on the southern part of the beach 2 and 2.4 miles, respectively, from Point Allerton. From Nantasket Beach to Cohasset Harbor, about 3 miles to the east-southeastward, the coast presents a general hilly appearance, and rocks and sunken ledges extend 0.5 mile offshore in places.

Atlantic Hill, Center Hill, and **Green Hill** are prominent on the stretch of coast between Nantasket Beach and Cohasset Harbor. **Gun Rock** is off the west point of the entrance of a cove off **Crescent Beach,** between Center Hill and Green Hill. The cove is protected by a breakwater extending 135 yards northward from the foreshore at Green Hill; thence 330 yards westward to the vicinity of **Seal Rock,** which is about 500 yards eastward of Gun Rock.

Black Rocks are a group of rocky islets off Green Hill. The large 20-foot-high islet has a house on it.

Shoals extend eastward and northward from Point Allerton. Two drying rocks, about 0.1 mile apart, lie about 0.2 mile northward of the point; the eastern rock uncovers 5 feet. A lighted bell buoy is moored about 0.5 mile northward of the point. **Ultonia Ledge,** the eastern end of the broken ground, has unmarked spots covered 15 to 24 feet extending 1.3 miles east-northeastward from the point.

Harding Ledge, 1.5 miles eastward of Point Allerton, uncovers before low water and is marked by a daybeacon. A detached rock which uncovers 1 foot is 0.2 mile southwest of the daybeacon. Between Harding Ledge and Point Allerton, the bottom is very uneven, and vessels should pass outside the lighted bell buoy which is moored 0.3 mile northeast of the ledge.

Thieves Ledge, 2.4 miles east-northeastward of Point Allerton and covered 27 feet, is marked on its northeast side by a lighted whistle buoy. Patches covered 32 feet and 34 feet are 0.5 mile east-northeastward and 1 mile east-southeastward, respectively, of the 27-foot spot. In heavy easterly gales the sea sometimes breaks on the ledge and the patches.

Three and One-half Fathom Ledge, cleared to a depth of 18 feet, about 3 miles northeastward of Point Allerton, is marked by a lighted bell buoy about 0.2 mile southeastward of the ledge. **Martin Ledge,** covered 14 feet, is 0.8 mile southwest of Three and One-half Fathom Ledge and is marked on its eastern side by a buoy. **Boston Ledge,** covered 18 feet, is 1.4 miles southwest of Three and One-half Fathom Ledge and is marked by a buoy.

Shag Rocks, 1.2 miles northward of Point Allerton and 0.3 to 0.6 mile east-northeastward of Boston Light, are 20 feet high and surrounded by extensive covered ledges and foul ground. Reefs and foul ground extend 0.5 mile east-northeastward to within 0.2 mile of Boston Ledge, and west-southwestward to within 0.2 mile of Boston Light.

Nash Rock Shoal, covered 19 feet, lies about 0.4 mile southwest of Boston Light.

Boston Light (42°19.7′ N., 70°53.4′ W.), 102 feet above the water, is shown from an 89-foot white conical tower, on the southeast side of **Little Brewster Island,** about 1 mile northward of Point Allerton; a fog signal is sounded from the light station.

Great Brewster Island, 0.4 mile northwest of Little Brewster Island, is 103 feet high and has a bluff at the north end. Little Brewster and Great Brewster Islands lie on the northern side of the southeastern approach on a drying bank, of which **Great Brewster Spit,** the western part, extends about a mile west-southwestward from Great Brewster Island. The western end of the spit is marked by **Narrows Light,** which has a fog signal. Shoal ground extends about 0.3 mile southward from Great Brewster Spit, and on this extension are**Kelp Ledges,** awash, about 0.8 mile westward of Boston Light.

From the northern end of the bank on which Great Brewster Island lies, reefs extend about a mile east-northeastward and 0.7 mile northward; on the eastern extension are **Middle Brewster Island** and **Outer Brewster Island,** and on the northern extension are **Calf Island** and **Little Calf Island.** On these reefs are several islets, and offlying them are numerous shoals, the area between the Brewsters and Shag Rocks being particularly foul. Among these dangers is **Tewksbury Rock,** covered 9 feet, which is about midway between Outer Brewster Island and Martin Ledge.

Georges Island is about 2 miles west-southwestward of Boston Light and a mile north-northwestward across Nantasket Roads from Windmill Point. The island is the site of historic **Fort Warren** and has several other buildings on it. A State recreation park is on the island and a State marina is in a protected basin at the wharf on the west shore of the island. Fuel, water, most services, and berthing are available.

Lovell Island is 0.3 mile northward across the Narrows from Georges Island and on the south side of Boston South Channel. A pier is on the southwest side of the island. Ruins of several buildings are on the island. **Ram Head Flats** and **Ram Head** extend up to 0.8 mile northeastward from the island; Ram Head partly uncovers.

Gallops Island, 0.3 mile northwestward of Georges Island and the same distance westward across The Narrows from Lovell Island, is high and grassy on its northern side. The island is marked by a red brick building; a wharf in ruins, protected by a breakwater, is on the southwest side. A reef named **Nixes Mate** lies on the outer part of the shoal ground which extends 0.4 mile northwestward from Gallops Island; near the center of the reef is a low islet marked by a daybeacon.

Long Island, 0.6 mile westward of Gallops Island and 0.8 mile southward across President Roads from Deer Island, is 1.5 miles long in a northeast-southwest direction and has a greatest width of about 0.25 mile. Long Island is connected to Moon Head by a fixed bridge with a clearance of 51 feet for a center width of 150 feet at the channel span. **Long Island Head Light** (42°19.8′N., 70°57.5′W.), brick tower on the north end of the island. A large standpipe with red and white checkered sections, the gilded dome of a large hospital, and a tall brick stack are prominent on Long Island. The island has two wharves on the northwest side; the northeasterly one is in ruins.

Spectacle Island, on the south side of President Roads and 1.4 miles westward of Long Island, consists of two hills separated by a low valley. The ruins of several piers are on the west side of the island. An abandoned lighthouse on the northeast end of the island is prominent.

Channels.-Boston North Channel, Boston South Channel, and the Narrows Channel are the main entrances from the sea to President Roads. Several other channels of less importance are used by local vessels.

Boston North Channel leads from Broad Sound to President Roads from the northeastward. It is the principal entrance to Boston Harbor. A Federal project provides for a channel 1,500 feet wide dredged to 40 feet in the eastern 900 feet, and 35 feet in the western 600 feet. The channel is well marked by lighted buoys. See Notice to Mariners and the latest edition of the chart for controlling depths.

Boston South Channel leads from Broad Sound in a southwesterly and westerly direction to President Roads. The channel has a controlling depth of about 28 feet and is marked by unlighted buoys.

Pilots of deep-draft vessels use the North Channel most of the time. The South Channel is rarely, if ever, used, because deep-draft vessels have a tendency to feel the bottom, making steering difficult.

President Roads, between Deer Island and Governors Island Flats, has depths of 30 to 60 feet. Its northern part is used as a quarantine anchorage.

Nantasket Roads, westward of the southern entrance to The Narrows, is a good anchorage with depths up to 50 feet. There are numerous shoals in it that must be avoided by deep-draft vessels; the chart is the guide.

The Narrows is the channel that leads into President Roads from southeastward between Boston Light and Lovell Island on the northeast, and Point Allerton, Georges Island, and Gallops Island on the southwest. Depths of about 25 feet can be carried in the well-marked channel. Shoals with depths of 18 to 23 feet are in the southeastern approach to the Narrows.

Because of the strong currents and sharp turns, it is necessary to conn a ship by eye through the approaches and in The Narrows channel. The navigator must take precautions to prevent being set off course by crosscurrents sweeping in or out of Black Rock Channel and the channel between Gallops Island and Georges Island.

Hypocrite Channel is a natural channel leading between Green Island on the north and Little Calf Island on the south. The greatest draft that can be carried through it to Boston South Channel is about 18 feet. The channel has several unmarked dangers and is not recommended for strangers or for large vessels.

Black Rock Channel leads into The Narrows from eastward between Great Brewster Spit and Lovell Island. There is an unmarked ledge covered 8 feet nearly in midchannel. The channel is used only by small local craft and is not recommended for strangers.

A channel 250 yards wide leads into The Narrows from westward between Georges Island and Gallops Island. A light is on the north side of the channel near the end of the shoal off the southeast end of Gallops Island. The channel is suitable only for quick-working vessels on account of the sharp turn into The Narrows.

Nubble Channel leads from Nantasket Roads to President Roads between Nixes Mate and Long Island. Depths of about 15 feet can be carried in the channel. The channel is marked by buoys and a directional light shown from the structure of Deer Island Light.

Sculpin Ledge Channel leads between Long Island and Spectacle Island. It will accommodate vessels of about 8-foot draft to Hingham Bay by the passage southward of Peddocks Island. The deeper water favors Long Island, and in coming from President Roads the island should be followed at a distance of about 400 yards until up with the buoy southward of Sculpin Ledge. Pass about 300 yards southeastward of the buoy and round the southwesterly end of Long Island at a distance of 300 yards and pass under the channel span of the Long Island Viaduct.

The channel leading from Nantasket Roads to Boston, southward of Long Island and Spectacle Island, is partially marked by buoys and can be used by boats of 8-foot draft with the aid of the chart.

Boston Main Channel (also see Chart 13272 (248)) extends along the southern side of President Roads to the mouths of the Chelsea and Mystic Rivers, and to Charlestown Bridge on the Charles River. The channel has been dredged to 35 feet. It has been deepened to 40 feet for a 600-foot width from President Roads to the mouth of the Mystic River with a widening at the bend just northerly of Commonwealth Pier 5, South Boston.

The waters adjacent to the piers and wharves extending northward from Northern Avenue Bridge to and including Pier 4 along the Boston proper waterfront westward of the Boston Main Channel are **nonnavigable** owing to the redevelopment of this section of the waterfront. This area is shown in magenta on chart 13272 (248).

Anchorages (also see Chart 13272 (248)).-General, explosives, and special anchorage areas have been designated in Boston Harbor; see **110.1, 110.30, and 110.134,** Chapter 2, for limits and regulations.

The anchorage on the north side of President Roads is the most commonly used general anchorage in Boston Harbor. The anchorage in Nantasket Roads, westward of the southern entrance to The Narrows, is good with depths up to 50 feet. The anchorage on the westerly side of Georges Island has depths up to 36 feet and better bottom, and is sheltered from easterly winds. This anchorage is frequently used by vessels seeking shelter in easterly gales.

Tides.-The mean range of tide is 9 feet at the entrance to Boston Harbor and 9.5 feet at Boston and Charlestown. Daily predictions for Boston Commonwealth Pier No. 5 are given in the Tide Tables.

Currents.-Daily predictions are given in the Tidal Current Tables.

The **Tidal Current Charts** for Boston Harbor show the direction and velocity of the tidal current for each hour of the current at Deer Island Light. They present a comprehensive view of the tidal current movement for the harbor as a whole and also supply a means of readily determining for any time the direction and velocity of the current at various localities throughout the harbor.

For some distance northwestward of Cape Cod the tidal currents have a slight set into Cape Cod Bay on the flood and out of the bay on the ebb. Along the north shore of Massachusetts Bay the flood sets in a general southwesterly direction and the ebb in a northeasterly direction. The velocity of the currents is influenced greatly by the force and direction of the wind. Off the entrance to

Boston Harbor, the flood sets westward and the ebb eastward, increasing slightly in velocity as the entrance is approached.

The currents at Boston Lightship are described in chapter 3.

In Broad Sound the velocity of the current at strength in most places is less than 0.8 knot. This increases to about 1 knot or more on approaching the entrances of the channels leading into Boston Harbor.

In Boston South Channel, north of Ram Head, the velocity at strength is almost 2 knots. In the channel between Deer Island Light and Long Island Head the velocity at strength is nearly 2 knots. In Hypocrite Channel the velocity at strength is a little over 1 knot. In Black Rock Channel the velocity at strength is between 1 and 1.5 knots. The flood sets southwestward through the channel and the ebb northeastward. This should be kept in mind when passing through The Narrows.

Near the middle of the channel between Boston Light and Point Allerton the velocity at strength is about 1.5 knots. On the northern side of the channel southward of Great Brewster Spit the velocity is about half as great. In the middle of the channel in Nantasket Roads the velocity at strength is about 1.5 knots. In Nantasket Gut the velocity at strength is about 2.5 knots.

Between Georges Island and Gallops Island the velocity at strength is about 0.7 knot. The flood sets westward and the ebb northeastward.

Between Gallops Island and Long Island Head the velocity at strength is about 1 knot. The flood current sets southward to southwestward and the ebb in the opposite directions.

Between Moon Head and Long Island, the current is rotary, turning counterclockwise. The average velocity at strength is about 0.2 knot. Usually, strength of flood sets southwestward and strength of ebb eastward. Between Thompson Island and Spectacle Island the velocity at strength is about 0.5 knot. The flood sets northwestward and the ebb southeastward.

In Boston Main Channel from Spectacle Island to the Navy Yard the velocity at strength varies between 0.5 and 1 knot.

Weather.-Three important influences are responsible for the main features of Boston's climate. First, the latitude (42° N.) places the city in the zone of prevailing west to east atmospheric flow in which are encompassed the northward and southward movements of large bodies of air from tropical and polar regions. This results in variety and changeability of the weather elements. Secondly, Boston is situated on or near several tracks frequently followed by systems of low air pressure. The consequent fluctuations from fair to cloudy or stormy conditions reinforce the influence of the first factor, while also assuring a rather dependable precipitation supply. The third factor, Boston's east-coast location, is a moderating factor affecting temperature extremes of winter and summer.

Hot summer afternoons are frequently relieved by the locally celebrated "sea-breeze", as air flows inland from the cool water surface to displace the warm westerly current. This refreshing east wind is more commonly experienced along the shore than in the interior of the city or the western suburbs. In winter, under appropriate conditions, the severity of cold waves is reduced by the nearness of the then relatively warm water. The average date of the last occurrence of freezing temperature in spring is April 8; the latest is May 3, 1874 and 1882. The average date of the first occurrence of freezing temperature in autumn is November 7; the earliest on record is October 5, 1881. In suburban areas, especially away from the coast, these dates are later in spring and earlier in autumn by up to 1 month in the more susceptible localities.

Boston has no dry season. For most years the longest run of days with no measurable precipitation does not extend much more than 2 weeks. This "dry spell" may occur at any time of year.

Much of the rainfall from June to September comes from showers and thunderstorms. During the rest of the year, low-pressure systems pass more or less regularly and produce precipitation on an average of roughly one day in three. Coastal storms, or "northeasters", are prolific producers of rain and snow. The main snow season extends from December through March. The average number of days with 4 inches or more of snowfall is 4 per season, and days with 7 inches or more come about twice per season. Periods when the ground is bare or nearly bare of snow may occur at any time in the winter.

Relative humidity has been known to fall as low as 5 percent (May 10, 1962), but such desert dryness is very rare. Heavy **fog** occurs on an average of about 2 days per month with its prevalence increasing eastward from the interior of Boston Bay to the open waters beyond. Winds from the east to southwest bring fog ; westerly and northerly winds clear it away.

At all seasons the heaviest gales are usually from the northeastward or eastward. Although winds of 32 miles per hour or higher may be expected on at least 1 day in every month of the year, gales are both more common and more severe in winter.

The National Weather Service office is in the Customhouse. Barometers may be compared at the Logan International Airport in East Boston.

See page T-2 for the **Boston climatological table** and pages T-8 and T-9 for the **fog signal operations tables.**

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Fogs are prevalent throughout the year. Winds from the east to southwest bring fog ; westerly and northerly winds clear it away.

Ice.-The channels of Boston Harbor are navigable throughout the year. Ice rarely forms in the main channel. Occasionally during severe winters the greater part of the harbor is frozen, but towboats and steamers keep the main channels open. The Charles, Mystic, and Chelsea Rivers and the minor passages in the harbor sometimes are frozen during severe winters. They are almost invariably kept open, however, by tugboat traffic. When ice is prevalent, the buoys may be displaced or even carried away. Local towboats can be employed for breaking ice.

Routes.-Boston Harbor and approaches have very broken rocky bottom, and caution is required.

Approaching Boston from Cape Ann.-The soundings in the vicinity of Cape Ann are very irregular and cannot be depended on to locate even approximately the vessel's position. A **228°** course from 0.2 mile off the lighted whistle buoy, 2.5 miles eastward of Cape Ann Light, clears the offshore dangers between Cape Ann and Nahant, and leads close to the lighted gong buoy marking the entrance to Boston North Channel.

At night the lighted aids are sufficiently numerous to locate the position by cross bearings. In clear weather the course should be shaped to pass well northward of The Graves Light and enter through Boston North Channel.

Approaching Boston from Cape Cod.-Approaching the easterly side of the cape, soundings of 20 fathoms indicate a distance of 3 to 3.5 miles from shore, but off the north side of the cape, the 20-fathom curve draws closer inshore and the soundings are not so regular. Vessels standing to clear Boston Lightship on a course of **297°** from the locality of Peaked Hill Bar Lighted Whistle Buoy 2 PH will cross the southwesterly end of Stellwagen Bank in depths of 12 to 15 fathoms. Soundings on Stellwagen Bank cannot be depended on to locate a position, except near the extreme southwest end of the bank where the shoalest depth of 10 fathoms is found. The recommended route, however, for deep-draft vessels is via the **Boston Traffic Separation Scheme,** which is described at the beginning of this chapter.

As the entrance to Boston Harbor is approached, after crossing Stellwagen Bank, soundings of 20 fathoms or more insure a distance of at least 5 miles from the shore and well outside of outlying rocks. Inside the depths of 20 fathoms, the soundings are very irregular and cannot be depended upon as a rule to keep a vessel out of danger. Northeast of Nahant the 20-fathom curve runs closer inshore and some of the dangers extend offshore nearly to the curve.

In the approach to Boston Lightship from the southward, the coast from Scituate to Minots Ledge Light should be given a berth of 4 miles to avoid the broken ground of Stellwagen Ledges.

Entering Boston Harbor in fog.-In thick weather a course should be laid to clear Boston Lightship by a safe distance when approaching from either Cape Ann or Cape Cod, and the water should not be shoaled to less than 20 fathoms unless the fog signal of the lightship is heard and the vessel located by radar or other means. From the lightship, steer a course to pass 0.4 mile northward of The Graves Lighted Whistle Buoy 5 and enter the harbor via Boston North Channel. Unless the lightship is located, no attempt should be made to enter the harbor.

If a vessel in the vicinity of Cape Cod is overtaken by fog or thick weather, she may find it convenient to anchor in Provincetown Harbor or on the west side of the cape south of Provincetown, where there is a good lee and the holding ground is in 7 to 12 fathoms.

Voluntary Vessel Reporting and Movement Plan, Boston Harbor and Approaches.--On December 16, 1971, the New England Water Traffic Separation Conference, a committee comprised of marine industry and Coast Guard members, voted to adopt a voluntary reporting and movement plan as outlined below for Boston Harbor in the interest of promoting the safe movement of vessels in the area.

Boston Tow Boat Company, because of its uniqueness in having dispatchers on duty 24 hours a day and maintaining radio and telephone contact with the pilots and other operational services within the harbor, has volunteered to accept and record the information received and relay this information on an advisory basis assuming no liability.

Mariners of ocean tugs and barges, as well as coastwise vessels not picking up a Boston Pilot, are requested to call "KCB-445" on VHF-FM Channel 16 (156.80 MHz) or 10 (156.50 MHz) upon arrival in a reporting zone within a radius of 5 miles of Boston Lightship giving the following information: (a) type of vessel (whether self-propelled or towing), (b) if towing vessel, whether on hawser, alongside or pushing, (c) destination, (d) deep draft, and (e) radio frequency that they may be contacted on during the transit of the harbor. It is also requested that mariners again check in with "KCB-445" when their transit is completed and the vessel is moored or anchored.

Prior to departure, it is requested that mariners call "KCB-445" on Channel 16 or 10 giving their estimated time of departure, where bound (whether by Narrows or North Channel), the radio frequency that the transiting vessel will guard, and again a call when leaving the reporting zone around Boston Lightship.

The Dispatcher at "KCB-445" will be available to disseminate advisory information that he may have on hand concerning vessel movements in Boston Harbor and approaches to assist the incoming or outgoing mariner. This service will be maintained 24 hours a day. However, Boston Tow Boat Company volunteers its services and those of its

employees, agents, and servants without assuming any liability, but working for the best interests of safety within the port and its approaches.

It is also requested that towing vessels with tows operating within the harbor report their intentions to the Dispatcher, so that he may pass this information to incoming or outgoing vessels that might meet said tows in close quarters.

In the event mariners are unable to contact "KCB-445" on Channels 16 or 10, they are requested to pass on the same information to the Boston Pilot Boat on station , which in turn, will relay the information to the Dispatcher at "KCB-445".

The cooperation of all mariners transiting the Boston Harbor area is requested in the interest of safe navigation.

Pilotage is compulsory for all foreign vessels, with few exceptions, and for U.S. vessels under register in foreign trade. Pilotage is optional for coastwise vessels which have on board a pilot licensed by the Federal government for these waters. The pilot boats meet vessels within sight of the Boston Lightship. During winter , with a northwesterly wind, the pilot boats may meet vessels to the northwestward of Boston Approach Lighted Buoy "BG" (42°23′27″N., 70°51′31″W.), seeking shelter under Nahant Head. The pilot boats often land or pick up pilots at the town wharf at Nahant Harbor.

The pilot boats, the 70-foot BOSTON PILOT and the 52-foot THOMAS KNOX, have black hulls with the word PILOT in black letters on either side of the white superstructure. Both are equipped with radar. Vessels are requested to give a 4-hour advance notice of their time of arrival. The pilot boats maintain a 24-hour radio watch on VHF-FM Channel 16 (158.80 MHz). The pilot boats also maintain a radio watch on VHF-FM channel 11 (156.55 MHz) from 0700 to 1800 hours. A pilot boat being on its station and displaying the signals required by law constitutes an offer of pilotage service. Such compliance will entitle the pilot to the regular fee for pilotage from vessels otherwise liable therefor. A vessel under 350 tons register bound into the port of Boston declining the services of a pilot is liable to one-half the pilotage fees. A vessel under 350 tons register bound out of the port of Boston is not liable for pilotage unless such services are requested.

Pilots for Weymouth and Quincy are obtained from the Boston Pilot boat. Pilots can be notified by radio, telegraph, or by radiotelephone through the Boston Marine Operator. The office of the Boston Pilots is on the second floor of No. 66 Long Wharf; telephone (617-227-3575).

Towage.-Tugs up to 3,000 hp are available at Boston. The tugs maintain radio communications on VHF-FM channel 10 (156.50 MHz). Inbound vessels are usually met in the vicinity of Anchorage areas 1 or 2. Arrangements for tugs are usually made in advance through ships' agents. Fireboats are also available; the call for the fireboat is five prolonged blasts of the ship's whistle.

Quarantine, **immigration,** and **agriculture quarantine** officials are stationed in Boston; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through the ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service; see Public Health Service, Chapter 1. Quarantine anchorages for Boston Harbor are on the north side of President Roads and on Bird Island Flats.

The U.S. Public Health Services maintains a **hospital** in Boston; see Appendix for address.

Boston is a **customs port of entry.**

Coast Guard.-The Captain of the Port, and the Marine Inspection office are at the Boston Coast Guard Base. A **vessel documentation office** is in downtown Boston; see Appendix for addresses.

Harbor regulations.-There are many rules and regulations of the Commonwealth of Massachusetts and the city of Boston affecting the handling of petroleum products, rafting of lumber, speed of vessels, control of motorboats, pollution, disposal of refuse, handling of lines, movement of vessels as directed, anchorage areas, etc. It is recommended that the navigator obtain from the harbormaster copies of the rules affecting his particular interest. His office is at 521 Commercial Street.

The call for the harbormaster or police vessel is three short and one long blast of the whistle.

Caution.-Mariners should be aware of frequent interpier movement of small auxiliary craft often maneuvering with difficulty in the vicinity of the Boston Naval Shipyard piers.

Wharves.-The Port of Boston has more than 150 piers and wharves with more than 30 miles of berthing space, most of which are located on the main channel at East Boston, Charlestown, Mystic River, South Boston, and on Chelsea River and Chelsea waterfront.

The piers and wharves generally are of open-pile concrete deck construction, extending from stone or timber bulkheads with solid fill. Only the deep-draft facilities are described; the other active facilities in the port are used as repair berths, and by government vessels, fishing vessels, small craft, and barges. For a complete description of the port facilities, refer to the Port Series, a Corps of Engineers publication. The alongside depths for the facilities described are reported; for information on the latest depths contact the Massachusetts Port Authority or the private operator. All of the facilities have direct highway connections, and most have railroad connections. Water and electrical shore power connections are available at most piers and wharves.

General cargo at the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particu-

lar facility. A 50-ton floating crane, and crawler and mobile cranes up to 150 tons can be rented.

Numerous warehouses and cold storage facilities adjacent to the waterfront are available.

Six of the seven large general cargo terminals are owned or leased by the Massachusetts Port Authority. Containerized cargo is handled at the Castle Island Terminal and at the Boston Army Base Terminal. Most of the deepwater oil and bulk terminals are on the Chelsea River and Mystic River.

The office of the Superintendent of the Port Authority's marine terminals is at 470 Atlantic Avenue, Boston, Mass. 02210; telephone, 617-482-2930.

Facilities at South Boston:

Castle Island Terminal, Berths 11-17:

Berth 17 (42°20′27″ N., 71°00′46″ W.): south side of Reserved Channel; 500-foot face, 35 feet alongside; deck height, 15 to 16 feet; 27½-ton container crane; 10 acres open storage; receipt and shipment of container cargo; owned by Massachusetts Port Authority, operated by Sea-Land Inc.

Berths 16-11; contiguous to the westward of Berth 17; Berths 15-11, 2,995-foot face; Berth 16, 610-foot face; 35 feet alongside; deck height, 15 to 16 feet; 370,000 square feet covered storage, 4 million square feet open storage, 50-ton crane; receipt and shipment of general cargo, receipt of lumber, petroleum products, bulk cement, and automobiles, shipment of scrap metal; owned by Massachusetts Port Authority, operated by Wiggin Terminals Inc.

White Fuel Corp. Tanker Wharf (42°20′30″ N., 71°01′40″ W.): south side of Reserved Channel; 84-foot face, 265 feet with dolphins, 40 to 39 feet alongside; deck height, 14 feet; receipt and shipment of petroleum products, receipt of molasses, and bunkering vessels; owned and operated by White Fuel Corp.

Army Base Terminal (42°20′38″ N., 71°01′50″ W.): north side of Reserved Channel; south side 3,705 feet long, east side 351 feet long, north side 964 feet long; 35 feet alongside; deck height, 18 feet; two 27½-ton cranes, 940,000 square feet covered storage; receipt and shipment of general and container cargo; owned by U.S. Government, leased to Massachusetts Port Authority, operated by Port Terminals Inc.

Commonwealth Pier 6 (42°21′03″ N., 71°02′18″ W.): 300-foot face, southeast side 1,150 feet long, northwest side 1,200 feet long; 25 to 20 feet alongside; deck height, 16 feet; receipt of seafood for processing and distribution; mooring, fueling, icing, and servicing fishing vessels; owned by Massachusetts Port Authority, operated by Boston Fish Market Corp.

Commonwealth Pier 5: 175 yards northwestward of Pier 6; 400-foot face, southeast and northwest sides 1,200 feet long; 40 feet alongside; deck height, 18 feet; 500,000 square feet covered storage, 1 million cubic feet freezer space; receipt and shipment of general cargo, passengers, receipt of tallow and animal fats; owned and operated by Massachusetts Port Authority.

Facilities at East Boston:

East Boston Terminal, Piers 1, 3, and 4: owned by Massachusetts Port Authority and operated by Penn Central.

Pier 4 (42°21′46″ N., 71°02′17″ W.): 240-foot face, 35 feet alongside; southeast side 780 feet long, 31 feet alongside; northwest side 780 feet long, 32 feet alongside; deck height, 20 ½ feet; 169,000 square feet covered storage; receipt and shipment of general cargo.

Pier 3: 150 yards northwestward of Pier 4; 252-foot face, 35 feet alongside; southeast side 780 feet long, 32 feet alongside; northwest side 610 feet long, 35 feet alongside; deck height, 20 feet; 142,000 square feet covered storage; receipt and shipment of general cargo, receipt of liquid latex.

Pier 1: 150 yards northwestward of Pier 3; 390-foot face, southeast and northwest sides 605 feet long; 35 feet alongside; deck height, 16 feet; 165,000 square feet covered storage; receipt and shipment of general cargo, receipt of liquid latex and vegetable oils.

Facilities at Charlestown:

Hoosac Pier (42°22′15″ N., 71°03′26″ W.): 515-foot face, 35 feet alongside;northeast side 535 feet long, 35 to 25 feet alongside; southwest side 525 feet long, 35 to 25 feet alongside; deck height, 15 to 16½ feet; 172,000 square feet covered storage; receipt and shipment of general cargo, receipt of steel and plywood; owned and operated by Massachusetts Port Authority.

Mystic Pier 1 (42°22′50″ N., 71°02′55″ W.): 468-foot face, 40 feet alongside; south side 897 feet long, 35 feet alongside; north side 672 feet long, 35 feet alongside; deck height, 15½ feet; 150,000 square feet covered storage; receipt and shipment of general cargo, receipt of lumber and steel products; owned and operated by Massachusetts Port Authority.

Facilities on Mystic River, south bank:

U.S. Gypsum Co. Wharf: immediately westward of Mystic River-Tobin Memorial Bridge; 500 feet of berthing space, 24 feet alongside; deck height, 16 feet; receipt of gypsum rock from self-unloading vessels; owned and operated by U.S. Gypsum Co.

The John F. Moran Docks (Boston-Mystic Public Container Wharf): In 1970, a 900-foot container wharf was being constructed just westward of the U.S. Gypsum Wharf by the Massachusetts Port Authority.

Mystic Wharf: about 0.3 mile westward of Mystic River-Tobin Memorial Bridge; 900-foot face, 35 feet alongside; deck height, 16 feet; 25 acres open storage, cranes up to 20 tons; shipment of scrap metals, receipt of steel products; owned by Massachusetts Port Authority, operated by Schiavone and Sons Inc.

Pier 51 (42°23′05″ N., 71°03′33″ W.): 130-foot face, 31 to 20 feet alongside; deck height, 16 feet; west side 694 feet long, 31 to 27 feet alongside; deck height, 20 feet; 88,000 square feet covered storage; receipt and shipment of general cargo; owned and operated by Wiggin Terminals Inc.

Revere Sugar Refinery Wharf: 0.1 mile westward of Pier 51; 453-foot face, 30 feet alongside; deck height, 18 feet; unloading rate 400 tons per hour from two 8-ton unloading towers with grab buckets; receipt of raw sugar; owned and operated by Revere Sugar Refinery.

American Sugar Co. Wharf: 0.1 mile westward of Revere Sugar Wharf; 371-foot face, 30 feet alongside; deck height, 18 feet; receipt of raw sugar and fuel oil; owned and operated by American Sugar Co.

Facilities on Mystic River, north bank:

Union Carbide West Chemical Wharf (42°23′20″ N., 71°03′56″ W.): 50-foot face, with 820 feet of berthing space available with dolphins and use of adjacent wharves to the eastward, 36 to 27 feet alongside; deck height, 18 feet; receipt of chemicals, petrochemicals, and solvents; owned by Eastern Marine Leasing Corp., operated by Union Carbide Co.

Prolerized New England Scrap Metal Wharf: adjacent eastward of Union Carbide Wharf; 320-foot face, with 820 feet of berthing space available with dolphins and use of adjacent wharves to east and westward, 36 feet alongside; deck height, 14 feet; loading rate 600 tons per hour using loading tower and conveyor belt; shipment of scrap metals; owned by Hugo Neu Steel Products Inc., and Proleride Transport Systems, operated by Prolerized New England Co.

Prolerized New England Sulphur Wharf: adjacent eastward of Scrap Metal Wharf; 40-foot face, providing 820 feet of berthing space with dolphins and use of adjacent wharves to the westward, 36 feet alongside; deck height, 22 feet; receipt of liquid sulphur; owned by Hugo Neu Steel Products Inc., and Proleride Transport Systems, operated by Freeport Sulfur Co.

Humble Oil Everett Terminal Wharf: 0.2 mile eastward of Sulphur Wharf; 125-foot face providing 1,085 feet of berthing space with dolphins, 42 to 37 feet alongside; deck height, 15 feet; receipt and shipment petroleum products, receipt of asphalt, bunkering vessels; owned and operated by Humble Oil and Refining Co.

Marquette Cement Wharf (42°23′18″ N., 71°03′20″ W.): 250-foot face, 19 to 20 feet alongside; deck height, 14 feet; receipt of cement by self-unloading vessels; owned by Allied Concrete Corp., operated by Marquette Cement Manufacturing Co.

Facilities on Chelsea River, north bank:

Metropolitan Petroleum Wharf (42°23′06″ N., 71°02′43″ W.): 315-foot face providing 560 feet of berthing space with dolphins, 35 feet alongside; deck height, 14 feet; receipt and shipment petroleum products, bunkering vessels; owned and operated by Metropolitan Petroleum Co.

Eastern Minerals Wharf (42°23′12″ N., 71°02′21″ W.): 140-foot face, 17 feet alongside; deck height, 14 feet; receipt of bulk salt; owned by Texaco Inc., operated by Eastern Minerals Inc.

Eastern Minerals Pier: 100 yards eastward of Eastern Minerals Wharf; 220-foot face, 25 feet alongside; deck height, 14 feet; receipt of bulk salt; owned by Texaco Inc., operated by Eastern Minerals Inc.

Texaco Pier (42°23′09″ N., 71°02′04″ W.): 60-foot face providing 270 feet of berthing space with dolphins, 36 feet alongside; deck height, 20 feet; receipt of petroleum products; owned and operated by Texaco Inc.

Cities Service Oil Co. Wharf (42°23′07″ N., 71°01′31″ W.): 1,325-foot face providing 1,025 feet of berthing space, 30 feet alongside; deck height, 14 feet; receipt of petroleum products; owned and operated by Cities Service Oil Co.

American Oil Co. Wharf: 0.2 mile northeastward of Cities Service Wharf; 790 feet of berthing space with dolphins, 32 feet alongside; deck height, 14 feet; receipt and shipment petroleum products; owned by American Oil Co., operated by Northeast Petroleum Corp.

Gulf Oil Tanker Wharf (42°23′34″ N., 71°01′05″ W.): 620-feet face, 31 feet alongside; deck height, 15 feet; receipt and shipment petroleum products, bunkering small vessels; owned and operated by Gulf Oil Corp.

Facilities on Chelsea River, south bank:

Union Oil Co. Pier (42°23′51″ N., 71°00′50″ W.): south side 900 feet long providing 600 feet of berthing space, 35 feet alongside; deck height, 15 feet; receipt and shipment petroleum products; owned and operated by Union Oil Co. of Boston.

Sunoco Pier: 75 yards south of Union Oil Pier: north side 265 feet long, 20 to 10 feet alongside; south side 450 feet of berthing space with dolphins, 30 to 27 feet alongside; deck height, 11 feet; receipt and shipment petroleum products; owned by Sun Oil Co., operated by Sun Oil Co., and Northeast Petroleum Corp.

Atlantic-Richfield Co. Pier: 75 yards south of Sunoco Pier; north and south sides 550 feet with dolphins; 35 to 10 feet along north side; 21 to 10 feet along south side; deck height, 15 feet; receipt and shipment petroleum products; owned by Gibbs Oil Co., operated by Gibbs Oil Co. and Atlantic-Richfield Co.

Mobil Oil Corp. Wharf (42°23′05″ N., 71°01′30″ W.): 1,177-foot face, 30 feet alongside; deck height, 15 feet; receipt and shipment petroleum products, bunkering small vessels; owned and operated by Mobil Oil Corp.

State Fuel Co. Wharf (42°23′05″ N., 71°02′05″ W.): 80-foot face, 300 feet with dolphins, 35 feet alongside; deck height, 15 feet; receipt and shipment petroleum products; owned and operated by State Fuel Co. Inc.

Supplies.-Provisions and marine supplies of all kinds are available in the port of Boston. All grades of heavy marine bunker fuel, lubricants, and diesel fuel can be obtained. Vessels may bunker directly at several of the marine oil terminals or may be serviced by barges at anchor or at loading berths. The city water is of good quality and suitable for either drinking or boilers and can be obtained at most of the piers and wharves. Gasoline can be obtained at the marinas or from barges anchored in the stream in the summer.

Repairs.-The port of Boston has excellent facilities for making all types of hull and engine repairs to vessels of all sizes. Several of these firms operate waterfront facilities for the construction, repair, and conversion of oceangoing vessels, tugs and towboats, barges, and various types of small vessels. In addition, there are a number of firms without waterfront facilities which are engaged in marine repair work. These companies maintain shops and portable equipment for making above-waterline repairs and for installing equipment, gear, and machinery on all types of craft at their berths. There are several drydocks and marine railways available in the port. The largest non-Government repair facilities are located in East Boston and in Quincy. The East Boston yard has two floating drydocks, the largest of which has a lifting capacity of 18,000 tons, overall length of 622 feet, and a maximum clear width of 93 feet; a smaller graving dock at the yard has a length of 256 feet, width of 46 feet at the entrance, and a depth of 16½ feet over the keel blocks. The yard has several cranes with capacities up to 25 tons. The Quincy yard has three graving docks and two floating drydocks. The largest graving dock has a length of 938 feet, width of 147 feet at the entrance, and a depth of 18 feet over the keel blocks; the largest floating drydock has a lifting capacity of 8,000 tons, overall length of 354 feet, and a maximum clear width of 85½ feet. Two overhead traveling bridge cranes, each with a 150-ton capacity or a combined capacity of 300 tons, and smaller cranes are available at the yard. The Quincy yard also builds very large vessels.

The largest of several marine railways in the port can handle vessels up to 350 feet in length and up to 3,000 tons.

Facilities for handling larger ships are available by special arrangement with the Department of the Navy; however, the availability of the facilities is governed by naval needs. The Navy does not enter into competition with the non-Government facilities.

Several smaller repair facilities in the port cater to yachtsmen and small-craft operators.

Communications.-Boston is the terminus of two trunk railroads; the Boston and Maine Railroad and the Penn Central. About 100 steamship lines serve the port in foreign trade to or from over 300 world ports. There is little or no coastwise traffic except in bulk gypsum, liquid sulfur, cement, and petroleum.

Several major airlines provide frequent scheduled services between Logan International Airport in East Boston and domestic and overseas points.

Boston has through bus and rail service to all points. There are numerous trucking firms engaged in long- and short-haul freight service from the port.

Small-craft facilities.-Public float landings for small craft are at Summer Street, Northern Avenue, on Charles River, and several other places along the waterfront.

Chart 13272 (248).-East Boston, on the northeastern side of Boston Harbor, is separated from the city of Chelsea by Chelsea River. The waterfront has modern piers and a large ship repair yard. These facilities were described earlier in this chapter under Wharves, Boston Harbor.

The Jeffries Yacht Club is in the cove northwestward of Bird Island Flats on Jefferies Point in East Boston. A boatyard, close southwestward of the yacht club, has a marine railway that can handle vessels up to 100 tons for hull and engine repairs; a 10-ton crane is also available. A 700-ton marine railway is available at a repair facility at about midpoint along the waterfront on the west side of East Boston.

Chelsea is separated from Charlestown, on the western side of the harbor, by the Mystic River. **Charlestown** is separated from Boston proper by the Charles River. The Navy Yard occupies a large part of the deepwater front of Charlestown. **South Boston** is on the peninsula southeast of the city proper, from which it is separated by Fort Point Channel.

Logan International Airport is between Governors Island Flats and East Boston. The airport area, almost entirely filled land, is low, flat, and quite extensive. **Governors Island,** on the northeast side of Boston Main Channel and at the southerly end of the airport, is a low grass-covered peninsula.

Castle Island, on the southwest side of Boston Main Channel 1 mile northwestward of Spectacle Island, is marked by **Fort Independence.** It is connected to the shore westward by filled land. Several boulders bare at low water are a short distance southeastward of Castle Island. On the northeast corner of the island is the 52-foot granite **Donald McKay Monument,** erected in 1933 to commemorate the famous East Boston builder of clipper ships.

Pleasure Bay, just westward of Castle Island, is closed by an earth-filled dam extending from the southern end of the island to the jetty light southeastward of **City Point.**

Reserved Channel, 0.5 mile northwestward of Castle Island, is a dredged unmarked channel which leads westward from the Boston Main Channel for about a mile to near a drawbridge. In 1967, the channel had a controlling depth of 32

feet. The bridge has a retractile span with a channel width of 39 feet and a clearance of 6 feet; see **117.75 (a) through (f) and (j)**, Chapter 2, for drawbridge regulations and opening signals.

There are modern and extensive freight terminals on the north and south sides of Reserved Channel; these facilities were described earlier in this chapter under Wharves, Boston Harbor.

Fort Point Channel separates Boston proper from South Boston. A dredged channel with a controlling depth of 21 feet in 1959 leads from the entrance to Dorchester Avenue Bridge, a distance of 0.7 mile. The waters of Fort Point Channel above the easterly side of Dorchester Avenue Bridge have been declared nonnavigable; the area is to be filled in and developed for industrial and business use. Vessels bound into Fort Point Channel require the assistance of tugs.

The deeper portion of the channel is crossed by three bridges. Northern Avenue Bridge has a swing span with a clearance of 7 feet. Deeper water is found in the east draw. See **117.75 (a) through (f) and (i)(2)**, Chapter 2, for drawbridge regulations and opening signals. The Congress Street Bridge has a bascule span with a clearance of 6 feet. The Summer Street Bridge has a rectractile span with a clearance of 4 feet. The Congress and Summer Street bridges are kept in the closed position. See **117.75(a) and (i)(1)**, Chapter 2, for drawbridge regulations.

Charles River, on the western side of the harbor between Boston proper and Charlestown, is the approach by water to **Cambridge** and Watertown. The entrance of the river to the first bridge has been dredged for its full width to a depth of 35 feet. The controlling depth is about 15 feet from this bridge to Charles River Dam, about 1 mile above the entrance.

The lock in the **Charles River Dam** is 350 feet long between gates, with a clear width of 45 feet, and has a depth of 17 feet at low water on the lower sill. The upper sill has 21 feet over it at the level of the river above the dam. See **207.10**, Chapter 2, for regulations governing the use, administration, and navigation of the lock.

Charles River above the dam is maintained at a height of 8.5 feet above mean low water. In 1964, it was reported that there was a controlling depth of 15 feet to Arsenal Street Bridge, thence 3 feet for 2 miles to the head of navigation at Galen Street bridge in **Watertown**. The river above the dam is used by many yachts and small craft. No toll is charged for passage through the lock. There are four yacht clubs on the river, some college sailing and rowing clubs, and two large marinas, one above and one below the dam and two public float landings above the dam.

Below the dam Charles River is crossed by several fixed and drawbridges. The Charlestown Bridge has a fixed span with a clearance of 23 feet. Use the south span. The highway bridge about 200 yards upstream has a fixed span with a clearance of 48 feet due to an overhead pipeline being suspended from below the bridge. The four Boston and Maine Railroad Bridges have bascule spans raised as a unit with a clearance of 3 feet. The two bascule bridges at the dam have a clearance of 5 feet. Regulations and opening signals for the drawbridges crossing Charles River below the dam are given in **117.75 (a) through (f), and (h)**, Chapter 2.

Above the dam, Charles River is crossed by 12 fixed bridges. The Longfellow Bridge just above Broad Canal has a clearance of 29 feet above permanent water level. Above this bridge the clearance is 12 feet above permanent water level except at the Galen Street Bridge in Watertown-Newton where the clearance is 11 feet. The minimum channel width of these bridges is 45 feet.

Lechmere Canal, adjacent and northwestward of the dam, is crossed near the mouth by a highway bridge with a 40-foot bascule span having a clearance of 7 feet above permanent water level. (See 117.75(a)(5) and (h)(4), chapter 2, for drawbridge regulations.)

Broad Canal, extending westward from just downstream of the Cambridge end of the Longfellow Bridge, is crossed by five bridges. The first four are highway bridges with bascule spans having a least channel width of 32 feet and a least clearance of 4 feet above permanent water level. The fifth is a railroad bridge, 0.5 mile above the mouth, with a swing span having a channel width of 32 feet and a clearance of 2 feet above permanent water level.

Little Mystic Channel is a slip about 0.6 mile long just northward of the Navy Yard at Charlestown. Midchannel depths range from 31 feet at the entrance to 17 feet 600 yards westward of the bridge. The fixed highway bridge over the channel has a clearance of 100 feet. The horizontal clearance in the channel is limited to 75 feet due to the remains of the approaches of the former Chelsea Street Bridge immediately downstream.

Chelsea River, emptying into Boston Harbor from eastward between East Boston and Chelsea, is the approach to important wharves and facilities, and to the city of **Revere** at the head, 2.6 miles above the entrance.

There are dredged depths of 27 to 30 feet in Chelsea River from the mouth to a point about 1 mile upstream from the Chelsea Street Bridge.

Two drawbridges cross the river. The Andrew P. McArdle Bridge, just above the mouth, has a bascule span with a clearance of 21 feet, and the Chelsea Street Bridge, 0.8 mile upstream, has a bascule span with a clearance of 9 feet. See **117.75 (a) through (f)**, Chapter 2, for drawbridge regulations and opening signals.

Chelsea River has a heavy traffic of deep-draft oil tankers. The tankers berth at the oil company terminals and storage areas on both banks of the river. These facilities were described earlier in this chapter under Wharves, Boston Harbor.

A ship repair firm, on the north bank on the west side of McArdle Bridge, has two marine railways, the largest of which can haul out vessels up to 350 feet in length or 3,000 tons. The yard has machine shops.

Mystic River, which empties into Boston Harbor opposite Chelsea River, is the approach by water to the towns of **Medford** and **Malden.**

In April 1973, the controlling depths in the dredged channel were 31 feet (33 feet at midchannel) to within 550 yards of the Malden Bridge, thence 22 feet (27 feet at midchannel) to within 100 yards of the Malden Bridge, thence in 1969, 14 feet to about 800 feet above the bridge; thence in 1946, 3 feet to Craddock Bridge, 4.4 miles above the entrance.

Two special small vessel anchorages are on either side of the north end of the Mystic River-Tobin Memorial Bridge; see **110.1 and 110.30 (c) and (d),** Chapter 2, for limits and regulations.

The mouth of the Mystic River is crossed by the Mystic River-Tobin Memorial Bridge, a high-level fixed highway bridge, with a clearance of 135 feet. The Malden Bridges, 1.2 miles above the mouth, have bascule spans with a clearance of 12 feet. The Boston and Maine railroad bridge, 1.5 miles above the mouth, has a swing span with no clearance at high water. See **117.75 (a) through (g),** Chapter 2, for drawbridge regulations and opening signals.

Amelia Earhart Dam, an earth-filled dam with 3 locks, crosses the Mystic River about 1.6 miles above the mouth. The largest lock, a commercial-vessel type, has a length of 325 feet, a width of 45 feet, and depths of 15½ feet over the lower sill and 11½ feet over the upper sill. Two smaller parallel locks just westward have lengths of 120 feet, widths of 22 feet, and depths of 6½ feet over the lower sills and ½ foot over the upper sills. See **207.9,** Chapter 2, for regulations governing the use, administration, and navigation of the locks.

There are no overhead vertical restrictions on any of the locks.

The Boston and Maine railroad bridge, just upstream from the Malden River Entrance, has a channel width of 44 feet and no vertical clearance at normal pool level; see **117.75 (a) and (g)(3),** Chapter 2, for drawbridge regulations and opening signals. The Wellington Bridge, 2.2 miles above the mouth, has a bascule span with a clearance of 13 feet at normal pool level; see **117.75 (a) through (f),** Chapter 2, for drawbridge regulations and opening signals. The Harvard Street Bridge (General Lawrence Bridge), 3.3 miles above the mouth, has a bascule span, maintained in a closed position, with a clearance of 8 feet at normal pool level; see **117.75 (a) and (g) (2),** Chapter 2, for drawbridge regulations. Highway 93 bridge about 0.5 mile above the General Lawrence Bridge has a fixed span with a clearance of 16 feet at normal pool level.

A large marina is on the north bank of the river, just westward of the Boston and Maine Railroad bridge. Gasoline, water, ice, marine supplies, storage facilities, a small-craft launching ramp, and a 15-ton mobile hoist are available; hull, engine, and electronic repairs can be made.

There are two yacht clubs on the river above the mouth of the Malden River: the Winter Hill at Somerville and the Riverside at Medford. The Chelsea Yacht Club is on the north bank on the east side of the Mystic River-Tobin Memorial Bridge. Gasoline, diesel fuel, water, and electricity are available at the floats, which have 30 feet alongside.

Island End River is a tributary of the Mystic River entering from northward, 0.5 mile above the entrance. A large wharf is at the western side of the entrance with a channel privately dredged to 30 feet leading to it. The wharf, which is about 350 yards long, has a least depth alongside of about 22 feet to within 100 yards of its northerly end. A smaller wharf about 150 yards above the large wharf has a least depth of 2 feet. Above the large wharf, the river gradually shoals from 4 to less than 2 feet at its head. There is considerable business at the wharves near the entrance, principally vessels carrying petroleum products and cement. A rocky shoal on the east side of the entrance, and the current of Mystic River running across the entrance, make navigation difficult for large vessels. A tug usually is employed to assist such vessels.

Malden River, a tributary of Mystic River from northward, has a privately dredged channel 6 feet deep for a distance of 1.6 miles upstream. In 1959, the controlling depth to the first highway bridge was about 2 feet. Two highway bridges with bascule spans cross the river. The first, 0.2 mile above the mouth, has a clearance of 18 feet at normal pool level; see **117.75 (a) through (f),** Chapter 2, for drawbridge regulations and opening signals. The second. 1.1 miles above the mouth, has a clearance of 6 feet at normal pool level.

An overhead power cable with a clearance of 60 feet crosses Malden River about 0.5 mile above the first bridge.

Chart 13270 (246).-North and west of President Roads is an area of flats, much of which bares at low water. Between **Deer Island Flats** and **Governors Island Flats,** a buoyed channel with a least depth of 7 feet leads to the Cottage Park Yacht Club at **Winthrop. Storm warning signals are displayed;** see chart. Branch channels lead to several other yacht clubs.

The easterly channel leading to Winthrop Head had a controlling depth of 5 feet in 1970. A light marks the west side of the entrance, and buoys mark the channel. **Snake Island,** on the westerly side of the channel, is 10 feet high and barren.

The Winthrop Yacht Club, a town wharf with depths of about 5 feet alongside its floats, and a marina are on the east bank at Winthrop Head. Gasoline, water, ice, some marine supplies, a small-craft launching ramp, and overnight berthage are available at the marina.

The westerly channel leading to **Belle Isle Inlet** has a controlling depth of about 15 feet. A special anchorage area has been designated off the Pleasant Park Yacht Club, just south of the inlet; see **110.1 and 110.30 (b)**, Chapter 2, for limits and regulations. The highway bridge over the mouth of the inlet has a 25-foot fixed span with a clearance of 6 feet. Farther west of the mouth of the inlet are the Orient Heights and East Boston Yacht Clubs. Fuel, water, and various services are available at the yacht clubs.

Dorchester Bay extends southwestward from President Roads between Spectacle Island and Thompson Island on the east and South Boston on the west. The bay is filled with extensive flats, large areas of which are nearly bare at low water and rise abruptly from the edge of the channel.

The principal traffic through Dorchester Bay is in oil and building materials. Tankers berth at Commercial Point.

In 1953-66, the controlling depths in the dredged channel through Dorchester Bay to the Neponset highway bridge in the Neponset River were: 12 feet at midchannel to Buoy 9 about 500 yards southward of Commercial Point and thence 13 feet to Buoy 13; thence in 1967-68, 10 feet for a middle width of 80 feet to the highway bridge. The channel is buoyed.

Special and general anchorage areas have been designated for Dorchester Bay; see **110.1, 110.30 (e) through (g), and 110.134 (a) (4) and (b) (3)**, Chapter 2, for limits and regulations. The yacht anchorage most commonly used is south and east of City Point, clear of the cable area.

Old Harbor, on the west side of Dorchester Bay, just south of South Boston, is filled with flats having little water over them. A channel with a least depth of 5 feet leads to the yacht clubs and the public float in the northeastern part of the harbor, westward of City Point.

Squantum Channel leads from the main channel in Dorchester Bay to a marina east of **Squantum Point.** In 1959, the controlling depth was 16 feet in the channel and 15 feet in the basin at the shore end. The channel to the basin, which is enclosed and protected by stone breakwaters, is marked by buoys. Gasoline, diesel fuel, water, and electricity can be obtained at the floats, and a 30-ton mobile hoist, storage facilities, and marine supplies are available; hull, engine, and electronic repairs can be made.

Storm warning signals are displayed; see chart.

Dorchester Bay Basin, on the southwest side of Dorchester Bay, is entered about 0.2 mile westward of **Commercial Point**, the western entrance point to Neponset River. A channel, privately marked by seasonal buoys, leads to a yacht club on the northwest side of the basin. The entrance to the basin is crossed by a highway bridge with a bascule span having a clearance of 12 feet; see **117.75 (a) through (f)**, Chapter 2, for drawbridge regulations and opening signals. A tall stack, about 0.3 mile westward of Commercial Point, is prominent.

Neponset River enters Dorchester Bay from the south between Commercial Point and Squantum Point. A dam is at **Milton**, 3 miles above the mouth. Small craft with local knowledge navigate to Milton during times of high water.

Several yacht clubs and small-craft facilities are on the river. Gasoline, diesel fuel, water, ice, marine supplies, storage facilities, lifts up to 40 tons, and marine railways up to 75 feet are available. Complete hull, engine, and electronic repairs can be made.

Four highway bridges, three fixed and one bascule, and a fixed railroad bridge cross Neponset River below the dam at Milton. The fixed bridges have clearances of 30 feet, and the bascule bridge has a clearance of 6 feet. See **117.75 (a) through (f), and (1)**, Chapter 2, for drawbridge regulations and opening signals.

Quincy Bay indents the southerly shore of Boston Harbor between the peninsulas of Squantum and Houghs Neck. Depths in the bay are in general 8 to 10 feet, but shoals partly bare at low water extend 0.5 to 0.7 mile from its southerly side.

Special, general, and explosives anchorages have been designated for Quincy Bay; see **110.1, 110.30 (h) and (i), and 110.134 (a) (5), and (b) (2) and (3)**, Chapter 2, for limits and regulations.

The wharf extending from the south side of **Rainsford Island**, at the northeastern entrance to Quincy Bay, is in ruins. **Quarantine Rocks** extend 0.5 mile southward of the island.

Sunken Ledge, bare at low water, is about 1 mile southward of Rainsford Island. A daybeacon is on the ledge, and a light is 0.2 mile southeast of it. A buoy marks a channel west of the ledge.

Hangman Islet, small and rocky, is near the middle of the entrance to Quincy Bay, 0.6 mile southwestward of Sunken Ledge. The end of a reef extending 0.2 mile southwestward from the islet is marked by a daybeacon. A ledge covered 2 feet is 0.4 mile northward of the daybeacon.

Squantum, on the west side of Quincy Bay, is marked by a water tank and a spire. Several lighted radio towers in **North Quincy**, southwestward of Squantum, are visible from the bay. **Moon Head**, which can be recognized by the grassy hill and bluff on its easterly end, is connected to Squantum by a causeway.

A channel with depths of 8 to 12 feet leads northward from Quincy Bay between Moon Head and Long Island to President Roads. **Long Island Viaduct**, which crosses the channel from Moon Head to Long Island, has a fixed span over the navigation channel with a clearance of 51 feet for the center 150 feet.

The route is either by **Western Way**, between Thompson Island and Spectacle, or by Sculpin Ledge Channel, westward of Long Island.

Wollaston Channel, privately maintained, leads southwestward from the westerly end of Quincy Bay to the small basin of the Squantum and Wollaston Yacht Clubs. In 1969, the reported controlling depths were 7 feet in the channel and 6 feet in the basin. The channel is marked by buoys.

Houghs Neck, on the southeast side of Quincy Bay, is marked at its northeasterly end by **Quincy Great Hill,** 100 feet high and mostly settled. An elevated tank on the hill is very conspicuous. **Nut Islet,** marked by a power station and stack, is connected by a causeway 300 yards northward of Quincy Great Hill.

A daybeacon marks the outer end of an overflow pipeline extension with riprap cover, off the northeast end of Nut Islet. The pipeline extends 150 yards into the bay and is submerged at high water. **Pig Rock,** about 0.6 mile eastward of Nut Islet, is visible at all stages of the tide. It consists of a pile of rocks on the shoal area formerly used as a foundation for a light.

The Quincy Yacht Club is on the eastern side of Houghs Neck. A channel marked by buoys and private range lights leads to the club wharf.

West Gut is a buoyed channel leading into Hingham Bay between Nut Islet and Peddocks Island. The channel through West Gut has a controlling depth of about 23 feet; a 17-foot spot is on the north side of the channel, just southward of Buoy 6.

Hingham Bay is that part of Boston Harbor southeastward of Peddocks Island. It is the approach to Weymouth Fore River, Weymouth Back River, Hingham Harbor, and Weir River. Extensive shoals make out from the southerly shore and surround the islands in the bay. **Hull Bay,** the eastern part of the bay, also has many shoal areas. Special anchorage areas have been designated in Hull Bay; see **110.1 and 110.31,** Chapter 2, for limits and regulations.

The easterly entrance to Hingham Bay is through Hull Gut, but the entrance through West Gut, southward of Peddocks Island, is frequently used by vessels bound into Weymouth Fore or Weymouth Back Rivers.

Hull (Nantasket) Gut, a dredged channel between Peddocks Island and Windmill Point, leads into Hingham Bay from Nantasket Roads and is a section of the Weymouth Fore River Channel improvement. The tidal currents have an average velocity of about 2.2 knots at strength and generally follow the direction of the channel; the flood sets southward and the ebb northward. An unmarked rocky shoal cleared to a depth of 15 feet is about 500 yards southward of Windmill Point Light.

A channel about 13 feet deep, commencing just southward of the buoy marking **Inner Seal Rock,** about 0.6 mile southeastward of Windmill Point Light, leads to a wharf on the northwest side of **Hog Island** which has four radar towers and domes on it. The island is connected to the mainland by a causeway and fixed bridge.

A buoyed channel, eastward of Hog Island, leads northward to a special anchorage area in **Allerton Harbor;** see **110.1 and 110.31 (a),** Chapter 2, for limits and regulations. The Hull Yacht Club is on the north side of the harbor.

A marina with depths of about 6 feet alongside its floats is at **Waveland,** about 0.7 mile southeastward of Hog Island. Gasoline, diesel fuel, water, ice, electricity, marine supplies, a small-craft launching ramp, and a 30-ton fixed lift are available; hull, engine, and electronic repairs can be made.

Weymouth Fore River has its entrance on the southwest side of Hingham Bay between Houghs Neck and **Grape Island,** and is the approach by water to **Quincy Point, Weymouth, East Braintree,** and several landings. A large shipyard, an electric powerplant, and several other industries are on the river. Waterborne commerce is principally in petroleum products, chemicals, and steel products.

The following are prominent upon entering Weymouth Fore River: a flagpole on Weymouth Great Hill, the large stacks of the Boston Edison Power Plant on the east side of the river just above the bridge crossing at Quincy Point, and the two tall stacks near **Quincy Center.**

Channels.-A federal project provides for a 30-foot channel which leads from the sea through Nantasket Roads, Hull Gut, and Hingham Bay, thence into Weymouth Fore River to a turning basin extending 0.5 mile above the bridge crossing the river at Quincy Point. The channel is well marked. See Notice to Mariners and the latest edition of the chart for controlling depths. A channel with a controlling depth of about 6 feet leads from above the turning basin to the head of navigation on the river at Weymouth.

The channel through West Gut was described earlier in the chapter.

A special anchorage area has been designated in Weymouth Fore River; see **110.1 and 110.30 (j) and (k),** Chapter 2, for limits and regulations.

State Route 3A highway bridge crossing Weymouth Fore River at Quincy Point has a bascule span with a clearance of 33 feet. State Route 53 highway bridge crossing at Weymouth has a bascule span with a clearance of 12 feet; see **117.75 (a) through (f),** Chapter 2, for drawbridge regulations and opening signals. Overhead power cables crossing the river in two places between the bridges have a least clearance of 100 feet.

Town River Bay is a branch of Weymouth Fore River north of Quincy Point. A Federal project provides for a channel 27 feet deep from the junction with Weymouth Fore River to a point 1 mile upstream, with a turning basin 24 feet deep at the inner end; thence 15 feet deep to a point just below the Quincy Electric Light & Power Company plant, 1.2 miles above the mouth. See Notice to

Mariners and latest edition of the chart for controlling depths. A pinnacle rock, covered 21 feet, is in about 42°15′15″ N., 70°59′01″ W. on the northerly edge of the channel and the southerly edge of the turning basin. About 175 yards above the head of the project on Quincy Reach, an overhead power cable has a clearance of 35 feet.

There are two oil terminals which ship and receive petroleum products, and several private piers used occasionally for mooring of barges and other small vessels on Town River Bay. A marina and a yacht club are on the south bank about 0.5 mile and 0.7 mile, respectively, above the entrance, and a marina is on the north bank about 0.9 mile above the entrance. A 600-ton marine railway is available at the marina on the north bank, and two marine railways, 50 tons and 200 tons, are at the marina on the south bank. Gasoline, diesel fuel, water, ice, marine supplies, and engine and hull repairs can be obtained at these small-craft facilities. A buoyed channel dredged to 6 feet leads to the marina on the north bank of Town River Bay.

Weymouth Back River is just eastward of Weymouth Fore River and southward of **Grape Island.** A wharf of a fertilizer works is on the north side of the river on Eastern Neck. In April 1969, the controlling depth in the dredged channel to the fertilizer wharf was 10 feet; the channel is buoyed.

A good anchorage is at the entrance to Weymouth Back River, 0.2 to 0.3 mile westward of Grape Island. A special anchorage area has been designated in Weymouth Back River; see **110.1 and 110.30 (1),** Chapter 2, for limits and regulations.

The Lincoln Street (State Route 3A) highway bridge crossing the river has a fixed span with a clearance of 36 feet, 1.8 miles above the entrance. An overhead power cable at the bridge has a clearance of 55 feet.

Hingham Harbor and Weir River in the southeasterly end of Hingham Bay are shallow. Their common entrance is close westward of Bumkin Island. The channel leads in a southeasterly direction for about 0.5 mile from the westerly end of **Bumkin Island** and then divides. The branch leading eastward is Weir River.

The channel leading to Hingham Harbor trends southward, is narrow, and has a depth of 14 feet up to the harbor entrance off **Crow Point.** The channel is buoyed. The Hingham Yacht Club has a clubhouse, pier, and floats at Crow Point. Private lights mark the ends of the pier. It is reported that considerable shoaling has occurred along the face of the pier and the northern half cannot be approached by large vessels, except at half tide or higher. Water is available at the pier.

Storm warning signals are displayed; see chart.

Hingham Harbor is a cove 1 mile in length, with an average width of about 0.6 mile. At low water it is a dry flat through which a narrow and tortuous buoyed channel winds to the town of Hingham. In 1967, the channel had a controlling depth of 4 feet to the vicinity of the old steamship wharf; thence about 4 feet to the basin to the westward.

Special anchorage areas have been designated eastward of Crow Point at the entrance to Hingham Harbor and at the southern end of the harbor; see **110.1 and 110.32,** Chapter 2, for limits and regulations.

The small-boat basin at the south end of the harbor has depths of 2 to 6 feet. A town float landing and ramp are on the south side of the basin, and there are two service wharves where gasoline, diesel fuel by truck, water, and most other services are obtainable. Boat rental and outboard repairs are made.

Weir River leads to the wharf at **Nantasket Beach.** In May 1972, the channel had a controlling depth of about 4 feet, but extensive flats, mostly bare at low water, are on both sides of it. Privately maintained buoys mark the channel. The channel is used by excursion boats running from Boston to Nantasket Beach during the summer. Nantasket Beach has a large wharf with 16 to 18 feet alongside, and a public float landing for small craft north of it which is in place during the summer. There are two small marinas. Gasoline and water are available. There is an amusement park with a conspicuous roller coaster at Nantasket Beach.

12. MINOTS LEDGE TO PROVINCETOWN, MASSACHUSETTS

This chapter describes the Massachusetts coast southward from Minots Ledge, off Cohasset Harbor, to and including Cape Cod Bay. Also discussed are the principal harbors of Cohasset, Scituate, Green, Duxbury, Plymouth, Barnstable, Sesuit, Rock, Wellfleet, Pamet, and Provincetown, and New Inlet and its tributaries. Provincetown and Plymouth with their seafood handling and processing facilities and fleets of fishing vessels are the principal commercial harbors. Pleasure boating is prevalent with some commercial fishing at the other harbors.

Chart 13269 (244).-Minots Ledge Light (42°16.2′N., 70°45.6′W.), 85 feet above the water, is shown from a 97-foot dark gray conical tower on **Outer Minot.** This ledge, which uncovers 3 feet, is about 6 miles southeastward of Point Allerton and 1 mile north-northeastward of **Strawberry Point,** the northeastern extremity of **Scituate Neck.** Outer Minot is the outermost of the visible dangers off the entrance to Cohasset Harbor.

Submerged rocks and very broken ground, on which the sea breaks in heavy weather, extend more than 1 mile northeastward and 2.5 miles eastward of the light. The outer limit of the broken ground is marked by a lighted whistle buoy, 2.4 miles eastward of Minots Ledge Light. This area should be avoided.

Numerous rocks and ledges extend westward and southward from the light across the entrances to Cohasset Harbor. **East Shag Rock,** 7 feet high and **West Shag Rock,** 6 feet high, are the most prominent southwestward of the light. Shifting boulders are reported on the shoal just eastward of **Barrel Rock** (42°15.5′ N., 70°47.1′ W.), marked by a daybeacon.

Three natural channels lead into **Cohasset Harbor** through the area of rocks and ledges:**Western Channel,** which enters between **Brush Ledge** and **Chittenden Rock:The Gangway,** a passage which leads between **The Grampuses** and **West Hogshead Rock;** and **Eastern Channel,** which leads between **Enos Ledge** and **West Willies.** Although all three channels are marked by buoys, there are numerous unmarked dangers.

The Gangway passage is the widest, but there are unmarked 9- and 10-foot rocky shoals in the middle of it, and it should be used only in clear weather and with a smooth sea, even in small craft. Eastern Channel is the clearest and deepest of the three. The best time to enter is on a rising tide.

Boundary lines of inland waters.-The lines established for the waters described in this chapter are given in **82.10**, Chapter 2.

Cohasset Harbor is a large shallow bight southwestward of Minots Ledge Light and about 6 miles southeastward of Point Allerton. The harbor is frequented by numerous yachts and fishing craft. A prominent lookout tower is near the summit of a hill eastward of **The Glades** on the east side of the harbor. Anchorage is available in depths of 6 to 10 feet in the outer harbor.

Cohasset Cove, the inner harbor, is protected by a breakwater which extends about 0.1 mile northward from near the westerly end of **Bassing Beach.** The breakwater is partially covered at high water.

A dredged channel leads southward from the outer harbor to an anchorage basin southward of Bryant Point in Cohasset Cove, the inner harbor. There are three additional dredged anchorage areas: one is immediately southward of the Cohasset Cove anchorage; one in **Bailey Creek,** in the southeastern part of the inner harbor; and one immediately westward of the southern end of the Cohasset Cove anchorage. In 1967-68, the controlling depth in the channel from the outer harbor to the Cohasset Cove anchorage was 7 feet, thence in 1960, 7 feet in the anchorage. In 1967-68, depths of 5½ feet were available in the anchorage southward of the Cohasset Cove anchorage and in the Bailey Creek anchorage, and 3 to 4 feet in the westerly anchorage. The channel into Cohasset Cove is marked by lights and buoys; a light is off **Bryant Point.**

A rock, which uncovers 6½ feet, is in 42°14′21″ N., 70°47′15″ W., close to the southerly edge of the channel leading to the anchorage in Bailey Creek. Another rock, covered about 1 foot, is reported in the westerly anchorage, about 65 yards northeastward of the town landing on the southerly side of the anchorage; caution is necessary when maneuvering around the service wharves eastward of this landing.

Cohasset is a town on the west side of the inner harbor. There is some fishing, but the town is mostly residential. The Cohasset Yacht Club, close westward of Bryant Point, has depths of 5 to 8 feet reported alongside its float landing; water is available. A service facility is on the south side of the westerly anchorage; gasoline, ice, provisions, and marine supplies are available. The town maintains four float landings in various parts of the inner harbor; depths of 3 to 5 feet are reported alongside these landings. The **harbormaster** maintains an office in a cottage which overlooks the town wharf southwestward of the entrance to Bailey Creek. The Cohasset Sailing Club, about 100 yards eastward of this town landing, has a depth of 3 feet reported alongside its float landing. A small-craft

launching ramp is about 150 yards eastward of the sailing club.

A boatyard is just westward of the dam at the head of the inner harbor. Depths of 8 feet are reported alongside the yard's float landing. The marine railway at the yard can handle craft up to 55 feet in length for hull and engine repairs or open or covered storage; gasoline and water are available.

Cohasset Harbor is usually closed by ice for about 2 months during normal winters.

Stellwagen Ledges, consisting of rocks awash and covered, extend 3.8 miles south-southeastward from Davis Ledge to Tar Pouch. Some of these ledges lie over 1 mile from shore and are covered 5 to 16 feet in surrounding depths of 4 to 9 fathoms. Most of them are unmarked. Strangers should keep over 3 miles from shore.

Davis Ledge, covered 13 feet and marked by a lighted horn buoy, is about 0.4 mile eastward of Minots Ledge Light. **Tobias Ledge,** about 0.25 mile eastward of Strawberry Point, is marked by a daybeacon. **Tar Pouch,** covered 14 feet and marked by a buoy, is about 1 mile northeastward of the entrance to Scituate Harbor.

Scituate Harbor, about 4 miles southeastward of Cohasset Harbor, is used mostly by yachts and fishermen, and occasionally as a harbor of refuge by draggers.

Cedar Point, on the north side of the harbor, is marked by a white abandoned lighthouse tower maintained by the town of **Scituate,** which is on the west side of the harbor. The harbor is partially protected by breakwaters.

The north breakwater extends about 300 yards southeastward from the southeast extremity of Cedar Point. **Scituate North Jetty Light** (42°12.2′N., 70°42.8′W.), 18 feet above the water, is shown from a red and white checkered daymark on a white skeleton tower with a small white house on the seaward end of the north breakwater. The south jetty extends about 100 yards northward from the southern point of the entrance. A lighted gong buoy, 0.7 mile eastward of the north breakwater, marks the approach to the harbor. About 1 mile northwestward of the entrance is a group of tall radio towers which are very conspicuous when approaching the harbor.

On the high land about 2 miles westward of the entrance to Scituate Harbor, there is a conspicuous high tower with pointed top which is visible many miles from seaward.

It is reported that the bar at the entrance breaks entirely across the channel at low tide and in heavy weather. The most unfavorable weather is from the northeast. The harbor is free of ice most of the winter.

Channels.-Scituate Harbor is entered by a dredged channel which leads through the entrance to just inside the jetties, thence to an anchorage basin at the south end of the harbor. In April 1971, the controlling depth to the anchorage basin was 8½ feet, thence 7 feet in the basin. Another dredged anchorage basin is in the northwestern part of the harbor; depths of 6 to 8 feet are available in the basin. Depths of about 6 feet are available in the cove in the southeastern part of the harbor. The channel and anchorage basins are marked by buoys. A channel leads southward from the harbor channel to the Coast Guard pier on the east side of the harbor.

The mean range of tide is 8.8 feet.

Storm warning signals are displayed; see chart.

The Scituate Harbor Yacht Club is on the west shore of the harbor, about 0.5 mile westward of the jetty light. Depths of 8 feet are reported alongside the outer floats; gasoline and water are available. Southward of the yacht club are the Satuit Boat Club and the Satuit Waterfront Club. Between them there are two small-craft launching ramps and a marina with depths of 8 feet reported alongside its service float. Gasoline, diesel fuel, and water are available at the float. The Scituate town pier is on the west side of the harbor, about 0.6 mile above the jetty light. Another marina with several floats is close southward of the town pier; gasoline, diesel fuel, and water are available. A large parking lot is at the marina. A public dock and a small-craft launching ramp are just southward of the marina.

A boatyard, at the head of the cove at the southeast end of the harbor, has a marine railway that can handle craft up to 35 feet in length for hull and engine repairs or dry open winter storage. Gasoline, electricity, and water are available at the service float, which has a reported depth of 6 feet alongside.

Marine supplies, boat rental, tackle, and most services are available at the marinas and the boatyard. Groceries and lodging are available within walking distance.

On the south side of the entrance to Scituate Harbor is a bluff known as **First Cliff.** A similar formation, known as **Second Cliff,** is about 0.6 mile south of the entrance.

Chart 13267 (1207).-New Inlet, on the north side of **Fourth Cliff** and 2 miles southward of Scituate Harbor, is the approach to North River and South River.

Storm warning signals are displayed; see chart.

The inlet had a reported depth of about 5 feet over the bar in 1970. It is marked by a fairway bell buoy off the entrance and by several channel buoys, but the channel is subject to change and is never entered except by small craft with local knowledge. Strangers should not attempt to cross the bar on the ebb with an easterly wind or in heavy seas as waves break across the bar. The bar consists of boulders that are reported to be particularly numerous on the south side of the inlet. A strong current flows out of the inlet during the falling tide.

Sand and gravel were formerly shipped from a wharf on the east bank about a mile above the mouth of **Herring River**, a tributary of North River from the north. In 1970, it was reported that with local knowledge about 4 feet could be carried to the wharf and to a marina in a basin about 0.4 mile above the wharf. The marina boatyard has a 25-ton mobile hoist that can haul out craft up to 60 feet in length for hull and engine repairs, or dry covered or open winter storage. Gasoline, diesel fuel, electricity, and water are available at the floats, which have a reported 3 to 6 feet alongside. Ice, provisions, and marine supplies can be obtained at the marina, and lodging and restaurants are available nearby.

North River formerly emptied into the sea near **Rexhame**, but its present outlet dates from the great storm of 1898. The river has been partly cleared of boulders to **Hanover**, 10 miles above the entrance. The depth to this point is about 2 feet. Local knowledge is advisable to navigate the river. Navigation at spring tides in excess of 9 feet above mean low water is difficult because of flooding of large areas of marshland on either side of the river. The channel to the State Route 3A bridge is partially marked by privately maintained stakes in the summer.

About 1.4 miles above the mouth, the south abutment of an abandoned railway bridge, which has been removed, is used as a town landing. There are no services at the float, which has 6 feet reported alongside. The channel is very narrow here, and the currents flow strongly, especially on the ebb.

State Route 3A highway bridge crossing the river about 1.9 miles above the mouth has a 32-foot bascule span with a clearance of 12 feet. The second highway bridge about 4 miles above the mouth has a 27-foot bascule span with a clearance of 6 feet. (See **117.77**, chapter 2, for drawbridge regulations.)

There are two marinas at the first highway bridge. The one on the north bank just east of the bridge is principally for outboards; a small-craft launching ramp is at the facility. The marina on the south bank just west of the bridge has gasoline and water available at a float which had 3 feet of water reported alongside and a paved small-craft launching ramp. Outboard boat rental and bait are available.

About 1.5 miles above the first highway bridge, at Kings Landing, is a boatyard. Boats up to 40 feet in length are hauled out on skids for hull and engine repairs or open winter storage. The river has a posted **speed limit** of 5 miles per hour.

South River, emptying through New Inlet from southward, is used by fishermen and yachtsmen. **Humarock** is a small village on the beach between South River and the ocean, 1.5 miles southward of New Inlet. Local knowledge of the river channel is advisable to navigate to the town. In 1966, the controlling depth was 3 feet from the entrance to the first bridge and thence shoaling to bare about 350 yards above this bridge. The channel is marked by privately maintained stakes during the summer. The boundary line between the towns is in midchannel in both North and South Rivers.

The first highway bridge crossing the river about 1.9 miles above the mouth has a 30-foot fixed span with a clearance of 11 feet. There is a marina on the east bank just north of the bridge, and another on the west bank just south of the bridge. Both marinas have small-craft launching ramps, and service floats with 2 to 5 feet reported alongside; water, gasoline, and electricity are available. The marina on the east bank has a marine railway that can haul out boats up to 40 feet in length for hull and engine repairs or dry open or covered winter storage. Ice, provisions, and marine supplies are obtainable, and restaurants and lodging are nearby. Guest moorings are maintained by the marinas. A **speed limit** of 5 miles per hour is posted on the river. The Marshfield Yacht Club is on the west bank about 0.3 mile above the first highway bridge; a depth of 4 feet is at the float landings. Water and electricity are available at the floats. There is a boatyard on **Little Creek** about 0.3 mile northwestward of the lower bridge. Boats up to 40 feet in length are hauled out at high water for dry winter storage and minor repairs. the **harbormaster** can usually be found here.

The second highway bridge about 2.5 miles above the mouth has a 24-foot fixed span with a clearance of 5 feet; there is little or no navigation above the second bridge.

Chart 13246 (1208).-Cape Cod Bay is contained between the peninsula of Cape Cod, on the east and south, and the mainland of Massachusetts on the west. Between these limits the bay is about 20 miles in diameter with depths ranging from 10 to 32 fathoms, except close to the shore and in its southeasterly part. Race Point, the northwesterly extremity of Cape Cod, is the eastern point; and Gurnet Point, on the north side of the entrance to Plymouth Bay, is the western point of the entrance to Cape Cod Bay.

Within the limits of Cape Cod Bay are several harbors, including those of Plymouth on the western shore, Sandwich and Barnstable on the southern shore, and Wellfleet and Provincetown on the eastern shore. It is also the approach to Cape Cod Canal, which connects Cape Cod Bay with Buzzards Bay.

The shallow harbors of Cape Cod Bay, such as Plymouth, Barnstable, and Wellfleet, usually are closed to navigation by ice a part of each winter. This ice, together with the ice that forms in the shallower parts of Cape Cod Bay in severe winters, is driven by the winds out into the bay. There it masses into heavy fields or windrows, sometimes as much as 10 feet or more thick, making navigation in parts of the bay unsafe or impractical. The prevailing northerly winds drive the ice

down to the southern end of the bay, but on a few occasions it has been known to obstruct Provincetown Harbor for several days. The movements of the ice depend largely on the winds, the tidal currents apparently have little or no effect.

Deep-draft vessels entering Cape Cod Bay from the northward should pass eastward of the lighted whistle buoy which is about 7 miles northeastward of Brant Rock and well east of the extremity of the broken bottom extending over 4 miles offshore in this direction.

Chart 13253 (245).-Brant Rock is a village about 5 miles southward of Fourth Cliff. The village derives its name from **Brant Rock,** a distinctive bare rocky islet about 300 yards offshore which is joined to the shore by a stone jetty. A square concrete tower in the village is very prominent. For about 1 mile south of Brant Rock to the entrance of Green Harbor River, foul ground extends offshore for nearly 1.5 miles to **Farnham Rock,** which is covered 14 feet. A lighted bell buoy is just eastward of the rock.

Green Harbor River has its entrance west of **Blackmans (Bluefish) Point** at the southern end of **Green Harbor Point. Bartlett Rock,** which uncovers 2 feet, and **Howland Ledge,** covered 7 feet, are 0.6 and 1.2 miles, respectively, eastward of the entrance. Both are marked by buoys. An obstruction reported covered 6 feet is about 75 yards south of a line between the buoys. A small jetty is on each side of the entrance. A dredged channel, marked by buoys, leads from the entrance to a turning basin about 0.6 mile above the jetties. A dredged anchorage basin is on the east side of the channel off the town wharf. In September 1972, shoaling to bare had occurred from the entrance to the first turn, but with local knowledge a depth of 3 feet could be carried around the bare spots; thence the controlling depths were 5 feet to the turning basin with 4½ feet in the turning basin and anchorage basin.

The town wharf is on the east bank about 0.4 mile above the jetties. Gasoline, diesel fuel, and water are available at the float landings at the wharf, which have a reported 4 feet alongside. There is a snack bar on the wharf, and restaurants and lodging are nearby. There are a large parking area and a small-craft launching ramp; party and charter boat hire are available. There is a marina just south of the town wharf with electricity and water available at the berths. Guest berths are maintained, and boats up to about 25 feet in length are hauled out on skids for open winter storage.

Green Harbor is a small village on the west side of the river. Four prominent radio towers are just southwest of the village and 5 miles northward of the entrance to Plymouth Bay. A marina and the Green Harbor Yacht Club are on the west bank near the head of the harbor close southward of the causeway. Berthage, electricity, gasoline, diesel fuel, water, marine supplies, and a small-craft launching ramp are available at the marina. The service float has 6 feet reported alongside. A 15-ton mobile hoist can haul out vessels for hull, engine, electrical, and electronic repairs, and for open winter storage.

High Pine Ledge, awash at low water, is marked on its easterly side by a buoy about 0.8 mile off **Duxbury Beach** and 2 miles northward of Plymouth (Gurnet) Light. The ledge extends from the buoy nearly to the shore; vessels should not attempt to pass westward of the buoy.

Plymouth Bay is about 20 miles southeastward of Minots Ledge Light. From its entrance, between Gurnet Point and Rocky Point, it extends about 2.5 miles westward to **Plymouth Beach. Warren Cove,** the southern part of Plymouth Bay, is sometimes used as a temporary anchorage.

Plymouth Harbor is about 1 mile wide at its northern end, gradually narrowing to its southern end. Most of the harbor is dry at low water. The channels in Plymouth Harbor and tributaries usually have soft bottoms. The channel through the entrance is well marked and easily followed in clear weather.

Plymouth is a town on the southwestern side of Plymouth Harbor. There is some waterborne commerce at Plymouth, most of it being shipments of oil to the cordage firms. At the town wharf, fishing craft unload fish, scallops, and lobsters for shipment to New York markets.

Duxbury Bay is between Duxbury Beach on the east, Saquish Neck on the southeast, and the mainland on the west. It is about 3 miles long, with an average width of 2 miles. The bay is full of flats, mostly bare at low water, through which are several narrow and crooked channels. Shoals covered in spots by little water rise abruptly on both sides of these channels, and at low water the shoal edges are revealed by discolored water.

Duxbury, a town on the west shore of the bay, is a summer yachting and residential resort.

Kingston Bay, between the mainland and the western point of Duxbury Bay, is about 1.5 miles wide. However, because of its numerous flats, it is unfit for navigation except at high water and with a pilot. The village of **Kingston** is nearly 1 mile back from its western shore on **Jones River.** This bay is of little importance either as a harbor or port.

Prominent features.-Gurnet Point, on the north side of the entrance to the bay, is marked by **Plymouth (Gurnet) Light** (42°00.2′N., 70°36.1′W.), 102 feet above the water and shown from a 39-foot white octagonal tower with a white dwelling. The light station has a fog signal. Storm warning signals are displayed; see chart.

Rocky Point, on the south side of the entrance, is about 3 miles south of Gurnet Point.

Duxbury Pier Light (41°59.2′N., 70°38.9′W.), 35 feet above the water, is shown from a brown conical tower; a fog signal is at the light. It marks the north side of the channel and the south end of the shoal between the main channel and **Cowyard.**

Captains Hill, on the peninsula between Duxbury and Kingston Bays, is about 200 feet high. On its summit is **Standish Monument,** 291 feet high, which can be seen from all directions when approaching the harbor. **Manomet Hill,** about 5 miles southward of Gurnet Point, is 390 feet high, heavily wooded, and conspicuous in approaching the entrance.

On **Manomet Point** (see chart 13246 (1208)), a hotel building is prominent. The monument at Plymouth, a standpipe, and several tanks in and about Plymouth are conspicuous. A lookout tower on **Monks Hill** (see chart 13246 (1208)), about 2.5 miles westward of Plymouth, and the buildings and stack of the Plymouth Cordage Company at **North Plymouth** are prominent. From eastward and northeastward the buildings at Plymouth also are conspicuous.

Plymouth Harbor Channel is a dredged channel which leads southward from Plymouth Bay from a point 0.3 mile southwestward of Duxbury Pier Light to the State Pier at Plymouth, about 2 miles above the entrance, thence to a turning basin off the Town Wharf, about 0.2 mile above the State Pier. In July 1970, the controlling depth was 9½ feet to the turning basin except for shoaling to 2 feet in the left half of the channel between the westerly end of the State Pier and Buoy 21; depths of 14 feet were available in the turning basin. The channel is marked by a light with a white sector marking the entrance, buoys, another light, and privately maintained lighted ranges. The range structures are difficult to identify in the daytime.

A breakwater is on the north side of the channel about 0.2 mile northeastward of the State Pier.

Plymouth Cordage Company Channel, State-maintained, leads from the southerly end of the Cowyard, westward of Duxbury Pier Light, to the Plymouth Cordage Company Wharf, 1.7 miles northwestward of Plymouth. The channel is marked by buoys.

The bar at the entrance shoals rapidly after each dredging. In 1964, shoaling to 9 feet was reported in the channel for about 0.6 mile westward of The Nummet. The section of the channel approaching the wharf is privately marked.

Duxbury Bay Channels.-Where the several bay channels come together in the locality westward of Duxbury Pier Light, a channel extends northward up Duxbury Bay until west of **Clarks Island.** This channel,**Cowyard,** about 200 yards wide and with depths of 20 to 35 feet, offers good anchorage for small craft. The channel splits at a point westward of Clarks Island. The eastern branch, **Beach Channel,** is unmarked and continues up the easterly side of Duxbury Bay. A highway bridge at **Powder Point,** at the junction of **Back River** with Duxbury Bay, has a 25-foot fixed span with a clearance of 5 feet.

The western branch has a deep natural channel for about 1.5 miles from the area of Clarks Island northward of the fork in the channel. The channel to this point is buoyed and easily followed, and at this point connects with a dredged channel that leads northwesterly to an anchorage basin at the village of Duxbury. In July 1973-February 1974, the controlling depth in the dredged channel was 1 foot (5 feet at midchannel) to the basin with 2 to 4½ feet in the basin. This part of the channel is known as the Yacht Club Channel and is buoyed.

Anchorages.-Vessels waiting for the tide or weather may anchor on the north side of the entrance channel southeast of Saquish Head and eastward of the buoy marking the extremity of the shoal that makes southward from that head, or they may proceed to the intersection of the bay channels and anchor where the swinging room is greatest, between 500 and 600 yards westward of Duxbury Pier Light.

The best anchorage is in the Cowyard, but small lightdraft vessels often find good anchorage under the lee of Plymouth Beach. Yachts and small craft anchor in the anchorage basin off the wharves at Plymouth. A special small-vessel anchorage is southeastward of the State Pier off the Plymouth Yacht Club; limits and regulations are given in **110.1** and **110.35,** Chapter 2.

Dangers-Outer Tautog Rock, with 2 feet over it, is part of an unmarked shoal extending about 0.5 mile northward of Rocky Point.

Browns Bank is in the central part of Plymouth Bay. Northward of Browns Bank, and between it and **Saquish Neck** and **Saquish Head,** is the entrance channel to Plymouth Harbor and Duxbury Bay.

The unmarked channels in Kingston Bay and Duxbury Bay are narrow and crooked and lead between flats bare or nearly so at low water; local knowledge is required to carry the best water. The best time for strangers to navigate these channels inside the harbor is at low water when the flats are visible.

Tides and currents.-The mean range of the tide is 9.2 feet at the entrance off Gurnet Point and 9.5 feet at Plymouth. In the channel between Gurnet Point and Duxbury Pier the tidal current at strength has a velocity of about 1.4 knots. The set is generally in the direction of the channel; but the ebb sets southward and eastward across Browns Bank, while the flood sets northward and westward above Saquish Head, and sweeps strongly around Duxbury Pier Light northward into the Cowyard.

Ice often closes the harbor from about the first of January through February. When there is ice in the harbor, the Cowyard is not a safe anchorage. In winter the safest anchorage from ice is in the channel southward or eastward of Saquish Head, and vessels sometimes go to sea on account of drift ice at this anchorage. Westerly winds tend to carry the ice out in fields. Normally the channel to the Plymouth Cordage Company dock is open to traffic all winter. Northwesterly winds sometimes bring ice in, but southerly winds clear it out.

Quarantine and **immigration** officials are stationed in Boston, and customs officials in New Bedford; see Appendix for addresses. Vessels subject to such inspections generally make arrangements in advance through ships' agents; officials usually board vessels at their berths.

Plymouth is a **customs port of entry.**

The nearest Coast Guard **vessel documentation office** is in New Bedford, Mass.; see Appendix for address.

Harbor regulations.-The several towns have harbor regulations that are enforced by the various **harbormasters,** who control the moorings. The Plymouth and Duxbury harbormasters maintain offices on their respective town wharves. The **speed limit** is 6 miles per hour in Plymouth Harbor.

Wharves.-The 400-foot pier of the Cordage Company at **North Plymouth** in Kingston Bay is the only general cargo pier in the bay. Draggers often take refuge at this pier in winter, as it is seldom closed under ice conditions in Plymouth Harbor. It is reported that vessels drawing from 12 to 15 feet berth on the north side. The south side is not used. Fishing vessels discharge their catch at the town wharf at Plymouth and Duxbury. The town wharf at Plymouth has a reported 8 feet alongside its service float; a small-craft launching ramp is closeby. The State Pier at Plymouth has 12 feet alongside. The replica of the MAYFLOWER is berthed on the south side of the State Pier.

Supplies.-Gasoline, diesel fuel, and water are available at the Plymouth and Duxbury town wharves, and at most of the marinas and boatyards. Ice, provisions, bottled gas, and marine supplies are available at Plymouth and Duxbury. Motels, hotels, restaurants, laundromats, shops, and markets are in the area.

Repairs.-There is a boatyard at Plymouth, one at North Plymouth, and several at Duxbury. These facilities can make hull, engine, and electronic repairs, and have storage facilities and marine supplies. The boatyard at Plymouth, about 0.2 mile southeastward of the State Pier, has a 75-foot marine railway, a 30-ton crane, gasoline, and diesel fuel. Depths of 4 feet are reported alongside the service float; guest moorings are maintained. The largest marine railway at Duxbury can handle craft up to 50 feet in length; lifts up to 12 tons are also available. The boatyard at North Plymouth, close southward of the Cordage Company Wharf, has a 75-foot marine railway.

Small-craft facilities.-There are well-equipped marinas at Duxbury and Plymouth at which gasoline and diesel fuel, water, berthing with electricity, and most yacht services are available. Small-boat launching ramps, both public and private, are available. The Duxbury Yacht Club, at the northwest corner of the turning basin at Duxbury, and the Plymouth Yacht Club, about 0.3 mile southward of the State Pier at Plymouth, offer various services to visiting yachtsmen. Gasoline is available at the Plymouth Yacht Club float.

Communications.-Plymouth is served by a freight branch of the Penn Central Railroad. There is local taxi service and bus service to Boston and other inland points. Numerous trunk lines serve the area.

Chart 13246 (1208).-Between Rocky Point and Manomet Point, a distance of 2.5 miles, there are several outlying rocks which will be avoided by giving the shore a berth of 1 mile. The shore is backed by high wooded hills, the most conspicuous of which is Manomet Hill, 390 feet high. **Manomet Point** is a bluff marked by a prominent hotel. Also prominent is the large rectangular reactor housing of the Pilgrim Nuclear Power Station, about 0.4 mile southeastward of Rocky Point. Seaward of the power station, stone breakwaters enclose a basin from which cooling water is obtained. This basin is hazardous to approach in heavy weather since seas break over the breakwaters. A privately maintained buoy is about 0.3 mile eastward of Rocky Point.

White Horse Beach is a summer resort northwest of Manomet Point. **White Horse Rocks,** 10 feet high, and a group of rocks awash are part of an unmarked shoal which extends about 0.7 mile northward from White Horse Beach.

Mary Ann Rocks, two rocks that uncover about 5 feet, are 0.7 and 0.9 mile southeastward of the northerly end of Manomet Point and are marked by a whistle buoy and a lighted gong buoy, 0.8 mile and 1.4 miles eastward, respectively, from the outer rock. **Stone Horse Rocks,** awash at low water, are southwestward of Mary Ann Rocks and form a part of a reef extending almost a mile southeastward from Manomet Point.

Stellwagen Rock, covered 7 feet and unmarked, is 1.7 miles southward of Manomet Point and 0.8 mile from shore.

From Manomet Point to **Peaked Cliff,** a distance of 7 miles, the shore is a line of high bluffs backed by woods. Shoals with little water in places extend 0.6 mile from shore just southward of **Center Hill Point.** A standpipe on 140-foot-high **Indian Hill,** about 1.5 miles north of Center Hill Point, is prominent.

Ellisville Harbor is a small-boat harbor about 0.4 mile northward from **Lookout Point.** The entrance, which is almost bare, is protected by a small jetty on the northern side. The basin is shoal and available for small craft only at half tide or better.

From Peaked Cliff the shore is low and trends southeastward. At the resort town of **Sagamore Beach,** 2 miles northwestward of Cape Cod Canal, a standpipe is prominent.

Chart 13236 (251).-Cape Cod Canal is a deep-draft sea-level waterway that extends westward from Cape Cod Bay to the head of Buzzards Bay. The waterway has a project depth of 32 feet and a least overhead clearance of 135 feet. The eastern entrance to the canal is marked by a lighted 244°56'

range, lighted buoys, lights, a fog signal, and a radiobeacon. A tall stack, on the south bank of the canal about 0.75 mile above the eastern entrance, is prominent.

A detailed description of the Cape Cod Canal and its facilities are given in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

Chart 13246 (1208).-Cape Cod is a long peninsula forming the easterly extremity of Massachusetts. It makes out from the mainland in an easterly direction for 31 miles, thence extends northward and westward for over 25 miles. The portion of Cape Cod between Cape Cod Canal and Chatham is known as the **Upper Cape.** This region is wooded and has numerous towns and villages. The northern trend of Cape Cod, forming what is sometimes termed the **Hook of the Cape,** is known as the **Lower Cape.** This section is well settled and composed almost entirely of sandy lands with high, bare sand dunes, and low, nearly level plains. Much of the outer shore of the lower cape is part of the Cape Cod National Seashore under the U.S. Department of the Interior.

Sandwich Harbor (see also chart 13229 (114-SC)), 1 mile southeastward of the eastern entrance of Cape Cod Canal, is the approach to the town of **Sandwich.** The shore in front of the town is low marsh, faced by a sand beach. In May 1970, the channel to the town was bare at low water. The harbor is suitable only for small craft; currents are weak and variable. There are no waterfront facilities at Sandwich Harbor, but fuel, water, and other services are obtainable at the East Boat Basin just inside the entrance to Cape Code Canal.

Springhill Beach extends 2.3 miles southeastward from Sandwich Harbor to Scorton Harbor. The latter harbor is surrounded by sand dunes backed by cultivated lowlands.

Scorton Harbor, 3.5 miles southeastward of the entrance of Cape Cod Canal, has a narrow entrance bare at low water. Small local fishing boats sometimes enter the harbor at half tide or higher. The harbor has no wharves. **Scorton Ledge,** an unmarked 12-foot ledge, is 0.7 mile north-northeastward of the entrance.

Chart 13251 (339).-Barnstable Harbor, 10 miles eastward of Cape Cod Canal entrance, is the approach to the town of **Barnstable** and the village of **Yarmouth Port.** It is used mostly by local fishing and charter fishing boats and pleasure boats. A lighted bell buoy, about 1.6 miles northward of Beach Point Light, marks the approach.

Prominent features.-Prominent landmarks include the privately owned tower of a former lighthouse on the south side of Beach Point; a standpipe and a lighted radio tower at Barnstable; and a tank and spire in Yarmouth.

Beach Point Light (41°43.5'N., 70°16.5'W.), 46 feet above the water, is shown from a white skeleton tower with a red rectangular daymark and small white house on the eastern end of **Beach Point.**

Channels.-The channel into Barnstable Harbor is marked by buoys. The bar channel is subject to change, and strangers should obtain local information before entering. With northerly winds a heavy sea makes on the bar, and vessels bound to Barnstable should take shelter in the eastern entrance to Cape Cod Canal or anchor in Plymouth or Provincetown Harbors until the weather moderates.

In 1970, it was reported that the channel in Maraspin Creek leading to the wharves at Barnstable had a controlling depth of 4 feet. Maraspin Creek Entrance Light, about 0.2 mile northward of Blish Point, is maintained from May to November by the town of Barnstable. From the light to **Blish Point,** the channel was privately marked by bush stakes in 1970.

Anchorages.-Sheltered anchorage is available in the channel between Beach Point and Maraspin Creek entrance.

Dangers.-The entrance is obstructed by a shifting bar with about 5 feet over it. The harbor is nearly filled by flats and shoals which extend 2 miles off the entrance from the shore eastward of the light. A buoy about 280 yards southeastward of the light marks the outer extremity of the shoal extending southeastward from the point.

The south side of the harbor is very foul with covered rocks and ledges most of which are unmarked; extreme caution should be exercised if heading for the yacht club without local knowledge. Several rocks near the channel leading to the yacht club are marked by private seasonal black mooring buoys; these aids should not be taken as marking the entrance to Maraspin Creek.

Tides and currents.-The mean range of tide is 9.5 feet. Velocities of the tidal current in the entrance at strength average 1.3 knots, flooding southward and ebbing northward.

Ice generally obstructs the harbor during a part of the winter.

Storm warning signals are displayed; see chart.

Harbor regulations.-Berthage at the float landings along the western and southern sides of Maraspin Creek are under the control of the **harbormaster,** whose office is at the marina on the west side of the creek.

Small-craft facilities.-A seafood-packing and cold storage wharf with a reported 8 feet alongside is on the west side of Maraspin Creek, about 120 yards southward of Blish Point. A marina just southward of the cold storage plant has 3 to 6 feet reported alongside its floats. Gasoline and diesel fuel are available at the service float, and ice, provisions, and marine supplies are obtainable nearby. There is a 15-ton mobile hoist that can haul out boats up to 45 feet in length for hull and engine repairs and dry covered or open winter storage.

A marina, on the east side of the creek, is used primarily by outboard boats. Gasoline, water, and

electricity are available at the float landings, which have a reported 3 feet alongside. Outboard motor repair and open winter storage are available for small craft which are hauled out using trailers. A paved town small-craft launching ramp is on the north side of this marina.

Guest berths with 3 to 6 feet alongside with water and electricity available are maintained by the marinas and the town. A snack bar and other conveniences are at the harbor, and lodging, a grocery store, and restaurants are within walking distance.

The Barnstable Yacht Club is on the southern side of Barnstable Harbor about 0.6 mile westward of the entrance to Maraspin Creek. Another paved town small-craft launching ramp is about 0.3 mile westward of the yacht club.

In October 1970, the channel to **Yarmouth** had shoaled over; it bares before low water, and the town landing is no longer used.

North Dennis is a town 3.5 miles eastward of Beach Point Light. **Scargo Hill,** 170 feet high and the highest hill in the vicinity, is southeastward of North Dennis. Prominent stone lookout towers are on the hill.

Nobscusset Point, 4.2 miles eastward from Beach Point Light, has a small breakwater which formerly provided a limited anchorage for small craft, but in 1959 the area inside the breakwater was bare at low water.

Chart 13250 (581).-Between Barnstable and Wellfleet are several creeks which are used by local boats and launches at high water, but all of them are dry at low water. The 18-foot curve is from 0.2 to 0.3 mile from shore between North Dennis and Sesuit Harbor, but eastward of the latter it is 0.5 to 1.5 miles from shore.

Sesuit Harbor, 5 miles eastward of Barnstable Harbor, has two jetties marked by private seasonal aids. The west jetty is marked by a light, and the east jetty by a daybeacon. A seasonal lighted buoy about 0.5 mile northward of the entrance marks the approach. In 1970, it was reported that the controlling depth between the jetties was about 2 feet; depths of 6 to 7 feet were reported inside the harbor. The channel between the jetties is subject to frequent shoaling, and local knowledge should be obtained before entering.

East Dennis is a village 0.5 mile inland. The waters of the harbor have been designated a small-vessel anchorage; see **110.1** and **110.37,** Chapter 2, for limits and regulations. The moorings and berths at the town marina are under the control of the **harbormaster,** whose office is on the west side at the town landing. A **speed limit** of 4 miles per hour is in force in the harbor.

Members of the Dennis Yacht Club moor their boats in the small bight on the west side of the channel just inside the west jetty. A marina, on the west side of the harbor about 0.35 miles southward of the jetty light, has depths of 6 feet reported alongside its service floats. The marina has a 30-ton capacity hydraulic flatbed trailer that can handle craft up to 55 feet in length for hull and engine repairs and dry covered or open winter storage; 12 hours' advance notice is required for its use. Gasoline, diesel fuel, water, ice, provisions, marine supplies, rental boats, guest berths, charter fishing boats, and a 3-ton mobile hoist are available.

About 250 yards southward of the marina is the town landing with ramps, two piers, and float landings at which berthing with electricity and water are available. The landing has a restaurant.

A public small-craft launching ramp and an adjoining float landing are on the east side of the harbor, about 0.4 mile southward of the jetty light. Ample parking is available, and lodging can be obtained in town.

Rock Harbor, on the south side of **Rock Harbor Creek,** is about 7 miles eastward of Sesuit Harbor. The centerline of the channel forms part of the boundary between the towns of **Orleans** and **Eastham.** A lighted bell buoy is about 1.7 miles west of the entrance, and a private, lighted, range marks the entrance. The front light, 12 feet above the water, is shown from a steel pole on the channelward end of a stone jetty. The rear light, 22 feet above the water and 309 yards 100° from the front light, is shown from the west gable of a brown painted building at the head of the harbor. The channel is marked by private seasonal bush stakes.

In October 1970, the approach from about 0.7 mile offshore to the channel entrance was reported to bare at low water. Also, shoaling was reported in the entrance channel inside the jetty and in the basin in the harbor. The harbor is usually entered 2 hours on either side of high water; local knowledge is advised.

The Orleans town wharf and marina extends along the south and east sides of the harbor from the jetty to the head. Party boats, draggers, yachts, and other small craft moor at the berths at which water and electricity are available; depths of 5 to 6 feet are reported alongside the berths. Gasoline and diesel fuel are available at a service wharf on the east side of the lower bend in the creek; depths of 5 feet are reported alongside the wharf. The Eastham town marina, on the west bank of the river just above the lower bend, has a small-craft launching ramp. Another launching ramp is on the southern side of the harbor near the jetty. There is a **harbormaster;** the harbor is under the jurisdiction of the Selectmen of the towns of Orleans and Eastham.

A naval aircraft bombing target **danger area** is centered in 41°49′46″ N., 70°02′54″ W. on the hulk of the former liberty ship JAMES LONGSTREET; limits and regulations are given in **204.4,** Chapter 2. The ship has been scuttled in 14 feet of water, with her hull showing above high water, about 2.5 miles northwestward of Rock Harbor. A lighted buoy is 250 yards westward of the hulk.

Wellfleet Harbor is on the western side of the hook of Cape Cod, near its southern end. **Wellfleet** is a town at the head of the harbor. **Mayo Beach** is also at the head of the harbor. The sandspit extending eastward from **Shirttail Point** is protected by stone revetment and is paved for a parking area for the town wharf and marina. The basin north of the spit has been developed into a large marina with floats and berths for small craft and yachts.

Prominent features.-Wellfleet Harbor Breakwater Light (41°55.5'N., 70°02.2'W.), privately maintained and 16 feet above the water, is shown from a small red framework structure on the end of the breakwater that protects the inner harbor and anchorages. Two church spires in the town of Wellfleet and a fire lookout tower in South Wellfleet are also prominent.

Channels.-A dredged channel, marked by lighted and unlighted buoys, leads from deep water in Wellfleet Harbor to a dredged anchorage basin southward of the town wharf at Wellfleet. In March 1972, the controlling depths were 9½ feet in the channel and 10 feet in the anchorage basin. The channel is subject to frequent changes.

An unmarked channel leads from the anchorage into **Duck Creek** to the basin of the town marina. In October 1970, the controlling depth in this channel was reported to be about 4 feet.

Anchorages.-The inner harbor offers the best anchorages; the dredged basin south of Wellfleet town landing has reported depths of 5½ to 7 feet. In the outer harbor, northeast of **Smalley Bar,** the anchorage in depths of from 12 to 21 feet is somewhat exposed in westerly winds. In northerly gales vessels sometimes anchor on the lee side of **Billingsgate Shoal in 12 to 42 feet; the shoal breaks the sea so that vessels with good ground tackle can ride out a heavy gale from northward.**

Dangers.-Extensive shoals are in the entrance and extend about 5.5 miles westward of **Billingsgate Island,** marking the western side of the entrance to the harbor. The island is covered at high water.

The approach channel into Wellfleet outer harbor leads between the shoals and is narrow in places, but it is marked by buoys and is easily followed in daytime in clear weather. The breakwater that protects the inner harbor is reported to cover at extreme high tides. Bush stakes mark the clam and oyster flats in the inner harbor.

Tides and currents.-The mean range of tide is 10 feet. The tidal currents at strength in the harbor entrance, north of Smalley Bar, average 0.7 knot on the flood and 0.5 knot on the ebb.

The harbor is usually closed by **ice** during a part of each winter.

Storm warning signals are displayed; see chart.

Harbor regulations.-The town wharf, landings, and moorings in the harbor are under the control of the **harbormaster** ,whose office is on the town wharf.

Small-craft facilities.-The town pier and the town wharf extend southward and eastward, respectively, from Shirttail Point. The town pier has depths of 10 feet reported at its head, and depths of 4 to 5 feet are reported alongside the floats along its eastern side; gasoline, diesel fuel by truck, water, and electricity are available. Floats with electricity and water are available on the north side of the town wharf; a small-craft launching ramp is on the south side. Guest berths are under the control of the harbormaster. A snack bar, restaurant, and a marine supply store are at the shoreward end of the town wharf. Groceries and lodging are available within walking distance. The Wellfleet Yacht Club at the west end of Mayo Beach has many conveniences for visiting yachtsmen.

Great Island, on the western side of Wellfleet Harbor, is now part of the Cape Cod National Seashore under the U.S. Department of the Interior. Its beaches are open to pleasure boatmen who can either beach their boats or anchor a short distance offshore. Great Island has no facilities.

Chart 13249 (580).-Pamet Harbor , at the mouth of **Pamet River,** about 5.5 miles southeast of Provincetown, is a small harbor frequented by yachts and a few fishermen. Pamet River leads eastward to the town of **Truro.** The ruins of a railroad trestle are near the mouth of the river at the head of the harbor. The harbor is entered by a privately dredged channel that leads eastward between two jetties thence southeastward to an anchorage basin, about 0.3 mile above the jetties. In 1970, it was reported that the harbor could not be entered for 2 hours on either side of low water. The shoals which extend 1 mile off the entrance are changeable.

A town small-craft launching ramp, beach, and parking lot are on the east side of the anchorage basin. The Pamet Harbor Yacht Club is just southward of the ramp. Water is available at the club. The harbor is reported to be a good small-craft refuge during hurrricanes.

Provincetown Harbor, formed by a turn in the northern end of the hook of Cape Cod, has a diameter of about 2 miles. It is one of the best harbors on the Atlantic Coast, having a sizable anchorage area in depths of 12 to 57 feet with excellent holding ground. Coasters and fishermen find protection here in gales from any direction.

The historical town of **Provincetown,** on the northwestern side of the harbor, is at the site of the first landing of the MAYFLOWER in the New World. It is the home port of numerous fishing, lobster, charter, pleasure, and sightseeing boats.

Prominent features.-Pilgrim Monument, a slim stone structure 348 feet above the water, which rises 252½ feet above **High Pole Hill** in Provincetown, is the most prominent landmark on the cape. **Race Point Light** (42°03.7' N., 70°14.6' W.), 41 feet above the water, is shown from a 40-foot

white tower on the northwest point of Cape Cod. The light station has a fog signal. A fairway lighted bell buoy is 2 miles northwestward of the light.

Wood End Light (42°01.3'N., 70°11.6'W.), 45 feet above the water, is shown from a 39-foot white square tower, near the water on the southern end of the hook of the cape. The light has a fog signal. **Long Point Light,** 36 feet above the water, is shown from a white square tower at the eastern end of Long Point on the western side of the harbor entrance; a fog signal is at the light.

A standpipe, about 0.2 mile westward of the monument, and a tank, about 1.5 miles northeastward of the monument, and several church spires in Provincetown are prominent from the bay. Several radar domes in North Truro are also prominent. A large white bathhouse, part of the Cape Cod National Seashore, is prominent on Herring Cove about 1.7 miles northwestward of Wood End Light.

Prominent from the north are the observation tower and buildings of the Race Point Coast Guard Station, about 1.4 miles northeastward of Race Point Light, and the aerolight at Provincetown Municipal Airport just southward of the station. The cupola of the Cape Cod National Seashore's Visitors Center, on **Ocean View Hill** about 0.8 mile southeastward of the station, is prominent from the north and east. At night Highland Light will show over the land westward of it when the entrance is approached on certain bearings.

Anchorage.-Excellent anchorage may be had in Provincetown Harbor. Numerous fishing vessels work out of Provincetown during the year. During the summer months, floats are set out that are capable of mooring vessels up to 40 feet in length. Larger vessels must tie up at permanent piers. In addition, small craft sometimes anchor in **Herring Cove,** 0.8 mile southward of Race Point Light. A temporary lee from easterly winds is found well inshore in depths of 10 to 24 feet.

Dangers.-Shank Painter Bar, which extends to a maximum distance of 0.6 mile offshore between Race Point and Wood End Lights, rises abruptly from deep water. **Wood End Bar** is the continuation of the shoal that makes sharply into Wood End. A bell buoy is about 0.6 mile southwestward of Wood End Light. A 2,500-foot stone breakwater is about 300 yards southeastward of the end of the town pier. The breakwater extends northeastward from a point in 42°02'45" N., 70°10'55" W., approximately parallel to the shoreline. The east and west ends of the breakwater are each marked by a light. Strangers should exercise caution when operating in the area.

The two **measured trial courses** between Race Point and Long Point Lights are the outer and inner naval standardization courses for submarines, which may be operating submerged while making trial runs in the Provincetown area. The outer course, a combined **measured half nautical mile and a nautical mile** on the bearing 131°16'-311°16', is between Race Point and Wood End; the inner course, **a measured nautical mile,** on the bearing 045°57'-225°57', is between Wood End and Long Point. Both courses are marked by shore ranges and the outer course also by buoys.

Caution.-Shipping should keep a sharp lookout for periscopes and avoid as far as possible navigation along or across the trial courses, as the submarines may or may not be escorted by surface vessels. Caution should also be exercised when navigating in the vicinity of Race Point, especially during periods of darkness and low visibility, because of the numerous fishing craft which operate in the area. There are large fishweirs in the harbor.

Tides and currents.-The mean range of tide in Provincetown Harbor is 9.1 feet.

The tidal current velocities between Race Point and Highland Light are very strong, but diminish to less than 1 knot between Highland Light and Chatham Light. The flood sets southwestward, and the ebb northeastward. Tide rips occur during heavy weather when the wind is against the current. Westward of the stretch of coast between Wood End and Race Point, the velocity at strength is about 1 knot. In this locality the ebb current sets northwesterly and the flood sets southeasterly. At the entrance and in the harbor the tidal currents have little velocity. The Tidal Current Tables should be consulted for current predictions.

Ice forms only in severe winters in the harbor, and then only for short periods. There are recorded cases of fields of ice being driven northward from the shallow harbors of Cape Cod Bay into the harbor so as to close it briefly, but such cases are rare. **Storm warning signals are displayed;** see chart.

Harbor regulations.-Moorings and berths at the town wharf are under the control of the **harbormaster** ,whose office is at the outer end of the wharf.

The U.S. Public Health Service maintains a **contract physician's office** in Provincetown; see Appendix for address.

Wharves.-The town pier, known as MacMillan Wharf, is a long finger pier extending 1,300 feet into the bay from a large municipal parking lot. Two seafood-packing plants are on the outer end of the pier, which has a reported 13 feet alongside. There are several float landings along the southwestern side of the pier inshore of the packing plants, which are used by charter and sightseeing craft. A finger pier, about 850 yards to the southwestward, is used by a commercial seafood-packing company to unload commercial fishing vessels. It has a reported 10 feet alongside its outer end.

The finger pier of a marina is about 120 yards southwestward of the town pier. Float landings are along the northeastern side of the pier, and gasoline and diesel fuel are available at the service float. Guest berths with water and electricity are

maintained. In December 1967, depths of 11 feet were available in the basin between the town pier and the marina's pier except for shoaling along the edges.

In 1973, a 7-foot shoal spot was reported in about 42°02′50″N., 70°10′56″W., in the approach to MacMillan Wharf and the finger pier about 120 yards southwestward of it. Mariners are advised to exercise caution when operating in this area.

Supplies.-Marine supplies, restaurants, laundromats, lodging, groceries, and shops of all kinds are available within walking distance in town.

Repairs.-There are two boatyards with marine railways about 0.5 mile southwestward of the town pier. Either can haul out boats up to 70 feet in length. All types of hull and engine repairs can be made, and machine shop repairs can be made on short notice.

Communications.-Bus and taxi service is available throughout the year. During the summer, regularly scheduled flights to Boston depart from the Provincetown Municipal Airport, which is about 2 miles northwestward of the town pier.

Chart 13246 (1208).-From Race Point the Cape Cod shore curves northeastward, eastward, and then southeastward to the **Highlands,** a total distance of about 9 miles, and is composed of bare sand dunes of various heights. On the approach to the Highlands, the sand dunes are covered with brownish-looking growth of grass and the land is higher. The pitch of the cape at this point shows a high bluff on which stands Highland Light. At the Highlands, the shore may be safely approached as close as 0.5 mile, but the water shoals somewhat abruptly, and care must be taken not to go inside the 5-fathom curve. Much of the shoreline area of this portion of the lower cape is part of the Cape Cod National Seashore.

Peaked Hill Bar includes shoals with a least depth of 10 feet about 3.5 miles northeast of Race Point Light. The bar is about 0.6 mile offshore and extends for about 4 miles paralleling the coastline. Vessels have grounded here, mainly because of failure to take soundings. This area should be given a berth of at least 2 miles. A lighted whistle buoy is about 2.5 miles off Peaked Hill Bar and about 5 miles northwestward of Highland Light. Keeping in a depth of 20 fathoms will ensure passing 2.5 to 3 miles off the eastern side of Cape Cod and will lead to the lighted whistle buoy off Peaked Hill Bar.

Between Race Point and Chatham Light, tidal current velocities are generally less than 1 knot. Strengths of flood and ebb set northward and southward, respectively, along the coast. The time of current changes rapidly, strength of flood or ebb occurring about 2 hours later off Nauset Beach Light than off Chatham Light.

Highland (Cape Cod) Light (42°02.4′N., 70°03.7′W.), 183 feet above the water, is shown from a 66-foot white tower, with covered way to the dwelling, situated on the brow of a hill at the north end of the Highlands. The light station has a radiobeacon and a fog signal. A stone crenelated tower, a red brick stack, a red and white skeleton tower, and three spherical radar domes on the summit of a hill, 0.5 mile south of the light, are prominent.

The eastern side of Cape Cod is described in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

APPENDIX

National Ocean Survey.-Coast Pilots, Nautical Charts, Tide Tables, Tidal Current Tables, Tidal Current Diagrams, and Tidal Current Charts, are sold by the National Ocean Survey and by authorized sales agents located in many U.S. ports and in some foreign ports. Mail orders should be addressed to National Ocean Survey, Distribution Division (C44), 6501 Lafayette Ave., Riverdale, Md. 20840, and accompanied by a check or money order payable to NOS, Department of Commerce. Remittance from outside the United States should be made either by an International Money Order or by a check payable on a U.S. bank. Chart catalogs, which include a list of sales agents are free upon request. The National Ocean Survey maintains over-the-counter cash sales offices at 6501 Lafayette Ave., Riverdale, Md.; at 6001 Executive Blvd., Room 713, Bldg. 1, Washington Science Center, Rockville, Md. (small orders only); at Lake Survey Center, 630 Federal Office Building and U.S. Courthouse, Detroit, Mich.; and at 632 Sixth Ave., Room 303, Anchorage, Alaska.

National Ocean Survey Field Offices:

Norfolk: Director, Atlantic Marine Center, NOS, National Oceanic and Atmospheric Administration, 439 West York Street, Norfolk, Va. 23510.

Detroit: Director, Lake Survey Center, NOS, National Oceanic and Atmospheric Administration, 630 Federal Building and U.S. Courthouse, Detroit, Mich. 48226.

Seattle: Director, Pacific Marine Center, NOS, National Oceanic and Atmospheric Administration, 1801 Fairview Avenue East, Seattle, Wash. 98102.

Coast Pilots:

U.S. Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod, 1974.

U.S. Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook, 1974.

U.S. Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry, 1974.

U.S. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West, 1974.

U.S. Coast Pilot 5, Atlantic Coast-Gulf of Mexico, Puerto Rico, and Virgin Islands, 1974.

U.S. Coast Pilot 7, Pacific Coast and Hawaii, 1968.

U.S. Coast Pilot 8, Alaska-Dixon Entrance to Cape Spencer, 1969.

U.S. Coast Pilot 9, Pacific and Arctic Coasts, Alaska-Cape Spencer to Beaufort Sea, 1964.

Distances Between United States Ports, Fifth (1973) Edition.

Coast Pilots 1, 2, 3, 4, and 5 have been computerized and are published annually. When other Coast Pilots are computerized, they will be issued on an annual basis. In the meantime, all the books, except Coast Pilots 1, 2, 3, 4, and 5 should be used only by reference to the latest supplement which can be obtained free from National Ocean Survey, Distribution Division (C44), 6501 Lafayette Ave., Riverdale, Md. 20840, and from NOS sales agents.

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.

Narragansett Bay to Nantucket Sound.

Narragansett Bay.

Block Island Sound and Eastern Long Island Sound.

Long Island Sound and Block Island Sound.

New York Harbor.

Delaware Bay and River.

Upper Chesapeake Bay.

Charleston Harbor, S.C., including the Wando, Cooper, and Ashley Rivers.

San Francisco Bay.

Puget Sound, Northern Part.

Puget Sound, Southern Part.

Tidal Current Diagrams:

Block Island Sound and Eastern Long Island Sound.

Long Island Sound and Block Island Sound.

Publications.-A resume 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.-Coasts of the United States and Possessions: Published by National Ocean Survey; for sale by NOS and its sales agents.

Mississippi River (Cairo Ill., to Gulf of Mexico): Published and for sale by Mississippi River Commission, Vicksburg, Miss.

Black Warrior-Tombigbee Rivers System: Published and for sale by U.S. Army Engineer District, Mobile, Ala.

Alabama River: Published and for sale by U.S. Army Engineer District, Mobile, Ala.

Mississippi River (Cairo, Ill., to Minneapolis, Minn.) and Illinois Waterway (Mississippi River to

Lake Michigan): Published and for sale by the 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 NOS and its sales agents.

Foreign countries: Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by that office and its sales agents.

Coast Pilots.-Coasts of the United States and Possessions: Published by National Ocean Survey; for sale by NOS and its sales agents.

Great Lakes Pilot.-Lakes Ontario, Erie, Huron, Michigan, and Superior, their connecting channels, and the St. Lawrence River: Published by the National Ocean Survey; for sale by NOS and its sales agents.

Sailing Directions (Foreign countries).-Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by that office and its sales agents.

Tide and Tidal Current Tables, and Tidal Current Charts and Tidal Current Diagrams; Published by National Ocean Survey; for sale by NOS and its sales agents.

Marine Weather Services Charts: Published by National Weather Service; for sale by NOS and its sales agents.

Notice to Mariners may be obtained free from the following: Local Notices to Mariners-District Commander of the Local Coast Guard district; Weekly Notice to Mariners, coasts of the United States, Possessions, and foreign-Defense Mapping Agency Hydrographic Center (DMAHC); Weekly Notice to Mariners, Great Lakes-Commander, Ninth Coast Guard District, Cleveland, Ohio.

Special Notice to Mariners are published annually in Notice to Mariners 1. These notices contain important information of considerable interest to all mariners. Interested parties are advised to read these notices.

Light Lists.-United States and Possessions: Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Foreign countries: Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by that office and its sales agents.

Radio Navigational Aids.-Atlantic and Mediterranean Area (Pub. 117A), and Pacific and Indian Oceans Area (Pub. 117B); Published by Defense Mapping Agency Hydrographic Center (DMAHC) and for sale by that office and its sales agents. **Worldwide Marine Weather Broadcasts** (formerly Radio Weather Aids, Pub. 118); Published by the National Weather Service; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Miscellaneous.-The Nautical Almanac, The Air Almanac, and American Ephemeris and Nautical Almanac: Published by U.S. Naval Observatory; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

American Practical Navigator (Bowditch) (H.O. Publication No.9), and International Code of Signals (H.O. Pub. No. 102): Published by the Defense Mapping Agency Hydrographic Center (DMAHC); for sale by its sales agents or from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Rules of the Road, International-Inland (CG-169). Rules of the Road, Western Rivers (CG-184). Rules of the Road, Great Lakes (CG-172): Published by and free on application to the U.S. Coast Guard.

Port Series of the United States: Part 1 (Port administration and services) published by Maritime Administration, U.S. Department of Commerce; Part 2 (port conditions and facilities) published by Corps of Engineers, U.S. Army. Both parts are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Official U.S. Coast Guard Recreational Boating Guide (CG-340): Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price $1.30.

Marine Radio Telephony-How to correctly operate your radiotelephone set in the 2 MHz band; and Maritime Mobile VHF-FM Radio Telephony-Usage in the United States: Published by Radio Technical Commission for Marine Services; for sale by RTCM Services, c/o Federal Communications Commission, Washington, D.C. 20554.

Corps of Engineers Offices:

New England Division Office: 424 Trapelo Rd., Waltham, Mass., 02154. The New England Division, an operating division with both district and division functions, covers all the coastal and tributary waters described in this Coast Pilot.

Environmental Protection Agency (EPA).-Regional offices and States in the EPA coastal regions:

Region I (New Hampshire, Maine, Massachusetts, Rhode Island): J.F. Kennedy Federal Bldg., Room 2303, Boston, Mass. 02203.

Region II (New Jersey, New York, Puerto Rico, Virgin Islands): 26 Federal Plaza, Room 908, New York, N.Y. 10007.

Region III (Delaware, Maryland, Virginia, Pennsylvania): Curtis Bldg., 6th and Walnut Sts., Philadelphia, Pa. 19106.

Region IV (Alabama, Florida, Georgia, Mississippi, South Carolina, North Carolina): 1421 Peachtree St., N.E., Atlanta, Ga. 30309.

Region VI (Louisiana, Texas): 1600 Patterson St., Suite 1100, Dallas, Tex. 75201.

Region IX (California, Hawaii, Guam): 100 California St., San Francisco, Calif. 94102

Region X (Alaska, Oregon, Washington): 1200 Sixth Ave., Seattle, Wash. 98101.

Coast Guard District Offices:

Commander, First Coast Guard District, 150 Causeway Street, Boston, Mass., 02114. The coastal waters and tributaries of Maine, New Hampshire, and Massachusetts described in this Coast Pilot.

Coast Guard Captains of the Port:

Portland Captain of the Port, U.S. Coast Guard Base, 259 High Street, South Portland, Maine, 04106.

Boston Captain of the Port, U.S. Coast Guard Base, 427 Commercial Street, Boston, Mass., 02109.

Coast Guard Marine Inspection Offices:

U.S. Federal Building, 76 Pearl Street, Portland, Maine, 04111.

U.S. Coast Guard Base, 427 Commercial Street, Boston, Mass., 02109.

Coast Guard Documentation Offices:

Maine:

Bangor: Room 148 Federal Bldg., Rockland, Maine, 04841.

Bar Harbor: Room 148 Federal Bldg., Rockland, Maine, 04841.

Bath: Room 18 U.S. Customhouse, Portland, Maine, 04111.

Belfast: Room 148 Federal Bldg., Rockland, Maine, 04841.

Calais: Room 148 Federal Bldg., Rockland, Maine, 04841.

Eastport: Room 148 Federal Bldg., Rockland, Maine, 04841.

Jonesport: Room 148 Federal Bldg., Rockland, Maine, 04841.

Portland: Room 18 U.S. Customhouse, Portland, Maine, 04111.

Rockland: Room 148 Federal Bldg., Rockland, Maine, 04841.

New Hampshire:

Portsmouth: Room 18 U.S. Customhouse, Portland, Maine, 04111.

Massachusetts:

Boston: 20th Floor U.S. Customhouse, Boston, Mass., 02109.

Gloucester: Room 203 U.S. Post Office Bldg., Gloucester, Mass., 01930.

New Bedford: Room 6 U.S. Customhouse, New Bedford, Mass., 02740.

Plymouth: Room 6 U.S. Customhouse, New Bedford, Mass., 02740.

Salem: Room 203 U.S. Post Office Bldg., Gloucester, Mass., 01930.

Coast Guard Stations.-The stations listed are in the area covered by this Coast Pilot. They have search and rescue capabilities and may provide lookout, communication, and/or patrol functions to assist vessels in distress. They guard the International radiotelephone distress, safety, and calling frequency 2182 kHz and the National distress calling and safety frequency 156.80 MHz (channel 16) of the maritime mobile VHF-FM band.

Maine:

Eastport (44°54.4′ N., 66°59.1′ W.). A subunit of Jonesport Coast Guard Station; radio contact is made through the Jonesport station.

Jonesport (44°31.6′ N., 67°37.0′ W.). Near north end of bridge over Moosabec Reach.

Southwest Harbor (44°16.5′ N., 68°18.7′ W.). At the southerly end of Clark Point.

Rockland (44°06.2′ N., 69°06.1′ W.). On west side of Rockland Harbor.

Boothbay Harbor (43°50.6′ N., 69°38.5′ W.). About 100 yards southwest of the northeast tip of McKown Point.

Portland (43°38.7′ N., 70°14.9′ W.). In South Portland on the south bank of the Fore River.

New Hampshire:

Portsmouth Harbor (43°04.2′ N., 70°42.5′ W.). On Newcastle Island, at Portsmouth Harbor Light.

Massachusetts:

Gloucester (42°35.5′ N., 70°41.2′ W.). West side of Gloucester Harbor, on Oldhouse Cove.

Boston (42°22.1′ N., 71°03.1′ W.). In Boston Harbor, on the south bank of Charles River at the mouth.

Point Allerton (42°18.2′ N., 70°54.8′ W.). About 0.4 mile east of Windmill Point on Hull Bay.

Scituate (42°12.0′ N., 70°43.0′ W.). On the southern shore of Scituate Harbor.

Cape Cod Canal (41°46.4′ N., 70°30.0′ W.). East entrance to the canal, near Sandwich, Mass.

Cape Cod Coast Guard Air Station (41°37.5′ N., 70°31.5′ W.). On Cape Cod at Otis Air Force Base.

Race Point (42°04.7′ N., 70°13.4′ W.). About 1.5 miles northeast of Race Point Light.

Coast Guard Radio Broadcasts.-Urgent, safety, and scheduled marine information broadcasts are made by Coast Guard radio stations. In general, these broadcasts provide information vital to vessels operating in the approaches and coastal waters of the United States including Puerto Rico and U.S. Virgin Islands. Transmissions are as follows:

Urgent and safety broadcasts:

(1) **By radiotelegraph:** (a) Upon receipt, except within 10 minutes of the next silent period, for urgent messages only; (b) during the last 15 seconds of the first silent period after receipt; (c) repeated at the end of the first silent period which occurs during the working hours of one-operator ships unless the original warning has been cancelled or superseded by a later warning message.

(2) **By radiotelephone:** (a) upon receipt; (b) repeated 15 minutes later, for urgent messages only; (c) additional broadcasts at the discretion of the originator.

(3) Urgent broadcasts are preceded by the urgent signal; XXX for radiotelegraph; PAN for radiotelephone. Both the urgent signal and message are transmitted on 500 kHz and 2182 kHz,

respectively. Safety broadcasts are preceded by the safety signal: TTT for radiotelegraph; SECURITE for radiotelephone. After the preliminary signal 500 kHz and 2182 kHz, the station shifts to its assigned working medium frequency for the radiotelegraph broadcast and 2670 kHz for the radiotelephone transmission.

Scheduled broadcasts.-The following Coast Guard radio stations make scheduled broadcasts, preceded by a preliminary call on 500 kHz and 2182 kHz, at the times and frequencies indicated:

Radiotelegraph:

NMF, Boston, Mass., 472 kHz, 1150 and 1950 e.s.t.

Radiotelephone:

NMF, Boston, Mass., 2670 kHz, 0540, 1140, 1740, and 2340 e.s.t.

Customs Ports of Entry:

Boston Region:

Portland District: Portland, Bangor, Bar Harbor, Bath, Belfast, Calais, Eastport, Jonesport, Rockland, Portsmouth, N.H.

Customs station: Bucksport (supervised by Belfast port of entry).

Boston District: Boston, Gloucester, Plymouth, Salem. Customs station: Provincetown (supervised by Plymouth port of entry).

National Weather Service Offices.-The following offices will provide forecasts and climatological data or arrange to obtain these services from other offices. They will also check barometers in their offices or by telephone; refer to the local telephone directory for numbers:

Boston, Mass.: Logan International Airport, East Boston.

Atlantic Weather Project, National Weather Service, U.S. Coast Guard Base, 427 Commercial St., Boston, Mass. 02109.

Portland, Maine: Federal Bldg., 151 Forest Ave.

Radio Weather Broadcasts.-Taped or direct broadcasts of forecasts and storm warnings are made by commercial and Coast Guard radio stations in the areas covered by this Coast Pilot. These are usually made several times a day; the transmission schedules are shown on the Marine Weather Services Chart for the area Eastport Maine to Montauk Point, N.Y. The charts are for sale by the National Ocean Survey, Distribution Division (C44), 6501 Lafayette Ave., Riverdale, Md. 20840, and its authorized sales agents. Price, 25 cents each.

The weather broadcast schedules of Coast Guard radio stations are also listed in the description of Coast Guard marine services found elsewhere in this appendix.

VHF-FM Weather Broadcasts.-National Weather Service VHF-FM radio stations provide mariners with continuous FM broadcasts of weather warnings, forecasts, radar reports, and selected weather observations. These stations usually transmit on 162.55 or 162.40 MHz. Reception range is up to 40 miles from the antenna site, depending on terrain, type of receiver, and antenna used. The following VHF-FM radio stations are located in or near the area covered by this Coast Pilot:

KHB-35, Boston, Mass. (42°22′ N., 71°03′ W.), 162.40 MHz.

KDO-95, Portland, Maine, (43°46′ N., 70°20′ W.), 162.55 MHz.

KEC-73, Hyannis, Mass. (41°41′N., 70°20′W.), 162.55 MHz.

Public Health Service Quarantine Stations.-Stations where quarantine examinations are performed:

Boston, Mass., U.S. Quarantine Station, Logan International Airport, East Boston, Mass., 02128.

At other ports, quarantine and/or medical examinations are usually performed by Public Health Service contract personnel or by quarantine inspectors from the nearest quarantine station. Inquiries concerning quarantine matters should be directed to the nearest quarantine station.

Public Health Service Hospital:

Boston, Mass.: 77 Warren Street (Brighton), 02135.

Public Health Service Outpaitient Clinic:

Portland, Maine: 331 Veranda Street, 04103.

Public Health Service Contract Physician's Offices:

Bar Harbor: Hancock Street.

Bath, Maine: 118 Front Street.

Boothbay Harbor, Maine: St. Andrew's Hospital.

East Machias, Maine: High Street.

Gloucester, Mass.: 8 Thacker Road.

Marshfield, Mass.: 1928 Ocean Street.

Newburyport, Mass.: 194 High Street.

Provincetown, Mass.: 322 Commercial Street.

Rockland, Maine:

Southwest Harbor, Maine: 100 Main Street.

Radio shore stations providing medical advice.-Messages to shore stations may be transmitted in code groups or plain language; messages should be signed by the master and be prefixed: "DHMEDICO".

The following stations maintain a continuous guard on 500 kHz and are most accessible in point of radio connection with medical relief facilities of the U.S. Public Health Service in the area covered by this Coast Pilot.

NMF, Boston, Mass.

WCC, Chatham, Mass.

Department of Agriculture Quarantine Offices.-Maritime Ports covered by this Coast Pilot where Agriculture Quarantine inspectors are located and inspections conducted:

Maine:

Bangor: Bangor International Airport, P.O. Box 1053, 04401.

Portland: Room 301, U.S. Courthouse, 156 Federal Street, 04111.

Massachusetts:
Boston: Room 710, 408 Atlantic Avenue, 02210.

Immigration and Naturalization Service Offices:
Maine:
Bangor: Room 329, 202 Harlow Street, P.O. Box 677, 04401.
Bar Harbor: Canadian National Ferry Terminal, 04609.
Calais: 1 Maine Street, P.O. Box 266, 04619.
Eastport: U.S. Post Office Bldg., 04631.
Lubec: Federal Building, U.S. Post Office and Border Station, Washington Street and Campobello Bridge, 04652.
Portland: Room 319, U.S. Courthouse, P.O. Box 578, 04112.
Massachusetts:
Boston: John F. Kennedy Federal Building, Government Center, 02203.

Federal Communications Commission Offices:
District Field Office:
Boston, Massachusetts: Room 1600, U.S. Customhouse, 02109.

Measured Courses.-The positions of measured courses are shown on the chart and their description is included in the Coast Pilots when information is reported to the National Ocean Survey. Courses are located in the following places covered by this Coast Pilot:
West Penobscot Bay, eastward of Monroe Island 13307 (209)
Sheepscot River, west side of Barter Island 13296 (230)
Gloucester Harbor, west side of entrance 13281 (233)
Cape Cod, between Race Point and Wood End, and between Wood End and Long Point 13249 (580)
The pages in the text describing the courses can be obtained by referring to the index for the geographic places; chart numbers follow the names.

CLIMATOLOGICAL TABLES

These tables were compiled from National Weather Service data. Sky cover is expressed in a range of 0 for no clouds to 10 for complete sky-cover. The number of 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 $\frac{1}{4}$ mile.

(a) means length of record in years.
(b) means climatological standard normals, 1931-1960.
* means less than one-half.
T means trace, an amount too small to measure.

EASTPORT, MAINE, 44°55'N., 66°59'W. Elevation (ground) 80 feet. WB-1960

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent): 7:30 a.m. EST	1:30 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)	30	30	30	30	30	30	30	30	65	34	67		80	59	63	71	71	71	80	60	30	67
Jan.	30.6	15.1	22.9	58	-16	4.11	2.47	18.0	74	72	11.7		61SE	45	6.6	8	8	15	15	5	*	2
Feb.	31.0	15.9	23.5	54	-22	3.44	1.91	18.0	74	70	11.6		59N	50	6.2	8	7	13	13	5	*	2
Mar.	37.4	24.2	30.8	76	-10	3.68	1.93	12.7	75	69	10.9		53E	52	6.3	8	9	14	14	4	*	3
Apr.	47.0	33.2	40.1	81	10	3.50	2.21	4.4	77	71	9.9		52E	51	6.5	7	9	14	12	2	1	4
May	56.8	40.6	48.7	90	24	3.09	2.94	T	79	71	8.4		49SE	52	6.6	7	11	13	12	*	1	6
June	64.4	47.2	55.8	92	36	3.55	2.65	0	82	75	7.3		43E	54	6.6	6	12	12	12	0	3	8
July	70.5	52.4	61.5	89	44	3.07	2.63	0	85	77	6.5		53NW	56	6.2	7	13	11	12	0	4	12
Aug.	70.4	53.4	61.9	93	42	2.86	4.20	0	85	76	6.4		44NE	57	6.0	9	11	11	11	0	3	10
Sept.	64.0	49.3	56.7	92	33	3.53	3.66	0	84	75	7.5		41NE	55	6.0	9	9	12	11	0	1	6
Oct.	55.2	42.0	48.6	80	22	3.62	2.89	0.1	81	72	9.3		66E	50	6.2	8	9	14	11	*	1	4
Nov.	45.2	32.8	39.0	71	4	4.48	3.69	3.0	80	75	10.3		66NE	38	7.2	5	8	17	12	3	*	2
Dec.	34.0	19.5	26.8	60	-23	3.74	3.15	10.7	77	73	11.2		72E	40	6.9	7	8	16	14	4	*	1
Year	50.5	35.5	43.0	93	-23	42.67	4.20	66.9	79	73	9.3		72E	51	6.4	89	114	162	149	23	14	60

PORTLAND, MAINE (Portland International Jetport) 43°39'N., 70°19'W. Elevation (ground) 47 feet. WB-1969

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent): 7 a.m. EST	1 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)	(b)	(b)	(b)	29	29	(b)	29	29	29	29	29	15	29	29	26	29	29	29	29	29	29	29
Jan.	31.8	11.7	21.8	64	-21	4.37	2.04	18.9	78	63	8.0	N	43SE	55	6.2	10	6	15	11	5	0	2
Feb.	33.5	12.1	22.8	64	-39	3.80	3.21	20.9	78	60	8.3	N	50N	60	5.9	9	7	12	10	5	*	2
Mar.	40.7	22.0	31.4	86	-21	4.34	3.47	13.5	76	59	8.7	W	66NE	57	6.2	9	8	14	11	4	1	3
Apr.	52.5	32.4	42.5	85	8	3.73	2.43	2.8	74	55	8.6	S	50S	57	6.4	8	8	14	12	1	1	3
May	64.2	41.7	53.0	92	23	3.41	2.33	0.3	75	57	8.0	S	43NW	57	6.5	7	10	14	13	*	2	6
June	73.1	51.1	62.1	97	33	3.18	5.58	0.0	78	60	7.0	S	39SW	61	6.3	8	10	12	11	0	5	5
July	79.5	56.7	68.1	98	40	2.86	2.23	0.0	80	59	6.6	S	38W	65	6.1	8	11	12	9	0	4	7
Aug.	78.4	55.2	66.8	100	33	2.42	4.18	0.0	84	59	6.4	S	60E	64	5.8	10	11	10	10	0	3	6
Sept.	70.2	47.2	58.7	95	23	3.52	7.49	T	86	60	6.8	S	54SE	62	5.5	11	8	11	8	0	2	6
Oct.	59.8	37.4	48.6	88	18	3.20	7.71	0.3	85	59	7.4	N	39N	59	5.5	11	8	12	9	*	1	5
Nov.	47.6	28.6	38.1	73	5	4.17	3.39	3.1	85	64	7.6	W	66NE	46	6.7	8	7	15	12	1	*	4
Dec.	35.3	16.3	25.8	62	-21	3.85	3.82	13.9	81	62	7.7	N	54SE	54	6.0	10	7	14	11	3	*	2
Year	55.6	34.4	45.0	100	-39	42.85	7.71	73.7	80	60	7.6	S	66NE	59	6.1	109	101	155	126	18	18	53

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 103 in July 1911; maximum monthly precipitation 12.29 in January 1935; minimum monthly precipitation 0.09 in October 1924; maximum snowfall in 24 hours 23.3 in January 1935.

CAPE ANN (Rockport, Mass.) 42°39'N., 70°37'W. Elevation (ground) 80 feet. WB-1962

Month	Air temperature (°F.) Normal: Daily maximum	Normal: Daily minimum	Normal: Monthly	Extreme: Record highest	Extreme: Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent)		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)	30	30	30	32	32	17	32	17														
Jan.	35.6	21.6	28.6	68	-10	4.44	2.76	13.7														
Feb.	35.7	21.4	28.6	62	-16	3.84	3.15	13.7														
Mar.	42.1	28.3	35.2	83	1	3.98	3.12	11.2														
Apr.	52.5	36.9	44.7	88	17	3.70	4.02	0.8														
May	63.4	45.8	54.6	90	32	3.66	3.36	0														
June	72.5	54.7	63.6	97	39	2.45	2.10	0														
July	78.2	60.7	69.5	100	47	3.00	3.85	0														
Aug.	76.8	59.9	68.4	100	41	3.35	3.79	0														
Sept.	69.2	53.5	61.4	97	33	3.34	5.80	0														
Oct.	59.3	44.4	51.9	84	24	3.50	3.07	T														
Nov.	49.4	35.6	42.5	71	11	4.33	4.00	0.4														
Dec.	38.5	24.8	31.7	63	-15	3.84	4.80	7.3														
Year	56.1	40.6	48.4	100	-16	43.43	5.80	47.1														

BOSTON, MASSACHUSETTS (Logan International Airport) 42°22'N., 71°02'W. Elevation (ground) 15 feet. WB-1969

Month	Air temperature (°F.) Normal: Daily maximum	Normal: Daily minimum	Normal: Monthly	Extreme: Record highest	Extreme: Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent): 7 a.m. EST	1 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)	(b)	(b)	(b)	5	5	(b)	18	34	5	5	12	15	12	34	34	34	34	34	18	34	34	34
Jan.	36.8	23.0	29.9	62	-4	3.94	2.07	12.5	67	57	12.7	NW	45SW	53	6.3	9	7	15	12	3	*	2
Feb.	37.4	23.1	30.3	58	-3	3.32	2.68	12.2	68	59	12.9	WNW	47E	57	6.1	8	7	13	11	3	*	2
Mar.	44.6	30.7	37.7	66	6	4.22	4.13	8.1	69	59	12.7	NW	42ENE	57	6.3	8	8	15	12	2	*	2
Apr.	55.7	40.0	47.9	83	22	3.77	2.09	0.7	68	55	12.2	WNW	45NW	56	6.5	7	9	14	12	*	1	2
May	67.5	50.1	58.8	93	37	3.34	5.74	T	68	55	11.4	SW	43NE	59	6.5	6	11	14	11	0	3	3
June	76.3	59.2	67.8	95	46	3.48	2.46	0.0	74	59	10.5	SW	38NNW	63	6.2	7	10	13	11	0	4	2
July	81.9	65.4	73.7	98	54	2.88	2.42	0.0	73	56	10.0	SW	39N	65	6.2	7	12	12	9	0	5	2
Aug.	80.0	63.3	71.7	93	47	3.66	8.40	0.0	75	57	9.9	SW	56NNW	66	5.7	9	11	11	10	0	4	2
Sept.	73.4	57.1	65.3	95	38	3.46	5.64	0.0	79	61	10.2	SW	50S	64	5.4	11	8	11	9	0	2	2
Oct.	62.7	47.2	55.0	85	30	3.14	4.26	T	75	55	11.0	SW	39NW	61	5.5	11	8	12	9	0	1	2
Nov.	51.9	37.8	44.9	69	21	3.93	3.33	1.2	75	63	11.7	SW	50SW	52	6.4	8	7	15	12	*	*	2
Dec.	40.1	26.5	33.3	70	-3	3.63	4.17	7.5	70	60	12.3	WNW	43NW	54	6.1	9	8	14	11	2	*	1
Year	59.0	43.6	51.4	98	-4	42.77	8.40	42.2	72	58	11.5	SW	56NNW	60	6.1	100	106	159	128	11	19	23

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 104 in July 1911; lowest temperature -18 in February 1934; minimum monthly precipitation T in March 1915; maximum speed and direction of wind 76S in September 1938.

PROVINCETOWN, MASS. 42°04'N., 70°12'W. Elevation (ground) 30 feet. WB-1964

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent)		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	24	24	24	24	24	11														
Jan.	38.9	26.0	32.5	58	-4	3.98	2.78	7.5														
Feb.	38.5	25.2	31.9	60	-3	3.37	2.04	7.4														
Mar.	44.0	30.4	37.2	76	10	3.94	3.10	5.3														
Apr.	53.8	38.2	46.0	83	19	3.72	1.80	T														
May	64.9	46.5	55.7	86	28	2.53	2.60	T														
June	73.7	56.1	64.9	98	41	3.01	2.60	0														
July	79.7	62.2	71.0	97	44	2.32	2.00	0														
Aug.	78.5	61.9	70.2	94	42	3.34	2.47	0														
Sept.	71.9	56.1	64.0	93	30	4.30	9.92	0														
Oct.	62.6	47.2	54.9	82	25	3.85	4.20	0														
Nov.	52.4	39.0	45.7	71	16	3.71	3.37	0.6														
Dec.	42.0	29.2	35.6	65	-6	3.44	2.18	3.7														
Year	58.4	43.2	50.8	98	-6	41.51	9.92	24.5														

SANDWICH, MASS. 41°46'N., 70°30'W. Elevation (ground) 65 feet. WB-1964

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent)		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)	19	19	19	19	19	19	19	19														
Jan.	39.5	24.4	32.0	64	-2	4.11	3.22	6.1														
Feb.	39.9	24.4	32.2	63	-4	3.94	2.03	8.6														
Mar.	45.4	30.3	37.9	79	6	3.81	2.26	5.9														
Apr.	55.2	38.6	46.9	83	16	4.41	2.66	T														
May	64.6	46.8	55.7	86	31	3.82	2.51	T														
June	74.0	56.3	65.2	98	39	2.34	2.27	0														
July	79.8	63.0	71.4	98	46	2.79	3.04	0														
Aug.	77.5	61.7	69.6	100	48	5.09	5.40	0														
Sept.	71.9	55.5	63.7	94	38	3.16	3.11	0														
Oct.	63.6	47.0	55.3	88	28	3.44	2.73	T														
Nov.	53.7	38.2	46.0	77	18	4.79	2.65	0.1														
Dec.	42.3	28.5	35.4	64	0	4.12	3.09	5.0														
Year	59.0	42.9	51.0	100	-4	45.82	5.40	25.7														

NANTUCKET, MASSACHUSETTS (Memorial Airport) 41°15'N., 70°04'W. Elevation (ground) 43 feet. WB-1969

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum 24 hrs.	Snow, sleet mean total	Humidity (percent): 7 a.m. EST	1 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)	(b)	(b)	(b)	4	4	(b)	23	23	4	4	22	14	23	23	23	23	23	23	23	23	22	22
Jan.	39.2	26.8	33.0	63	2	4.22	2.82	8.7	79	67	12.8	NW	51NW	42	7.0	7	6	18	13	2	*	5
Feb.	38.1	24.6	31.4	54	5	3.76	2.32	10.6	79	67	13.2	WNW	57NW	48	6.9	6	6	16	12	2	*	5
Mar.	42.5	29.6	36.1	60	10	4.54	2.92	7.5	80	67	13.2	NW	63N	56	6.5	8	8	15	12	2	1	6
Apr.	50.6	38.0	44.3	69	23	3.76	4.48	0.9	80	65	12.7	WSW	55N	56	6.5	7	8	15	12	*	2	8
May	59.9	45.3	52.6	77	32	2.88	6.53	0.0	80	69	11.3	SW	43N	59	6.7	7	8	16	10	0	3	10
June	67.8	54.8	61.3	89	40	2.92	3.02	0.0	88	76	10.4	SW	34NE	61	6.6	7	8	15	8	0	3	12
July	74.3	61.7	68.0	90	50	2.71	2.65	0.0	87	76	9.6	SW	36S	60	6.8	6	9	16	8	0	4	15
Aug.	74.4	61.7	68.1	86	46	3.68	3.67	0.0	89	75	9.5	SW	63SE	60	6.4	8	8	15	9	0	3	13
Sept.	69.3	56.4	62.9	83	36	3.51	5.05	0.0	87	71	10.3	SW	63SE	60	6.1	9	8	13	8	0	2	7
Oct.	60.8	47.8	54.3	77	22	3.70	3.21	T	82	67	11.2	SW	60E	58	5.8	10	8	13	9	0	1	7
Nov.	52.3	39.5	45.9	68	20	4.05	4.95	0.3	80	71	11.6	NW	61NW	42	7.1	5	8	17	12	*	1	5
Dec.	42.5	29.6	36.1	58	4	3.93	4.26	6.8	78	69	12.3	WNW	50W	41	7.0	6	8	17	13	2	*	4
Year	56.0	43.0	49.5	90	2	43.66	6.53	34.8	83	70	11.5	SW	63SE	55	6.6	86	93	186	125	8	20	98

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 95 in August 1948; lowest temperature -6 in February 1918; maximum speed and direction of wind 79E in March 1914.

METEOROLOGICAL TABLE FOR COASTAL AREA OFF MASSACHUSETTS, NEW HAMPSHIRE, AND MAINE

Boundaries: From 42°N. northward to coast, and from 66°W. westward to coast

	Weather Elements	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Percentage frequency	Wind ≧ 34 knots	10.5	10.3	3.4	1.5	0.1	0.0	0.0	0.2	1.0	3.5	4.3	10.7
	Wave height ≧ 10 feet	13.3	13.8	4.5	1.9	0.8	0.2	0.0	0.1	1.8	6.4	8.3	11.3
	Visibility < 2 naut. mi.	8.3	8.5	5.4	8.6	12.1	16.8	22.7	17.4	10.0	6.1	5.2	7.1
	Precipitation	21.7	23.7	15.3	11.7	9.8	8.0	4.7	6.9	7.2	7.0	13.2	22.1
	Sky overcast or obscured	49.6	44.3	35.0	34.5	34.1	31.1	31.1	30.8	28.9	28.8	40.8	47.0
	Thunder and lightning	0.0	0.1	0.0	0.1	0.1	0.4	0.5	0.5	0.3	0.1	*	0.0
	Temperature ≧ 85°F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Temperature ≦ 32°F	40.9	45.8	22.3	2.9	0.0	0.0	0.0	0.0	0.0	0.1	1.7	26.6
	Mean temperature (°F)	34.1	32.7	36.4	41.5	47.3	54.8	61.2	62.0	58.8	53.1	45.7	37.9
	Mean relative humidity (%)	79	79	78	80	85	86	88	88	84	81	78	80
	Mean cloud cover (eighths)	6.0	5.6	4.7	4.5	4.7	4.6	4.7	4.4	4.0	4.2	5.3	5.9
Millibars	Mean sea-level pressure	1014	1013	1013	1015	1015	1014	1015	1015	1018	1017	1016	1016
	Extreme maximum sea-level pressure	1052	1042	1040	1042	1038	1033	1030	1037	1041	1039	1041	1045
	Extreme minimum sea-level pressure	976	970	977	980	990	994	994	992	988	973	980	971

*0.0-0.05%

These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

MEAN SURFACE WATER TEMPERATURES (T) AND DENSITIES (D)

Stations	Years	Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec		Mean	
		(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}
Eastport, Maine 44°54'N., 66°59'W.	40	3.3	23.8	1.7	23.7	1.7	23.6	2.9	23.3	4.7	23.2	6.8	23.5	9.2	23.8	10.7	24.0	11.0	24.1	10.3	24.2	8.6	24.0	5.9	23.8	6.4	23.8
Bar Harbor, Maine 44°23'N., 68°12'W.	23	1.4	23.7	0.4	23.7	1.7	23.5	4.6	23.2	7.8	23.2	11.3	23.3	13.7	23.5	14.2	23.6	13.1	23.8	11.1	24.0	8.3	23.9	4.3	23.7	7.6	23.6
Portland, Maine 43°40'N., 70°15'W.	37	0.7	22.3	0.1	22.1	1.5	21.3	4.6	20.5	8.8	20.8	12.7	21.6	15.2	22.3	15.6	22.5	14.4	22.5	11.2	22.5	7.3	22.2	3.1	22.0	7.9	21.9
Portsmouth, N.H. 43°05'N., 70°45'W.	26	2.1	21.7	1.3	21.5	2.3	19.7	5.6	18.1	9.2	19.7	12.7	21.4	15.0	22.5	15.8	22.9	14.6	23.0	11.3	23.0	8.2	22.1	4.5	21.2	8.6	21.4
Boston, Mass. 42°21'N., 71°03'W.	48	1.8	21.0	1.2	20.9	3.4	19.1	7.4	18.8	11.9	19.8	16.0	20.9	18.3	21.8	18.8	22.0	17.5	21.8	13.5	22.0	9.1	21.5	4.3	21.3	10.3	20.9

F (Fahrenheit) = 1.8C (Celsius) + 32

Density as used in this table is the specific gravity of the sea water or the ratio between the weight of a sea-water sample and the weight of an equal volume of distilled water at 15°C (59°F). These figures representing density at 15°C (ρ_{15}) are expressed in terms of sigma-t (σ_t) where t = 15°C and σ_{15} = (ρ_{15} − 1) 1000. Thus, for $\rho_{15} = 1.0238$, $\sigma_{15} = 23.8$. Obtain the pamphlet, "Surface Water Temperature and Density, Atlantic Coast, North and South America, C&GS Publication 31-1", for greater detail; for sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, price $1.00.

DETERMINATION OF WIND SPEED BY SEA CONDITION

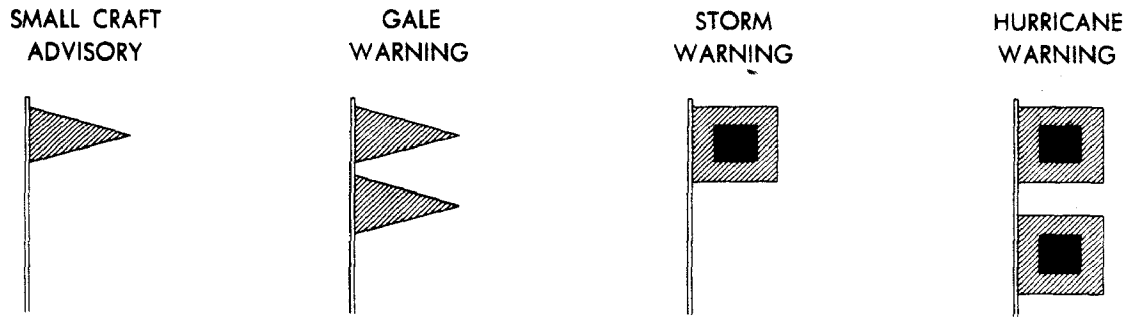
Miles per hour	Knots	Descriptive	Sea Conditions	Wind force (Beaufort)	Probable wave height (in ft.)
0-1	0-1	Calm	Sea smooth and mirror-like.	0	-
1-3	1-3	Light air	Scale-like ripples without foam crests.	1	1/4
4-7	4-6	Light breeze	Small, short wavelets; crests have a glassy appearance and do not break.	2	1/2
8-12	7-10	Gentle breeze	Large wavelets; some crests begin to break; foam of glassy appearance. Occasional white foam crests.	3	2
13-18	11-16	Moderate breeze	Small waves, become longer; fairly frequent white foam crests.	4	4
19-24	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray.	5	6
25-31	22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray.	6	10
32-38	28-33	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins.	7	14
39-46	34-40	Gale	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind.	8	18
47-54	41-47	Strong gale	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble, and roll over; spray may reduce visibility.	9	23
55-63	48-55	Storm	Very high waves with long overhanging crests. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea is white in appearance. The tumbling of the sea becomes heavy and shocklike. Visibility is reduced.	10	29
64-72	56-63	Violent storm	Exceptionally high waves that may obscure small and medium-sized ships. The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility is reduced.	11	37
73 or more	64 or more	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very much reduced.	12	45

ATMOSPHERIC PRESSURE CONVERSION TABLE

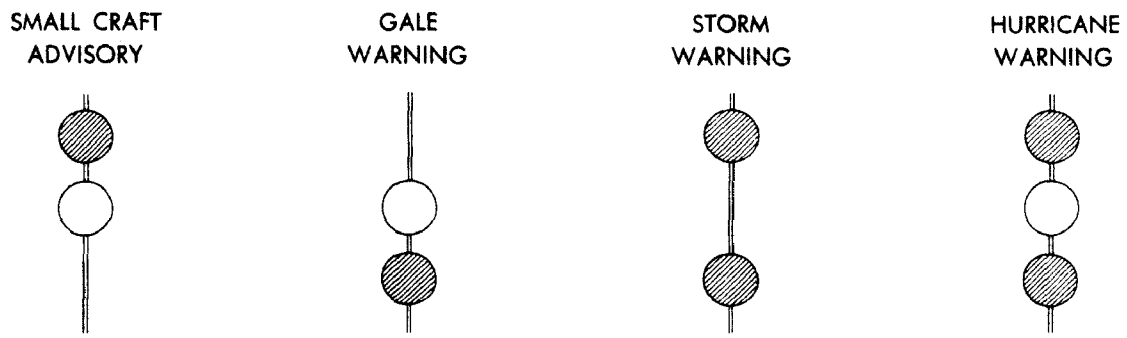
Inches	Millibars	Inches	Millibars	Inches	Millibars
28.44	963	29.32	993	30.21	1023
28.53	966	29.41	996	30.30	1026
28.62	969	29.50	999	30.39	1029
28.70	972	29.59	1002	30.48	1032
28.79	975	29.68	1005	30.56	1035
28.88	978	29.77	1008	30.65	1038
28.97	981	29.86	1011	30.74	1041
29.06	984	29.94	1014	30.83	1044
29.15	987	30.03	1017	30.92	1047
29.24	990	30.12	1020	31.01	1050

NATIONAL WEATHER SERVICE COASTAL WARNING DISPLAYS

DAYTIME SIGNALS



NIGHT (LIGHT) SIGNALS



Note: Shaded area represents the color RED on flags and lights.

EXPLANATION OF DISPLAYS

Small Craft Advisory: One RED pennant displayed by day and a RED light ABOVE a WHITE light at night, to alert mariners to sustained (more than two hours) weather or sea conditions, either present or forecast, that might be hazardous to small boats. Mariners learning of a Small Craft Advisory are urged to determine immediately the reason by tuning their radios to the latest marine broadcasts. Decision as to the degree of hazard will be left up to the boatman, based on his experience and size and type of boat. The threshold conditions for the Small Craft Advisory are usually 18 knots of wind (less than 18 knots in some dangerous waters) or hazardous wave conditions.

Gale Warning: Two RED pennants displayed by day and a WHITE light ABOVE a RED light at night to indicate that winds within the range 34 to 47 knots are forecast for the area.

Storm Warning: A single square RED flag with a BLACK center displayed during daytime and two RED lights at night to indicate that winds 48 knots and above, no matter how high the speed, are forecast for the area. However, if the winds are associated with a tropical cyclone (hurricane) the STORM WARNING display indicates that winds within the range 48 to 63 knots are forecast.

Hurricane Warning: Displayed only in connection with a tropical cyclone (hurricane). Two square RED flags with BLACK centers displayed by day and a WHITE light between two RED lights at night to indicate that winds 64 knots and above are forecast for the area.

Note: A "HURRICANE WATCH" is an announcement issued by the National Weather Service via press and radio and television broadcasts whenever a tropical storm or hurricane becomes a threat to a coastal area. The "Hurricane Watch" announcement is not a warning, rather it indicates that the hurricane is near enough that everyone in the area covered by the "Watch" should listen to their radios for subsequent advisories and be ready to take precautionary action in case hurricane warnings are issued.

Note: A SPECIAL MARINE WARNING BULLETIN is issued whenever a severe local storm or strong wind of brief duration is imminent and is not covered by existing warnings or advisories. No visual displays will be used in connection with the Special Marine Warning Bulletin; boaters will be able to receive these special warnings by keeping tuned to a NOAA VHF-FM radio station or to Coast Guard and commercial radio stations that transmit marine weather information.

HOURS OF OPERATION OF FOG SIGNALS
(U. S. Coast Guard)

Light station	20 Calendar years - 1950 thru 1969														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				
West Quoddy Head, Maine 44°48.9'N., 66°57.1'W.	91	79	82	78	133	185	286	253	147	83	54	83	1554	2128	1427	65	1857
Little River, Maine 44°39.0'N., 67°11.5'W.	73	66	64	74	107	188	285	235	125	79	66	72	1434	2146	1342	44	1703
Libby Island, Maine 44°34.1'N., 67°22.1'W.	105	84	87	91	135	196	290	271	140	94	72	85	1650	2364	1526	65	1954
Moose Peak, Maine 44°28.5'N., 67°32.0'W.	76	72	70	77	112	181	276	234	120	78	56	58	1410	2005	1580	36	1934
Petit Manan, Maine 44°22.1'N., 67°51.9'W.	114	107	121	106	139	198	303	266	150	106	96	109	1815	2941	1493	65	2144
Mount Desert, Maine 43°58.1'N., 68°07.7'W.	71	60	69	69	119	174	262	229	121	81	59	70	1384	2246	1401	56	1744
Egg Rock, Maine 44°21.2'N., 68°08.3'W.	72	57	56	60	83	130	204	166	89	58	44	51	1070	1675	1206	45	1587
Bass Harbor Head, Maine 44°13.3'N., 68°20.3'W.	77	69	85	73	101	154	215	197	108	79	69	70	1297	2428	971	44	1590
Burnt Coat Harbor, Maine 44°08.1'N., 68°26.9'W.	68	64	74	73	112	155	226	213	121	76	72	75	1329	2636	1017	38	1782
Matinicus Rock, Maine 43°47.0'N., 68°51.3'W.	89	85	86	100	135	176	261	244	140	86	82	80	1564	2264	1301	65	1700
Owls Head, Maine 44°05.5'N., 69°02.7'W.	64	66	66	64	82	130	177	152	99	64	65	64	1093	1831	828	44	1177
Fort Point, Maine 44°28.0'N., 68°48.7'W.	78	76	76	65	62	97	139	138	94	74	66	81	1046	2348	646	44	930
Manana I. Fog Signal, Maine 43°45.8'N., 69°19.7'W.	90	87	95	93	131	171	214	204	123	88	82	86	1464	1976	1122	65	1551
Whitehead, Maine 43°58.7'N., 69°07.5'W.	73	70	73	66	100	140	213	189	111	67	61	59	1222	1990	1317	65	1650
Marshall Point, Maine 43°55.0'N., 69°15.7'W.	95	84	89	78	105	138	193	163	101	77	75	80	1278	2026	796	44	1120
The Cuckolds, Maine 43°46.8'N., 69°39.0'W.	81	74	80	70	95	111	177	161	96	69	61	70	1145	1825	1240	55	1663
Seguin, Maine 43°42.5'N., 69°45.5'W.	84	82	99	82	110	136	181	166	105	77	83	80	1285	2161	1265	65	1684
Doubling Point, Maine 43°53.0'N., 69°48.4'W.	34	39	38	25	31	36	58	50	42	44	38	46	481	894	379	45	806
Halfway Rock, Maine 43°39.4'N., 70°02.2'W.	107	96	109	105	131	172	234	220	143	114	109	102	1642	2855	1038	44	1510

HOURS OF OPERATION OF FOG SIGNALS
(U. S. Coast Guard)

Light station	20 Calendar years - 1950 thru 1969														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				
Portland Lightship, Maine 43°31.6'N., 70°05.5'W.	91	84	96	76	112	136	158	144	107	74	75	71	1224	1872	1016	41	1513
Cape Elizabeth, Maine * 43°34.0'N., 70°12.0'W.	94	98	98	94	115	127	195	163	145	84	83	72	1368	2263	987	65	1514
Portland Head, Maine 43°37.4'N., 70°12.5'W.	89	74	89	64	97	108	151	134	82	66	70	78	1102	1824	902	65	1319
Wood Island, Maine 43°27.4'N., 70°19.8'W.	76	82	98	76	97	121	143	140	98	85	88	90	1194	2091	762	44	1206
Goat Island, Maine 43°21.5'N., 70°25.5'W.	78	68	85	59	91	101	152	145	89	70	74	80	1092	2211	638	39	1155
Cape Neddick, Maine 43°09.9'N., 70°35.5'W.	72	74	78	58	84	107	129	121	84	69	68	71	1015	2183	660	44	768
Whaleback, Maine ** 43°03.5'N., 70°41.8'W.	54	65	58	53	80	84	120	106	73	63	56	51	863	1423	907	65	1350
Isles of Shoals, N.H. 42°58.0'N., 70°37.4'W.	94	102	106	84	104	122	154	139	102	94	90	94	1285	1923	750	43	1314
Annisquam Harbor, Mass. 42°39.7'N., 70°40.9'W.	60	57	59	34	35	24	36	35	25	27	50	54	496	1304	160	19	474
Cape Ann, Mass. 42°38.2'N., 70°34.5'W.	85	90	93	67	90	99	123	123	82	67	67	65	1051	1761	736	65	1091
Eastern Point, Mass. 42°34.8'N., 70°39.9'W.	68	62	77	46	78	73	107	89	68	60	51	52	831	1787	630	51	1155
Bakers Island, Mass. 42°32.2'N., 70°47.2'W.	68	68	79	54	69	78	80	86	59	55	52	59	807	1984	602	44	1058
Boston Lightship, Mass. 42°20.4'N., 70°45.5'W.	78	76	79	58	70	74	93	88	52	49	48	54	819	1369	874	52	1231
Boston, Mass. 42°19.7'N., 70°53.4'W.	67	69	73	45	56	65	85	80	53	48	44	51	736	1331	691	65	918
Deer Island, Mass. 42°20.4'N., 70°57.3'W.	59	67	64	34	48	47	75	64	54	57	50	60	679	1400	385	44	668
Plymouth (Gurnet), Mass. 42°00.2'N., 70°36.1'W.	75	68	76	44	69	70	86	80	66	43	40	44	761	1148	563	42	919
Canal Breakwater, Mass. 41°46.8'N., 70°29.4'W.	146	131	152	134	132	174	195	177	136	125	144	128	1774	2920	1135	20	1692
Race Point, Mass. 42°03.7'N., 70°14.6'W.	78	75	77	67	84	113	98	92	65	56	49	53	907	1417	697	65	1519

*15 years (1950-1964)
**14 years (1950-1963)

ATLANTIC OCEAN DISTANCES FOR DEEP-DRAFT VESSELS MONTREAL, CANADA, TO PANAMA CANAL ZONE

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: New York, N. Y., is 1399 nautical miles from San Juan, P. R.

	MONTREAL, CANADA* 45°30.2'N., 73°33.0'W.	Cabot Strait 47°07.0'N., 60°17.0'W.	Gut of Canso (Lock) 45°39.0'N., 61°25.0'W.	Portland, Maine 43°39.4'N., 70°14.7'W.	Boston, Mass. 42°22.0'N., 71°03.0'W.	NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	Philadelphia, Pa. 39°56.8'N., 75°08.3'W.	Baltimore, Md. 39°16.0'N., 76°34.5'W.	CHESAPEAKE BAY ENT. 36°56.3'N., 75°58.6'W.	Norfolk, Va. 36°50.9'N., 76°17.9'W.	DIAMOND SHOALS 35°08.0'N., 75°15.0'W.	Wilmington, N. C. 34°14.0'N., 77°57.0'W.	Charleston, S. C. 32°47.2'N., 79°55.2'W.	Savannah, Ga. 32°05.0'N., 81°05.7'W.	Jacksonville, Fla. 30°19.2'N., 81°39.0'W.	Key West, Fla. 24°33.7'N., 81°48.5'W.	STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	Tampa, Fla. 27°56.5'N., 82°26.7'W.	Pensacola, Fla. 30°24.0'N., 87°13.0'W.	Mobile, Ala. 30°42.5'N., 88°02.5'W.	NEW ORLEANS, La. (via SW Pass) 29°57.0'N., 90°03.7'W.	Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	Galveston, Tex. 29°19.0'N., 94°47.0'W.	Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	San Juan, P. R. 18°27.8'N., 66°06.7'W.	YUCATAN CHANNEL 21°50.0'N., 85°03.0'W.	Panama Canal (Atlantic Ent.) 9°23.5'N., 79°55.3'W.	PANAMA CANAL (Pacific Ent.) 8°53.0'N., 79°31.0'W.
Cabot Strait 47°07.0'N., 60°17.0'W.	681																												
Gut of Canso (Lock) 45°39.0'N., 61°25.0'W.	717	120																											
Portland, Maine 43°39.4'N., 70°14.7'W.	1276	595	484																										
Boston, Mass. 42°22.0'N., 71°03.0'W.	1318	637	526	100																									
NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	1311	630	519	203	163																								
NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	1534	853	742	426	386	223																							
Philadelphia, Pa. 39°56.8'N., 75°08.3'W.	1682	1001	890	575	535	372	240																						
Baltimore, Md. 39°16.0'N., 76°34.5'W.	1838	1157	1046	734	694	531	417	392																					
CHESAPEAKE BAY ENT. 36°56.3'N., 75°58.6'W.	1689	1008	896	584	544	381	267	242	150																				
Norfolk, Va. 36°50.9'N., 76°17.9'W.	1716	1035	923	611	571	408	294	269	173	27																			
DIAMOND SHOALS 35°08.0'N., 75°15.0'W.	1729	1048	936	628	588	425	345	322	267	117	144																		
Wilmington, N. C. 34°14.0'N., 77°57.0'W.	1948	1267	1155	847	807	644	564	541	486	336	363	219																	
Charleston, S. C. 32°47.2'N., 79°55.2'W.	2014	1333	1221	913	873	710	630	607	552	402	429	285	151																
Savannah, Ga. 32°05.0'N., 81°05.7'W.	2088	1407	1295	987	947	784	704	681	626	476	503	359	227	102															
Jacksonville, Fla. 30°19.2'N., 81°39.0'W.	2172	1491	1379	1071	1031	868	788	765	710	560	587	443	315	197	145														
Key West, Fla. 24°33.7'N., 81°48.5'W.	2479	1798	1690	1387	1347	1184	1109	1086	1031	881	908	764	667	572	543	462													
STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	2540	1859	1751	1448	1408	1245	1170	1147	1092	942	969	825	728	633	604	523	73												
Tampa, Fla. 27°56.5'N., 82°26.7'W.	2772	2091	1983	1680	1640	1477	1402	1379	1324	1174	1201	1057	960	865	836	755	305	232											
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	2977	2296	2188	1885	1845	1682	1607	1584	1529	1379	1406	1262	1165	1070	1041	960	510	437	347										
Mobile, Ala. 30°42.5'N., 88°02.5'W.	3011	2330	2222	1919	1879	1716	1641	1618	1563	1413	1440	1296	1199	1104	1075	994	544	471	389	89									
NEW ORLEANS, La. (via SW Pass) 29°57.0'N., 90°03.7'W.	3080	2399	2291	1988	1948	1785	1710	1687	1632	1482	1509	1365	1268	1173	1144	1063	613	540	502	288	269								
Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	3240	2559	2451	2148	2108	1945	1870	1847	1792	1642	1669	1525	1428	1333	1304	1223	773	700	697	504	491	441							
Galveston, Tex. 29°19.0'N., 94°47.0'W.	3242	2561	2453	2150	2110	1947	1872	1849	1794	1644	1671	1527	1430	1335	1306	1225	775	702	703	509	496	446	89						
Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	3347	2666	2558	2255	2215	2052	1977	1954	1899	1749	1776	1632	1535	1440	1411	1330	880	807	810	618	605	555	249	207					
San Juan, P. R. 18°27.8'N., 66°06.7'W.	2445	1764	1669	1531	1486	1334	1399	1395	1375	1225	1252	1114	1153	1138	1156	1121	966	1017	1249	1448	1448	1557	1717	1719	1824				
YUCATAN CHANNEL 21°50.0'N., 85°03.0'W.	2730	2049	1937	1629	1589	1426	1346	1323	1268	1118	1145	1001	904	809	780	699	251	192	404	533	562	587	691	696	769	1111			
Panama Canal (Atlantic Ent.) 9°23.5'N., 79°55.3'W.	3203	2522	2419	2189	2149	1986	1972	1955	1904	1754	1781	1637	1609	1563	1564	1513	1060	1001	1213	1342	1371	1396	1487	1493	1549	990	809		
PANAMA CANAL (Pacific Ent.) 8°53.0'N., 79°31.0'W.	3249	2568	2465	2235	2195	2032	2018	2001	1950	1800	1827	1683	1655	1609	1610	1559	1106	1047	1259	1388	1417	1442	1533	1539	1595	1036	855	46	

*Quebec, Canada - SUBTRACT 139 miles.

All tabular distances are by outside routes which can be used by the deepest-draft vessel that the listed ports can accommodate. Lighter-draft vessels can save considerable mileage by transiting Canso Lock (Canada), the Cape Cod Canal (Massachusetts), and the Chesapeake and Delaware Canal (Delaware-Maryland); see the detailed tables. Gulf of Mexico distances are through the Shipping Safety Fairways, recomputed in 1970 to conform with latest fairway revisions.

GULF OF MAINE DISTANCES

CALAIS, MAINE, TO CAPE COD, MASS.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Portland, Maine, is 100 nautical miles from Boston, Mass.

	Calais, Maine 45°11.4'N., 67°16.7'W.	Eastport, Maine 44°54.3'N., 66°59.0'W.	Lubec, Maine 44°51.7'N., 66°59.0'W.	Machiasport, Maine 44°41.9'N., 67°23.6'W.	Jonesport, Maine 44°31.6'N., 67°37.0'W.	Bar Harbor, Maine 44°23.5'N., 68°12.0'W.	Buck Harbor, Maine 44°20.3'N., 68°44.2'W.	Stonington, Maine 44°09.2'N., 68°39.8'W.	Rockland, Maine 44°06.0'N., 69°05.5'W.	Searsport, Maine 44°27.0'N., 68°54.0'W.	Bucksport, Maine 44°34.3'N., 68°48.0'W.	Bangor, Maine 44°47.7'N., 68°46.3'W.	Boothbay Harbor, Maine 43°51.0'N., 69°37.6'W.	Wiscasset, Maine 43°59.5'N., 69°40.1'W.	Bath, Maine 43°54.5'N., 69°48.7'W.	Augusta, Maine 44°18.9'N., 69°46.4'W.	Portland, Maine 43°39.4'N., 70°14.7'W.	York Harbor, Maine 43°07.9'N.,	Portsmouth, N. H. 43°04.6'N., 70°44.5'W.	Newburyport, Mass. 42°48.8'N., 70°52.4'W.	Rockport, Mass. 42°40.0'N., 70°36.5'W.	Gloucester, Mass. 42°36.6'N., 70°39.6'W.	Salem, Mass. 42°31.3'N., 70°52.5'W.	Marblehead, Mass. 42°30.2'N., 70°50.7'W.	Lynn, Mass. 42°27.3'N., 70°56.6'W.	Boston, Mass. 42°22.0'N., 71°03.0'W.	Scituate, Mass. 42°11.9'N., 70°43.5'W.	Plymouth, Mass. 41°57.6'N., 70°39.8'W.	CAPE COD CANAL ENT. 41°46.8'N., 70°29.0'W.	Provincetown, Mass. 42°02.5'N., 70°10.0'W.	NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.
24																																
26	3																															
61	46	35																														
66	42	40	20																													
98	83	72	52	34																												
125	109	98	80	60	39																											
118	107	91	73	53	33	16																										
145	130	118	100	82	62	22	20																									
152	137	126	107	89	70	16	24	23																								
159	145	133	115	96	77	22	30	33	13																							
176	162	150	132	113	94	39	47	50	30	17																						
168	153	142	123	105	86	57	53	42	61	70	87																					
189	175	162	144	124	105	68	64	62	80	89	106	21																				
187	173	161	142	122	103	67	63	59	78	86	104	23	30																			
214	200	188	169	149	130	94	90	86	105	113	131	50	57	27																		
198	183	172	153	135	115	85	81	71	90	98	115	36	44	40	66																	
222	208	196	178	159	140	114	109	99	118	126	144	64	72	67	94	43																
230	216	204	186	167	148	123	119	107	126	135	151	74	82	78	104	56	11															
241	226	215	197	178	159	137	132	118	137	145	162	86	94	89	116	67	25	22														
236	221	210	192	173	154	131	126	115	134	143	160	84	92	88	115	66	29	27	16													
245	230	219	200	182	163	138	133	126	145	153	170	95	103	98	125	79	42	40	31	17												
252	237	226	208	189	170	149	145	133	152	160	177	102	110	105	132	87	49	47	38	24	12											
251	236	225	207	188	169	148	143	132	151	159	176	101	109	104	131	86	48	46	37	23	11	5										
261	246	235	217	198	179	157	153	142	161	169	186	110	118	114	141	95	58	56	47	33	22	18	14									
265	250	239	221	203	184	162	158	147	166	174	191	115	123	119	146	100	63	61	51	37	26	27	19	13								
259	244	233	215	196	177	159	155	142	161	169	186	112	120	115	142	97	60	58	48	34	26	24	22	22	21							
268	253	242	224	206	188	174	163	155	174	182	199	125	133	129	156	112	75	73	64	50	43	45	39	40	40	20						
270	255	244	226	209	190	176	165	160	178	187	204	130	139	137	164	118	83	81	72	58	52	53	48	48	52	29	20					
258	243	232	214	197	179	165	155	148	166	175	192	119	127	123	150	107	75	73	63	49	45	49	45	47	49	29	26	22				
312	297	286	271	257	243	237	226	223	242	250	267	207	217	213	240	203	182	180	171	157	155	159	156	159	163	143	144	144	132			

Portland Lightship (43°31.6'N., 70°05.5'W.) to Portland, 11.3 miles.
Boston Lightship (42°20.4'N., 70°45.5'W.) to Boston: via Northeastern Approach, 15.6 miles; via Southeastern Approach, 14.3 miles.

Each distance is by shortest route that safe navigation permits between the two ports concerned. Vessels standing along the coast must make their own adjustments for non-direct routes. For example, the table shows a distance of 214 miles by direct route from Machiasport to Provincetown; the distance via Matinicus Rock and Cape Ann is 235 miles. Distances from Eastport to Machiasport and other ports farther southward are via deep Head Harbor Passage, which is 8 miles farther than via shallow Lubec Channel.

Radio Bearing Conversion Table

Table of corrections, in minutes

[DIFFERENCE OF LONGITUDE IN DEGREES]

Mid. L.	½°	1°	1½°	2°	2½°	3°	3½°	4°	4½°	5°	5½°	6°	6½°	7°	7½°	8°	8½°	9°	9½°	10°
15°	4	8	12	16	19	23	27	31	35	40	43	47	50	54	58	62	66	70	74	78
16°	4	8	12	17	21	25	29	33	37	41	45	50	54	58	62	66	70	74	79	83
17°	4	9	13	18	22	26	31	35	39	44	48	53	57	61	66	70	75	79	83	88
18°	5	9	13	19	23	28	32	37	42	46	51	56	60	65	70	74	79	83	88	93
19°	5	10	15	20	24	29	34	39	44	49	54	59	63	68	73	78	83	88	93	98
20°	5	10	15	21	26	31	36	41	46	51	56	62	67	72	77	82	87	92	98	103
21°	5	11	16	21	27	32	38	43	48	54	59	64	70	75	81	86	91	97	102	108
22°	6	11	17	22	28	34	39	45	51	56	62	67	73	79	84	90	96	101	107	112
23°	6	12	18	23	29	35	41	47	53	59	64	70	76	82	88	94	100	105	111	117
24°	6	12	18	24	31	37	43	49	55	61	67	73	79	85	92	98	104	110	116	122
25°	6	13	19	25	32	38	44	51	57	63	70	76	82	89	95	101	108	114	120	127
26°	7	13	20	26	33	39	46	53	59	66	72	79	85	92	99	105	112	118	125	131
27°	7	14	20	27	34	41	48	54	61	68	75	82	89	95	102	109	116	123	129	136
28°	7	14	21	28	35	42	49	56	63	70	77	84	92	99	106	113	120	127	134	141
29°	7	15	21	29	36	44	51	58	65	73	80	87	95	102	109	116	124	131	138	145
30°	7	15	22	30	38	45	53	60	68	75	83	90	98	105	113	120	127	135	143	150
31°	8	15	23	31	39	46	54	62	70	77	85	93	100	108	116	124	131	139	146	155
32°	8	16	24	32	40	48	56	64	72	79	87	95	103	111	119	127	135	143	151	159
33°	8	16	25	33	41	49	57	65	74	82	90	98	106	114	123	131	139	147	155	163
34°	8	17	25	34	42	50	59	67	75	84	92	101	109	117	126	134	143	151	159	168
35°	9	17	26	34	43	52	60	69	77	86	95	103	112	120	129	138	146	155	163	172
36°	9	18	26	35	44	53	62	71	79	88	97	106	115	123	132	141	150	159	168	176
37°	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	163	172	181
38°	9	18	28	37	46	55	65	74	83	92	102	111	120	129	139	148	157	166	175	185
39°	9	19	28	38	47	57	66	75	85	94	104	113	123	132	142	151	160	170	179	189
40°	10	19	29	39	48	58	68	77	87	96	106	116	125	135	145	154	164	174	183	193
41°	10	20	30	39	49	59	69	79	89	98	108	118	128	138	148	157	167	177	187	197
42°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	151	161	171	181	191	201
43°	10	20	31	41	51	61	72	82	92	102	113	123	133	143	153	164	174	184	194	205
44°	10	21	31	42	52	63	73	83	94	104	115	125	135	146	156	167	177	188	198	208
45°	11	21	32	42	53	64	74	85	95	106	117	127	138	149	159	170	180	191	201	212
46°	11	22	32	43	54	65	76	86	97	108	119	129	140	151	162	173	183	194	205	216
47°	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	186	197	208	219
48°	11	22	33	45	56	67	78	89	100	111	123	134	145	156	167	178	190	201	212	223
49°	11	23	34	45	57	68	79	91	102	113	125	136	147	158	170	181	192	204	215	226
50°	11	23	34	46	57	69	80	92	103	115	126	138	149	161	172	184	195	207	218	230
51°	12	23	35	47	58	70	82	93	105	117	128	140	152	163	175	186	198	210	221	233
52°	12	24	35	47	59	71	83	95	106	118	130	142	154	165	177	189	201	213	225	236
53°	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
54°	12	24	36	49	61	73	85	97	109	121	133	146	158	170	182	194	206	218	231	243
55°	12	25	37	49	61	74	86	98	111	123	135	147	160	172	184	197	209	221	233	246
56°	12	25	37	50	62	75	87	100	112	124	137	149	162	174	187	199	211	224	236	249
57°	13	25	38	50	63	75	88	101	113	126	138	151	164	176	189	201	214	226	239	252
58°	13	25	38	51	64	76	89	102	115	127	140	153	165	178	191	204	216	229	242	254
59°	13	26	39	51	64	77	90	103	116	129	141	154	167	180	193	206	219	231	244	257
60°	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260

Example. A ship in latitude 39°51′. N., longitude 67°35′ W., by dead reckoning, obtains a radio bearing of 299° true on the radiobeacon located in latitude 40°37′. N., longitude 69°37′ W.

Radiobeacon station	Latitude	40°37′ N.
Dead-reckoning position of ship	Latitude	39°51′
Middle latitude		40°14′
Radiobeacon station	Longitude	69°37′ W.
Dead reckoning position of ship	Longitude	67°35′
Longitude difference		2°02′

Entering the table with difference of longitude equals 2°, which is the nearest tabulated value and opposite 40° middle latitude, the correction of 39′ is read.

As the ship is east of the radiobeacon, a minus correction is applied. The Mercator bearing then will be 299°−000°39′=298°21′. To facilitate plotting, subtract 180° and plot from the position of the radiobeacon the bearing 298°21′−180°, or 118°21′ (Mercator bearing reckoned clockwise from true north).

Distance of Visibility of Objects at Sea

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer whose eye is at sea level; in practice, therefore, it is necessary to add to these a distance of visibility corresponding to the height of the observer's eye above sea level.

Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles
6	2. 8	48	7. 9	220	17. 0	660	29. 4	2, 000	51. 2
8	3. 1	50	8. 1	240	17. 7	680	29. 9	2, 200	53. 8
10	3. 6	55	8. 5	260	18. 5	700	30. 3	2, 400	56. 2
12	4. 0	60	8. 9	280	19. 2	720	30. 7	2, 600	58. 5
14	4. 3	65	9. 2	300	19. 9	740	31. 1	2, 800	60. 6
15	4. 4	70	9. 6	320	20. 5	760	31. 6	3, 000	62. 8
16	4. 6	75	9. 9	340	21. 1	780	32. 0	3, 200	64. 9
18	4. 9	80	10. 3	360	21. 7	800	32. 4	3, 400	66. 9
20	5. 1	85	10. 6	380	22. 3	820	32. 8	3, 600	68. 6
22	5. 4	90	10. 9	400	22. 9	840	33. 2	3, 800	70. 7
24	5. 6	95	11. 2	420	23. 5	860	33. 6	4, 000	72. 5
26	5. 8	100	11. 5	440	24. 1	880	34. 0	4, 200	74. 3
28	6. 1	110	12. 0	460	24. 6	900	34. 4	4, 400	76. 1
30	6. 3	120	12. 6	480	25. 1	920	34. 7	4, 600	77. 7
32	6. 5	130	13. 1	500	25. 6	940	35. 2	4, 800	79. 4
34	6. 7	140	13. 6	520	26. 1	960	35. 5	5, 000	81. 0
36	6. 9	150	14. 1	540	26. 7	980	35. 9	6, 000	88. 8
38	7. 0	160	14. 5	560	27. 1	1, 000	36. 2	7, 000	96. 0
40	7. 2	170	14. 9	580	27. 6	1, 200	39. 6	8, 000	102. 6
42	7. 4	180	15. 4	600	28. 0	1, 400	42. 9	9, 000	108. 7
44	7. 6	190	15. 8	620	28. 6	1, 600	45. 8	10, 000	114. 6
46	7. 8	200	16. 2	640	29. 0	1, 800	48. 6		

Conversion Table, Degrees to Points and Vice Versa

° ′	Points	° ′	Points	° ′	Points	° ′	Points
0 00	N	90 00	E	180 00	S	270 00	W
2 49		92 49		182 49		272 49	
5 38	N ½ E	95 38	E ½ S	185 38	S ½ W	275 38	W ½ N
8 26		98 26		188 26		278 26	
11 15	N x E	101 15	E x S	191 15	S x W	281 15	W x N
14 04		104 04		194 04		284 04	
16 53	N x E ½ E	106 53	ESE ½ E	196 53	S x W ½ W	286 53	WNW ½ W
19 41		109 41		199 41		289 41	
22 30	NNE	112 30	ESE	202 30	SSW	292 30	WNW
25 19		115 19		205 19		295 19	
28 08	NNE ½ E	118 08	SE x E ½ E	208 08	SSW ½ W	298 08	NW x W ½ W
30 56		120 56		210 56		300 56	
33 45	NE x N	123 45	SE x E	213 45	SW x S	303 45	NW x W
36 34		126 34		216 34		306 34	
39 23	NE ½ N	129 23	SE ½ E	219 23	SW ½ S	309 23	NW ½ W
42 11		132 11		222 11		312 11	
45 00	NE	135 00	SE	225 00	SW	315 00	NW
47 49		137 49		227 49		317 49	
50 38	NE ½ E	140 38	SE ½ S	230 38	SW ½ W	320 38	NW ½ N
53 26		143 26		233 26		323 26	
56 15	NE x E	146 15	SE x S	236 15	SW x W	326 15	NW x N
59 04		149 04		239 04		329 04	
61 53	NE x E ½ E	151 53	SSE ½ E	241 53	SW x W ½ W	331 53	NNW ½ W
64 41		154 41		244 41		334 41	
67 30	ENE	157 30	SSE	247 30	WSW	337 30	NNW
70 19		160 19		250 19		340 19	
73 08	ENE ½ E	163 08	S x E ½ E	253 08	WSW ½ W	343 08	N x W ½ W
75 56		165 56		255 56		345 56	
78 45	E x N	168 45	S x E	258 45	W x S	348 45	N x W
81 34		171 34		261 34		351 34	
84 23	E ½ N	174 23	S ½ E	264 23	W ½ S	354 23	N ½ W
87 11		177 11		267 11		357 11	

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.12 feet or 1,852 meters 1 statute mile = 5,280 feet or 1,609.35 meters

Nautical miles	0	1	2	3	4	5	6	7	8	9
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.769	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.126	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.483	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.840	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.197	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.554	81.705	82.856	84.007	85.158	86.308	87.459	88.610	89.761	90.911
80	92.062	93.213	94.364	95.515	96.665	97.816	98.967	100.118	101.268	102.419
90	103.570	104.721	105.871	107.022	108.173	109.324	110.475	111.625	112.776	113.927

STATUTE MILES TO INTERNATIONAL NAUTICAL MILES

Statute miles	0	1	2	3	4	5	6	7	8	9
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.249	19.118	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.746	55.615	56.484	57.353	58.222	59.091	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029

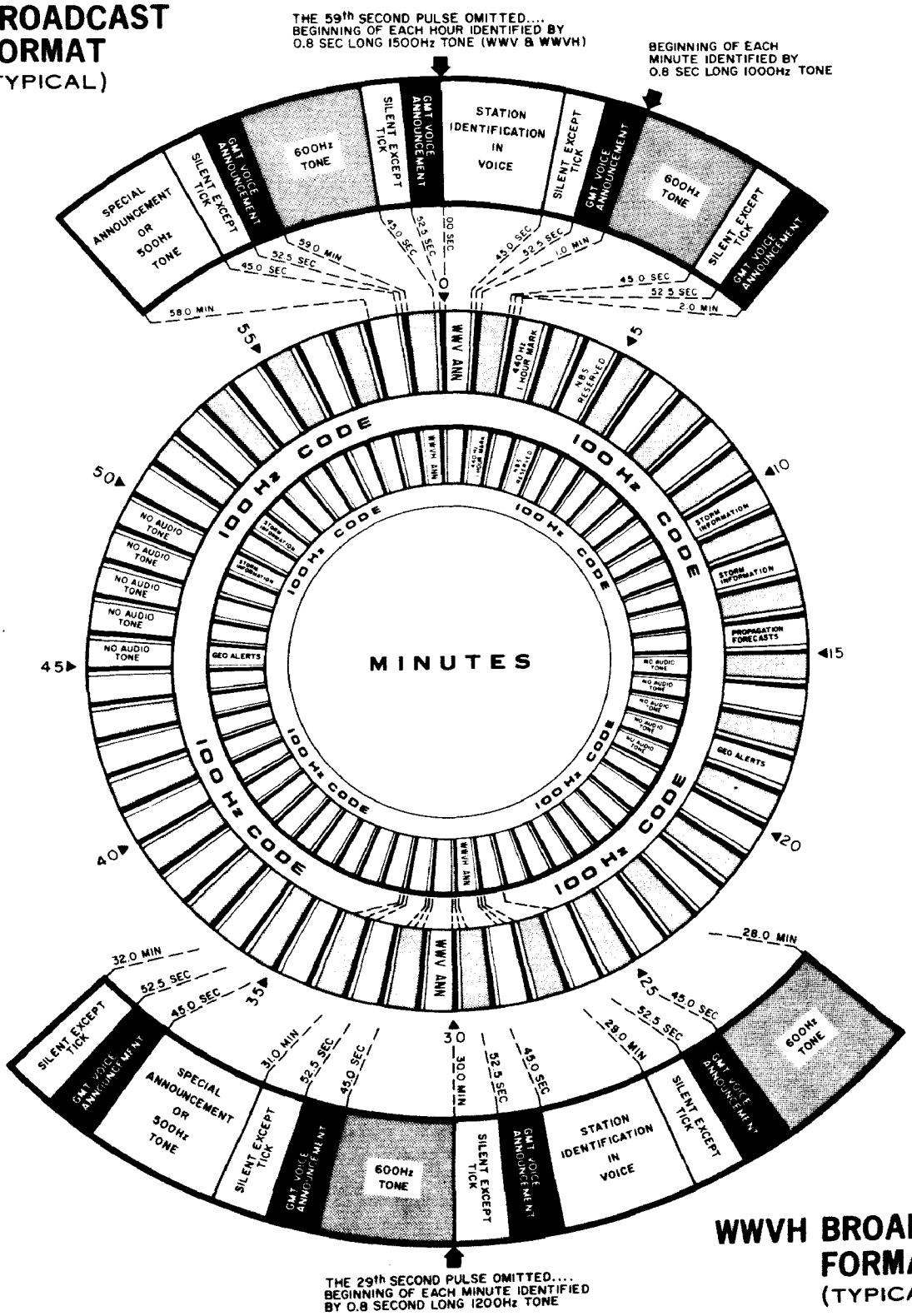
FEET TO METERS

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

METERS TO FEET

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

WWV BROADCAST FORMAT (TYPICAL)



WWVH BROADCAST FORMAT (TYPICAL)

THE 29th SECOND PULSE OMITTED....
BEGINNING OF EACH MINUTE IDENTIFIED
BY 0.8 SECOND LONG 1200Hz TONE

97935

Form Approved. OMB No. 41-R2455

NOAA FORM 77-6
(10-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

COAST PILOT REPORT

PLEASE MAIL TO:

Director
National Ocean Survey
National Oceanic and Atmospheric Administration
ATTENTION: C324
Rockville, Maryland 20852

This record of your experience and observations when coasting, entering port, and/or following inside channels will be used to correct, amplify, or confirm the description now given in the Coast Pilot.

Please use additional sheets if more space is needed.

Additional report forms will be provided upon receipt of each report.

GEOGRAPHIC LOCATION			
LATITUDE	LONGITUDE	CHART NUMBER	COAST PILOT NUMBER
VESSEL		MASTER/COMMANDING OFFICER	
DATE OF OBSERVATION		OBSERVER	

I. LANDMARKS: Mention those visible from seaward and useful for navigation (day and/or night); include natural ranges and indicate the pair of marks forming a range. Photographs of landmarks difficult to describe are solicited; each view should be labeled with the distance off and the direction towards which the camera was pointed.

TYPE	CHARTED		LATITUDE	LONGITUDE	DESCRIPTIVE INFORMATION HELPFUL IN IDENTIFICATION
	YES	NO	*(Approximate)*		

II. RADAR: List best radar targets and, if known, give maximum useful radar range at which the object can be positively identified and used. Mention under remarks places you have observed radar returns to be misleading.

NAME OR TYPE OF FEATURE *(Include approximate latitude and longitude if necessary to identify on chart)*	MAXIMUM USEFUL RANGE

III. ROUTES: Where entrance and inside routes are not marked by aids to navigation, show recommended directions for Coast Pilot (latitude and longitude of entrance point, and distances and true courses made good); include natural steering ranges if available.

USCOMM-DC 4694-P73

IV. DANGERS: Mention those of concern to the navigator where special caution should be indicated in the Coast Pilot.

V. CURRENTS: Indicate places you have experienced conditions of current where special caution should be mentioned in the Coast Pilot.

VI. ANCHORAGES: Mention best anchorage in the area and other secure anchorages having good holding ground.

LOCATION *(Include anchorage bearings and natural ranges if available)*

TYPE OF BOTTOM OBSERVED:

	EXCEL.	GOOD	FAIR	POOR	COMMENT
HOLDING QUALITY					
PROTECTION OFFERED					
ACCESSABILITY					

RECOMMENDED FOR VESSELS:

LENGTH	DRAFT
____ TO ____ FT.	____ TO ____ FT.

VII. REMARKS:

VIII. OTHER COAST PILOT CHANGES

U.S. COAST PILOT

NUMBER	EDITION	PAGE	LINE(S)

NOTE: Any chart(s) submitted with your report to show conditions will be replaced free of charge.

READ: STRIKE OUT: INSERT AFTER: *(Circle one)*

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