VK
401
.N32
8th ed.
(1973)

U.S. DEPARTMENT OF COMMERCE
Peter G. Peterson, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White, Administrator
NATIONAL OCEAN SURVEY
Allen L. Powell, Director

United States Coast Pilot 2

EIGHTH EDITION - 1973

ATLANTIC COAST

Cape Cod to Sandy Hook

Corrected through:

Local Notices to Mariners issued by Coast Guard District Commanders, October 18, 1972

Weekly Notice to Mariners published by Defense Mapping Agency Hydrographic Center, No. 48, November 25, 1972.

Next edition, about January 1974

LIBRARY
Recatalogued
AUG 17 1994
N.O.A.A.
U.S. Dept. of Commerce

Washington, D.C.: 1973
For sale by the National Ocean Survey and its sales agents
Price $2.00

National Oceanic and Atmospheric Administration

Climate Database Modernization Program

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages
Faded or light ink
Binding intrudes into the text

This document has been imaged through the NOAA Climate Database Modernization Program. To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or www.reference@nodc.noaa.gov.

LASON
Imaging Subcontractor
12200 Kiln Court
Beltsville, MD 20704-1387
March 28, 2002

LIMITS OF UNITED STATES COAST PILOTS

Atlantic Coast

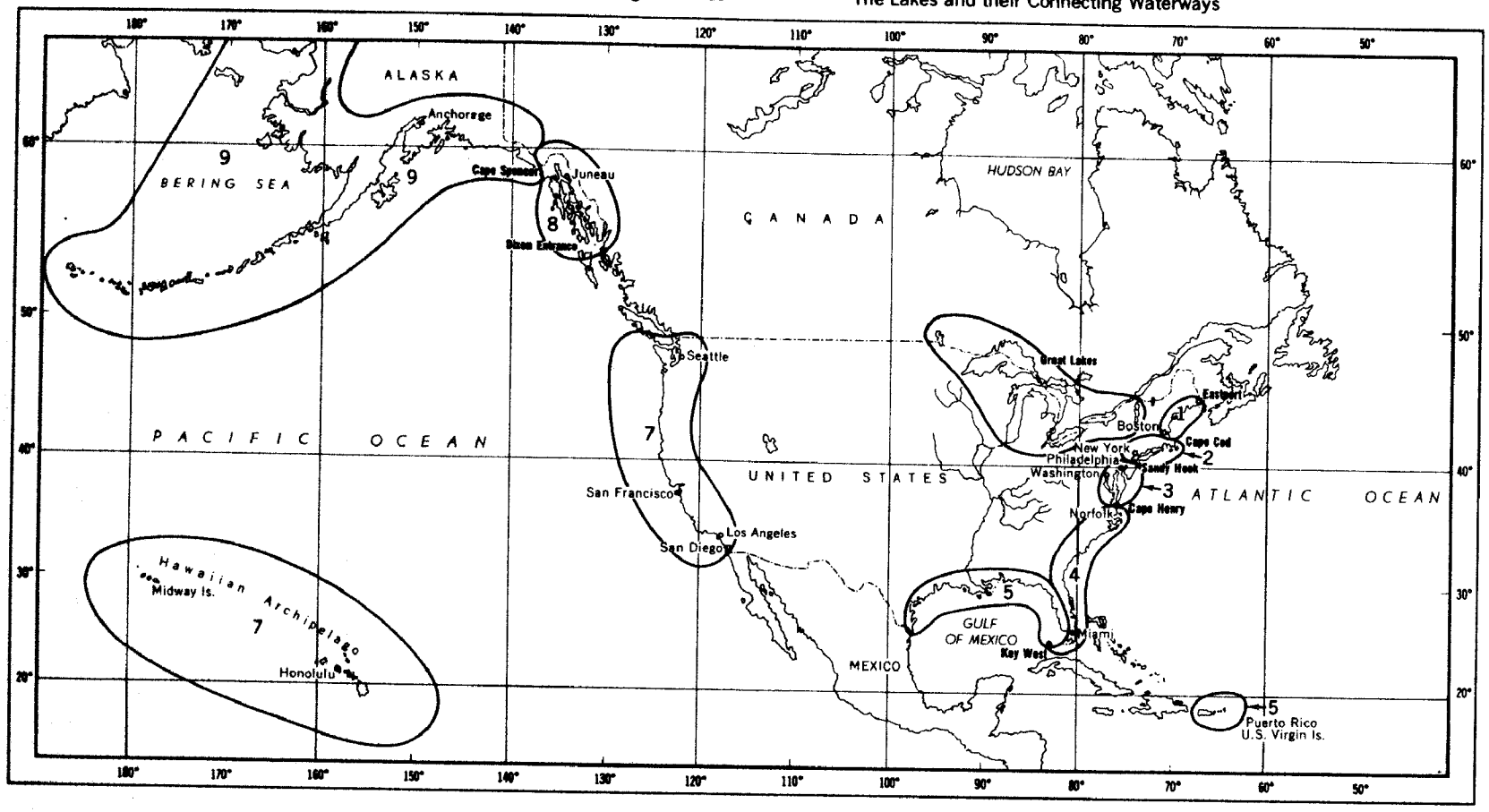
1 Eastport to Cape Cod
2 Cape Cod to Sandy Hook
3 Sandy Hook to Cape Henry
4 Cape Henry to Key West
5 Gulf of Mexico, Puerto Rico, and Virgin Islands

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 Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook, is published by the National Ocean Survey, pursuant to Public Law 80–373 as amended, (33 USC 883a and b). 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.

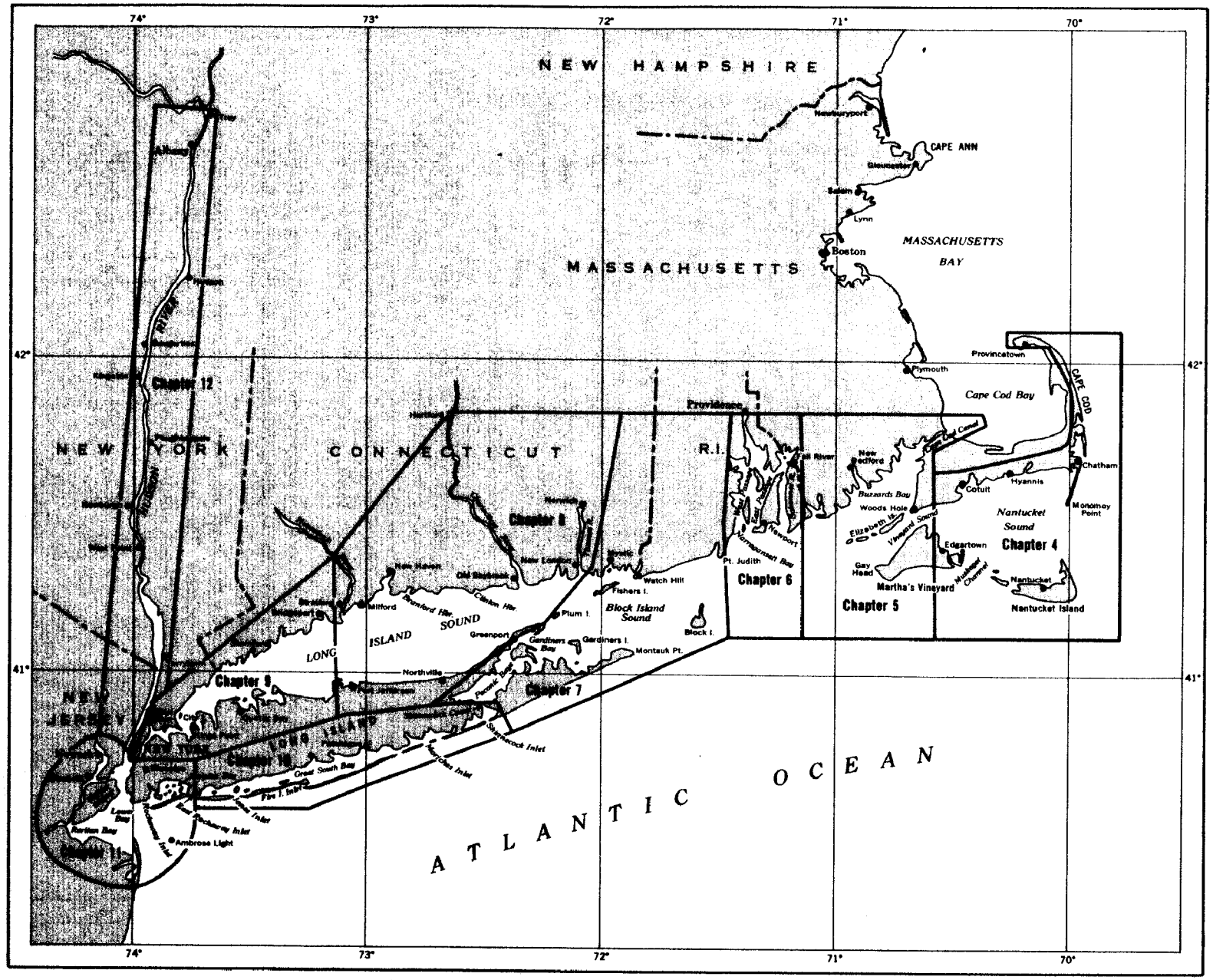
Coast Pilot 2 supplements the navigational information shown on the marine charts of the area, and is based upon the work of the National Ocean Survey and updated by reports from other Federal agencies, State and local governments, maritime associations, port authorities, mariners, and others. New editions are published about every 5 years after field observations have been made by the National Ocean Survey 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.

The Eighth (1973) Edition, which supersedes the Seventh (1966) Edition, is a new edition and includes the July-December 1971 field observations of Lieutenant Clarence W. Tignor, USNOAA. Subsequent issues are updated editions and include information published in notices to mariners, reports from maritime organizations, and reports from National Ocean Survey vessels that have performed hydrographic surveys in areas covered by Coast Pilot 2. The tables which follow the appendix are usually updated about every 5 years when new editions are published. The Coast Pilot is corrected through dates of Notices to Mariners shown on the title page.

Mariners and others are urged to report promptly to the National Ocean Survey 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 printed in the Weekly Notice to Mariners for your convenience.

Errors or omissions found in the book 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 2 will be published annually.



COAST PILOT 2 - GRAPHIC CHAPTER INDEX

Contents

	Page
Preface	III
Chapter 1. General Information	1
Chapter 2. Navigation Regulations	23
Chapter 3. Cape Cod to Sandy Hook	75
Chapter 4. Outer Cape Cod and Nantucket Sound	89
Chapter 5. Vineyard Sound and Buzzards Bay	105
Chapter 6. Narragansett Bay	124
Chapter 7. Block Island Sound	139
Chapter 8. Eastern Long Island Sound	156
Chapter 9. Western Long Island Sound	179
Chapter 10. South Coast of Long Island	205
Chapter 11. New York Harbor	215
Chapter 12. Hudson River	234
Appendix	245
Tables	(Follow Appendix)
Climatological	T-1
Meteorological	T-5
Mean Surface Water Temperatures and Densities	T-6
Beaufort Scale of Wind Force	T-7
Small Craft, Gale, Storm and Hurricane Warnings	T-8
Distance Tables	T-9
Radio Bearing Conversion Table	T-13
Distance of Visibility of Objects at Sea and Conversion Table, Degrees to Points and Vice Versa	T-14
Conversion Tables	T-15
WWV and WWVH Broadcast Formats	T-16
Coast Pilot Report	T-17
Index	(Follows Tables)

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 and 4 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.

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 current 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, 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 7 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 the National Ocean Survey 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.—All times are given in local standard time in the 24-hour system (i.e., noon is 1200, 2:00 p.m. is 1400, and midnight is 0000 unless otherwise stated.)

Winds.—Directions are the true directions from which the winds blow. Speeds are 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 the National Ocean Survey 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 perused 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 National Ocean Survey charts and related publications is usually published in the Notices to Mariners, the local district engineer office should be consulted where depth information is critical.

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

Vessels operating within the limits of the Coast Guard districts can obtain information affecting National Ocean Survey 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, National Ocean Survey 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.

Bureau of Customs, Department of the Treasury.—The Bureau of Customs 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 Bureau of Customs 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 Bureau of Customs may issue, without charge, a **cruising license**, valid for a period of up to six 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. United States 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 the National Ocean Survey 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, 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 National Ocean Survey basic field surveys, supplemented by data from other Government organizations.

Tide Tables are issued annually by the National Ocean Survey in advance of the year for which they are prepared. These tables include predicted times and heights of high and low waters for every day in the year for a number of reference stations and differences for obtaining similar predictions for numerous other places. They also include other useful information such as a method 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, land-locked harbors, or on tidal rivers, the time of slack current may differ by several hours from the time of high or low water. The relation of the times of high or low water to the turning of the current depends upon a number of factors, so that no simple general rule can be given. To obtain the times of slack water, reference should be made to the Tidal Current Tables.

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

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

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 U.S. 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 United States 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 ice breaking 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, New York 10004; Commander, Western Area, U.S. Coast Guard, 630 Sansome Street, San Francisco, California 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 PROCEDURES.

Light Lists, published by the Coast Guard, describe aids to navigation, consisting of lights,

fog signals, buoys, lightships, daybeacons, and electronic aids, in U.S. (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 in such 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.

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 copied into 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".

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 United States ports; see appendix. 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, Radio Weather 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; it also administers foreign and domestic quarantine laws and conducts medical examinations of aliens.

A vessel arriving at a port under the control of the United States shall undergo **quarantine** inspection prior to entry unless exempted from such inspection by section 71.46 or 71.47 of Foreign Quarantine Regulations (42 CFR Part 71), and Supplemental Provisions, of the Public Health Service, Department of Health, Education, and Welfare.

Vessels subject to quarantine inspection shall upon arrival at ports under the control of the United States fly a yellow flag, and await inspection, as provided in section 71.62 of Foreign Quarantine Regulations. Only the pilot shall board or be permitted to board any vessel subject to quarantine inspection until after it has been inspected by the quarantine officer and granted pratique, except with the permission of the quarantine officer. A person boarding such vessel shall be subject to the same restrictions as those imposed on the persons on the vessel. No person shall leave or be permitted to leave any vessel subject to quarantine inspection until after it has been granted pratique, except with the permission of the quarantine officer.

Vessels subject to quarantine inspection may apply for and receive pratique by radio. Requests for radio pratique should be made in accordance with instructions on the Maritime Quarantine Declaration (HSM 13.19, 7-69) and addressed directly to the vessel's agent for relay to the quarantine station. Upon evaluation of information contained in the radio message, either radio free or radio provisional pratique will be granted to the vessel. In the case of radio free pratique, the vessel may proceed directly to dockside without inspection by a quarantine officer. Vessels granted radio provisional pratique may proceed to dockside for partial or complete inspection, depending upon the evaluation of the radio message received.

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

National quarantine regulations will be found at the stations of the Public Health Service and at United States consulates and will be furnished to vessels upon application to officers of the Service or to Director, Foreign Quarantine Program, Center for Disease Control, Atlanta, Georgia 30333.

United States merchant seamen are entitled to **medical relief** obtainable through the Public Health Service. A United States seaman is one engaged on board in care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service, on board, of those so engaged. Hospitals, outpatient clinics, and 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, for summarization and publication of climatological data having general value and applicability, and for research basic to improvement of the national weather service.

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. The 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. The NWS supplies shipmasters with blank forms, printed instructions, and such other materials as is essential to the making and recording of observations. In the course of an average peacetime year, more than 400,000 observations are received from vessels representing every maritime nation and reaching every quarter of the globe.

The **hurricane and storm warning service** was established primarily to aid marine interests. Warnings are issued whenever winds, weather, 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, daily newspapers, government and commercial radio, and by storm warning displays. 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.

The 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 more than 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 the NWS.

DISTRESS SIGNALS AND 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 one 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 (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).

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 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.

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.

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 and after its arrival.

When requesting helicopter assistance:

(1) Give the accurate position, time, speed, course, weather conditions, sea conditions, wind direction and velocity, type of vessel, 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 search lights vertically to aid the flight crew in locating the ship and turn them off when the helicopter is on the scene.

(5) Be sure and 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 envolope 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 he shoots.

(3) Have material ready for chafing gear.

Surface ship procedures for assisting an aircraft that must ditch.—The following are recommended procedures for assisting an aircraft that desires to ditch alongside:

By day: (1) Establish a radiotelephone watch on 2182 kHz if equipped. Attempt to contact the aircraft on this frequency.

(2) Maintain a radiotelegraphy watch on 500 kHz. The Rescue Coordination Center controlling the case will try to contact the ship on this frequency via a shore radio station. Communications with the aircraft may have to be relayed in this manner.

(3) Be prepared to send homing signals for the aircraft on 410 kHz or 522 kHz.

(4) Provide black smoke if possible to aid aircraft in sighting the ship.

(5) Post extra lookouts.

(6) Prepare to stop vessel or proceed towards plane according to circumstances.

(7) Have two lifeboats and lifeboat crews ready. Include in each lifeboat two ring buoys with buoyant heaving lines, and fire extinguishers.

(8) Have medicine chest, stretchers, blankets, hot drinks and food ready.

(9) Have ships' hospital prepared to receive injured persons.

(10) Rig Jacobs ladders. Rig cargo net or rope mail sling on lee side amidships by cargo boom, to be used if necessary to heave up exhausted survivors. Injured persons should be left in the lifeboat to be hoisted aboard with it.

(11) Be prepared to give aircraft information on weather and sea conditions. Aircraft will want to know wind direction and force; direction, height, and length of primary and secondary swell systems. If pilot selects ditch heading in sufficient time and conditions otherwise permit, lay foam path along ditching course.

(12) When aircraft is in sight set course parallel to ditch heading that pilot has chosen. If not in communication with the aircraft by the time the plane is sighted and unable to obtain pilot's ditch heading, set course parallel to the main swell system and into the wind component, if any.

(13) If on board, use a liferaft or buoyant apparatus in water as a landing platform at the Jacobs ladder.

(14) Instruct coxswains to recover those survivors in the water or clinging to wreckage before recovering those in liferafts.

(15) Keep the Rescue Coordination Center advised by radio, prior to, and subsequent to ditching.

By night.—In addition to procedures recommended for daytime, the following are also recommended if the emergency occurs at night:

(1) Lay a string of not less than 6 ring buoys with water lights approximately 500 feet apart in a single line along the ditch heading received from the pilot. Take station two-thirds down the lighted lane off to one side. The aircraft will attempt to land close to the lighted lane. Do not use carbide water lights because of the danger of gasoline on the water.

(2) Light up the ship with all fixed deck lights and rig cargo lights on masts, king posts, top of decks, etc., if possible.

(3) Use searchlights as visual beacons, shining one vertically and sweeping the sky at 15° off the horizon with the other. Do not shine lights toward the aircraft at any time, since this would blind the pilot.

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 118.

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 the 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 ship of the United States 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 the NWS in furnishing these special reports in order that warnings to shipping and coastal areas may be issued.

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

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

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 **United States Naval Observatory,** Washington, D.C., makes time signals 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, Colorado (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 7½ 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 sec.

Standard Time Intervals.—An audio pulse (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. See appendix for diagram of detailed tone broadcast schedules.

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, Colorado, 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 10th and 12th minute of each hour from WWV and at the 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, Silver Spring, Maryland, 20910.

"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, Colorado 80302. Quantities may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 at 25 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 listed on the SC series of charts. 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 National Ocean Survey 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 obsolete, further use of the chart for navigation may be dangerous. Announcements of new editions of nautical charts are usually published in notices to mariners. A monthly 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.

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, 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 bluetint 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 lay on the ocean floor. Warning signs are often posted to warn mariners of their existence.

The installation of submarine cables or pipelines in United States waters or the continental shelf of the U.S. 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 the National Ocean Survey 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, are 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' adherance 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 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 rip-rap 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 that 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 navigator should check the position by shore bearings, soundings, or other means, and not rely entirely on a buoy being on its charted position and showing its proper characteristic. Buoys are liable to be carried away, shifted, capsized, or sunk as a result of storms, ice conditions, collision, or other accident. Lighted buoys may become extinguished or show improper characteristics, or sound buoys may not function because of storm, ice, or collision.

The charted position of a buoy is the location of its sinker. Since a buoy is moored to it by varying lengths of chain, the position shifts due to wind and current; a vessel attempting to pass close aboard always risks collision with a yawing buoy.

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

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

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

Temporary changes in aids are not included on the charts.

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

A vessel steering a course for a radiobeacon should observe the same precautions as when steering for a light or any other mark. If the radiobeacon is aboard a lightship, particular care should be exercised to avoid the possibility of collision, and sole reliance should never be placed on sighting the lightship or hearing its fog signal. If there are no dependable means by which the vessel's position may be fixed and the course changed well before reaching the lightship, a course should be selected that will 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 is given in the appendix for the conversion of a radio bearing into a Mercator bearing. 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. The National Ocean Survey shows Loran lines on general charts of the United States 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 two nautical miles per microsecond and, therefore, should be avoided whenever possible. Loran is a long-range aid to navigation and should not normally be used in pilot waters. The use of skywaves is not recommended within 250 miles of either station.

Caution must be used in matching loran signals to insure that the ground wave signal of one station is not unknowingly matched with a skywave signal of the other station of the pair, or a one-hop skywave signal from station with a two-hop skywave signal from the other.

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, the 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 signs, use distinctive standard shape marks to show regulatory information. The signs are white with black letters, and have a wide orange border. They signify speed zones, restricted areas, danger areas, and directions to various places. Aids to navigation on state waters use red and black buoys to mark channel limits. Red and black buoys are generally used in pairs. The boat should pass between the red buoy and its companion black buoy. If the buoys are not placed in pairs, the distinctive color of the buoy indicates the direction of dangerous water from the buoy. White buoys with red tops should be passed to the 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 Administration is headquarters of a warning system which has field reporting stations (seismic and tidal) in most countries around the Pacific. When a warning is broadcast, waterfront areas should be vacated

for higher ground, and ships in the vicinity of land should head for the deep water of the open sea.

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

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

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

SPECIAL SIGNALS FOR CERTAIN VESSELS

Special signals for surveying vessels.—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 ves-

sels, 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 2 or 3 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 (1 prolonged blast followed by 2 short blasts).

Submarine emergency identification signals.—United States 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 fifteen to forty-five seconds. The flares or stars are propelled to a height of three hundred to four hundred feet from which they descend by small parachute. The flares or stars burn for about twenty-five 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. Naval 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 Naval 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 life jackets and other floating objects; ejection of emergency transmitter buoy, which sends the CW coded signal "SOS SUB SUNK SOS" on 121.5 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 18, Part 610 and Title 33. Parts 152—154.

Other requirements for the protection of navigable waters.—United States 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 log rafts 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 United States control, will be subject to control by agencies of the United States Government. The allocation and employment of such vessels, and of domestic port facilities, equipment, and services will be performed by appropriate agencies of the War Transport Administration. The movement, routing, and diversion of merchant ships at sea will be controlled by appropriate naval commanders. The movement of merchant ships within domestic ports and dispersal anchorages will be coordinated by the U.S. Coast Guard. The commencement of naval control will be signalled by a general emergency message. See 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 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 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 Channel 13 (156.65 MHz),the Bridge-to-Bridge Radiotelephone frequency, in addition to 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 2. 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 is (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 hire while navigating;

(3) Every towing vessel of 28 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 Communication 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) Wherever 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 S.W., Washington, D.C. 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. [Reserved]

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.

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

82.15 Nantucket Sound, Vineyard Sound, Buzzard's Bay, Narragansett Bay, Block Island Sound, and easterly entrance to Long Island Sound.

(a) A line drawn from Chatham Light to Pollock Rip Lighted Horn Buoy "PR"; thence to Great Round Shoal Channel Entrance Lighted Whistle Buoy "GRS"; thence to Sankaty Head Light.

(b) A line drawn from the westernmost extremity of Smith Point, Nantucket Island, to No Mans Land Lighted Whistle Buoy 2; thence to Gay Head Light; thence to Block Island Southeast Light; thence to Montauk Point Light on the easterly end of Long Island, N.Y.

82.20 New York Harbor. A line drawn from East Rockaway Inlet Breakwater Light to Ambrose Light; thence to Highlands Light (north tower).

PART 110—ANCHORAGE REGULATIONS

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

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

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

Subpart A—Special Anchorage Areas

110.38 Edgartown Harbor, Mass. An area in the inner harbor easterly of the project channel and south of Chappaquiddick Point bounded as follows: Beginning at latitude 41°23′19″, longitude 70°30′32″; thence southeasterly along the shore to latitude 41°22′52″, longitude 70°30′12″; thence 287°30′ 1,600 feet; thence 327°30′, 700 feet; thence 359° true, 800 feet; thence 24°15′ approximately 900 feet to the point of beginning.

NOTE: The area is reserved for yachts and other small recreational craft. Fore and aft moorings and temporary floats or buoys for marking anchors in place will be allowed. All moorings shall be so placed that no vessel when anchored shall extend into waters beyond the limits of the area. Fixed mooring piles or stakes are prohibited.

110.40 Silver Beach Harbor, North Falmouth, Mass. All the waters of the harbor northward of the inner end of the entrance channel.

110.45 Onset Bay, Mass. Northerly of a line extending from the northernmost point of Onset Island to the easternmost point of Wickets Island; easterly of a line extending from the easternmost point of Wickets Island to the southwest extremity of Point Independence; southerly of the shore line; and westerly of the shore line and of a line bearing due north from the northernmost point of Onset Island.

110.47 Little Narragansett Bay, Watch Hill, R.I. All of the navigable waters of Watch Hill Cove southeasterly of a line beginning at the shore end of the United States project groin on the southerly shore of the cove and running 41°30′ true, to the northerly shore of the cove at a point about 200 feet west of the west side of the shore end of Meadow Lane, with the exception of a 100-foot wide channel running from the westerly end of the cove in a southeasterly direction to the Watch Hill Yacht Club pier, thence along in front of the piers on the easterly side of the cove northerly to the shore at the north end of the cove.

110.48 Thompson Cove on east side of Pawcatuck River below Westerly, R.I. Eastward of a line extending from the channelward end of Thompson Dock at the northern end of Thompson Cove 184° to the shore at the southern end of Thompson Cove.

110.50 Stonington Harbor, Conn. (a) Area No. 1. Beginning at the southeastern tip of Wamphassuc Point; thence to the northwesterly end of Stonington Inner Breakwater; thence along the breakwater to longitude 71°54′50.5″; thence to latitude 41°20′25.3″, longitude 71°54′50.5″; thence to a point on the shoreline at latitude 41°20′32″, longitude 71°54′54.8″; thence along the shoreline to the point of beginning.

(b) Area No. 2. Beginning at a point on the shoreline at latitude 41°19′55.8″, longitude 71°54′28.9″; thence to latitude 41°19′55.8″, longitude 71°54′37.1″; thence to latitude 41°20′01.6″, longitude 71°54′38.8″; thence to a point on the shoreline at latitude 41°20′02″, longitude 71°54′34.3″; thence along the shoreline to the point of beginning.

(c) Area No. 3. Beginning at a point on the shoreline at latitude 41°20′29.5″, longitude 71°54′43″; thence to latitude 41°20′25.6″, longitude 71°54′48.5″; thence to latitude 41°20′10.7″, longitude 71°54′48.5″; thence to the shoreline at latitude 41°20′10.7″; thence along the shoreline to the point of beginning.

NOTE: A fixed mooring stake or pile is prohibited. The General Statutes of the State of Connecticut authorizes the Harbor Master of Stonington to station and control a vessel in the harbor.

110.50a Fishers Island Sound, Stonington, Conn. An area on the east side of Mason Island bounded as follows:

Beginning at the shore line on the easterly side of Mason Island at latitude 41°20′06″; thence due east about 600 feet to latitude 41°20′06″, longitude 71°57′37″; thence due south about 2,400 feet to latitude 41°19′42″, longitude 71°57′37″; thence due west about 1,000 feet to the shore line on the easterly side of Mason Island at latitude 41°19′42″; thence along the shore line 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 will be prohibited. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction and the discretion of the local Harbor Master.

110.50b Mystic Harbor, Groton and Stonington, Conn. (a) Area No. 1. Beginning at Ram Point on the westerly side of Mason Island at latitude 41°19′44″, longitude 71°58′42″; thence to latitude

41°19′30″, longitude 71°58′43″; thence to latitude 41°19′36″, longitude 71°58′58″; thence to latitude 41°19′45″, longitude 71°58′56″; thence to the point of beginning.

(b) Area No. 2. Beginning at a point about 250 feet southerly of Area 1 and on line with the easterly limit of Area 1 at latitude 41°19′27″ longitude 71°58′44″; thence to latitude 41°19′19″, longitude 71°58′45″; thence to latitude 41°19′25″, longitude 71°58′59″; thence to latitude 41°19′33″, longitude 71°58′58″; thence 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. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the areas. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction and at the discretion of the local Harbor Master.

110.50c Mumford Cove, Groton, Conn. (a) Area No. 1. Beginning at a point on the easterly shore of Mumford Cove at latitude 41°19′36″, longitude 72°01′06″; thence to latitude 41°19′30″, longitude 72°01′04″; thence to the shoreline at latitude 41°19′31″, longitude 72°01′00″; and thence along the shoreline to the point of beginning.

(b) Area No. 2. Beginning at a point on the easterly shore of Mumford Cove at latitude 41°19′15″, longitude 72°00′54″; thence to latitude 41°19′14.5″, longitude 72°00′59″; thence to latitude 41°19′11″, longitude 72°00′58″; thence to latitude 41°19′10″, longitude 72°00′54″; thence to latitude 41°19′12.5″, longitude 72°00′52″; thence to latitude 41°19′14″, longitude 72°00′55″; and thence to the point of beginning.

NOTE. The areas are 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 placing of temporary moorings will be under the jurisdiction, and at the discretion, of the local Harbor Master.

110.50d Mystic Harbor, Noank, Conn. (a) The area comprises that portion of the harbor off the easterly side of Morgan Point beginning at a point at latitude 41°19′15″, longitude 71°59′13.5″; thence to latitude 41°19′15″, longitude 71°59′00″; thence to latitude 41°19′02.5″, longitude 71°59′00″; thence to latitude 41°19′06″, longitude 71°59′13.5″; and thence 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 extend beyond the limits of the area.

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

110.51 Groton, Conn. The waters between an unnamed cove and Pine Island. (a) Beginning at a point on the shoreline of Avery Point at latitude 41°19′01″, longitude 72°03′45″; thence to a point in the cove at latitude 41°19′02″, longitude 72°03′38″; thence southerly to a point at latitude 41°18′56.6″, longitude 72°03′36″; thence northeasterly to a point at latitude 41°19′03″, longitude 72°03′21.4″; thence terminating at the tip of Jupiter Point at latitude 41°19′04″, longitude 72°03′21.5″.

(b) Beginning at a point on the shoreline of Pine Island at latitude 41°18′47″, longitude 72°03′37″; thence to latitude 41°18′54.5″, longitude 72°03′35.5″; thence northeasterly to a point at latitude 41°19′0.07″, longitude 72°03′21″; thence terminating at a point at latitude 41°18′53.8″, longitude 72°03′19″.

NOTE: The areas designated by (a) and (b) of this section are principally for vessels used for recreational purposes. Vessels shall be anchored so that no part of the vessel obstructs the 75 yard wide channel. Temporary floats or buoys for marking the location of the anchor of a vessel at anchor may be used. Fixed mooring piles or stakes are prohibited.

110.52 Thames River, New London, Conn. (a) Area No. 1. An area in the westerly part of Greens Harbor bounded as follows: Beginning at a point on the shore 100 yards southeasterly of the southerly side of Thames Street extended; thence 84°, 420 yards; thence 156°, 425 yards; thence 240°, 210 yards to the shore; and thence northwesterly along the shore to the point of beginning.

(b) Area No. 2. An area in the westerly part of Greens Harbor bounded as follows: Beginning at a point on the shore 15 yards southeasterly of the southerly side of Converse Place extended; thence 54°, 170 yards; thence 114°30′, 550 yards; thence 266°30′, 250 yards; thence 234°, 230 yards, to the shore; and thence northwesterly along the shore to the point of beginning.

110.53 Niantic, Conn. Beginning on the shoreline at latitude 41°18′25.3″, longitude 72°12′16.3″; thence to latitude 41°18′23.3″, longitude 72°12′11.6″; thence to latitude 41°18′50.7″, longitude 72°11′51.5″; thence to the shoreline at latitude 41°18′56.5″, longitude 72°12′05.6″; thence along the shoreline to the point of beginning.

NOTE: This area is for public use, principally for vessels used for a recreational purpose. A temporary float or buoy for marking the location of the anchor of a vessel at anchor may be used. Fixed mooring piles or stakes are prohibited.

110.54 Long Island Sound, on west side of entrance to Pataguanset River, Conn. An area east of Giants Neck (formerly known as Grant Neck) described as follows: Beginning at a point bearing 114°, 75 feet, from the outer end of the breakwater at the south end of Giants Neck; thence 90°, 1,050 feet; thence 22°17′30″, 2,140 feet; thence 283°27′15.5″, 240 feet; thence 220°36′39″, 1,252.6

feet; thence 295°23′16.5″, 326.5 feet; thence 269°02′42.6″, 240 feet; thence 261°46′50.9″, 181.9 feet; thence 226°28′07.7″, 275.9 feet; thence 147°43′27.7″, 449.4 feet; thence 238°01′35.8″, 379.6 feet; and thence approximately 156°31′05.8″, 462.11 feet, to the point of beginning.

110.55 Connecticut River, Conn. (a) West of Calves Island at Old Saybrook. Beginning at a point bearing 254°09′16″, 153 yards, from Calves Island 20 Light; thence 157°, 1,037 yards; thence 175°, 150 yards; thence 265°, 250 yards; thence 350°, 660 yards; thence 337°, 460 yards; and thence approximately 67°, 135 yards, to the point of beginning.

(a-1) Area No. 1, at Essex. Beginning at a point on the shore on the west side of Haydens Point bearing approximately 211°, 270 yards, from Haydens Point Light; thence 270°, 160 yards; thence due north, 140 yards; thence 300°, 190 yards; thence 330°, 400 yards; thence 90°, 60 yards; thence 150°, 350 yards; thence 120°, about 434 yards to a point on the shore; thence along the shore southwesterly to the point of beginning.

(b) Area No. 2, at Essex. Beginning at a point latitude 41°21′22″, longitude 72°22′53″; thence 205°30′, 375 yards; thence 194°31′, 100 yards; thence 185°00′, 440 yards; thence 153°30′, 80 yards; thence 121°00′, 220 yards; thence due north approximately 1060 yards 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. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction and at the discretion of the local Harbor Master.

(c) West of Brockway Island at Essex. That portion of the waters northwest of a line ranging 238° from latitude 41°22′20.7″, longitude 72°22′49.8″ to the shoreline; southwest of a line connecting a point at latitude 41°22′20.7″, longitude 72°22′49.8″ and a point at latitude 41°22′28.2″, longitude 72°22′56″; and southeast of a line ranging 238° from latitude 41°22′28.2″, longitude 72°22′56″ to the shoreline.

NOTE: This area is principally for vessels used for a recreational purpose. A mooring buoy is permitted. Fixed mooring piles or stakes are prohibited.

(d) Area No. 1, at Eddy Rock Light. Beginning at latitude 41°26′38″, longitude 72°27′37″; thence extending southeasterly to latitude 41°26′12″, longitude 72°27′18″; thence extending westerly to latitude 41°26′11″, longitude 72°27′22″; thence extending northwesterly to latitude 41°26′23″, longitude 72°27′42″; thence extending northerly to latitude 41°26′36″, longitude 72°27′43″; thence extending easterly to the point of beginning.

(e) Area No. 2, at Lord Island. Beginning at latitude 41°26′11″, longitude 72°27′16″; thence extending south southeasterly to latitude 41°26′03″, longitude 72°27′02″; thence extending southeasterly to latitude 41°25′59″, longitude 72°26′51″; thence extending southwesterly to latitude 41°25′58″, longitude 72°26′52″; thence extending northwesterly to latitude 41°26′05″, longitude 72°27′11″; thence extending north northwesterly to latitude 41°26′10″, longitude 72°27′20″; thence extending easterly to the point of beginning.

NOTE: The areas designated by paragraphs (d) and (e) of this section are 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 areas. The anchoring of vessels and placing of mooring floats or buoys will be under the jurisdiction, and at the discretion of the local Harbor Master. Area 2 will not be used during the shad fishing season.

(e-1) Area No. 1 at Chester. Beginning at a point about 600 feet southeasterly of the entrance of Chester Creek, at latitude 41°24′23″, longitude 72°25′41″; thence due south about 1,800 feet to latitude 41°24′05″, longitude 72°25′41″; thence due east about 600 feet to latitude 41°24′05″, longitude 72°25′32″; thence due north about 1,800 feet to latitude 41°24′23″, longitude 72°25′32″; thence due west about 600 feet to the point of beginning.

NOTE: The area is principally for use by yachts and other recreational craft. A mooring buoy is allowed. Fixed mooring piles or stakes are prohibited.

(e-2) Area No. 2 at Chester. That area south of latitude 41°24′43.9″, west of longitude 72°25′35″, north of latitude 41°24′33.4″, and east of longitude 72°25′40.8″.

NOTE: Area No. 2 may not be used during the shad fishing season, April 1 to June 15, inclusive. A mooring buoy is permitted at other times. Fixed mooring piles or stakes are prohibited.

(f) Vicinity of Mouse Island Bar below Portland. On the north side of the river shoreward of lines described as follows: (1) Beginning at a point bearing 02°, 175 yards, from Mouse Island 73 Light; thence 270°, 480 yards; and thence due north, approximately 230 yards, to the shore. (2) Beginning at the said point bearing 02°, 175 yards, from Mouse Island 73 Light; thence 70°, 400 yards; and thence 350°, approximately 250 yards, to the shore.

(g) Area at Portland. Beginning at a point on the shore, about 700 feet southeasterly from the easterly end of the New York, New Haven and Hartford Railroad Company bridge at latitude 41°33′55″, longitude 72°38′43″; thence 250° to latitude 41°33′54″, longitude 72°38′46″; thence 160° to latitude 41°33′48″, longitude 72°38′43″; thence 145° to latitude 41°33′44″, longitude 72°38′39″; thence 55° to a point on the shore at latitude 41°33′47″, longitude 72°38′32″; thence along the shore 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 limit of the area or closer than 50 feet to the Federal channel limit. The anchoring of vessels and the placing of temporary moorings will be under the jurisdiction, and at the discretion of the local Harbor Master.

110.56 Noroton Harbor, Darien, Conn. (a) Beginning at a point on the southwesterly side of Long Neck Point at latitude 41°02′10″, longitude 73°28′44″; thence northwesterly to latitude 41°02′17′, longitude 73°29′11″; thence in a north-northwesterly direction to the southeast side of Pratt Island at latitude 41°02′28″, longitude 73°29′17″; thence following the shoreline around the easterly and northerly sides of Pratt Island, the westerly and northerly sides of Pratt Cove, and the westerly side of the Darien River to the causeway and dam at Gorham Pond on the north; thence along the downstream side of the causeway and dam to the easterly side of the Darien River, thence along the easterly shoreline to the point of beginning.

NOTE: An ordinance of the town of Darien, Conn. requires the Darien Harbor Master's approval of the location and type of any mooring placed in this special anchorage area.

110.58 Cos Cob Harbor, Greenwich, Conn. (a) Area A. Beginning at the mean low water line about 2,800 feet downstream from the easterly end of the New York, New Haven and Hartford Railroad Bridge at latitude 41°01′23″, longitude 73°35′40″, thence extending True west to latitude 41°01′23″, longitude 73°35′42″; thence extending southwesterly to a point at latitude 41°01′02″, longitude 73°35′50″; thence True east to a point on the shoreline at latitude 41°01′02″, longitude 73°35′48″; thence extending along the mean low water line to the point of beginning.

(b) Area B. Beginning at the mean low water line about 700 feet downstream from the westerly end of the New York, New Haven and Hartford Railroad Bridge at latitude 41°01′42″, longitude 73°35′47″; thence True east to latitude 41°01′42″, longitude 73°35′45″; thence southeasterly to latitude 41°01′23″, longitude 73°35′44″; thence southwesterly to latitude 41°01′04″, longitude 73°35′52″, thence southwesterly to latitude 41°01′02″, longitude 73°35′55″; thence True west to a point on shore on the northerly side of Goose Island at latitude 41°01′02″, longitude 73°36′00″; thence True north to a point at the mean low water line at latitude 41°01′05″, longitude 73°36′00″; thence along the mean low water line to the point of beginning.

NOTE: The areas are 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 into the waters beyond the limits of the areas or closer than 50 feet to the Federal channel limits.

110.60 Port of New York and vicinity. (a) Huntington Harbor. Beginning on the shoreline at latitude 40°54′19.5″, longitude 73°26′07.9″; thence to latitude 40°54′19.5″, longitude 73°26′02.4″; thence along the eastern shoreline to the Mill Dam Road Bridge; thence along the downstream side of the bridge to the westerly side of Huntington Harbor; thence along the western shoreline to the point of beginning.

(a-1) Centerport Harbor. Beginning at the shoreline at latitude 40°54′00″, longitude 73°22′55.3″; thence to latitude 40°54′03.8″, longitude 73°22′52.1″; thence along the eastern shoreline to the Mill Dam Bridge; thence along the downstream side of the bridge to the westerly side of Centerport Harbor; thence along the western shoreline to the point of beginning.

(a-2) Northport Harbor. Beginning on the shoreline at latitude 40°54′25″, longitude 73°22′05″; thence to latitude 40°54′37.5″, longitude 73°21′32.9″; thence along the eastern shoreline to latitude 40°53′33.1″, longitude 72°21′28.2″; thence to latitude 40°53′25.8″, longitude 73°21′37.7″; thence along the shoreline to the point of beginning.

NOTE: The areas designated by paragraphs (a), (a-1), and (a-2) of this section are principally for vessels used for a recreational purpose. A vessel shall be anchored so that no part of the vessel comes within 50 feet of the marked channel. A temporary float or buoy for marking the location of the anchor of a vessel at anchor may be used. Fixed mooring piles or stakes are prohibited.

(b) New Rochelle Harbor, west and south of Glen Island. That portion of Long Island Sound Anchorage No. 1 (described in 110.155) between Hog Island, Travers Island, Neptune Island and Glen Island and the mainland, to the westward of a line extending from the cupola at the southeast extremity of Glen Island to the easternmost extremity of Hog Island, and to the northeastward of a line extending from the southwest extremity of Hog Island to the southeast corner of Travers Island; excluding therefrom all waters within 25 feet of the 50-foot channel west and south of Glen Island.

(b-1) New Rochelle, Echo Bay. That portion of Long Island Sound Anchorage Grounds No. 1-A and No. 1-B (described in 110.155(a) (2) and (3)) northwest of a line ranging 30°30′ from the northeastern tip of Davenport Neck to the southeastern tip of Premium Point.

NOTE: An ordinance of the Town of New Rochelle N.Y., requires a permit from the New Rochelle Harbor Master or the New Rochelle Superintendent of Bureau of Marinas, Docks and Harbors before any mooring is placed in this spe-

cial anchorage area.

(c) New Rochelle Harbor, east of Glen Island. That portion of Long Island Sound Anchorage No. 1 (as described in 110.155(a)) between Glen Island and Goose Islands breakwater, northward of a line extending from the northwest end of Goose Islands breakwater to the cupola at the north end of the bathing beach on Glen Island.

(c-1) City Island Harbor, east of City Island. That portion of Long Island Sound Anchorage No. 1 (described in 110.155) between City Island and Hart Island eastward of a line ranging 339° between the steeple on City Island and the westernmost corner of the Administration Building at Orchard Beach; southward of a line ranging 50° between the northerly abutment on the westerly end of the City Island drawbridge and tangent to Chimney Sweeps; westward of a line tangent to Chimney Sweeps and ranging 163° toward the west gable on Rat Island and westward of a line tangent to the easterly side of High Island and ranging 152°30′ from the west gable on Rat Island; and northward of a line ranging 56° between the Buryea Pier at Belden Point, City Island to Hart Island Light, except for the cable and pipe line area extending between City Island and Hart Island.

(d) Eastchester Bay, west of City Island. That portion of Long Island Sound Anchorage No. 1 (as described in 110.155(a)) west of City Island and within the following limits: Northward of a line ranging 244° from the Duryea Pier at the foot of City Island Avenue to Big Tom Nun Buoy No. 2 (latitude 40°50′01″, longitude 73°47′25″); thence northeastward of a line ranging 329° from Big Tom Nun Buoy No. 2 through the Nun Buoy (latitude 40°50′46″, longitude 73°48′01″) off the southern end of Rodman Neck; southeastward of a line ranging 205° from the east abutment of the City Island Bridge through the south tower of the Bronx-Whitestone Bridge; and southward of a line ranging 90° from the Pelham War Memorial in Pelham Bay Park and the steeple of the church at the southeast corner of Elizabeth Street and City Island Avenue.

(e) Eastchester Bay, along west shore. That portion of Long Island Sound Anchorage No. 1 (as described in 110.155 (a)) along the west shore of Eastchester Bay north of and including Weir Creek, shoreward of a line ranging 349° from the end of the timber pier at the foot of Pope Place, Edgewater, and through the transmission tower at the northeast side of the draw of the New York, New Haven and Hartford Railroad Bridge over Eastchester Creek, and having as its northerly limit the line ranging 79° through the row of telephone poles along the north side of Watt Avenue.

(f) Eastchester Bay, Locust Point Harbor. That portion of Long Island Sound Anchorage No. 2 (as described in 110.155(a)) included within the limits of Locust Point Harbor between Wright Island and Throgs Neck and to the westward of a north and south line (longitude 73°47′58″) through the southerly corner of the concrete culvert at the southerly end of the stone wall at Locust Point on Wright Island.

(g) Manhasset Bay, west area at Manorhaven. That portion of Long Island Sound Anchorage No. 4 (described in 110.155) westward of a line (longitude 73°42′53″) ranging 180° from the end of the Town of North Hempstead pier at Manorhaven; northwestward of a line ranging 233° from the intersection of the shore and the northerly line of Corchang Avenue (extended) on Tom Point toward Plum Point Shoal Buoy 3 (latitude 40°49′48.5″, longitude 73°43′25″); and northeastward of a line ranging 119° from the cupola on Plum Point toward the inshore end of the northerly side of the Purdy Boat Company pier at Port Washington; excluding therefrom the seaplane restricted area described in 207.35.

(h) Manhasset Bay, east area at Manorhaven. That portion of Long Island Sound Anchorage No. 4 (described in 110.155) bounded as follows: Beginning at the southerly tip of Tom Point; thence 270° to latitude 40°49′58″, longitude 73°42′41″; thence 234° to latitude 40°49′48.5″, longitude 73°42′58″; thence 90° to latitude 40°49′48.5″, longitude 73°42′22.5″; thence 20° to latitude 40°50′01.5″, longitude 73°42′16″; thence due north to the point of land at Manorhaven northeasterly of Tom Point; and thence southwesterly along the shore to the point of beginning.

(i) Manhasset Bay, at Port Washington. That portion of Long Island Sound Anchorage No. 4 (described in 110.155) southward of latitude 40°49′44″; eastward of a line ranging 161° from the offshore end of the Yacht Service, Inc., pier on the Copp Estate at Manorhaven toward the flagpole on the end of the Whitney Dock at Plandome; and northward of latitude 40°49′06″.

(i-1) Manhasset Bay, at Kings Point. That portion of Long Island Sound Anchorage No. 4 (described in 110.155 (a) (6)) bounded as follows: Beginning at a point on the shoreline at latitude 40°49′24.4″, longitude 73°43′41.5″; thence to a point at latitude 40°49′32.5″, longitude 73°43′30.1″; thence to a point at latitude 40°49′42.9″, longitude 73°43′55.2″; thence to a point on the shoreline at latitude 40°49′39″, longitude 73°43′59″; thence along the shoreline to the point of beginning.

(j) Manhasset Bay, at Plandome. That portion of Long Island Sound Anchorage No. 4 (described in 110.155) southward of the line of the Whitney Dock at Plandome extended; eastward of a line ranging 186° from the Manhasset-Lakeville Water District tank at Thomaston toward the tank at Tom Point; and northward of Thompson's pier at Plandome extended.

(j-1) Kings Point. That portion of Long Island Sound Anchorage No. 4 (described in 110.155) beginning on the shoreline at latitude 40°49′00.3″, longitude 73°45′43.5″; thence to latitude 40°49′03.9″, longitude 73°45′47.1″; thence to latitude 40°49′12.9″, longitude 73°45′41.2″; thence

to latitude 40°49′18.7″, longitude 73°45′30.3″; thence to latitude 40°49′08.2″, longitude 73°45′19″; thence along the shoreline to the point of beginning.

NOTE: Temporary floats or buoys for marking anchors in place are allowed. Fixed mooring piles or stakes are prohibited. An ordinance of the village of Kings Point regulates mooring and anchoring in the area which includes this special anchorage area.

This special anchorage area is within the limits of Long Island Sound Anchorage No. 4 as described in 110.155(a) (6).

(k) Little Neck Bay. That portion of Long Island Sound Anchorage No. 5 (as described in 110.155(a) (7)), southeastward of a line ranging approximately 20°30′ from the flagpole at Fort Totten, Willets Point to the outermost dolphin of the U.S. Merchant Marine Academy's pier at Kings Point, Long Island.

(l) Flushing Bay, north area. That portion of East River Anchorage No. 10 (described in 110.155), in the vicinity of College Point, southeastward of a line tangent to the west side of College Point ranging from College Point Reef Light to the offshore end of the most northerly rack of the former College Point Ferry slip.

(l-1) Flushing Bay, north central area. That portion of East River Anchorage No. 10 (described in 110.155) on the east side of Flushing Bay, southward of a line projecting due west from the tank located on the north side of the foot of 15th Avenue, College Point, eastward of a line parallel to, and 50 feet east of the east channel line in Flushing Bay, and northward of a line ranging 42° from Flushing Bay Light 8 on the north end of the dike.

(l-2) Flushing Bay, south central area. That portion of East River Anchorage No. 10 (described in 110.155) on the east side of Flushing Bay, southward of a line ranging 52° from a point at latitude 40°46′29″, longitude 73°51′16″; eastward of a line parallel to, and 50 feet east of the east channel line in Flushing Bay, and northward of a line ranging 67° from a point at latitude 40°46′12″, longitude 73°51′06″ to the shore.

(m) Flushing Bay, southeast area. That portion of East River Anchorage No. 10 (described in 110.155) south of a line ranging 60° from the northeasterly corner of the municipal pier at the Flushing Bay Boat Basin toward the stack (latitude 40°45′54″, longitude 73°50′29″) of the New York City Asphalt Plant.

(m-1) Flushing Bay, southwest area. That portion of East River Anchorage No. 10 (described in 110.155) southwest of the breakwater, projecting offshore and southeast of La Guardia Airport; southerly of a line extending from the offshore end of the breakwater at latitude 40°45′53″, longitude 73°51′06″ to Flushing Bay Light 12 on the southerly end of the dike; westerly of a line extending from Flushing Bay Light 12 to a point at latitude 40°45′48″, longitude 73°51′00″; northwesterly of a line ranging 229° from the point at latitude 40°45′48″, longitude 73°51′00″ to the shore.

(m-2) Flushing Bay, west area. That portion of East River Anchorage No. 10 (described in 110.155) adjacent to the northeasterly side of La Guardia Airport, easterly of a line ranging 39° from the control tower at La Guardia Airport to College Point Reef Light, southward of a line extending due west from the tank on the north side of the foot of 15th Avenue, College Point, westward of a line parallel to, and 100 feet west of the west channel line in Flushing Bay and northerly of a line extending due west from Flushing Bay Light 8 on the north end of the dike.

NOTE: The anchoring of vessels and placing of temporary moorings in anchorage areas described in paragraphs (m) and (m-1) of this section will be under the jurisdiction, and at the discretion of the local Harbor Master appointed by the City of New York.

(n) Bowery Bay. All of that portion of East River Anchorage No. 10 (described in 110.155) on the west side of Bowery Bay.

(o) Hudson River, at Yonkers. Northward of a line on range with the footbridge across the New York Central Railroad Company tracks at the southerly end of Greystone Station; eastward of a line on range with the square, red brick chimney west of the New York Central Railroad Company tracks at Hastings-on-Hudson and the easterly yellow brick chimney of the Glenwood powerhouse of the Yonkers Electric Light and Power Company; and southward of a line on range with the first New York Central Railroad Company signal bridge north of the Yonkers Yacht Club.

(o-1) Hudson River, at Glenwood, Yonkers, New York. That portion of the waters of the easterly side of Hudson River and adjacent to the northerly limits of the City of Yonkers, New York, northward of the northerly face of an outfall sewer pipe which is 2,200 feet north of the Glenwood powerhouse; east of a line on range with the northwest corner of the powerhouse bulkhead and the westerly end of the outfall sewer pipe; and southward of a line ranging 110° true to the first New York Central Railroad Company's signal bridge, north of the Yonkers Corinthian Yacht Club house.

(o-2) Hudson River, at Nyack. That portion of the waters north of a line ranging 270° from latitude 41°05′35.1″, longitude 73°54′27″, to the shoreline; west of a line connecting latitude 41°05′35.1″, longitude 73°54′27″, and latitude 41°06′06.3″, longitude 73°54′27″; and south of a line ranging 270° from latitude 41°06′06.3″, longitude 73°54′27″ to the shoreline.

NOTE: The area is principally for use by yachts and other recreational craft. A mooring buoy is permitted.

(p) Hudson River, at Hastings-on-Hudson. That portion of the waters northerly of a line extending from a point at latitude 40°59′56.0″, longitude

73°53′11.3″ to the shore at latitude 40°59′55.7″; easterly of lines extending from the aforementioned point at latitude 40°59′56.0″, longitude 73°53′11.3″ through a point at latitude 41°00′04.6″, longitude 73°53′10.9″ to a point at latitude 41°00′14.6″, longitude 73°53′08.2″; and southerly of a line extending from the last mentioned point to the shore at latitude 41°00′14.2″.

(p-1) Hudson River, at West Point. That portion of the waters of the westerly side of the Hudson River, adjacent to the United States Military Academy, shoreward of a line connecting the extreme northwest corner of the south dock with a projection of land located approximately 1,575 feet north thereof.

(p-2) Hudson River, at Hyde Park, N.Y. Beginning at a point on the shoreline at latitude 41°49′06.5″ N., longitude 73°56′35.3″ W.; thence west to a point at latitude 41°49′06.5″ N., longitude 73°56′42.5″ W.; thence north-northeasterly to a point at latitude 41°49′12.5″ N., longitude 73°56′40.7″ W.; thence due east to a point on the shoreline at latitude 41°49′12.5″ N., longitude 73°56′37.7″ W.; thence along the shoreline to the point of beginning.

(q) Newark Bay, southeast area. That portion of the waters on the southeasterly side of Newark Bay, north of a line ranging from the offshore end of the breakwater north of the former Elco Boat Works through Newark Bay Channel Buoy 6; east of a line ranging from a point 200 yards east of the east pier of the lift span of the Central Railroad Company of New Jersey bridge to a point 200 yards east of the east end of the lift span of the Pennsylvania-Lehigh Valley Railroad bridge; and south of a line ranging from the southwest corner of the bulkhead at Bayonne City Park through Newark Bay Channel Buoy 11.

NOTE: This special anchorage is within the limits of General Anchorage No. 37, described in 110.155(h) (4).

(r) Newark Bay, southwest area. That portion of the waters on the southwesterly side of Newark Bay, north of a line ranging from Kill Van Kull Light 16 through Kill Van Kull Light 18 and Kill Van Kull Channel Buoy 20, northeast of a line through Kill Van Kull Channel Buoy 20 perpendicular to the Singer Manufacturing Company's bulkhead, and southeast of a line 150 feet east of and parallel to the Singer Manufacturing Company's bulkhead, and south of a line 250 feet south of and parallel to the Central Railroad Company of New Jersey bridge and west of a line perpendicular to the dike at Kill Van Kull Light 16, excluding therefrom the "Pipe Line Area."

NOTE: The greater portion of this special anchorage is within the limits of general anchorage No. 34, described in 110.155(h) (1).

(r-1) Great Kills Harbor. Beginning at a point on the shoreline at latitude 40°32′05.6″, longitude 74°08′24.2″; thence to latitude 40°32′06.7″, longitude 74°08′27.6″; thence to latitude 40°32′19″, longitude 74°08′23.1″; thence to latitude 40°32′27.8″, longitude 74°08′25.9″; thence to latitude 40°32′40.2″, longitude 74°08′10.5″; thence to latitude 40°32′44.2″; longitude 74°08′12.9″; thence along the northern and eastern shoreline to the point of beginning.

NOTE: The special anchorage area is principally for use by yachts and other recreational craft. A temporary float or buoy for marking the location of the anchor of a vessel at anchor may be used. Fixed mooring piles or stakes are prohibited. Vessels shall be anchored so that no part of the vessel comes within 50 feet of the marked channel. No vessel shall be anchored in such a manner as to interfere with the use of a mooring buoy authorized to be placed by the Captain of the Port, New York. No mooring buoy shall be placed in this special anchorage area except as authorized by the Captain of the Port, New York. The Captain of the Port regulations in 110.155(1) (7) apply. /T11This special anchorage area is within the limits of General Anchorage No. 28 described in 110.155(f) (3).

(s) Jamaica Bay. That portion of the waters on the westerly side of Jamaica Bay, westerly of a line ranging from Island Channel Buoy 21 through Island Channel Buoy 23, northward of a line ranging from Island Channel Buoy 21 to the north abutment of the Shore Parkway Bridge across Paerdegat Basin, and southward of a line ranging 310° from Island Channel Buoy 23.

(s-1) Jamaica Bay, south area. That portion of Broad Channel westerly of a line bearing 190°30′ from the northerly terminus of the New York City Transit Authority trestle across Broad Channel to latitude 40°35′50″, longitude 73°49′06″, and thence northerly of a line bearing 254° to the shore.

NOTE: The area will be principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. The Captain of the Port of New York is authorized to issue permits for maintaining mooring buoys within the anchorage. The method of anchoring these buoys shall be as prescribed by the Captain of the Port. No vessel shall anchor in the anchorage in such manner as to interfere with the use of a duly authorized mooring buoy. The Captain of the Port, New York regulations in 110.155(1) (7) apply.

(t) Cold Spring Harbor. That portion of the waters of Cold Spring Harbor easterly of a line ranging from the Cupola in the extreme inner harbor through Cold Spring Harbor Light; southerly of a line ranging from the southernmost point of an L-shaped pier off Wawepex Grove through the Clock Tower at Laurelton and northerly of a line ranging from the outer end of the Socony Mobil Oil Company's pier at Cold Spring Harbor through the Clock Tower at Laurelton, with the exception of an area within a 300-foot radius of the outer end of the Socony Mobil Oil Company's pier.

(u) Oyster Bay Harbor, New York. That portion of Oyster Bay Harbor adjacent to the easterly side of Centre Island, westerly of a line on range with

Cold Spring Harbor Light and the Stone House on the end of Plum Point, Centre Island.

(u-1) Hempstead Harbor, New York. That portion of the waters of Hempstead Harbor southerly of the Glen Cove Breakwater, northerly of a line ranging from "Dome" at Sea Cliff through Hempstead Harbor Buoy 9, and easterly of a line ranging from Glen Cove Breakwater Light through Hempstead Harbor Anchorage Buoys "A" and "B" and Hempstead Harbor Buoy 9, except for the entrance to Glen Cove Creek as defined by Hempstead Harbor Anchorage Buoy "A" and Glen Cove Entrance Buoy 1 on the north side of the entrance, and Hempstead Harbor Anchorage Buoy "B" the Glen Cove Entrance Buoy 2 on the south side of the entrance.

(v) Hudson River, at Coeymans, New York. That portion of the waters of the westerly side of Hudson River, west of Coeymans Middle Dike, north of a line bearing due west from a point 700 feet south of Upper Hudson River Light No. 43, and south of a line bearing due west from Upper Hudson River Light No. 45, except for an area 125 feet wide, adjacent to and east of the bulkhead fronting the Village of Coeymans and Barren Island Dike.

(w) Hudson River, at Cedar Hill, New York. That portion of the westerly side of the Hudson River, adjacent to Cedar Hill Dike, 250 feet in width, bounded on the south by the northerly side of the cut in the dike at the junction of the Vloman Kill and the Hudson River, and extending northerly therefrom 1,600 feet.

(x) Sheepshead Bay—(1) Western Area. South of a line 25 feet south of and parallel to the bulkhead wall along the south side of Emmons Avenue; east of a line 200 feet east of and parallel to the prolonged west line of East 15th Street; north of a line 75 feet north of and parallel to the bulkhead wall along the north side of Shore Boulevard between Amherst Street and Dover Street and as prolonged to a point 315 feet south of the bulkhead wall along the south side of Emmons Avenue and 25 feet west of the prolonged west side of Ocean Avenue; and west of a line parallel to and 25 feet west of the prolonged west line of Ocean Avenue.

(2) Northern Area. South of the established U.S. pierhead line on the north side of the bay; west of the prolonged west line of Coyle Street; north of a line ranging from a point 90 feet south of said pierhead line in said prolonged west line of Coyle Street to the intersection of the south line of Shore Boulevard and the west line of Kensington Street; north of a line parallel to and 325 feet north of the bulkhead wall along the north side of Shore Boulevard; northeast of a line ranging from the point of intersection of the last-mentioned line with the prolonged east line of East 28th Street, toward a point on the prolonged east line of East 27th Street and 245 feet south of the established U.S. pierhead line on the north side of the bay; and east of the prolonged east side of East 27th Street.

(3) Southern Area. South of a line extending from a point 175 feet northerly of the bulkhead wall along the north side of Shore Boulevard (perpendicular distance) and in the prolonged west side of Hastings Street to a point on the prolonged east side of Mackenzie Street 125 feet north of the bulkhead wall on the north side of Shore Boulevard; thence south of a line parallel to and 125 feet northerly of the bulkhead wall along the north side of Shore Boulevard from the last-mentioned point to the prolonged west line of Coyle Street; north of a line parallel to and 25 feet north of the bulkhead wall along the north side of Shore Boulevard; and east of the prolonged west side of Hastings Street.

(4) Captain of the Port Regulations. In Sheepshead Bay, N.Y., Western, Northern and Southern Special Anchorage Areas, the Captain of the Port—New York mooring regulations in 110.155 (1) (7) apply with the following modifications:

(i) Two anchors shall be used.

Note: Contact Captain of the Port for anchor type and weight, minimum chain size requirement, and placement of anchor.

(ii) A Sheepshead Bay, N.Y., mooring position is designated by the encircled number from the Coast Guard mooring chart, and the distance from the nearest range number, and the distance from the nearest bulkhead line. (Example: circle 2-W in Western Area 50′ East of range No. 20, 40′ South of bulkhead line.)

(iii) The area is principally for vessels used for a recreational purpose.

Subpart B—Anchorage Grounds:

110.140 Buzzards Bay, Nantucket Sound, and adjacent waters, Mass. (a) New Bedford Outer Harbor—(1) Anchorage A. West of Sconticut Neck, and shoreward of a line described as follows: Beginning at a point 100 yards southwest of Fort Phoenix Point; thence 154° along a line which passes 100 yards east of New Bedford Channel Buoys 8, 6, and 4, to a point bearing approximately 130°, 225 yards, from New Bedford Channel Buoy 4; thence 87°, 340 yards; thence 156° along a line approximately one mile to its intersection with a line ranging 87° from the cupola on Clarks Point; thence 87° to Sconticut Neck.

(2) Anchorage B. Southeast of a line ranging 222° from the southwest corner of Fort Phoenix to the New Bedford shore; west of a line ranging 154° from Palmer Island Light to Butler Flats Light; and north of a line bearing 267° from Butler Flats Light to the shore.

(b) Buzzards Bay near entrance to approach channel to Cape Cod Canal—(1) Anchorage C. West of a line parallel to and 850 feet westward from the centerline of Cleveland Ledge Channel; north of a line bearing 129° from the tower on Bird Island; east of a line bearing 25°30′ and passing through Bird Island Reef Bell Buoy 13; and south of a line bearing 270° from Wings Neck Light.

(2) Anchorage D. Beginning at a point bearing

185°, 1,200 yards, from Hog Island Channel 4 Light; thence 129° to a point bearing 209°, approximately 733 yards, from Wings Neck Light; thence 209° to Southwest Ledge Buoy 10; thence 199° along a line to its intersection with a line bearing 129° from the tower on Bird Island; thence 309° to a point 850 feet easterly, right angle distance, from the centerline of Cleveland Ledge Channel; thence northeasterly along a line parallel to and 850 feet eastward from the centerline of Cleveland Ledge Channel to its intersection with a line bearing 218°30′ from the point of beginning; thence 38°30′ to the point of beginning.

(c) Vineyard and Nantucket Sounds—(1) Anchorage E. South of a line beginning at a point bearing 180° about 3.25 miles from Cuttyhunk Light; thence 65° to a point bearing 180°, 0.625 mile from Nashawena Lighted Whistle Buoy; thence 57°30′ passing 600 yards northerly of Middle Ground Lighted Bell Buoy 25A, to a point bearing 145°, 1.25 miles from Nobska Point Light; southwest of a line ranging 113° through West Chop Buoy 25 to East Chop Flats Bell Buoy 23; and west of a line bearing 163° between East Chop Flats Bell Buoy 23 and Lone Rock Buoy 1; and northerly of a line bearing 269° between Lone Rock Buoy 1 and a point on the mainland at Oak Bluffs about 0.30 mile southerly of Oak Bluffs Wharf.

(2) Anchorage F. Southeast of the Elizabeth Islands, north of a line ranging 97°30′ from Cuttyhunk Light toward Nashawena Lighted Whistle Buoy to a point 0.375 mile from that buoy; northwest of a line bearing 57°30′ from the last-named point to a point opposite the entrance to Woods Hole; and southwest of a line from the shore of Nonamesset Island bearing 114° and ranging through West Chop Light and East Chop Light.

(3) Anchorage G. South of a line beginning at a point on the mainland at Oak Bluffs about 0.30 mile southerly of Oak Bluffs Wharf bearing 89° to Lone Rock Buoy 1; thence 113° from Lone Rock Buoy 1 to Outer Flats Bell Buoy 17; thence 86° to Cross Rip Lightship; thence 118°30′ to Tuckernuck Shoal Bell Buoy 7; thence ranging 149° toward Brant Point Light to the breakwater at Brant Point.

(4) Anchorage H. In the vicinity of Squash Meadow shoal, east of a line ranging 163° through Squash Meadow West End Buoy 21; north of lines parallel to and 0.5 mile northerly from lines joining Lone Rock Buoy 1, Outer Flats Bell Buoy 17, and Cross Rip Lightship; and south of a line ranging 97° from East Chop Light toward Cross Rip Lightship.

(5) Anchorage I. Northerly of a line ranging 109° from Nobska Point Light toward Hedge Fence Lighted Horn and Gong Buoy 16, and of a line ranging 97°30′ through Hedge Fence East End Buoy to Halfmoon Shoal Lighted Bell Buoy 12, thence 73° to Handkerchief Shoal Buoy 16, and thence to the westernmost point of Monomoy Island.

(6) Anchorage J. East of a line bearing 329°, parallel to and 0.875 mile northeasterly of a line running from Brant Point Light through Tuckernuck Shoal Bell Buoy 7, from Coatue Beach to a point 1.25 miles southeasterly from a line between Halfmoon Shoal Lighted Bell Buoy 12 and Handkerchief Shoal Buoy 16; thence 73°, parallel to and 1.25 miles southeasterly from a line running from Halfmoon Shoal Lighted Bell Buoy 12 through Handkerchief Shoal Buoy 16, to a point bearing 215° from Stone Horse North End Lighted Bell Buoy 9; thence 35° to Stone Horse North End Lighted Bell Buoy 9; thence 70° to a point bearing 207° from Pollock Rip Lightship; and thence 27° through, and to a point 5.0 miles northeasterly from, Pollock Rip Lightship.

(7)**Anchorage K.** North of line tangent to the southeasterly edge of Monomoy Point and extending to Bearse Shoal North End Buoy 2A and west of a line bearing 7° from Bearse Shoal North End Buoy 2A to Chatham Bar Buoy 2.

(d) The regulations. (1) Floats or buoys for marking anchors or moorings in place will be allowed in all areas. Fixed mooring piles or stakes are prohibited.

(2) Except in cases of great emergency, no vessels shall be anchored in New Bedford Outer Harbor, Buzzards Bay near the entrance to the approach channel to Cape Cod Canal, or Vineyard and Nantucket Sounds, outside of the anchorage areas defined in paragraphs (a) to (c) of this section.

(3) Anchors must not be placed outside the anchorage areas, nor shall any vessel be so anchored that any portion of the hull or rigging will at any time extend outside the boundaries of the anchorage area.

(4) Any vessel anchoring under the circumstances of great emergency outside any anchorage area must be placed near the edge of the channel and in such position as not to interfere with the free navigation of the channel, nor obstruct the approach to any pier nor impede the movement of any boat, and shall move away immediately after the emergency ceases or upon notification by an officer of the Coast Guard.

(5) A vessel upon being notified to move into the anchorage limits or to shift its position in anchorage grounds must get under way at once or signal for a tug, and must change position as directed with reasonable promptness.

(6) Whenever the maritime or commercial interests of the United States so require, any officer of the Coast Guard is hereby empowered to shift the position of any vessel anchored within the anchorage areas, of any vessel anchored outside the anchorage areas, and of any vessel which is so moored or anchored as to impede or obstruct vessel movements in any channel.

(7) Nothing in this section shall be construed as relieving the owner or person in charge of any vessel from the penalties of the law for obstructing navigation or for obstructing or interfering with range lights, or for not complying with the naviga-

tion laws in regard to lights, fog signals, or for otherwise violating the law.

110.142 Nantucket Harbor, Mass. (a) The anchorage grounds. In the Nantucket Harbor, beginning at a point 210 yards, 90°, from Brant Point Light; thence easterly to latitude 41°17′23″, longitude 70°05′14.5″; thence southerly to latitude 41°17′03″, longitude 70°05′14.5″; thence southwesterly to latitude 41°16′54″, longitude 70°05′23″; thence northwesterly to latitude 41°16′55″, longitude 70°05′31″; thence northeasterly to latitude 41°17′07.5″, longitude 70°05′27″; thence northeasterly to the point of beginning.

(b) The regulations. The anchorage is for the use of commercial and pleasure craft. Temporary floats or buoys for marking anchors or moorings in place will be allowed. Fixed mooring piles or stakes are prohibited. The anchoring of vessels including the placing of anchors and moorings is subject to the supervision and approval of the local harbor master.

110.145 Narragansett Bay, R.I. (a) East Passage—(1) Anchorage A. East of Conanicut Island, beginning at the easterly extremity of the Dumplings; extending 9° to a point at latitude 41°29′28″, longitude 71°21′05.5″; thence 356° for 5,350 feet; thence 24° for 5,700 feet; thence 12° for 1,100 feet; thence 311°30′ for 2,300 feet; thence 351° for 5,350 feet; thence 270° for 3,200 feet to the easterly side of Conanicut Island; thence generally along the easterly side of the island to a point on the easterly side of the island due west of the Dumplings; and thence due east to the point of beginning; excluding the approach of the Jamestown Ferry, a zone 900 feet wide to the southward of a line ranging 103° from a point, 300 feet north of the existing ferry landing toward the spire of Trinity Church, Newport.

(i) That portion of the area to the northward of the approach of the Jamestown Ferry shall be restricted for the anchorage of vessels of the U.S. Navy. In that portion of the area to the southward of the approach of the Jamestown Ferry, the requirements of the Navy shall predominate.

(ii) Temporary floats or buoys for marking anchors or moorings in place shall be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(2) Anchorage B. Off the west shore of Aquidneck Island to north of Coggeshall Point, northerly of a line ranging 075° from a point on the easterly end of Gould Island, latitude 41°32′13″, longitude 71°20′40.5″, toward the shore of Aquidneck Island; east of a line ranging 019° from the easternmost of the Dumplings to latitude 41°36′16″, longitude 71°17′48″; thence northeast to latitude 41°36′53″, longitude 71°17′07.5″; thence east to latitude 41°36′53″, longitude 71°16′40″; thence southwesterly to latitude 41°35′54″, longitude 71°17′17.5″; thence southeasterly to the shore at the easterly end of the north boundary of the cable area in the vicinity of Coggeshall Point; excluding the cable area in the vicinity of Coggeshall Point.

(2-a) Anchorage B-1. Off the southerly end of Prudence Island beginning at a point at latitude 41°34′08.9″, longitude 71°19′25.8″; thence 19° for 1,900 feet; thence 289° for 1,900 feet; thence 199° for 1,900 feet; thence 109° for 1,900 feet to the point of beginning.

(i) In this area the requirements of the Navy shall predominate.

(ii) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(2-b) Anchorage X-1, Naval explosives and ammunition handling anchorage. The waters of Narragansett Bay northeasterly of Gould Island within a circle having a radius of 500 yards with its center at latitude 41°33′18″, longitude 71°20′03″.

(i) This area will be used for anchoring naval vessels carrying or transferring ammunition or explosives under standard military restrictions as established by the Safety Manual, Armed Services Explosive Board. Explosives or dangerous materials include inflammable liquid or inflammable solids, oxidizing materials, corrosive liquids, compressed gases and poisonous substances.

(ii) No vessel shall anchor within 500 yards of the explosive anchorage area when occupied by vessels carrying explosives.

(iii) Not more than 2,000 tons Net High Explosives limit will be handled in the anchorage area.

(iv) No vessel shall be so anchored in the anchorage that it will at any time extend beyond the limits of the area.

(v) Naval vessels anchoring in the area will display the proper signals, and will be under the supervision of the Commander, U.S. Naval Base, Newport, Rhode Island.

(3) Anchorage C.

(i) [Reserved]

(ii) West of Coasters Harbor Island, west of a line bearing 351° from Tracey Ledge Buoy 5 through Seventeen-foot Spot Buoy northeast of Gull Rocks; south of a line bearing 292° from the cupola at the Naval War College; east of a line ranging 19° from the easternmost of the Dumplings toward Dyer Island North Point Shoal Lighted Bell Buoy 12A; and north of latitude 41°30′22″ which parallel passes through a point 230 yards north of Rose Island Shoal Northeast End Buoy 8.

(iii) In this area the requirements of the Navy shall predominate.

(iv) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(4) Anchorage D. West of Goat Island, south of a line bearing 247° from Newport Harbor Light; east of a line bearing 176°30′ from the northwesterly end of Rose Island; north of a line bearing 117° from the northerly end of the ferry slip at Jamestown to longitude 71°20′ and west of a line running north and south along longitude 71°20′.

(i) In this area the requirements of the Navy

shall predominate from May 1 to October 1, subject at all times to such adjustments as may be necessary to accommodate all classes of vessels which may require anchorage room.

(ii) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(5) Anchorage E. South of Coasters Harbor Island, east of a line bearing 341° from the outer end of Briggs Wharf to the southwestern shore of Coasters Harbor Island near the War College Building; and north of a line ranging 265° from the flagstaff at Fort Greene toward Rose Island Light.

(i) In this area the requirements of the naval service will predominate from May 1 to October 1, but will at all times be subject to such adjustment as may be necessary to accommodate all classes of vessels that may require anchorage room.

(ii) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(6) Anchorage F. In the central and southerly part of Newport Harbor proper, east of a line ranging 34° through a point 75 yards easterly of the end of the south wharf at Fort Adams toward Goat Island Shoal Light, a line ranging 329° through a point 35 yards east of the north end of the north wharf at Fort Adams toward the northeast corner of the Fort Adams stone wharf, and a line ranging 23° from the south corner of the north wharf at Fort Adams toward Newport Harbor Light; south of a line ranging 116° from Fort Adams Light to Ida Lewis Rock Light, and a line ranging 74° from the south end of the north wharf at Fort Adams toward the spire of the St. Spyridon Hellenic Orthodox Church; east of a line ranging 4° from the city stone pier at King Park toward the end of the Navy Section Base Fleet Wharf; south of a line ranging 95° from the south end of the wharf of the United States Naval Torpedo Station on Goat Island toward the northwest corner of Bowen's wharf; and west of a line ranging 176° from the southwest corner of the city wharf toward the southwest corner of Wellington and Houston Avenues opposite King Park, a line ranging 132° from the south end of the Torpedo Station wharf, Goat Island, toward the powerhouse chimney, Newport, and a line ranging 177° from the southeast corner of the city wharf through a point 50 yards westerly from the outer end of Commercial Wharf.

(i) Floats or buoys for marking anchors or moorings in place and fixed mooring piles or stakes are prohibited in this area:

(7) Anchorage G. In Newport Inner Harbor, northeast of a line ranging 108° from the southeast corner of the city wharf toward the northwest corner of the Government wharf.

(i) Floats or buoys for marking anchors or moorings in place and fixed mooring piles or stakes are prohibited in this area.

(b) West Passage—(1) Anchorage H. North of a line 1,000 yards long bearing 88° from Bonnet Point; west of a line bearing 3° from the eastern end of the last-described line; and south of a line ranging 302° through a point 200 yards south of the Kearny wharf toward the church spire at South Ferry, Boston Neck.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(2) Anchorage I. North of a line 1,000 yards long bearing 88° from Bonnet Point to the shore at Austin Hollow; east of a line bearing 183° from Dutch Island Light; and south of a line ranging 302° through a point 200 yards south of the Kearny wharf toward the church spire at South Ferry, Boston Neck.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(3) Anchorage J. At Saunderstown, south of a line ranging 110° from the south side of the ferry wharf toward the cable crossing sign on Dutch Island; west of a line ranging 192° from Plum Beach Shoal Buoy 1 PB toward the east shore of The Bonnet; and north of a line from the shore ranging 108° toward Dutch Island Light and the north end of the wharf at Beaver Head.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(4) Anchorage K. In the central and southern portion of Dutch Island Harbor, north of a line ranging 106° from Beaver Head Point Shoal Buoy 2 toward the Jamestown standpipe; east of a line ranging 14° from Beaver Head Point Shoal Buoy 2 toward the inshore end of the engineer wharf, Dutch Island; southeast of a line ranging 50° from Dutch Island Light toward the windmill north of Jamestown; and south of a line parallel to and 100 yards southwesterly from a line ranging 132° from the engineer wharf, Dutch Island, and the west ferry wharf, Jamestown.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(5) Anchorage L. North of a line ranging 101° from a point on shore 300 yards northerly of the Saunderstown ferry wharf toward the entrance to Round Swamp, Conanicut Island; west of a line bearing 15° parallel to and 1,000 feet westerly from a line joining the western point of Dutch Island and Twenty-three Foot Rock Buoy 4, and a line ranging 6° from Dutch Island Light toward Warwick Light; and south of a line ranging 290° from Sand Point, Conanicut Island, to Wickford Harbor Light, and a line bearing 226° from Wickford Harbor Light to Poplar Point tower.

(i) Temporary floats or buoys for marking

anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(6) Anchorage M. East and north of Dutch Island, northeast of a line ranging 316° from the inshore end of the west ferry wharf, Jamestown, toward the north end of Dutch Island to a point bearing 88°, 200 yards, from the engineer wharf, Dutch Island, thence ranging 3° toward the shore of Conanicut Island at Slocum Ledge; north of a line 200 yards off the Dutch Island shore ranging 281° from the entrance to Round Swamp toward a point on shore 300 yards northerly from the Saunderstown ferry wharf; east of a line ranging 15° from the western point of Dutch Island to Twenty-three Foot Rock Buoy 4; and south of a line bearing 77° from Twenty-three Foot Rock Buoy 4 to the shore.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(7) Anchorage N. West of the north end of Conanicut Island, south of a line bearing 262° from Conanicut Island Light; east of a line bearing 8° from Twenty-three Foot Rock Buoy 4; and north of a line ranging 290° from Sand Point toward Wickford Harbor Light.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(c) Bristol Harbor—(1) Anchorage O. South of the south line of Franklin Street extended westerly; west of a line bearing 164°30′ parallel to and 400 feet westerly from the State harbor line between Franklin and Constitution Streets, and of a line ranging 244° from a point on the north line of Constitution Street extended 400 feet beyond the State harbor line toward Usher Rock Buoy 3; and north of the north line of Union Street extended to the Popasquash Neck shore.

(i) Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes will not be allowed.

(d) The regulations. (1) Except in cases of great emergency, no vessel shall be anchored in the entrances to Narragansett Bay, in Newport Harbor, or in Bristol Harbor, outside of the anchorage areas defined in paragraphs (a), (b) and (c) of this section.

(2) Anchors must not be placed outside the anchorage areas, nor shall any vessel be so anchored that any portion of the hull or rigging shall at any time extend outside the boundaries of the anchorage area.

(3) Any vessel anchoring under the circumstances of great emergency outside the anchorage areas must be placed near the edge of the channel and in such position as not to interfere with the free navigation of the channel, nor obstruct the approach to any pier, nor impede the movement of any boat, and shall move away immediately after the emergency ceases, or upon notification by an officer of the Coast Guard.

(4) A vessel upon being notified to move into the anchorage limits or to shift its position on anchorage grounds must get under way at once or signal for a tug, and must change position as directed with reasonable promptness.

(5) Whenever the maritime or commercial interests of the United States so require, any officer of the Coast Guard is hereby empowered to shift the position of any vessel anchored within the anchorage areas, of any vessel anchored outside the anchorage areas, and of any vessel which is so moored or anchored as to impede or obstruct vessel movements in any channel.

(6) Nothing in this section shall be construed as relieving the owner or person in charge of any vessel from the penalties of the law for obstructing navigation or for obstructing or interfering with range lights, or for not complying with the navigation laws in regard to lights, fog signals, or for otherwise violating the law.

110.147 New London Harbor, Conn. (a) The anchorage grounds—(1) Anchorage A (Naval). In the Thames River east of Shaws Cove, bounded by lines connecting points which are the following bearings and distances from Monument, Groton (latitude 41°21′18″, longitude 72°04′48″): 243°, 1,400 yards; 246°, 925 yards; 217°, 1,380 yards; and 235°, 1,450 yards.

(2) Anchorage B. In the Thames River southward of New London, bounded by lines connecting points which are the following bearings and distances from New London Harbor Light (latitude 41°18′59″, longitude 72°05′25″): 2°, 2,460 yards; 9°, 2,480 yards; 26°, 1,175 yards; and 8°, 1,075 yards.

(3) Anchorage C. In the Thames River southward of New London Harbor, bounded by lines connecting a point bearing 100°, 450 yards, from New London Harbor Light, a point bearing 270°, 575 yards, from New London Ledge Light (latitude 41°18′21″, longitude 72°04′41″), and point bearing 270°, 1,450 yards, from New London Ledge Light.

(4) Anchorage D. In Long Island Sound approximately two miles westsouthwest of New London Ledge Light, bounded by lines connecting points which are the following bearings and distances from New London Ledge Light; 246°, 2.6 miles; 247°, 2.1 miles; 233°, 2.1 miles; and 235°, 2.6 miles.

(b) The regulations—(1) Anchorage A is for barges and small vessels drawing less than 12 feet. This anchorage shall be used only by naval vessels, and by other vessels holding special permits issued by the Captain of the Port when he finds that such special permits to anchor are not inimical to the requirements of the Navy.

(2) Except in emergencies, vessels shall not anchor in New London Harbor or the approaches thereto outside the anchorages defined in paragraph (a) of this section unless authorized to do so by the Captain of the Port.

110.148 Johnsons River at Bridgeport, Conn. (a) The anchorage grounds. In Johnsons River, beginning at a point "A" latitude 41°10′12.3″, longitude 73°09′50.2″; thence westerly to a point "B" latitude 41°10′12.3″, longitude 73°09′52.1″; thence southwesterly to point "C" latitude 41°10′10″, longitude 73°09′54.9″; thence south southwesterly to point "D" latitude 41°10′05″, longitude 73°09′56.1″; thence southeasterly to point "E" latitude 41°10′04″, longitude 73°09′55.9″; thence northeasterly to point "F" latitude 41°10′05″, longitude 73°09′54.5″; thence northerly to point "G" latitude 41°10′05.8″, longitude 73°09′54.5″; thence northeasterly to the point of beginning.

(b) The regulations. The anchorage is for use by commercial and pleasure craft. Temporary floats or buoys for marking anchors or moorings will be allowed. The anchoring of vessels and placing of temporary anchors or mooring piles are under the jurisdiction of the local harbor master. Fixed mooring piles or stakes will not be allowed.

110.150 Block Island Sound, N.Y. (a) The anchorage ground. A ¾-by 2-mile rectangular area approximately 3 miles east-northeast of Gardiners Island with the following coordinates: latitude 41°06′12″ N., longitude 72°00′05″ W., latitude 41°07′40″ N., longitude 72°01′54″ W.; latitude 41°08′12″ N., longitude 72°01′10″ W.; latitude 41°06′46″ N., longitude 71°59′18″ W.

(b) The regulations. This anchorage ground is for use of U.S. Navy submarines. No vessel or person may approach or remain within 500 yards of a U.S. Navy submarine anchored in this anchorage ground.

110.155 Port of New York. (a) Long Island Sound—(1) Anchorage No. 1. Southwest of a line between Neptune Island and Glen Island ranging from Aunt Phebe Rock Light and tangent to the north edge of Glen Island; southwest of a line tangent to the northeast edge of Glen Island and Goose Island breakwater; southwest of a line bearing southeasterly from the southwest end of Goose Island breakwater and on range with the south gable of the Casino on the northeast end of Glen Island; west of a line ranging from the east edge of Goose Island breakwater to the west edge of the north end of Hart Island; west of Hart Island; and northwest of a line extending from Hart Island Light to Locust Point; excluding from this area, however, (i) the waters northeast of a line ranging 303° from the southwest end of Hart Island; northwest of a line ranging from the water tank at the north end of Davids Island 207°40′ to the northwest end of City Island; and south of latitude 40°52′12″; and (ii) the waters west of Hunter Island; and south of a line ranging from the most southerly end of Glen Island tangent to the most northerly end of Hunter Island.

(i) Boats shall not anchor in this area in buoyed channels.

(ii) Boats shall be so anchored as to leave at all times an open, usable channel, at least 50 feet wide, west and south of Glen Island.

NOTE: Special anchorage areas in this anchorage are described in 110.60.

(2) Anchorage No. 1-A. Southwest of a line ranging from Duck Point, Echo Bay, through Bailey Rock Lighted Buoy 3 BR; northwest of a line ranging from Hicks Ledge Buoy 2H to Old Tom Head Rocks Buoy 4; and north of a line ranging from Old Tom Head Rocks Buoy 4 to the southernmost point of Davenport Neck.

NOTE: The special anchorage area in this anchorage is described in 110.60(b-1).

(3) Anchorage No. 1-B. West of a line ranging from the point on the southwest side of the entrance of Horseshoe Harbor, Larchmont, to Hicks Ledge Buoy 2H; north of a line ranging from Hicks Ledge Buoy 2H to Duck Point; and in Echo Bay north and west of the channel.

NOTE: The special anchorage area in this anchorage is described in 110.60(b-1).

(4) Anchorage No. 2. West of a line from Locust Point tangent to the northeasterly sea wall at Throgs Neck.

NOTE: Special anchorage areas in this anchorage are described in 110.60.

(5) Anchorage No. 3. Northeast of a line from the south side of Barker Point to Gangway Rock Bell Buoy 27; southeast of a line from Gangway Rock Bell Buoy 27 to Sands Point Reef Lighted Buoy 25; and southwest of a line from Sands Point Reef Lighted Buoy 25 through Sands Point Light to Sands Point.

(6) Anchorage No. 4. Manhassett Bay, excluding the seaplane restricted area described in 207.35; and that portion of Long Island Sound northeast of a line ranging from Stepping Stones Light through Elm Point Buoy 2 to Elm Point; southeast of a line ranging from Stepping Stones Light to Gangway Rock Bell Buoy 27; and southwest of Anchorage No. 3.

NOTE: Special anchorage areas in this anchorage are described in 110.60.

(7) Anchorage No. 5. In Little Neck Bay; and east of a line ranging from Fort Totten flagpole to Hart Island Light; and south of Anchorage No. 4.

NOTE: Special anchorage areas in this anchorage are described in 110.60.

(b) East River—(1) Anchorage No. 6. On Hammond Flats north of a line bearing 260° from the head of the pier on Throgs Neck at the foot of Pennyfield Avenue to the north tower of Bronx-Whitestone Bridge at Old Ferry Point.

(2) Anchorage No. 7. South of a line from Whitestone Point to the outer end of Willets Point Wharf.

(3) Anchorage No. 8. North of a line bearing 259° between the north tower of the Bronx-Whitestone Bridge at Old Ferry Point and a point at latitude 40°47′57″, longitude 73°52′16″; thence east of a line bearing 0° to latitude 40°48′06″; thence southeast of a line parallel to the bulkhead extending northeasterly to latitude 40°48′20″; thence north of a line bearing 296° to shore.

(4) Anchorage No. 9. East of a line from College

Point Reef Light tangent to the west side of College Point; and south of a line from College Point Reef Light to Whitestone Point.

(5) Anchorage No. 10. An area in Flushing Bay, beginning at a point on shore at La Guardia Airport at latitude 40°46′49″, longitude 73°52′21″; thence to latitude 40°47′20″, longitude 73°51′55″; and thence to a point on shore at College Point at latitude 40°47′38″, longitude 73°51′15″; and an area on the west side of Bowery Bay, beginning at a point on shore at latitude 40°46′58″, longitude 73°53′46″; thence to latitude 40°47′03″, longitude 73°53′39″; thence to latitude 40°47′00″, longitude 73°53′31″; thence to latitude 40°46′55″, longitude 73°53′32″; and thence to a point on shore at latitude 40°46′49″, longitude 73°53′39″.

NOTE: Special anchorage areas in this anchorage are described in 110.60.

(6) Anchorage No. 11. An area in East River beginning at a point on a pierhead at latitude 40°47′55″, longitude 73°53′19.5″; thence to latitude 40°47′40″, longitude 73°51′58″; and thence to a point on shore at latitude 40°47′16″, longitude 73°52′15″.

(7) [Reserved]

(8) Anchorage No. 14. In Hallets Cove, east of a line from a point on shore 100 feet west of the southerly prolongation of 2d Street, Astoria, to Gibbs Point.

(c) Hudson River—(1) Anchorage No. 16. North of a line on a range with the north side of the north pier of the Union Dry Dock and Repair Company Shipyard, Edgewater, New Jersey; west of a line ranging 25° from a point 120 yards east of the east end of said pier to a point (500 yards from the shore and 915 yards from the Fort Lee flagpole) on a line ranging approximately 100°22′ from the Fort Lee flagpole toward the square chimney on the Medical Center Building at 168th Street, Manhattan; and south of said line ranging between the Fort Lee flagpole and the square chimney on the Medical Center Building.

(i) Subject to the provisions for Anchorage No. 19 (for naval vessels), the Captain of the Port may shift the position, or clear the area, of any vessel so moored as to obstruct the use of this area for the additional anchorage of naval vessels when found necessary.

(2) Anchorage No. 17. North of a line bearing 66° from shore to a point at latitude 40°51′34″, longitude 73°56′54″; thence west of a line bearing 29° to latitude 40°52′27″, longitude 73°56′16″; thence 20° to latitude 40°54′17″, longitude 73°55′23″; thence 15° to latitude 40°56′20″, longitude 73°54′39″; thence south of a line bearing 284° to shore.

(i) Subject to the provisions for Anchorage No. 19 (for naval vessels), the Captain of the Port may shift the position, or clear the area, of any vessel so moored as to obstruct the use of this area for the additional anchorage of naval vessels when found necessary.

(3) Anchorage No. 18-A. East of lines bearing 8° from the northwest corner of the crib icebreaker north of the New York Central Railroad Company drawbridge across Spuyten Duyvil Creek (Harlem River) to a point 250 yards offshore and on line with the New York Central Railroad signal bridge at the foot of West 231st Street, extended, at Spuyten Duyvil, Bronx, New York; thence bearing 19° to the channelward face of the Mount St. Vincent Dock at the foot of West 261st Street, Riverdale, Bronx, New York.

(i) Subject to the provisions for Anchorage No. 19 (for naval vessels), the Captain of the Port may shift the position, or clear the area, of any vessel so moored as to obstruct the use of this area for the additional anchorage of naval vessels when found necessary.

(4) Anchorage No. 18-B. North of the south side of West 181st Street, prolonged; east of a line ranging 28° from the northwest corner of the east tower of George Washington Bridge and tangent to the east shore of the river at Inwood Hill Park; and south of the prolongation of the south side of Dyckman Street, Manhattan, New York, where it passes beneath the tracks of the New York Central Railroad.

(i) Subject to provisions for Anchorage No. 19 (for naval vessels), the Captain of the Port may shift the position, or clear the area, of any vessel so moored as to obstruct the use of this area for the additional anchorage of naval vessels when found necessary.

(5) Anchorage No. 19 (for naval vessels). North of a line bearing 298° and ranging from the south side of 70th Street, New York, to the south side of Pier 11-A, Weehawken; east of the east channel line of the federally improved Weehawken-Edgewater Channel, said east channel line being extended to a point opposite West 156th Street; thence east of a line bearing 17° ranging between the end of the pier at the foot of West 134th Street and a point on the George Washington Bridge 250 yards westward of the air beacon on the east bridge tower; and south of said bridge.

(i) [Reserved]

(ii) In the discretion of the Captain of the Port, small commercial or pleasure vessels may anchor in this area shoreward of a line extending from the channelward end of the New York Central Railroad pier at the foot of West 70th Street to the channelward end of the pier at the foot of West 129th Street and shoreward of the United States pierhead line between West 134th Street and a prolongation of the bridge over the New York Central Railroad tracks located 1,000 feet south of the George Washington Bridge.

(iii) The Captain of the Port may grant permission for one stake boat to occupy an area in the westerly 200-yard portion of the naval anchorage.

(iv) The Captain of the Port may permit limited temporary anchorage, not to exceed 24 hours, of commercial vessels awaiting berths in the westerly portion of the naval anchorage south of West 135th Street when use of the anchorage by naval vessels

will permit.

(v) The established anchorages for naval vessels having been found inadequate at times when large numbers of such vessels are in the harbor, a numbered series of anchorages is defined and established as shown on Key Charts Nos. 1 to 4, inclusive (not published in this section) in order that when a necessity for additional anchorages arises, permission may be given naval vessels to anchor at designated points serially numbered from 2 to 40 for capital ships, from 100 to 129 for intermediate ships, from 213 to 399 for destroyers and small craft, and from 508 to 611 for the anchorage of destroyers and small craft on the east side of the river, when the space is not required for capital or intermediate ships. Berths 16 to 18, 546, 547, and 551 to 555, are for use only on occasions when the other numbered berths available are not sufficient for the accommodation of the naval ships present. The Captain of the Port, on request from the proper naval authorities, may grant permission to occupy the numbered anchorages outside or extending outside of Anchorage No. 19, provided those specified in the request can be made available, commercial conditions at the time being given proper consideration. If, in his opinion, there are reasons why the anchorage or anchorages asked for should not be assigned, he will confer with the naval officers making the request, and if other numbers can be agreed upon will authorize their use; otherwise he will communicate the request to the Secretary of the Army with a statement of the circumstances and his recommendation.

(vi) Whenever this area is required for the anchoring of naval vessels, it shall be immediately cleared of commercial vessels by the Captain of the Port upon request of the appropriate naval authority.

(d) Upper Bay—(1) Anchorage No. 20. Northeast of Ellis Island; southeast of a line ranging approximately 50°15′ from the northwest corner of Ellis Island toward the end of Central Railroad of New Jersey Pier No. 7; south of a line ranging approximately 96°20′ from the southeast corner of Central Railroad of New Jersey Pier No. 11, toward the outer end of the Staten Island Ferry rack on the Manhattan shore; west of a line ranging approximately 183°30′ from the southeast corner of Lehigh Valley Railroad Pier "A" to latitude 40°41′54.3″, longitude 74°01′59″; and north of a line ranging approximately 85°10′ from the southeast corner of the northerly half of Ellis Island toward the outer end of the Staten Island Ferry rack on the Manhattan shore.

(i) No vessel shall cast anchor within this area south of the northerly limit of the cable area shown on United States Coast and Geodetic Survey Chart No. 745, between Ellis Island and the Manhattan shore.

(2) Anchorage No. 20-A. South of a line bearing 102° and ranging between the southeast corner of the southerly half of Ellis Island and Governors Island Light; west of a line bearing 194°30′ from latitude 40°41′42″, longitude 74°02′02″, to Main Channel Lighted Bell Buoy 31, thence 206° to latitude 40°40′05″, longitude 74°02′55″; and north of a line extended and ranging 313° through Claremont Terminal Channel Buoy 2 and the northeast corner of Caven Point Pier.

(i) The portion of Anchorage No. 20-A which is easterly of a line ranging 204°30′ from the east end of the east landing pier on Bedloe's Island to Bayonne Terminal Lighted Bell Buoy 2 and Robbins Reef Lighted Gong Buoy 27 and the northerly prolongation of that line is set aside as a temporary anchorage for vessels arriving in and leaving port. No vessel shall occupy this anchorage for a longer period than 72 hours, unless a permit is obtained from the Captain of the Port for that purpose.

NOTE: Anchorage No. 49-B in this area is reserved for vessels carrying explosives (see paragraph (m) (1) of this section) and is excluded from use as a general anchorage.

(3) Anchorage No. 20-B. South of a line bearing 129° from the southeast corner of Pennsylvania Railroad pier "B", Greenville Terminal, to the center of the south pier of the Bethlehem Steel Company Drydock, Brooklyn; west of a line bearing 206° from latitude 40°39′50″, longitude 74°03′05″, to latitude 40°39′31.5″, longitude 74°03′17″; north of a line bearing 121° and ranging from New Jersey Pierhead Channel North Entrance Buoy 15 to the northwest corner of Pier 3, Brooklyn; west of a line bearing 204°30′ and ranging from Bayonne Terminal Lighted Buoy 1 through Robbins Reef Lighted Gong Buoy 27 and Coast Guard Depot North Dock Light, St. George, Staten Island; north of a line ranging 262° from Robbins Reef Lighted Gong Buoy 27; and northeast of the channel approach to the north side of Constable Point.

(i) The portion of Anchorage No. 20-B which is easterly of a line ranging 204°30′ from the east end of the east landing pier on Bedloe's Island to Bayonne Terminal Lighted Bell Buoy 2 and Robbins Reef Lighted Gong Buoy 27 is set aside as a naval anchorage. The Captain of the Port may permit commercial vessels to anchor temporarily in this area, ordinarily for not more than 24 hours, when the anchorage will not be needed for naval vessels. Commercial vessels so anchored shall be moved at their own expense whenever the anchorage is needed for naval vessels.

(4) No vessel shall anchor between Ellis Island and the piers of the Central Railroad of New Jersey, or in the dredged channel approaches to this space or the piers and wharves of the railroad, or in the dredged channel approaches to the National Docks at Black Tom Island, to Bedloe's Island, to the Greenville and Claremont Terminals, or in the New Jersey Pierhead Channel or near the entrances to said channels so as to obstruct the approaches or interfere in anyway with the free navigation thereof.

(5) Anchorage No. 21. An area located at the

junction of Bay Ridge and Anchorage Channels, beginning at a point at latitude 40°38′11″, longitude 74°02′45.5″; thence to latitude 40°38′12″, longitude 74°03′05″; thence to latitude 40°38′57″, longitude 74°03′10″; thence to latitude 40°40′22.5″, longitude 74°02′14.5″; thence to latitude 40°40′25″, longitude 74°01′50″; thence to latitude 40°40′19.5″, longitude 74°01′28″; thence to latitude 40°39′49″, longitude 74°01′23″; thence to latitude 40°38′42″, longitude 74°02′32.5″; and thence to point of beginning. A fairway 600 feet wide crossing the anchorage marked by buoys at each entrance shall be excluded therefrom. Its northerly side connects a point at latitude 40°39′35″, longitude 74°02′46″ to a point at latitude 40°39′00″, longitude 74°02′13.5″. Anchorage No. 21 is divided into Anchorages Nos. 21-A and 21-B.

(i) Anchorage No. 21-A (for barges). That portion of Anchorage No. 21 north of the fairway and east of a line connecting a point at latitude 40°39′09″, longitude 74°02′22″ and a point at latitude 40°40′21″, longitude 74°01′34″.

(ii) Anchorage No. 21-B (for deepdraft vessels). That portion of Anchorage No. 21 south of the fairway, and that portion of Anchorage No. 21 north of the fairway and west of a line connecting a point at latitude 40°39′09″, longitude 74°02′22″ and a point at latitude 40°40′21″, longitude 74°01′34″.

(iii) Use of Anchorages Nos. 21-A and 21-B. Vessels of the various types required to use Anchorages Nos. 21-A and 21-B may be anchored in areas other than those set aside for them for a limited time after first obtaining a permit from the Captain of the Port, when and to the extent that they are not needed for vessels of the types assigned to them. No vessel shall occupy these anchorages for a period longer than 30 days, unless a permit is obtained from the Captain of the Port for that purpose.

(6) Anchorage No. 23 (temporary general anchorage). South of a line bearing 88° from the Turret Tower (Curtis High School), St. George, to its intersection at latitude 40°38′44″, longitude 74°03′55″, with a line bearing 146°30′ from the westerly tank of Bayonne Naval Depot, west of lines bearing 146°30′ from the westerly tank of Bayonne Naval Depot to latitude 40°38′25″, longitude 74°03′38.5″, thence 167° ranging from Robbins Reef Light to latitude 40°37′26.5″, longitude 74°03′21″; and north of a line bearing 84° on a range with the latter point, the northeast corner of Pier 19, Staten Island, and the tower of the Marine Hospital, Stapleton, Staten Island.

(i) No vessel shall occupy this anchorage for a period longer than 48 hours, unless a permit is obtained from the Captain of the Port for that purpose.

(ii) The entire area is designated a "temporary general anchorage," but vessels arriving at quarantine may anchor within that portion of this anchorage south of a line bearing 262° which is in prolongation of the north side of Pier 10, Staten Island, whenever Quarantine Anchorage No. 24 is congested and fully utilized.

(7) Anchorage No. 24 (quarantine anchorage). South of a line bearing 84° from the tower of the Marine Hospital, Stapleton, Staten Island, through the northeast corner of Pier 19, Staten Island, to latitude 40°37′26.5″, longitude 74°03′21″; west of a line bearing 167° ranging from Robbins Reef Light to latitude 40°36′32″, longitude 74°03′04″; and north of a line bearing 270° on range with the latter point and the northerly corner of Fort Lafayette.

(i) Vessels arriving at quarantine and awaiting inspection shall anchor to the south of a line bearing 262° and ranging from the southeast corner of Pier 25, Staten Island, to the south chimney of the Wrigley Plant, and shall clear said area immediately after being granted pratique. Whenever the area south of Pier 25, Staten Island, is congested, vessels arriving at quarantine and awaiting inspection may anchor in the northern section of the quarantine anchorage. Such vessels must clear the anchorage within 24 hours after being granted pratique. Vessels arriving for quarantine may anchor in that portion of Anchorage No. 23 south of a line bearing 262° which is in prolongation of the north side of Pier 10, Staten Island, whenever the quarantine anchorage is congested and fully utilized. No vessel shall occupy this section of the anchorage for a period longer than 48 hours, unless a permit is obtained from the Captain of the Port for that purpose.

(ii) Whenever the quarantine anchorage and the southerly part of Anchorage No. 23 are fully utilized, vessels shall anchor as directed by the Captain of the Port.

NOTE: The establishment of quarantine anchorages and the issuance of rules and regulations governing quarantine and their enforcement are under the jurisdiction of the administrator, Federal Security Agency, and the foregoing quarantine anchorage has been established under his authority.

(e) Gravesend Bay; Anchorage No. 25. North of a line ranging 271°30′ between Coney Island Light on Norton Point and the south point of Hoffman Island; east of a line bearing 342° from latitude 40°34′36″, longitude 74°01′42″, to latitude 40°35′59″, longitude 74°02′17″, and ranging through a point 250 yards due west of Fort Lafayette and a point 300 yards due east of Robbins Reef Light; and south of a line bearing 70° from latitude 40°35′59″, longitude 74°02′17″, through Fort Hamilton Southwest Buoy 20.

NOTE: Anchorage No. 49-C in this area is reserved for vessels carrying explosives (see paragraph (m) (2) of this section) and is excluded from use as a general anchorage.

(f) Lower Bay—(1) Anchorage No. 26. In Sandy Hook Bay south of a line extending from Point Comfort to Sandy Hook Point Light.

NOTE: Anchorages Nos. 49-F and 49-G in this area are reserved for vessels carrying explosives (see paragraph (m) (4) and (5) of this section) and

are excluded from use as general anchorages.

(i) Pleasure or commercial craft may not navigate or moor within 750 yards of the Naval Ammunition Depot Pier at Leonardo, New Jersey, nor anchor in the approach channel or the turning basin adjacent thereto.

(ii) When immediate action is required and representatives of the Coast Guard are not present in sufficient force to exercise effective control of shipping, the Commanding Officer of the Naval Ammunition Depot at Earle, New Jersey, may control the anchorage or movement of any vessel, foreign or domestic, to the extent he deems necessary to insure the safety and security of his command.

(2) Anchorage No. 27—(i) Atlantic Ocean. Beginning at Sandy Hook Light 15 to latitude 40°28′52″, longitude 74°00′03″; thence to latitude 40°28′41″, longitude 73°58′54″; thence to latitude 40°25′58″, longitude 73°55′00″; thence 180° to latitude 40°23′46″, thence 270° toward Highland Light and Sandy Hook shore; thence following the easterly shoreline of Sandy Hook to the point of beginning.

(ii) Romer Shoal. Beginning at latitude 40°27′30″, longitude 73°55′00″; thence due north to latitude 40°29′05″; thence to latitude 40°31′25″, longitude 74°00′55″; thence to latitude 40°32′11″, longitude 74°01′41″; thence to latitude 40°32′12″, longitude 74°02′07″; thence 180° to latitude 40°31′27″; thence to latitude 40°30′13″, longitude 74°00′07″; thence to the point of beginning.

(iii) Flynns Knoll. Beginning at Sandy Hook Channel Lighted Bell Buoy 18; thence along the north side of Sandy Hook Channel to Sandy Hook Channel Lighted Buoy; thence along the southwest side of Swash Channel to Junction Buoy; thence along the east side of Chapel Hill Channel to Chapel Hill Channel Buoy 2; and thence to the point of beginning.

(3) Anchorage No. 28. West of lines bearing 154°30′ from Fort Wadsworth Light to Craven Shoal Lighted Bell Buoy 19A, thence in succession to the buoys marking the east side of West Bank and the buoys on the west side of Chapel Hill Channel to Southwest Spit Junction Lighted Gong Buoy, thence 182° to a line extending from Sandy Hook Point Light to Point Comfort; north of the latter line and the New Jersey shore; and east of a line bearing 353° from the head of the Keansburg Steamboat Pier at Point Comfort, through Great Kills Flat Buoy 4, to the Staten Island shore; excluding from this area, however, (i) the waters west of a line ranging from the stack on Hoffman Island 344° through the northeast corner of the T-shaped pier at South Beach; northwest of a line ranging from Great Kills Light 39° and tangent to the offshore face of the T-shaped pier at Midland Beach; and northeast of a line ranging from the stack on Swinburne Island 301° to the shore end of the north jetty at New Creek; and (ii) the waters west of a line ranging from Conover Light at Leonardo, New Jersey, 340° through Old Orchard Shoal Light; northwest of a line bearing 230° from the stack on Hoffman Island; and northeast of a line ranging from Great Kills Light 332° through Marine Park Light at Crooks Point.

NOTE: A special anchorage area in this anchorage is described in 110.60 (r-1).

(g)[Reserved]

(h) Newark Bay—(1) Anchorage No. 34. South of the bridge of the Central Railroad Company of New Jersey; west of lines from a point on the bridge 100 yards west of the west pier of the west lift span to Newark Bay Channel Buoy 5, thence to the east end of the dike north of Shooters Island; north of the dike and a line ranging from the west end of the dike through Kill Van Kull Light 18 and Kill Van Kull Buoy 20; and east of a line 250 feet east of and parallel to the Singer Manufacturing Company bulkhead.

NOTE: A portion of this general anchorage is described as a special anchorage in 110.60(r).

(2) [Reserved]

(3) Anchorage No. 36. South of Port Newark Terminal Channel; west of a line ranging from a point 200 yards west of Newark Bay Light 3 to a point 100 yards west of the west pier of the west lift span of the Central Railroad of New Jersey Bridge; and north of said bridge.

(4) Anchorage No. 37. North of the Central Railroad of New Jersey bridge; east of a line ranging from a point 200 yards east of the east pier of the east lift span of the bridge to a point 200 yards east of the east end of the lift span of the Pennsylvania-Lehigh Valley Railroad bridge; and south of the latter bridge.

NOTE: A portion of this general anchorage is described as a special anchorage in 110.60(q).

(5) Anchorage No. 38. North of the Pennsylvania-Lehigh Valley Railroad bridge; east of lines ranging through a point 200 yards east of the east end of the lift span of the said bridge and the red channel buoys marking the dredged channel in Newark Bay and Hackensack River; and south of the Central Railroad Company of New Jersey bridge.

(6) Anchorage No. 39. Between the entrance channels of the Hackensack and Passaic Rivers, northwest of lines from the abutment of the Central Railroad of New Jersey bridge on the west side of the Hackensack River to Hackensack River Light 1, and thence to Newark Bay Light 5, and east of a line from said light ranging toward the southeast corner of the Texas Company wharf, and of a line ranging from the southeast corner of Gross Wharf to the abutment and end of fill of the Central Railroad of New Jersey bridge on the east side of the Passaic River.

(i) Arthur Kill—(1) Anchorage No. 41. The passage between Pralls Island and Staten Island included between a line running 29° from the extreme northwest point of Pralls Island to a point on Staten Island and a line from the southern point of Pralls Island to the north side of the mouth of Neck Creek at Travis, Staten Island.

(2) Anchorage No. 42. East of lines ranging from

the head of the Tottenville Shipyard Company pier at Tottenville, Staten Island, to the first pier of the Outerbridge Crossing west from the Staten Island shore, thence to Arthur Kill Light 10, thence to Arthur Kill Light 14, and thence to Arthur Kill Lighted Buoy 16; and south of a line from thence to Smoking Point.

(j) **Raritan Bay—(1) Anchorage No. 44.** An area in Raritan Bay located at the junction of Arthur Kill and Raritan River, beginning at a point at latitude 40°30′07″, longitude 74°15′13″; thence to latitude 40°30′01″, longitude 74°15′30″; thence to latitude 40°29′27″, longitude 74°15′06″; thence to latitude 40°29′24″, longitude 74°15′01″; thence to latitude 40°29′15″, longitude 74°14′55″; thence to latitude 40°29′14″, longitude 74°15′25″; thence to latitude 40°29′48″, longitude 74°15′48″; and thence to the point of beginning.

(i) The anchorage is restricted to deepdraft vessels except that barges may moor in that portion of the anchorage southerly of latitude 40°29′22″.

(ii) No vessel shall occupy the deepdraft portion of the anchorage for a longer period than 48 hours without a permit from the Captain of the Port.

(2) Anchorage No. 45. West of the Raritan Bay Channel leading into Arthur Kill; north of the Raritan River Channel leading into Raritan River; and east of the Cutoff Channel between Raritan River and Arthur Kill, except that part of the said area occupied by Anchorage No. 44.

(3) Anchorage No. 45-A. West of the Cutoff Channel between Raritan River and Arthur Kill; north of the Raritan River Channel; east of the New York and Long Branch Railroad bridge; and north of the Raritan River Channel to the prolongation of Market Street, Perth Amboy, New Jersey, in Arthur Kill.

(4) Anchorage No. 46. West of the west limit of Anchorage No. 28, as defined by a line bearing 353° from the head of the Keansburg Steamboat Pier at Point Comfort, through Great Kills Flat Buoy 4 to the Staten Island shore; north of Raritan Bay Channel as defined by the buoys and lights marking the north side of the channel, including Princess Bay; northeast of Raritan Bay Channel leading into Arthur Kill; and south of a line bearing 243° from the gable of a house at Ward Point, Staten Island.

(5) Anchorage No. 47. South of the Raritan River Channel from opposite the Sun Oil Company pier at South Amboy to Raritan River Buoy 3; thence south of a line in the direction of Boundary Daybeacon to latitude 40°28′48.5″, longitude 74°14′31.6″; thence south of lines through Raritan Bay Light 7B, Raritan Bay Light 3A, and the buoys marking the south side of Raritan Bay Channel Off Seguine Point to the west limit of Anchorage No. 28 as defined by a line bearing 353° from the head of the Keansburg Steamboat Pier through Great Kills Flat Buoy 4 to the Staten Island shore; and west of the latter line.

(i) Vessels shall not anchor in the channel to Keyport Harbor west of lines ranging from Keyport Channel Buoy 1 to Keyport Channel Buoy 9, thence through Keyport Channel Buoys 11 and 13 to the northeast corner of the easterly steamboat wharf; and east of a line extending from a point 400 yards west of Keyport Channel Buoy 1 tangent to the west shore at the mouth of Matawan Creek.

Note: Anchorage No. 49-D in this area is reserved for vessels carrying explosives (see paragraph (m) (3) of this section) and is excluded from use as a general anchorage.

(k) [Reserved]

(l) General regulations. (1) Except in cases of great emergency, no vessel shall be anchored in the navigable waters of the Port of New York outside of the anchorage areas established in this section, nor cast anchor within a cable or pipe line area shown on a Government chart, nor be moored, anchored, or tied up to any pier, wharf, or vessel in such manner as to obstruct or endanger the passage of any vessel in transit by, or to or from, adjacent wharves, piers, or slips.

(2) No vessel shall occupy for a longer period than 30 days, unless a permit is obtained from the Captain of the Port for that purpose, any anchorage for which the time of occupancy is not otherwise prescribed in this section. No vessel in a condition such that it is likely to sink or otherwise become a menace or obstruction to navigation or anchorage of other vessels shall occupy an anchorage except in an emergency, and then only for such period as may be permitted by the Captain of the Port.

(3) Whenever, in the opinion of the Captain of the Port, such action may be necessary, that officer may require any or all vessels in any designated anchorage area to moor with two or more anchors.

(4) Every vessel whose crew may be reduced to such number that it will not have sufficient men on board to weigh anchor at any time shall be anchored with two anchors, with mooring swivel put on before the crew shall be reduced or released, unless the Captain of the Port shall waive the requirement of a mooring swivel.

(5) Anchors of all vessels must be placed well within the anchorage areas, so that no portion of the hull or rigging shall at any time extend outside the boundaries of the anchorage area.

(6) Any vessel anchoring under circumstances of great emergency outside of the anchorage areas must be placed near the edge of the channel and in such position as not to interfere with the free navigation of the channel nor obstruct the approach to any pier nor impede the movement of any boat, and shall move away immediately after the emergency ceases, or upon notification by the Captain of the Port.

(7) The Captain of the Port may grant a revocable permit for the habitual maintenance and use of a given mooring space in an anchorage area. Application information for a mooring permit is available from:

Captain of the Port, Mooring Permit Section, Building 109, Governors Island, New York, N.Y. 10004.

(i) A mooring permit is issued to an individual, for his exclusive use, of a specific mooring, of a specific type, at a specific location, for a specific vessel.

(ii) Mooring permits shall expire on April 30 of the year after issuance.

(iii) Mooring permits are not transferable.

(iv) Moorings are shown on the large scale chart which may be seen at the office of the Captain of the Port—New York.

(v) Mooring anchor, chain, and pendant: (Note: Contact Captain of the Port for anchor type and weight, minimum chain size requirement, and placement of anchor.) These requirements may be waived or modified by the Captain of the Port upon written request from the applicant for such waiver or modification.

(vi) The mooring buoy shall be white in color with the Captain of the Port mooring permit number, in black letters, clearly visible at all times. The buoy is to extend not less than 1 foot above the surface of the water at all times, exclusive of flagstaffs, rings, quick pickup devices, etc.

(vii) All required equipment shall be provided by, installed by, and remain the property of the permit holder.

(viii) Mooring equipment should be raised at least every 2 years, inspected for deterioration and replaced if necessary.

(ix) Each person holding a mooring permit shall make what the Captain of the Port—New York considers reasonable use of the mooring. Nonuse of a mooring up to 30 days during the boating season is deemed reasonable.

(x) Moorings for which permits have expired without renewal or have been revoked by the Captain of the Port—New York shall be removed by the owner within 10 days of such expiration or revocation.

(xi) Granting of a Captain of the Port—New York mooring permit does not give a right of access across private property. Arrangements for access shall be made by the permit holder.

(xii) Each person to whom a Captain of the Port—New York mooring permit is issued agrees to hold harmless the United States, its officers, agents, and employees, for any death, personal injury, or damage which may result from the use of the permit or the rights granted under the permit.

(xiii) No vessel shall continuously occupy a mooring when a vessel in regular traffic requires the berth or when navigation would be menaced or inconvenienced thereby.

(xiv) No vessel shall moor in any anchorage in such a manner as to interfere with the use of a duly authorized mooring buoy. Nor shall any vessel moored to a buoy authorized by a Captain of the Port—New York permit be moored such that any portion of that vessel comes within 50 feet of a marked or dredged channel.

(xv) No vessel shall be navigated within the limits of an anchorage at speed exceeding 6 knots when in the vicinity of a moored vessel.

(xvi) In an emergency the Captain of the Port may shift the position of any unattended vessel moored in or near any anchorage.

(8) Barge dispensing stations and stake boats may be anchored in such places as the Captain of the Port may designate.

(9) Upon approval of the District Engineer, Corps of Engineers, the Captain of the Port may permit wrecking plant or other vessels legally engaged in recovering sunken property, or in laying or repairing pipe lines or cables legally established, or plant engaged in dredging operations, to anchor within channels of the Port of New York. Permit issued by the Captain of the Port is not necessary for plant engaged upon works of river and harbor improvement under the supervision of the District Engineer, but the District Engineer will notify the Captain of the Port in advance of all such proposed work.

(10) Whenever the maritime or commercial interests of the United States so require, the Captain of the Port is hereby empowered to shift the position of any vessel anchored within the anchorage areas, of any vessel anchored outside the anchorage areas, of any vessel which is so moored or anchored as to impede or obstruct vessel movements in any channel or obstruct or interfere with range lights and of any vessel which, lying at the exterior end of a pier or alongside an open bulkhead, obstructs or endangers the passage of vessels in transit by, or to or from, adjacent wharf property or impedes the movements of vessels entering or leaving adjacent slips.

(11) A vessel upon being notified to move into the anchorage limits or to shift its position on anchorage grounds, shall get under way at once or signal for a tug, and shall change position as directed, with reasonable promptness.

(12) Nothing in this section shall be construed as relieving any vessel or the owner or person in charge of any vessel from the penalties of law for obstructing navigation or for obstructing or interfering with range lights, or for not complying with the navigation laws in regard to lights, fog signals, or for otherwise violating law.

(m) Anchorages for vessels carrying explosives—(1) Anchorage No. 49-C (naval and military anchorage). In Gravesend Bay, north of a line bearing 260°30′ from latitude 40°34′58″, longitude 74°01′20″, to latitude 40°34′54″, longitude 74°01′49″, and ranging through the stack on Hoffman Island; east of a line bearing 342° from the last-mentioned point to latitude 40°35′59″, longitude 74°02′17″; south of line bearing 096° from the last-mentioned point to latitude 40°35′56″, longitude 74°01′45″; and west of a line bearing 343° from the last-mentioned point to latitude 40°34′58″, longitude 74°01′20″, and passing through Fort Hamilton Southwest Buoy 20.

(i) The Captain of the Port may permit the

anchorage of commercial vessels in the southerly part of the area south of a line bearing 252° from the flagpole in the vicinity of Bay Parkway, Brooklyn, when use of the anchorage by naval or military vessels will permit. Any commercial vessel so moored as to obstruct the use of the area for the anchorage of naval or military vessels may be required by the Captain of the Port to shift its position or clear the area when found necessary, at its own expense.

(ii) Fishing and navigation by pleasure and commercial craft are prohibited within the area at all times when vessels which are moored in the area for the purpose of loading or unloading explosives display a red flag by day or a red light by night, unless special permission is granted by the Captain of the Port.

(iii) Vessels carrying high explosives in this anchorage shall not anchor closer than 400 yards to one another, but the number of vessels which may anchor in the area at any one time shall be at the discretion of the Captain of the Port. This provision is not intended to prohibit barges or lighters from tying up alongside ships for the transfer of cargoes.

(iv) Vessels carrying high explosives shall not occupy this anchorage for a period of time longer than is necessary to receive or discharge such cargoes, or between sunset and sunrise except by special permit from the Captain of the Port in cases of great emergency.

(v) Barges and lighters loaded with explosives may anchor in the easterly portion of this area provided such barges and lighters are anchored so as not to approach one another closer than 300 feet. The Captain of the Port may authorize the placing of moorings in the easterly portion of the area and the making fast thereto of not to exceed three barges or lighters at each mooring, provided these moorings are so spaced that the vessels at one mooring shall at all times be not less than 300 feet from the vessels at an adjacent mooring.

(2) Anchorage No. 49-F (emergency naval anchorage). That portion of Sandy Hook Bay bounded by a line bearing 170°, 3,800 yards, from a point bearing 281°30′, 2,050 yards from Sandy Hook Light; thence 260°, 500 yards; thence 350°, 3,800 yards; thence 080°, 500 yards, to the point of beginning.

(i) This anchorage is to be used for the anchorage of naval vessels during emergencies only.

(ii) No pleasure or commercial craft shall navigate or moor within this area at any time when naval vessels which are moored in the area display a red flag by day or a red light by night.

(3) Anchorage No. 49-G (naval anchorage). That portion of Sandy Hook Bay bounded by a line bearing 208° 1,350 yards, from a point bearing 292°30′, 3,600 yards, from Sandy Hook Light; thence 298°, 620 yards; thence 002°, 1,250 yards; thence 107°, 1,150 yards, to the point of beginning.

(i) No pleasure or commercial craft shall navigate or moor within this area at any time when vessels which are moored in the area display a red flag by day or a red light by night.

(n) Regulations for explosive anchorages. (1) Anchorages Nos. 49-C, 49-F, and 49-G are reserved for vessels carrying explosives. All vessels carrying explosives shall be within these areas when anchored, except as provided in subparagraph (6) of this paragraph.

(2) A written permit shall be obtained from the Captain of the Port before vessels carrying explosives, or on which explosives are to be loaded, may proceed to the anchorages provided for them; and no vessel shall occupy a berth in such anchorage except by authority of such permit, which permit may be revoked at any time.

(3) Vessels used in connection with loading or unloading explosives on vessels in anchorage areas, including tugs and stevedore boats, shall carry a written permit from the Captain of the Port. The Captain of the Port may, in his discretion, require every person having business on board vessels which are being loaded with explosives, other than members of the crew, to have a pass from the Captain of the Port in such form as he shall prescribe. Such permit or pass shall be shown whenever required by him or by his authorized agents.

(4) Whenever any vessel not fitted with mechanical power anchors in the explosives anchorages while carrying explosives, the Captain of the Port may require the attendance of a tug upon such vessel when in his judgment such action is necessary.

(5) Vessels carrying explosives shall comply with the general regulations in paragraph (1) of this section when applicable.

(6) The District Engineer, Corps of Engineers, may authorize, in writing, a vessel carrying explosives for use on river and harbor works or on other work under federal permit issued by the District Engineer to anchor in or near the vicinity of such work without a permit from the Captain of the Port. The District Engineer will prescribe the quantities of such explosives allowed on such vessel and the conditions under which they are to be stored and handled, and will furnish the Captain of the Port with a copy of such safety instructions together with a copy of his written authorization.

(7) Every vessel loading, unloading, transporting, or containing explosives shall display by day a red flag at least 16 square feet in area at its masthead, or at least 10 feet above the upper deck if the vessel has no mast, and shall display by night a red light in the same position specified for the flag.

(8) When local regulations of any place require previous local authority for the transfer of explosives or fireworks between vessels or between a vessel and a wharf or other place ashore, the Captain of the Port will permit the removal from the anchorage of such vessel containing explosives to any place covered by such local regulations only

when he is satisfied that the required local authority has been granted.

110.156 Randall Bay, Freeport, Long Island, N.Y.(a) The anchorage grounds. Southward of a line 312 feet south of and parallel to the south side of Casino Street; eastward of a line 215 feet east of and parallel to the east side of West Side Avenue, said line extending southerly to a point 233 feet north of the prolonged north side of Clinton Street; northeastward of a line from the last-mentioned point to a point 243 feet southerly of the prolonged south side of Clinton Street and 210 feet east of the east side of Prospect Street; eastward of a line 210 feet east of and parallel to the east side of Prospect Street; northward of a line 25 feet north of and parallel to the prolonged north side of Suffolk Street; westward of a line 210 feet west of and parallel to the west side of South Long Beach Avenue, said line extending northerly to a point 222 feet south of the prolonged south side of Queens Street; southwestward of a line from the last-mentioned point to a point 74 feet northerly of the prolonged north side of Queens Street and 120 feet west of the west side of Roosevelt Avenue; and westward of a line 120 feet west of and parallel to the west side of Roosevelt Avenue.

(b) The regulations. (1) When applied for, a berth in this anchorage, if available, may be assigned to any vessel by the Captain of the Port of New York.

(2) The Captain of the Port is authorized to issue permits for maintaining mooring buoys within the anchorage. The method of anchoring these buoys shall be as prescribed by the Captain of the Port.

(3) No vessel shall anchor in the anchorage in such manner as to interfere with the use of a duly authorized mooring buoy.

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

(5) In case of emergencies, the Captain of the Port is authorized to shift the position of any unattended vessel moored in or near the anchorage.

PART 117—DRAWBRIDGE OPERATION REGULATIONS

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

117.78 Cape Cod Canal, Mass. (a) The lift span of the Buzzards Bay Railroad bridge will normally be kept in the raised (open) position except for the passage of trains or for maintenance. No signal is required if the lift span is raised.

(b) If the lift span is in other than the raised position, the opening signal shall be one long and one short blast.

(c) Signals to be sounded from the bridge are:

(1) Immediately preceding the raising of the

drawspan: One long blast.

(2) Immediately preceding the lowering of the drawspan: Two long blasts.

(3) When a vessel has sounded the opening signal and the drawspan cannot be raised immediately: Four short blasts in a rapid succession.

(4) When the draw is closed and visibility is reduced in foggy weather: Four shorts blasts in rapid succession every 2 minutes.

117.80 Acushnet River, Mass.; State of Massachusetts bridge between New Bedford and Fairhaven. (a) Prompt opening required. Except as otherwise provided in paragraph (b) of this section, the draw of the bridge shall, upon proper signal, be opened promptly for the passage of vessels unable to pass under the closed draw.

(b) Exceptions. (1) From 6:30 a.m. to 8:30 a.m., from 11:30 a.m. to 1:30 p.m., and from 4:00 p.m. to 6:00 p.m., on all days other than Sundays and legal holidays observed in the locality, the draw need not be opened for the passage of any vessels drawing less than 15 feet of water. The above periods of closure will not apply to vessels owned or operated by the U.S. Government, State or local authorities.

(2) During the period May 1 to October 1 between the hours of 9:00 p.m. and 5:00 a.m. (local time) and during the period October 1 to May 1, from one hour after sunset to one hour before sunrise, advance notice of two hours will be required for an opening. This advance notice will be given to the draw tender by telephone or otherwise. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be conveniently reached by telephone or otherwise at any hour of the 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 of this section together with a notice stating exactly how the draw tender may be reached.

(c) Signals—(1) By the vessel. The signal for opening the draw promptly when required shall be three short blasts of a whistle or horn. When a vessel drawing more than 15 feet of water intends to pass through the draw during the period described in paragraph (b)(1) of this section, three short blasts followed by one long blast shall be sounded. When any United States, State or municipal vessel as described in paragraph (b)(1) of this section intends to pass through the draw, four long blasts are sounded.

(2) By the bridge. If the draw is to be opened promptly, the draw tender shall reply by one long blast of a whistle or horn. If the draw cannot be opened promptly, the draw tender shall reply by three long blasts and, in addition a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

117.81 Apponaganset River, Mass.; Padanarum Highway Bridge at South Dartmouth. (a) The draw shall be opened promptly on signal for the passage of vessels between sunrise and 7:30 a.m., 9:30 a.m., and 11:30 a.m. 1:00 p.m., and 4:30 p.m., 6:30 p.m. and 1 hour after sunset, on all days from May 1 to October 31, inclusive, of each year.

(b) At all other times during the year when a bridge opening is desired a 6-hour advance notice must be given, in person, by telephone, or in writing, to the operator of the bridge or to the Selectmen of the Town of Dartmouth, Massachusetts. Upon receipt of such notice, the operator of the bridge, in compliance therewith, shall at the time specified in the notice and for a reasonable period thereafter be prepared to open the draw promptly on signal for the passage of the vessel.

(c) The advance notice required in paragraph (b) of this section shall not apply to vessels in an emergency, or to vessels operated by the United States and vessels employed for police or fire protection by any Town or municipality bordering on the Apponaganset River. The draw shall be opened promptly upon notification at any time of the day or night for such United States and municipal vessels, and for other vessels in an emergency.

(d) The call signal for opening the draw shall be three short blasts of a whistle or horn. If the draw can be opened immediately the call signal shall be acknowledged by one long blast of a whistle or horn. When the draw cannot be opened immediately the operator shall sound three long blasts and in addition a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

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

(f) The owner of or agency controlling the bridge shall maintain in good and efficient order the drawspan and the mechanical appliances for operating the same 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 drawspan to open.

(g) 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 any time, a copy of the regulations of this section together with a notice stating exactly how the operator may be reached by telephone or otherwise.

117.85 Sakonnet River, R.I.; State of Rhode Island highway bridge and New York, New Haven & Hartford Railroad Co. bridge at Tiverton. (a) The owner of or agency controlling each bridge shall maintain in good and efficient order the drawspan and the machinery and appliances for operating the same and for assisting vessels while passing through the draw. The owner of or agency controlling each bridge shall also provide and maintain

at the drawspan such number of draw tenders or operators as may be necessary to open and close the same promptly; and 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 drawspan to open.

(b) The signal for opening the draw of each of these bridges shall be three short blasts of a whistle or horn. This signal shall be answered by one long blast of a whistle or horn on the bridge when the operation of opening is commenced, or, if the draw cannot be opened promptly, by three long blasts and in addition a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

(c) Except as otherwise provided in paragraphs (d) and (h) of this section the draw of each bridge shall be immediately opened upon receiving the prescribed signal for the passage of vessels at any hour of the day or night.

(d) Exceptions: (1) When a train which will entirely cross the railroad bridge before stopping has reached the distance signal of the bridge and is in motion toward the bridge, the train may continue across the bridge, but in no case, except as provided in subparagraph (2) of this paragraph, shall the opening of the bridge for a vessel be delayed more than four minutes after the signal is given.

(2) When the draw of either of the bridges shall have been open for 10 minutes or longer, it may be closed for the crossing of trains, cars, vehicles, or persons, if any be waiting to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary for the trains, cars, vehicles, or persons to cross, it shall again be opened promptly for the passage of all vessels if there be any such desiring to pass. The length of time that a draw shall have been open shall be computed from the time that the draw is fully open, 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.

(3) The exceptions contained in this paragraph, shall not apply to vessels owned or operated by the United States, vessels in distress, and vessels employed for police and fire protection by any town or municipality touching upon Sakonnet River. All such United States and municipal vessels, and vessels in distress, shall be passed through the draws of the bridges at any hour of the day or night.

(e) For every vessel that cannot pass a closed bridge the operation of the draw shall afford full horizontal and vertical clearance in the draw opening regardless of the size or requirements of the passing vessel.

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

(g) The general regulations contained in paragraphs (a) to (f), inclusive, of this section shall apply to each bridge except as modified by the special regulation contained in paragraph (h) of this section. The special regulations shall not apply to vessels owned or operated by the United States, a vessel in distress, or to vessels employed for police or fire protection by any town or municipality touching upon Sakonnet River. All such United States and municipal vessels, and vessels in distress, shall be passed through the draws of the bridges during the closed period.

(h) State of Rhode Island highway bridge: From 7:10 a.m. to 7:40 a.m., Monday through Friday, inclusive, the draw of the highway bridge will not be required to be opened for the passage of vessels.

117.87 Taunton River, Mass.; bridges. (a) The signal for opening the draw of each of the drawbridges shall be three short blasts of a whistle or horn. This signal shall be answered by one long blast of a whistle or horn on the bridge when the operation of opening is commenced, or, if the draw cannot be opened promptly, by three long blasts and in addition a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

(b) Except as otherwise provided in this section, the draws of the bridges shall be immediately opened, upon receiving the prescribed signal, at all times during the day or night for the passage of foreign vessels and "vessels of the United States" as defined in R.S. 4311 (46 U.S.C. 251) unable to pass under the closed draws.

(c) When a train which will entirely cross a railroad bridge before stopping has reached the distance signal of the bridge and is in motion toward the bridge, the train may continue across the bridge, but in no case, except as provided in paragraph (f) of this section, shall the opening of the bridge for a vessel be delayed more than four minutes after the signal is given.

(d) Between 10:00 p.m. and 5:00 a.m. from May to October, inclusive, and between 6:00 p.m. and 6:00 a.m. from November to April, inclusive, the draw of the Bristol County highway bridge at Berkley shall be opened for the passage of all vessels which cannot pass the closed bridge upon notice given by telephone or otherwise to the operator at least 30 minutes in advance of the time the vessel desires to pass through the draw. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be reached by telephone or otherwise from the bridge, or through a public telephone exchange, and notice of such arrangements shall be kept conspicuously posted on the bridge.

(e) For all vessels or watercraft other than those described in paragraph (b) of this section which cannot pass the closed bridges, the draws shall, upon receiving the prescribed signal, be opened when two or more such vessels or other watercraft may be ready to pass through: Provided, That in no case shall the delay be more than 20 minutes.

(f) When the draw of any of the bridges shall have been open for 10 minutes or longer, it may be closed for the crossing of trains, cars, vehicles, or persons, if any be waiting to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary for the trains, cars, vehicles, or persons to cross, it shall again be opened promptly for the passage of foreign vessels or "-vessels of the United States," if there be any such desiring to pass. The length of time that a draw shall have been open shall be computed from the time that the drawspan is fully open, and the length of time that a draw has been closed shall be computed from the time that the drawspan ceases to move in closing.

(g) For every vessel that cannot pass the closed bridges the operation of the draw shall afford full horizontal and vertical clearance in the draw opening regardless of the size or requirements of the passing vessel.

(h) Trains, cars, vehicles, or persons shall not be stopped on any drawspan for the purpose of delaying the opening of the draw, nor shall any vessel or other watercraft be so handled or placed as to delay the opening or closing of any drawspan, but all passage over, under, or through a drawspan shall be prompt so as to reduce delays to water and land traffic to a minimum.

(i) The owner of or agency controlling each bridge shall maintain in good and efficient order the drawspan and the machinery and appliances for operating the same and for assisting vessels while passing through the draw. The owner of or agency controlling the bridge shall also provide and maintain at the drawspan such number of draw tenders or operators as may be necessary to open and close the same promptly; and 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 drawspan to open.

117.90 Providence Harbor, R.I.; bridges. (a) The regulations in this section shall govern the operation of the city of Providence highway bridge at Point Street across the upper Providence River and the New York, New Haven and Hartford Railroad Co. India Point Bridge at India Street, the State of Rhode Island Washington Bridge at Fox Point Boulevard, the New York, New Haven and Hartford Railroad Co. Tunnel Bridge, and the city of Providence Red Bridge at Waterman Street across Seekonk River.

(b) Except as otherwise provided in paragraphs (c) and (d) of this section the draw of each bridge across Seekonk River shall be opened promptly upon receiving the prescribed signal at all times during the day or night for the passage of vessels.

(c) Between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. daily the draws of the highway bridges over Seekonk River, except the Washington Bridge as provided in paragraph (d) of this section, need not be opened for the passage of vessels other than loaded self-propelled cargo vessels and any assisting tugs: Provided, That the bridges, except the Washington Bridge as provided in paragraph (d) of this section, shall be opened promptly at all times for vessels owned or operated by the United States or the city of Providence desiring passage because of an emergency involving danger to life or property, upon sounding four distinct blasts of a whistle or horn.

(d) The owner of or agency controlling the Washington Bridge across Seekonk River need not open the draw for the passage of vessels.

(e) The call signal for opening of the draw of each bridge shall be three short blasts of a whistle or horn. If the draw can be opened immediately, the call signal shall be acknowledged by one long blast of a whistle or horn on the bridge. If the draw cannot be opened immediately, the call signal shall be acknowledged by three long blasts, and in addition a red flag or ball by day and a red light at night shall be conspicuously displayed on the bridge.

(f) Point Street Bridge. Between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. daily the draw of the bridge need not be opened for the passage of vessels; at all other times at least 24 hours' advance notice is required, such notice to be given to the Director of Public Works, City Hall, Providence, R.I.: Provided, That the draw shall be opened at all times, upon request, for vessels owned or operated by the United States or the city of Providence desiring passage in an emergency involving danger to life or property. The owner of or agency controlling the bridge shall provide arrangements whereby the drawtenders can be reached readily by telephone or otherwise at any hour of the day or night, in case of emergency.

117.95 Mystic River at Mystic, Conn. (a) The New York, New Haven and Hartford Railroad Company bridge. (1) From April 1 to October 31, inclusive, at any time, day or night, the draw of this bridge shall be opened immediately upon receipt of the call signal for the passage of commercial vessels, vessels owned or operated by the United States Government, and vessels employed for police or fire protection by any town or municipality touching on the Mystic River, and as soon as practicable and in no case later than 20 minutes after receipt of the call signal for the passage of all other vessels which cannot pass the closed bridge: Provided, That the draw shall not be opened when an express passenger train, scheduled to pass beyond the bridge without stop, has entered the block in which the bridge is located, or when any other train which will entirely cross the bridge before stopping has reached the distance signal of the bridge, or when a passenger or mail train is actually ready to pass over it, but in any such case the opening of the bridge shall not be delayed more than eight minutes after the call signal is given.

(2) The call signal for opening the draw shall be one long blast and one short blast. When the draw is to be opened immediately the draw tender shall reply with one long blast. If the draw cannot be

opened immediately the draw tender shall reply with three long blasts, and in addition a red flag or ball by day or a red light by night shall be conspicuously displayed on the bridge.

(3) From November 1 to March 31, inclusive, at any time between the hours of 5:00 a.m. and 9:00 p.m. the draw of this bridge shall be opened immediately upon receipt of the above-described call signal and subject to all conditions contained in subparagraph (1) of this paragraph. From 9:00 p.m. to 5:00 a.m., the draw of the bridge shall not be required to be opened except on an 8-hour notice in advance of the time an opening is required.

(4) The 8-hour advance notice will not apply to vessels owned or operated by the United States, nor to vessels employed for police or 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 owners or agency operating the bridge shall, upon request, arrange for the opening of the drawspan as soon as practicable after receipt of the request.

(5) The owners or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where 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 of the owner or agency may be reached.

(b) Connecticut State Highway Department bridge. (1) The owner or agency controlling the bridge shall provide the appliances and personnel necessary for the safe, prompt and efficient operation of the draw.

(2) The draw shall normally be opened on the following schedule when the signal, hereinafter prescribed for the opening of the draw, is received from an approaching vessel or other watercraft which cannot pass under the closed draw. This schedule shall not be construed to prevent the opening of the draw immediately for governmental, police or fire protection or commercial vessels or any vessels in case conditions of wind, tide or heavy volume of river traffic are such as to cause a hazard to vessels or to the bridge.

(3) Between the hours of 8:15 a.m. and 7:17 p.m. the draw need be opened only once an hour at 15 minutes after the hour for the passage of vessels other than vessels owned or operated by the Government of the United States, vessels employed for police or fire protection and commercial vessels or any vessel under conditions described in subparagraph (2) of this paragraph.

(4) From May 1 to October 31, inclusive, between the hours of 7:15 p.m. and 8:15 a.m. and from November 1 to April 30, inclusive, between the hours of 7:15 p.m. and 8 p.m. and between the hours of 4 a.m. and 8:15 a.m. the draw shall be opened on call for the passage of vessels owned or operated by the Government of the United States, vessels employed for police and fire protection and commercial vessels. The draw shall be opened as soon as practicable and in no case later than 20 minutes after receipt of the call signal for all other vessels which cannot pass the closed draw.

(5) From November 1 to April 30, inclusive, between the hours of 8 p.m. and 4 a.m. the draw shall be opened for the passage of vessels upon notice to the drawtender given at least 1 hour in advance of the time of the requested opening.

(6) All times listed are referred to local times at Mystic.

(7) The signal for opening the draw shall be given by one long blast and two short blasts of a horn or whistle. If the draw cannot be opened immediately when the signal is given, a red flag or ball by day or a red light by night shall be conspicuously displayed on the bridge.

(8) The signal for opening the draw shall be answered by a whistle on the bridge with one long blast when the opening is commenced, or by three long blasts repeated at regular intervals until acknowledged by the vessel when the bridge cannot be opened promptly or, if opened, must be closed immediately.

(9) A copy of the regulations in this paragraph shall be conspicuously posted on both the upstream and downstream sides of the bridge in such a manner that it can be easily read at any time.

117.100 Thames River, Conn.; The New York, New Haven & Hartford Railroad Co. bridge between New London and Groton. (a) The draw of this bridge shall be opened at any time, day or night, immediately upon receipt of the call signal for the passage of commercial vessels, vessels owned or operated by the United States Government, and vessels employed for police or fire protection by any town or municipality touching on the Thames River, and as soon as practicable and in no case later than 20 minutes after receipt of the call signal for the passage of all other vessels which cannot pass the closed bridge: Provided, That when a westbound train scheduled to cross the bridge without stop has passed Midway Station, or a southbound train Groton Station, or an eastbound train New London Station, and is in motion toward the bridge, the draw shall not be opened for the passage of any vessel until the train has crossed the bridge.

(b) The call signal for opening the draw shall be three blasts. When the draw is to be opened immediately the draw tender shall reply with one blast. If the draw cannot be opened immediately the draw tender shall reply with four blasts, and in addition a red flag or ball by day or a red light by night shall be conspicuously displayed on the bridge.

117.105 Shaws Cove, New London Harbor, Conn.; bridge of New York, New Haven & Hartford Railroad Co. at New London, Conn. (a) Except as provided in subparagraphs (1) and (2) of this paragraph, the draw shall be immediately opened for the passage of foreign vessels and "vessels of the United States," as defined by section 4311 of the Revised Statutes (46 U.S.C. 251) at any time

between 6 a.m. and 7 p.m. upon a signal given by one long and one short blast of a whistle or horn.

(1) First exception. Between 11 a.m. and 1:30 p.m. and between 3:15 p.m. and 4:30 p.m., the bridge may remain closed to all vessels, except in the case of fire above the bridge or other similar emergency, when the draw shall be immediately opened upon the prescribed signal being given.

(2) Second exception. When a westbound train scheduled to cross the bridge without stop has passed New London Station, or an eastbound train Waterford Station, and is in motion toward the bridge, the draw shall be opened for the above-named vessel as soon as the train has crossed the bridge, but in no case shall the opening of the draw for the vessels above-described be delayed more than 10 minutes.

(b) The draw shall be opened as soon as practicable for the passage of all other vessels which cannot pass the closed bridge, at any time between 6 a.m. and 7 p.m., when the above-prescribed signal is given, but in no case shall such vessel be delayed more than 20 minutes, except as provided in the first exception under paragraph (a) of this section.

(c) Between 7 p.m. and 6 a.m., the draw shall be opened for the passage of all vessels which cannot pass the closed bridge, upon notice given by telephone or otherwise to the draw tender or the operator in the signal tower controlling the bridge signals at least 1 hour in advance of the time the vessel desires to pass through the draw, except that in case of fire or similar emergency the draw shall be promptly opened upon notification. Arrangements shall be provided whereby the draw tender or signal operator on duty can be conveniently reached by telephone between 7 p.m. and 6 a.m., and notice of such arrangements shall be kept conspicuously posted on the bridge.

(d) In case the bridge cannot be immediately opened when the signal is given, a red flag or ball by day and a red light by night shall be conspicuously displayed.

(e) Signals for the opening of the draw shall be answered by a whistle or horn on the bridge with the same signal named in paragraph (a) of this section (one long and one short blast) when opening is commenced; and by a series of four short blasts, each of not more than 1 second duration, when the bridge cannot be promptly opened.

117.110 Niantic River, Conn.; bridges of New York, New Haven & Hartford Railroad Co., and the State of Connecticut at Niantic, Conn. (a) The owners of, or agencies controlling the above-named bridges shall provide the appliances and personnel necessary for the safe, prompt and efficient operation of the draw.

(b) The draw shall be opened promptly when the signal, prescribed in paragraph (c) of this section for the opening of the draw, is received from an approaching vessel or other water craft which cannot pass under the closed draw except as provided in paragraph (c) of this section.

(c) Signals—(1) Call signals for opening of draw—(i) Sound signals. Railroad Bridge, one long and two short blasts of horn or whistle. Highway Bridge, three short blasts of horn or whistle.

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

(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 blasts of a horn or whistle, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals cannot be heard. 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, shall acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally a red flag by day and a red light by night.

(4) Exceptions—(i) For both bridges. Between 8 p.m. and 4 a.m. during the period from April 1 to October 31 and 6 p.m. and 6 a.m. during the remaining months of the year the draw shall be opened for the passage of all vessels which cannot pass the closed bridges upon notice given by telephone or otherwise to the operators at least one hour in advance of the time the vessel desires to pass through. The owners of the bridges shall provide arrangements whereby the draw tenders may be reached by telephone or otherwise, and notice of such arrangements shall be kept conspicuously posted on the bridges.

(ii) For the railroad bridge. When a train scheduled to pass beyond the bridge without stop has entered the block in which the bridge is located the draw shall be opened as soon as the train has crossed the bridge, unless another train similarly scheduled and running in the opposite direction to the first train enters the block before the first train clears the bridge, in which case the draw shall be opened as soon as both trains have crossed the bridge. Further delay for train operation across the bridge is prohibited.

(d) A copy of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of the bridges in such a manner

that it can be easily read at any time.

117.115 Connecticut River, Conn.; bridges. (a) The signal for opening the draw of each of the drawbridges shall be one long blast (of about five seconds' duration) of a whistle or horn. This signal shall be answered by one long blast of a whistle or horn on the bridge when the operation of opening is commenced, or, if the draw cannot be opened promptly, by a series of not less than four short, sharp blasts (each of not more than one second's duration) and in addition a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

(b) Except as provided in subparagraph (c) of this section, the draws of the bridges described in this section shall be promptly opened, upon the prescribed signal, at all times during the day or night, for the passage of foreign vessels and "vessels of the United States", as defined in section 4311 of the Revised Statutes (46 U.S.C. 251).

(c) Exceptions—(1) Railroad bridge at Lyme. When a westbound train scheduled to cross the bridge without stop has passed Lyme and Blackhall Station, or an eastbound train Saybrook Junction Station, and is in motion toward the bridge, the draw shall be opened for the vessels described in paragraph (b) of this section as soon as the train has crossed the bridge.

(2) Railroad bridge at Middletown. When a westbound train scheduled to cross the bridge without stop has passed Portland Station, or an eastbound train Middletown Station, and is in motion toward the bridge, the draw shall be opened for the vessels described in paragraph (b) of this section as soon as the train has crossed the bridge.

(d) For all other vessels which cannot pass the closed bridges the draws shall, upon the prescribed signal, be opened as soon as practicable, but in no case shall the delay be more than 20 minutes.

(e) For every vessel that cannot pass the closed bridge the operation of the draw shall afford full horizontal and vertical clearance in the draw opening, regardless of the size or requirements of the passing vessel.

117.120 New Haven Harbor, Quinnipiac and Mill Rivers, Conn.; bridges owned and operated by the State of Connecticut and city of New Haven. (a) The regulations in this section shall govern the operation of Chapel Street Bridge across Mill River, and Tomlinson Bridge, Ferry Street and Grand Avenue Bridges across Quinnipiac River.

(b) The owners of or agencies controlling the above-named bridges shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draws.

(c) The draw of each bridge shall be opened when the prescribed signal for the opening of the draw is received from an approaching vessel or other watercraft which cannot pass under the closed draw, except as hereinafter provided.

(d) Closed periods. The draws of the above-named bridges need not be opened between 7:30 and 8:30 a.m., 12:00 noon and 12:15 p.m., 12:45 and 1:00 p.m., and 4:45 and 5:45 p.m.

(e) Signals—(1) Call signals for opening of draw—(i) Sound signals.

Tomlinson Bridge, two short blasts of horn or whistle.

Chapel Street Bridge, three short blasts of horn or whistle.

Ferry Street Bridge, one short blast of horn or whistle.

Grand Avenue Bridge, one long blast of horn or whistle.

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

(2) Acknowledging signals—(i) By bridge operator—(a) 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 blasts of a horn or whistle, to be repeated at regular intervals until acknowledged by the vessel.

(b) Visual signals. Draw to open 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.

(ii) By the vessel. Vessels or other watercraft 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, shall acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally, a red flag by day and a red light by night.

(f) Posting of regulations. A copy of the regulations of this section shall be conspicuously posted on both the upstream and downstream sides of the above-named bridges in such manner that it can be easily read at any time.

117.121 (Revoked)

117.125 Housatonic River, Conn.; bridges (highway and railroad) between Milford and Stratford, Conn., known as the Washington Bridge, and bridge of New York, New Haven & Hartford Railroad Co. (a) For the highway bridge. (1) Except as provided for in subparagraph (2) of this paragraph, the draw shall be immediately opened at any hour of the day or night for the passage of foreign vessels and "vessels of the United States," as defined by section 4311, Revised Statutes (46 U.S.C. 251), upon a signal given by one long and one short blast of a horn or steam whistle.

(2) The draw of the bridge need not be opened, except in an emergency, between 7:00 a.m. and 9:00 a.m., Monday to Friday, inclusive, and between 4:00 p.m. and 5:45 p.m. every day throughout the year. At all other times including

the period 7:00 a.m. and 9:00 a.m. on Saturdays, Sundays, and legal holidays, the draw shall, when the signal described in subparagraph (1) of this paragraph is given, be opened as soon as practicable for all other vessels which cannot pass the closed bridge, but in no case shall the delay be over 20 minutes.

(3) In case the bridge cannot be immediately opened when the signal is given, a red flag or ball by day or a red light by night shall be conspicuously displayed.

(4) Signals for the opening of the draw shall be answered by a whistle or Klaxon horn on the bridge with the same signal, one long and one short blast named in paragraph (a) of this section, when the operation of opening is commenced, or by a series of not less than four short sharp blasts, each of not more than 1 second duration, when the bridge cannot be promptly opened.

(b) For the railroad bridge. (1) Except as provided for in subdivision (i) of this subparagraph, the draw shall be immediately opened at any hour of the day or night for the passage of foreign vessels and "vessels of the United States", as defined by section 4311, Revised Statutes (46 U.S.C. 251), upon a signal given by one long and two short blasts of a horn or steam whistle.

(i) Exception. When a train scheduled to pass beyond the bridge without stop has passed the last station nearest the bridge and is in motion toward the bridge, the bridge shall be opened for the vessels named in subparagraph (4) of this paragraph as soon as the approaching train has been brought to a stop at the drawbridge signal.

(2) The draw shall, when the signal described in subparagraph (1)(i) of this paragraph is given, be opened as soon as practicable for all other vessels which cannot pass the closed bridge, but in no case shall the delay be over 20 minutes.

(3) In case the bridge cannot be immediately opened when the signal is given, a red flag or ball by day or a red light by night shall be conspicuously displayed.

(4) Signals for the opening of the draw shall be answered by a whistle or Klaxon horn on the bridge with the same signal, one long and two short blasts, named in paragraph (e) of this section, when the operation of opening is commenced, or by a series of not less than four short sharp blasts, each of not more than one second duration, when the bridge cannot be promptly opened.

117.130 Poquonock and Johnsons Rivers, Conn.; bridges (highway and railroad) at Bridgeport. (a) The regulations in this section are prescribed to govern the opening of certain drawbridges in the city of Bridgeport, Connecticut:

Poquonock River:

Stratford Avenue Highway Bridge.

New York, New Haven and Hartford Railroad Bridge.

Congress Street Highway Bridge.

East Washington Avenue Highway Bridge.

Johnsons River:

Pleasure Beach Highway Bridge at end of Seaview Avenue.

(b) The signals. (1) The signals for opening the draws of the bridges shall be given by blast of a horn or steam whistle as follows:

For Stratford Avenue Highway Bridge, one long and one short blast.

For New York, New Haven and Hartford Railroad Bridge, three short blasts.

For Congress Street Highway Bridge, four short blasts.

For East Washington Avenue Highway Bridge, one long and two short blasts.

For Pleasure Beach Highway Bridge, one long and one short blast.

(2) In case the draw of any of the above bridges cannot be immediately opened when the signals are given, a red flag or ball by day and a red light by night shall be conspicuously displayed on the bridge.

(c) The regulations. (1) Except as hereinafter provided, the draws of the bridges shall be immediately opened upon the prescribed signal at all times of the day or night for the passage of foreign vessels and "vessels of the United States" as defined in section 4311 of the Revised Statutes (46 U.S.C. 251), and for any other vessels or watercraft which cannot pass the closed bridges the draws shall be opened at such time within 20 minutes after the prescribed signal as in the judgment of the bridge tender will cause the least interference with the land traffic over the bridge.

(2) Exceptions. Closed periods when the draws of the above highway bridges over the Poquonock River need not be opened:

(i) For vessels of any class: 6:45 a.m. to 7:15 a.m. 7:45 a.m. to 8:15 a.m.

(ii) Opened only for the passage of power-driven vessels other than yachts and pleasure craft, 50 feet or over in length or 25 tons or over net register: 11:45 a.m. to 1:15 p.m.

(iii) For vessels of any class except when emergency condition exists, such emergency to be decided mutually by the Superintendent of Bridges or his authorized representative, and navigation interests involved, and is provisionally defined as the passage of boats that are unavoidably compelled to pass through the bridges during the period due to urgency of service or condition of tide: 4:30 p.m. to 6:10 p.m.

(iv) Delay in opening the draw of the New York, New Haven, and Hartford Railroad Bridge for not more than 7 minutes after the giving of signal, is authorized when a train is actually ready to pass over the bridge.

(2-a) Exceptions for East Washington Avenue Highway Bridge. The draw shall open on signal if at least 24 hours' notice has been given, except during closed periods in paragraph (c)(2) of this section.

(3) For every vessel that cannot pass the closed bridges, the operation of the draws shall afford full

horizontal and vertical clearance of the draw opening regardless of the size or requirements of the passing vessel.

(4) There shall be conspicuously posted on both the upstream and downstream sides of the bridges in a manner that it can readily be read at any time a copy of the regulations of this section; a notice shall also be posted at the Stratford Avenue Bridge over the Poquonock River stating exactly how the Superintendent of Bridges, or his authorized representative, specified in subparagraph (2)(iii) of this paragraph may be reached.

117.131 Poquonock River, Grand Street Highway Bridge and Yellow Mill Channel, Yellow Mill Highway Bridge at Stratford Avenue, Bridgeport, Conn. (a) The owner of or agency controlling these bridges will not be required to keep drawtenders in constant attendance.

(b) Whenever a vessel unable to pass under the closed bridges desires to pass through the draw, at least 24 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 bridges, except in case of emergency the draw shall be opened promptly upon notification. Advance notice shall be given either in person, by telephone, or otherwise to the mayor, city of Bridgeport, Bridgeport, Conn., or to such person as may be designated an authorized representative for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

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

117.135 Saugatuck River, Conn.; bridge of New York, New Haven & Hartford Railroad Co., at Saugatuck, Conn. (a) Except as otherwise provided in this section, the draw shall be opened as soon as practicable for the passage of vessels that cannot pass under the closed bridge, upon a signal given by three short blasts (each of about 2 seconds' duration) of a horn or steam whistle, between 5:00 a.m. and 9:00 p.m. from June 1 to September 30, inclusive, and between 8:00 a.m. and 4:00 p.m. from October 1 to May 31, inclusive. An eight-hour advance notice shall be required for opening the draw from October 1 to May 31, inclusive, between 5:00 a.m. and 8:00 a.m. and between 4:00 p.m. and 9:00 p.m. The draw may remain closed at all other times.

(1) Exception. When a train scheduled to pass beyond the bridge without stop has passed the last station nearest the bridge and is in motion toward the bridge, the bridge shall be opened as soon as the approaching train has been brought to a stop at the drawbridge signal.

(b) In case the bridge cannot be opened immediately when the signal is given, a red flag or ball by day or a red light by night shall be conspicuously displayed.

(c) Signals for the opening of the draw shall be answered by a whistle or Klaxon horn on the bridge with the same signal, three short blasts, described in paragraph (a) of this section, when the operation of the opening is commenced, or by a series of not less than four short, sharp blasts, each of not more than 1 second duration, when the bridge cannot be promptly opened.

117.145 Norwalk River at Norwalk, Conn.; Washington Street Highway Bridge and the New York, New Haven & Hartford Railroad bridge. (a) The owners of or agencies controlling the bridges described in this section shall provide the appliances and personnel necessary for the safe, prompt and efficient operation of the draw.

(b) The draw shall be opened promptly when the signal, prescribed in paragraph (c)(1) of this section for the opening of the draw, is received from an approaching vessel or other water craft which cannot pass under the closed draw except as provided in paragraph (d) of this section.

(c) Signals—(1) Call signals for opening of draw—(i) Sound signals. Highway Bridge, three short blasts of horn or whistle. Railroad Bridge, one long and two short blasts of horn or whistle. Except that for vessels drawing at the time 14 feet and more the above signals shall be followed by one long blast of horn or whistle.

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

(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 blasts of a horn or whistle, 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 watercraft 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, shall acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally a red flag by day and a red light by night.

(d) Exceptions. (1) The highway bridge: Closed periods, when the draw need not be opened except on Saturdays, Sundays, and holidays and except for vessels drawing at the time more than 14 feet of water:

Between 7:00 a.m. and 8:45 a.m.

Between 11:45 a.m. and 1:15 p.m.

Between 4:00 p.m. and 6:00 p.m.

(2) The railroad bridge: Closed periods when the draw need not be opened: When signal for opening the bridge is given between the hours 7:00 a.m. and 9:00 a.m., or between 4:00 p.m. and 6:00 p.m. and low tide is predicted in the tide tables published by the United States Coast and Geodetic Survey to occur within 1 hour before or after the time when such signal is given, the opening of the bridge may be delayed not to exceed 20 minutes from the time such signal is given: Provided, however, That when a train scheduled to pass beyond the bridge without stop has passed the last station nearest the bridge and is in motion toward the bridge, the bridge need not be opened until the approaching train has been brought to a stop.

(e) A copy of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of the bridge in such manner that it can be easily read at any time.

117.150 Mianus River, Conn.; bridge of New York, New Haven & Hartford Railroad Co. at Coscob, Conn. (a) The signal for opening the draw of the bridge described in this section shall be given by three short blasts of a horn or steam whistle. In case the draw cannot be immediately opened when the signal is given, a red flag or ball by day or a red light by night shall be conspicuously displayed on the bridge.

(b) The signal for the opening of the draw shall be answered by three short blasts of a whistle or horn on the bridge when the operation of opening is commenced, or, if the bridge cannot be promptly opened, by a series of not less than four short, sharp blasts, each of not more than 1 second duration.

(c)(1) Except as provided in subparagraph (2) of this paragraph, the draw shall be immediately opened upon the prescribed signal at any time between 5 a.m. and 9 p.m. for the passage of foreign vessels and "vessels of the United States," as defined by section 4311 of the Revised Statutes (46 U.S.C. 251).

(2) Exception. When a train scheduled to pass beyond the bridge without stop has passed the last station nearest the bridge and is in motion toward the bridge, the bridge shall be opened for the vessels described in subparagraph (1) of this paragraph as soon as the train has crossed the bridge.

(d) For all other vessels which cannot pass the closed bridge, the draw shall, upon the prescribed signals and between the hours of 5 a.m. and 9 p.m., be opened as soon as practicable, but in no case shall the delay be over 20 minutes.

117.155 Hutchinson River, N.Y.; bridges. (a) The owners of or agencies controlling these drawbridges shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draws.

(b) All bridges, except the Eastchester Creek Bridge (I-95), shall open promptly on signal. The Eastchester Creek Bridge (I-95) shall open promptly on signal provided that at least 6 hours' advance notice has been given.

(c) Signals—(1) Call signals for opening of draw—(i) Sound signals. By vessels of the United States or of the City of New York, four distinct blasts of a whistle, horn, or megaphone, or four loud and distinct strokes of a bell, and by all other vessels, three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell, sounded within reasonable hearing distance of the bridge.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. 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.

(2) Acknowledging signals by the 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 two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. Draw to be opened immediately: A white flag by day, a green light by 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 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, shall acknowledge such signal by one long blast followed by one short blast, or by swinging to and fro horizontally a red flag by day or a red light by night.

(d) Trains, automobiles, trucks, other vehicles, and vessels shall not be stopped or operated in such manner as to hinder or delay the operation of the bridges, but all passage over drawspans or through draw openings shall be such as to expedite both land and water traffic.

(e) A copy of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of each bridge in such manner that it can be easily read at any time.

117.156 Westchester Creek and Bronx River, N.Y.; city of New York Bridges at Bruckner Expressway. (a) The owner of or agency controlling

the bridges shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draws for the passage of vessels.

(b) Vessels owned, controlled, or employed by the U.S. Government, State government, or by municipal departments shall be passed without delay through the draws of the bridges at any time, day or night, after giving a signal of four distinct blasts of a horn, whistle, or megaphone.

(c) All other vessels unable to pass under the closed bridges shall be passed through the draws of the bridges at any time, day or night, after giving a signal of three distinct blasts of a horn, whistle or megaphone, repeated at intervals when necessary until answered from the bridges, except between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m., Mondays through Fridays, inclusive.

(d) Upon receiving the signal from the vessel, the operators of the bridges, in case the draws can be opened immediately shall reply by three blasts of a horn, whistle, or megaphone. In case of accident to the machinery or other contingency necessitating delay in opening of the draws, the signal from the vessel shall be answered by the operators of the bridges by two blasts of a horn, whistle, or megaphone.

(e) Pedestrians and vehicles shall not be stopped on the bridges for the purpose of delaying their opening, nor shall watercraft or vessels be so manipulated as to hinder or delay the operation of the drawspans, but all passage over, through, or under the bridges shall be prompt, to prevent delay to either land or water traffic.

(f) Clearance gages of a type to be approved by the Commandant, shall be provided and kept in good legible condition. Unless otherwise specified, such clearance gages shall consist of two board gages painted white with black figures not less than 9 inches high, which shall indicate the headroom clearances under the closed spans at all stages of the tide. These gages shall be so placed that they will be plainly visible to the operator of a vessel approaching the bridges either upstream, or downstream, and shall be illuminated at night and during periods of decreased visibility caused by fog, rain, or snow.

(g) The bridges shall not be required to open for craft carrying appurtenances unessential to navigation which extend above the normal superstructure nor for those vessels regularly and habitually navigating the waterways which may be or are equipped with hinged or removable stacks, masts and flagpoles which can be lowered to pass under the closed draws of the bridges. Upon request, the District Commander, will cause inspection to be made of the superstructure and appurtenances of any craft habitually frequenting these waterways with a view to adjusting any differences of opinion in this regard between the vessel owner and the bridge owner.

117.160 Harlem River, N.Y.; bridges (a) The drawbridges which leave a clear space, between the under sides thereof and the high water of spring tides, of 24 feet, shall not be opened except for vessels propelled by steam with or without vessels in tow; nor shall they be required to be opened at any times other than between 10:00 a.m. and 5:00 p.m.

(b) To the end that the draws of the bridges shall not be required to be opened or operated oftener than necessary between 10:00 a.m. and 5:00 p.m. the pilothouses, flagpoles, and smokestacks of all tugs propelled by steam, with or without vessels in tow, habitually using the river, shall not exceed 24 feet in height above the water line or, if exceeding that height, shall be reduced in height or hinged so that they can conveniently pass underneath the draws when closed.

(c) Any tug passing the draw of any of the bridges as often as once a day for 10 days of any month will be regarded as using the river "-habitually" and shall conform to paragraph (b) of this section. A failure to comply with such requirement by any tug after one warning by the owner of or agency controlling any of the bridges shall be sufficient cause for a refusal to open the draw for the accommodation of such tug until such later time as may be convenient to the owner of or agency controlling the bridge.

(d) When a steam vessel wishes to pass a bridge within the time prescribed for opening the draw, it shall signify its intention by three blasts of the whistle. If the draw is ready to be opened, the signal shall be answered by three blasts of the whistle from the bridge; if the draw is not ready for opening, the signal shall be answered by two blasts from the bridge.

(e) The draw shall be opened with the least possible delay upon receiving the prescribed signal except when such signal is given to a railroad bridge five minutes or less before the scheduled arrival of an express passenger train. In such case the draw need not be opened until after the passage of the train unless the bridge tender has information that the train is delayed as much as five minutes.

(f) The draw of the low bridge at the mouth of Spuyten Duyvil Creek shall be opened at all times during the day and night when approached by boats desiring to pass it upon receiving the prescribed signal.

(g) Vessels owned, controlled, or employed by the United States or by the City of New York shall be passed without delay through the draw of any of the bridges at any time, day or night, after giving a signal of four blasts of the whistle.

117.165 Newton Creek, N.Y. (a) [Reserved].

(b) City of New York highway bridge across East Branch at Grand Street. The draw of this bridge shall be opened promptly, upon signal, for the passage of all vessels unable to pass under the closed bridge at any time, day or night, except between 6:45 and 7:00 a.m., 7:15 and 7:30 a.m., 7:45 and 8:00 a.m., 4:30 and 4:45 p.m., and 5:00 and 5:15 p.m. on all days other than Sundays and

holidays.

(c) Signals. Whenever a vessel unable to pass under either closed bridge approaches it, the signal of its desire for the draw to be opened shall be three blasts of a whistle or horn blown on the vessel. This signal shall be repeated at intervals until it is answered from the bridge. Upon receiving the signal from the vessel, the operator of the bridge, in case the draw can be opened immediately, shall reply by three blasts of a whistle or horn, or by three loud and distinct strokes of a bell. In case of accident to the machinery or other contingency necessitating delay in opening the draw, the signal from the vessel shall be answered by the operator of the bridge by two blasts of a whistle or horn or by two loud and distinct strokes of a bell.

117.175 Jamaica Bay and connecting waterways, New York. (a) City of New York highway bridge across Mill Basin on Belt Parkway. On Sundays from May 15 to September 30, inclusive, and on Memorial Day, Independence Day, and Labor Day, the draw of this bridge shall not be required to open for the passage of vessels between 12:00 noon and 9:00 p.m. (e.d.s.t.): Provided, That during the period from two hours before to one hour after the time of predicted high tide for the locality the bridge shall be opened promptly upon proper signal for the passage of vessels unable to pass under the bridge: Provided further, That the draw shall be opened promptly at any time for the passage of vessels owned, controlled or employed by the United States or by the City of New York. NOTE: For the purpose of the regulations in this part, high tide at the bridge shall be deemed to occur 15 minutes later than the time of high tide for Sandy Hook as given in the tide tables for the United States, published by the United States Coast and Geodetic Survey, Department of Commerce. The time stated in the tables is eastern standard time and one hour should be added thereto to convert to eastern daylight saving time.

(b) City of New York highway bridge at Shellbank Basin at Nolins Avenue. (1) On Sundays, holidays, and between 6 p.m. and 6 a.m., the draws of this bridge shall not be required to open for the passage of vessels. However, the draws shall be opened promptly at any time for the passage of vessels owned, controlled, or employed by the United States or by the city of New York when operators are present, and when operators are not required to be present the draws shall be opened for the passage of such vessels with the least possible delay upon receipt of verbal or written notice. In addition, the draws shall be opened for the passage of other vessels unable to pass under a closed bridge on Sundays, holidays, or between 6 p.m. and 6 a.m., if at least 24 hours' advance notice of the time the opening is required is given, by telephone or otherwise, to the authorized representative of the owner of or agency controlling the bridge. In addition to the posting of a copy of the regulations, required by paragraph (h) of this section, a notice shall be conspicuously posted on both the upstream and downstream sides of this bridge in such manner that it can be easily read at any time stating exactly how the authorized representative may be reached.

(2) When two or more vessels are approaching from opposite directions and intend to pass a bridge, each vessel shall signal for the opening of the draw as prescribed in paragraph (f) of this section. The vessel running with the current shall have the right-of-way. At slack tide the vessel running in ebb current direction shall have the right-of-way. When vessels are approaching the bridge from the same direction each vessel shall signal independently for the opening of the draw and shall be navigated in accordance with the applicable pilot rules.

(c) Jamaica Bay North Channel, New York City Transit Authority bridge at Hamilton Beach, and city of New York highway bridge across North Channel (Grassy Bay) at Jamaica Bay Boulevard, Borough of Queens, New York, N.Y. At least 24 hours' advance notice required. However, the draw shall be opened as soon as possible for the passage of vessels owned, controlled or employed by the United States or by the city of New York.

(d) [Reserved] NOTE: For the purpose of the regulations in this part, high tide at the bridge shall be deemed to occur 35 minutes later than the time of high tide for Sandy Hook as given in the tide tables for the United States, published by the United States Coast and Geodetic Survey, Department of Commerce.

(e) Requirements for operation of draws. The owners of or agencies controlling the bridges shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draws. Except as otherwise provided in paragraphs (a) to (d) of this section, the draws shall be opened promptly when the prescribed signal for the opening of a draw is received from an approaching vessel which cannot pass under the closed bridge.

(f) Signals—(1) Call signals for opening of draw—(i) Sound signals. By vessels of the United States or of the City of New York, four distinct blasts of a whistle, horn, or megaphone, or four loud and distinct strokes of a bell, and by all other vessels, three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell, sounded within reasonable hearing distance of the bridge.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. 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.

(2) Acknowledging signals by the 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 two loud and distinct

strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. Draw to be opened immediately: A white flag by day, a green light by 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 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, shall acknowledge such signal by one long blast followed by one short blast, or by swinging to and fro horizontally a red flag by day or a red light by night.

(g) Land and water traffic. Trains, automobiles, trucks, other vehicles, and vessels shall not be stopped or operated in such manner as to hinder or delay the operation of the bridges, but all passage over drawspans or through draw openings shall be such as to expedite both land and water traffic.

(h) Posting of regulations. A copy of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of each bridge in such manner that it can be easily read at any time.

117.180 Long Island Intracoastal Waterway; Nassau County highway bridges across Reynolds Channel at Long Beach and Atlantic Beach, N.Y. (a) The owner of or agency controlling these bridges shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draws.

(b) Except as provided in paragraph (c) of this section, the draws shall be opened promptly when the prescribed signal for the opening of the draw is received from an approaching vessel which cannot pass under the closed draw.

(c)(1) Atlantic Beach Bridge. From May 15 to September 30, inclusive, of each year, on Saturdays and Sundays and on Memorial Day, Independence Day, and Labor Day between 11:00 a.m. and 9:00 p.m., and on weekdays between 4:00 p.m. and 7:00 p.m., openings of the draw will be made, only if necessary, every half-hour on the hour and on the half-hour: Provided, That during the period from two hours before to one hour after the time of predicted high tide the bridge shall be opened promptly upon proper signal for the passage of vessels unable to pass under the closed draw: Provided further, That the draw shall be opened promptly at any time for the passage of vessels owned, controlled, or employed by the United States. The time specified is eastern daylight saving time or eastern standard time, whichever is in force.

NOTE: For the purpose of the regulations in this part, predicted high tide shall be deemed to occur ten minutes earlier than the time of predicted high tide for Sandy Hook as given in the tide tables for the United States published by the United States Coast and Geodetic Survey, Department of Commerce. The time stated in the tables is eastern standard time, and one hour should be added to convert to eastern daylight saving time.

(2) Long Beach Bridge. From May 15 to September 30, inclusive, of each year, on Saturdays and Sundays and on Memorial Day, Independence Day, and Labor Day between 3:01 p.m. and 7:59 p.m., openings of the draw will be made, only if necessary, every half-hour on the hour and on the half-hour: Provided, That the draw shall be opened promptly at any time for the passage of vessels owned, controlled, or employed by the United States. The time specified is eastern daylight saving time or eastern standard time, whichever is in force.

(d) Signals—(1) Call signals for opening of draw—(i) Sound signals. By vessels owned, controlled, or employed by the United States, four distinct blasts of a whistle, horn, or megaphone, or four loud and distinct strokes of a bell, and by all other vessels, three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell, sounded within reasonable hearing distance of the bridge.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. 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.

(2) Acknowledging singals by the 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 two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals may not be heard. Draw to be opened immediately: A white flag by day, a green light by 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 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, shall acknowledge such signal by one long blast followed by one short blast, or by swinging to and fro horizontally a red flag by day or a red light by night.

(e) Automobiles, trucks, other vehicles, and ves-

sels shall not be stopped or operated in such manner as to hinder or delay the operation of the bridges, but all passage over drawspans or through draw openings shall be such as to expedite both land and water traffic.

(f) The owner of or agency controlling the bridges shall provide and keep in good legible condition on each bridge two board gages painted white, with black figures not less than eight inches high, to indicate the minimum headroom clearance under the closed drawspan at all stages of the tide. The gages shall be so placed on each bridge that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream.

(g) The bridges shall not be required to open for craft carrying appurtenances unessential for navigation which extend above the normal superstructure. Military masts shall be considered as part of the normal superstructure.

NOTE: Upon request, the District Commander will cause inspection to be made of the superstructure and appurtenances of any craft habitually frequenting the waterway with a view to adjusting any differences of opinion in this matter between the vessel owner and the bridge owner.

(h) A copy of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of each bridge in such manner that it can be easily read at any time.

117.185 Hudson River, N.Y.; bridges at Albany and Troy. (a) Except as provided in paragraph (h) of this section, the draws of each of the bridges shall be opened promptly when the prescribed signal for the opening of the draw is received from an approaching vessel which cannot pass under the closed draw.

(b) The draw of any bridge shall not be required to remain open for the passage of vessels for a period longer, consecutively, than 15 minutes. Upon being closed it may remain closed for a time sufficient to allow delayed land traffic to pass, but in no case for a period longer, consecutively, than 20 minutes if a vessel desires to pass, unless at the expiration of such period a train in motion having passed the derailing point is approaching the draw, which train shall be permitted to pass before opening of the draw: Provided, That no train shall be stopped on the bridge between the derailing points except in a case of great emergency, after which the draw shall be opened promptly for any vessel desiring to pass: Provided further, That these limitations shall not apply to any vessel of more than 500 tons burden, to any tug with a tow on a hawser, to single tows which require longer than 15 minutes to pass through the draw, or to vessels downbound during a freshet whose height exceeds an elevation determined upon by the District Commander.

(c) The length of time that a draw has been opened shall be computed from the time that the drawspan begins to move in opening, and the length of time that a draw has been closed shall be computed from the time that the drawspan ceases to move in closing.

(d) Vessels with tows shall not so approach a bridge as to attempt to pass the draw in succession without interval. They shall arrange their approach so as to cause no delay in closing the draw promptly for the relief of land traffic.

(e) The draw of a bridge shall not be required to be opened for the passage of vessels habitually using the river which have stacks, jack staffs, or flagstaffs exceeding 21 feet in height above the water line and which are otherwise capable of clearing the bridge when closed. If such vessels wish to pass the bridge the stacks, jack staffs, or flagstaffs must be so erected that they may be lowered to permit the passage under the bridge. Any tug or vessel passing the draw of a bridge as often as once a day for 10 consecutive days of any month shall be regarded as using the river habitually within the meaning of this paragraph. A failure to comply with such requirement by any tug or vessel after one warning by the owner of or agency controlling any of the bridges shall be sufficient cause for a refusal to open the draw for the accommodation of such tug or vessel until such later time as may be convenient to the owner of or agency controlling the bridge.

(f) Vessels which are owned or controlled by the United States or by the police or fire departments of any of the neighboring cities or villages shall be passed without delay through the draws of any of the bridges on identification of such vessels.

(g) Signals—(1) Call signals for opening of draw. By vessels bound north: Three long blasts of the whistle or horn. By vessels bound south: Three long blasts followed by one short blast of the whistle or horn. If a vessel desires to pass through more than one bridge the call signal shall be repeated for each bridge. Private signals of towing or steamboat companies which may be mistaken by a bridge tender for call signals shall not be used.

(2) Acknowledging signals by the bridge operator—(i) All bridges. If the draw is to be opened, three long blasts of a whistle or horn. If the draw cannot be opened in time for the vessel to pass through safely, five short blasts of a whistle or horn.

(ii) Additional visible signals to be displayed by the bridges at Albany. The day signal shall be displayed at least 15 feet above the fixed day signal at the middle point of the drawspan and so as to be visible from both sides of the bridge. The night signal shall be displayed at least 15 feet above the fixed light at the center of the draw. The "fixed" signals referred to are those required by the regulations for lighting bridges prescribed by the United States Coast Guard (see Part 68 of this title). By day, if the draw is to be opened, the visible signal shall be a round ball not less than three feet in diameter and painted green, and if the draw is not to be opened, the visible signal shall be a latticework barrel-shaped sign five feet six inches high and four feet in diameter and painted red. By

night, if the draw is to be opened, the visible signal shall be a green light from a standard marine lamp, and if the draw is not to be opened, the visible signal shall be a red light from a standard marine lamp.

(h) The general regulations contained in paragraphs (a) to (g), inclusive, of this section shall apply to all bridges except as modified by special regulations contained in this paragraph.

(1) (Revoked)

(2) New York Central Passenger Bridge. The draw need not be opened for the passage of vessels during the period from December 16 to March 31, unless notice has been given 24 hours in advance of the time a vessel may be expected to pass through.

(3) New York Central Freight Bridge. The draw need not be opened for the passage of vessels during the period from December 16 to March 31, unless notice has been given 24 hours in advance of the time a vessel may be expected to pass through.

(4) [Reserved]

(5) Congress Street Bridge. The draw will be opened for the passage of vessels except during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.: Provided, That the draw need not be opened during the period from December 16 to March 31, between 6:00 p.m. and 7:00 a.m. unless notice has been given before 4:30 p.m. of the time a vessel may be expected to pass through.

(6) Troy-Green Island Bridge. The draw need not be opened for the passage of vessels during the period from December 16 to March 31 of each year. From April 1 to December 15 inclusive, of each year, openings will be made for the passage of vessels except during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.: Provided, That the draw need not be opened between 6:00 p.m. and 7:00 a.m. unless notice has been given before 4:30 p.m. of the time a vessel may be expected to pass through.

(7) 112th Street Bridge. The draw need not be opened for the passage of vessels during the period that the Federal Lock at Troy is inoperative: Provided, That provision is made for emergency operation of the bridge with the least possible delay upon receipt of oral or written notice. During the balance of the year, the bridge shall be opened for the passage of vessels except during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.: Provided, That the draw need not be opened between 6:00 p.m. and 7:00 a.m. unless notice has been given before 4:30 p.m. of the time a vessel may be expected to pass through.

NOTE: The time specified in all cases is eastern daylight saving or eastern standard time, whichever is in force.

117.190 Navigable waters in the State of New York and their tributaries; bridges where constant attendance of draw tenders is not required. (a) The owners of or agencies controlling the bridges listed in paragraph (f) of this section will not be required to keep draw tenders in constant attendance.

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

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

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

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

(f) The bridges to which this section applies, and the regulations applicable in each case, are as follows:

(1) Arm of Eastchester Bay; city of New York highway bridge between Rodman Neck and City Island. The draw need not be opened for the passage of vessels and the provisions of paragraphs (b) through (e) of this section shall not apply to this bridge.

(2) Bronx River; city of New York highway bridge at Westchester Avenue. The draw need not be opened for the passage of vessels and the provisions of paragraphs (b) through (e) of this section shall not apply to this bridge.

(3) Bronx River; New York, New Haven and Hartford Railroad Company bridge, north of Westchester Avenue. The draw need not be opened for the passage of vessels and the special regulations contained in paragraphs (b) to (e) of this section shall not apply to this bridge.

(4) Flushing Creek; Whitestone Parkway Bridge and the City of New York highway and rapid transit bridge at Roosevelt Avenue. The draws need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(5) Coney Island Creek; city of New York highway bridge at Harway (Cropsey) Avenue. The draw need not be opened for the passage of vessels and the provisions of paragraphs (b) through (e) of this section shall not apply to this bridge. This bridge shall be restored to an operable condition within 6 months after notification by the Commandant that such action is required.

(6) Coney Island Creek; City of New York highway bridge at Stillwell Avenue and New York City Transit Authority bridge near Stillwell

Avenue. The draws of the bridges need not be opened for the passage of vessels, and special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to these bridges.

(7) [Reserved]

(8) Richmond Creek; city of New York highway bridge at Richmond Avenue, Staten Island. The draw need not be opened for the passage of vessels and the provisions of paragraphs (b) through (e) of this section shall not apply to this bridge.

(9) Peekskill (Annsville) Creek; New York Central Railroad Company bridge near Peekskill, N.Y. The draw need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e), inclusive, of this section shall not apply to this bridge.

(10) Wappinger Creek; Penn Central Railroad bridge at New Hamburg. The draw shall be opened promptly upon signal from 11:30 a.m. to 7:30 p.m. from May 15 to October 15. At all other times at least 12 hours' advance notice shall be given to the Chief Train Dispatcher, Penn Central Railroad Company, New York, N.Y.

(10-a) Hudson River; State of New York highway (Troy-Menands) bridge between Albany and Rensselaer Counties. The draw need not be opened for the passage of vessels, and the special regulations contained in paragraphs (b) to (e) inclusive, of this section shall not apply to this bridge.

117.200 Newark Bay, Passaic and Hackensack Rivers and their navigable tributaries; General Regulations. (a) The draws of each bridge shall open promptly on signal except as prescribed in paragraphs (b), (c), and (f) of this section and except that the draw of the U.S. 1 and U.S. 9 bridge across the Passaic River shall open on signal if at least 6 hours' notice has been given.

(b) During the hours between 7:30 and 10:00 a.m. and between 5:00 and 7:30 p.m. drawbridges shall not be required to remain open longer than 10 minutes nor shall the passage of any vessel be delayed for longer than 10 minutes except as provided in paragraph (f) of this section.

(c) The draw of any bridge used solely for the United States mail, passenger, and express trains need not be opened for a vessel reaching said draw less than 5 minutes before the scheduled arrival of any such train until such train passes, unless the bridge tender has notice that the train is delayed more than 5 minutes. The owners of bridges acting under this rule shall maintain a tug at the drawbridge to control and aid in the passage of vessels.

(d) When a vessel approaches within signaling distance of a bridge for passage, the master thereof shall signify his intention by three blasts of a whistle or horn. For those bascule bridges that have two separate and distinct drawspans the approaching vessel shall signal for an opening of the bridge in the customary manner by three blasts of a whistle or horn, and this shall be followed after a short interval with one blast, if it is desired that the drawspan on the starboard hand as the vessel approaches be opened, or by two blasts if it is desired that the one on the port hand be opened. The signal of the craft shall be immediately answered by the tender or operator of the bridge. If the draw is ready to be immediately opened, the answer shall be three blasts of a whistle or horn from the bridge. In case of delay in opening the draw, as is provided for in this section, or as may be necessary by accident to the machinery or other contingency, the signal from the vessel shall be answered by two long blasts of a whistle or horn from the bridge. In all cases when delay signals have been given, a signal of three blasts of a whistle or horn shall be given as soon as it is possible to open the draw.

(e) Upon hearing or perceiving the signals prescribed, the tenders or operators of a drawbridge, except as provided in paragraphs (b), (c) and (f) of this section, shall at once open the draw signaled for so as to allow the prompt passage of any vessel or craft: Provided, That the bridge may not be opened when there is a train, wagon, or vehicle at the time passing over said drawspan, or a train approaching so closely that it cannot be safely stopped before reaching the bridge, but it shall be opened as soon as the drawspan can be cleared. In case the opening of the draw will be delayed under the provisions of paragraph (c) of this section the tug stationed at the draw shall immediately go to the assistance of the vessel.

(f) Each tug, towboat, barge and other small craft regularly and habitually navigating the aforementioned waterways shall be subject to inspection and measurement by the District Commander to determine which vessels, if any, would, by reasonable reductions in heights of masts and/or stacks, be capable of passing under the closed draw of any bridge affording at least vertical clearance of 35 feet at mean high water. The District Commander will notify the owners of such vessels as can be so modified, of the date by which the modifications shall be completed. In the event of the failure of said owners to comply with such notification, the District Commander will authorize the above bridge owners to delay opening their bridges, for the passage of said vessels, until convenient to do so, but on no occasion for more than 45 minutes: Provided, however, That such vessel shall not be so delayed when it has in tow another vessel or craft of such height as to require the opening of the bridge, or when, because of the stress of weather, prompt opening is necessary.

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

(h) The regulations in paragraphs (a) to (g) of this section apply only to commercial or pleasure vessels. Steamers or vessels employed or controlled by the United States Government, State government, or by municipal departments shall be

passed without delay through the draws of said bridges at any hour of the day or night, upon giving four blasts of the whistle.

(i) Clearance gages of a type to be approved by the Commandant shall be provided by the owner of each bridge and be kept in good legible condition. Unless otherwise specified, such clearance gages shall consist of two board gages painted white with black figures not less than 9 inches high, which shall indicate the headroom clearances under the closed span at all stages of the tide. These gages shall be illuminated at night and during the time of fog, rain and snow. These gages shall be so placed that they will be plainly visible to the navigator of a vessel approaching the bridge either up or downstream.

117.210 Raritan River and Arthur Kill, and their navigable tributaries; bridges. (a) All drawbridges spanning Raritan River and Arthur Kill, and their navigable tributaries, shall be opened promptly upon signal, for the passage of vessels during the day or night, except as prescribed in paragraph (b) of this section.

(b) During the hours between 7:30 and 10 a.m. and between 5 and 7:30 p.m. drawbridges shall not be required to remain open longer than 10 minutes nor be permitted to remain closed longer than 10 minutes to the exclusion of vessels approaching for passage: Provided, That the draw of any bridge used solely for United States mail, passenger, and express trains need not be opened for a vessel reaching said draw less than 5 minutes before the scheduled arrival of any such train, until such train passes, unless the bridge tender has notice that the train is delayed more than 5 minutes: Provided further, That the owners of bridges acting under this rule shall maintain a tug at the drawbridge to control and aid in the passage of vessels.

(c) When a vessel approaches within signaling distance of a bridge for passage, the master thereof shall signify his intention by three blasts of a whistle or horn. The signal shall be answered by three blasts of a whistle or horn from the bridge unless, under paragraph (b) of this section a delay in opening is permitted, when the answer from the bridge will be two blasts of whistle or horn, and the tug stationed at the draw shall immediately go to the assistance of the vessel.

(d) Upon hearing or perceiving the signals prescribed, the tenders or operators of a drawbridge, except as provided in paragraph (b) of this section shall at once open the drawspans of the bridge for the prompt passage of any vessel or craft: Provided, That the bridge may not be opened when there is a train, wagon, or vehicle at the time passing over said drawspan, or a train approaching so closely that it cannot be safely stopped before reaching the bridge, but it shall be opened as soon as the drawspan may be cleared.

(e) Wagons, vehicles, and trains shall not be stopped on a drawbridge or on a drawspan for the purpose of delaying the operation of the drawbridge, nor shall watercraft or vessels be so manipulated as to hinder or delay the operation of the drawspan, but all passage upon, through, or under a drawbridge shall be prompt, to prevent delay to either land or water communication.

(f) Paragraphs (a) to (e) of this section apply only to commercial or pleasure vessels. Steamers or vessels employed or controlled by the United States Government or by municipal departments shall be passed without delay through the draws of said bridges at any hour of the day or night upon giving four blasts of the whistle.

117.215 Navigable streams flowing into Raritan Bay (except Raritan River and Arthur Kill), the Shrewsbury River and its tributaries, and all inlets on the Atlantic Ocean including their tributaries and canals between Sandy Hook and Bay Head, N.J.: bridges.

(a) The owners of or agencies controlling drawbridges shall provide the appliances and the personnel necessary for the safe, prompt and efficient operation of the draws.

(b) Drawbridges shall be opened promptly for the passage of any vessel or other watercraft unable to pass under the closed spans, except as hereinafter provided.

(c) Signals—(i) 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. To be used in conjunction with sound signals when conditions are such that sound signals cannot be heard. 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.

(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 two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Visual signals. To be used in conjunction with sound signals when conditions are such that sound signals cannot be heard. 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, shall acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally a red flag by day and a red light by night.

(d) Trains, automobiles, trucks, and other vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of these drawbridges, but all passage over drawspans or through draw openings shall be so as to expedite both land and water traffic.

(e) The owners of or agencies controlling these bridges shall provide and keep in good legible condition two board gages painted white, with black figures not less than 8 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 the vessel approaching the bridge either up or downstream.

(f) These drawbridges shall not be required to open for craft carrying appurtenances unessential for navigation which extend above the normal superstructure. Military masts shall be considered as part of the normal superstructure. Upon request, the District Commander in charge of the locality will cause inspection to be made of the superstructure and appurtenances of any craft habitually frequenting those waterways, with a view to adjusting any differences of opinion in this matter between the vessel owner and the bridge owner.

(g) Copies of the regulations in this section shall be conspicuously posted on both the upstream and downstream sides of the bridges in such manner that it can be easily read at any time.

(h) [Reserved]

(i) [Reserved]

(j) The general regulations contained in paragraphs (a) to (g), inclusive, of this section shall apply to all bridges except as modified by the special regulations contained in this paragraph.

(1) Lemon Creek, N.Y.; the City of New York highway bridge at Bayview Avenue, Borough of Richmond, Staten Island, New York. The draw need not be opened for the passage of vessels between the hours of 4:00 p.m. and 8:00 a.m. from November 1, to March 31, inclusive, and between the hours of 10:00 p.m. and 6:00 a.m. from April 1, to May 15, inclusive, and from October 16, to October 31, inclusive.

(2) Shark River, N.J. (See Coast Pilot 3.)

(3) Shrewsbury River (South Branch), N.J. (i) Monmouth County bridge between the Boroughs of Rumson and Sea Bright. From May 15 to September 30, inclusive, of each year, on Saturdays, Sundays, Memorial Day, Independence Day, and Labor Day, between the hours of 11 a.m., e.d.s.t., and 7 p.m., e.d.s.t., openings of the draw shall be made only if necessary, every half-hour on the hour and half-hour.

(ii) The draw shall not be opened for a sailboat unless it is propelled by auxiliary power or is towed by a powered vessel.

(4) Route 35 drawbridge across Cheesequake Creek at Morgan, South Amboy, N.J.: The draw shall be opened promptly on signal at all times, except that between the hours of 7 a.m. to 7 p.m. from May 15 through October 15 the draw need be opened only on the hour.

117.225 Navigable waters in the State of New Jersey; bridges where constant attendance of draw tenders is not required. (a) The owners of or agencies controlling the bridges listed in paragraph (f) of this section will not be required to keep draw tenders in constant attendance.

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

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

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

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

(f) The bridges to which this section applies, and the regulations applicable in each case, are as follows:

(1) Overpeck Creek, New York, Susquehanna and Western Railroad Company bridge and West Shore Railroad Company (New York Central System) bridge at Ridgefield Park. From January 1 to March 31, inclusive, the bridges need not be opened for the passage of vessels. From April 1 to December 31, inclusive, at least 2 hours' advance notice required, except from May 1 to November 30, inclusive, between the hours of 8 a.m. and 5 p.m., the bridges will be opened promptly upon signal for the passage of vessels, in accordance with the regulations contained in 117.200.

(1-b) Hackensack River, New Jersey Department of Transportation bridge at Little Ferry. At least 6 hours' advance notice is required.

(2) Passaic River, Passaic and Bergen Counties highway bridges at Market Street and at West Eighth Street, Passaic. The draws need not be opened for the passage of vessels, and paragraphs (b) to (e) of this section shall not apply to these bridges.

(2-a) Passaic River, Erie Lackawanna Railroad bridge between Newark and West Arlington, N.J. The draw need not be opened from 11 p.m. to 7 a.m. From 7 a.m. to 11 p.m., the draw shall be opened promptly on signal provided 8 hours' advance notice has been given.

(2-b) Passaic River, Highway Route 3 bridge at Rutherford. At least 6 hours' advance notice required.

(2-c) Passaic River, Erie Lackawanna railroad bridge at Lyndhurst. From 8 a.m. to 12 midnight the draw shall open on signal. From 12 midnight to 8 a.m. the draw shall open on signal if at least 6 hours notice has been given.

(3) Elizabeth River. (i) Central Railroad Company of New Jersey bridge and Union County bridges at Baltic Street, Summer Street, South Street, and Bridge Street in the city of Elizabeth. The draws need not open for the passage of vessels and paragraphs (b) through (e) of this section do not apply to these bridges.

(ii) Union County bridge at South First Street, city of Elizabeth. The draws shall open on signal if at least 3 hours' advance notice has been given.

(iii) Union County bridge at South Front Street, city of Elizabeth. From 7 a.m. to 12 midnight, the draw shall open on signal. From 12 midnight to 7 a.m., the draw shall open on signal if at least 3 hours' advance notice has been given.

(4) [Deleted]

(5) Woodbridge Creek; Middlesex County highway bridge and The Central Railroad Company of New Jersey bridge at Maurer. At least four hours' advance notice required.

(6) Shrewsbury River (South Branch) at junction of Parker Creek and Oceanport Creek; Monmouth County Gooseneck Highway Bridge. From November 1 to April 30, inclusive, at least four hours' advance notice required. At all other times and in all other respects the regulations contained in 117.215 shall govern the operation of this bridge.

(7) Oceanport Creek; The New York and Long Branch Railroad Company bridge near Oceanport. At least four hours' advance notice required.

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
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

204.4 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.

204.5 Buzzards Bay, and adjacent waters, Mass.; danger zones for naval operations. (a) Atlantic Ocean in vicinity of No Mans Land—(1) The area. The waters surrounding No Mans Land within an area bounded as follows: Beginning at latitude 41°12′30″, longitude 70°50′30″; thence northwesterly to latitude 41°15′30″, longitude 70°51′30″; thence northeasterly to latitude 41°17′30″, longitude 70°50′30″; thence southeasterly to latitude 41°16′00″, longitude 70°47′30″; thence south to latitude 41°12′30″, longitude 70°47′30″; thence westerly to the point of beginning.

(2) The regulations. No vessel shall at any time enter or remain within a rectangular portion of the area bounded on the north by latitude 41°16′00″, on the east by longitude 70°47′30″, on the south by latitude 41°12′30″, and on the west by longitude 70°50′30″, or within the remainder of the area between 1 November and 30 April, inclusive, except by permission of the enforcing agency.

(3) The regulations in this paragraph shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

(b) [Reserved]

204.10 Narragansett Bay, R.I.; prohibited area. (a) Beginning at a point on the east shore of Conanicut Island at latitude 41°33′15″; thence southeasterly to latitude 41°32′44″, longitude 71°21′17″; thence southerly to latitude 41°32′09″, longitude 71°21′17″; thence southeasterly to latitude 41°31′50″, longitude 71°21′10″; thence southeasterly to latitude 41°31′26″, longitude 71°20′33″; thence easterly to latitude 41°31′27″, longitude 71°20′06″; thence northerly to a point on the southwesterly shore of Prudence Island at latitude 41°35′00″; thence northerly along the southwesterly shore of Prudence Island to a point at latitude 41°35′43″, longitude 71°20′15.5″; thence northwesterly to latitude 41°37′21″, longitude 71°20′48″; thence west to latitude 41°37′21″, longitude 71°21′48″; and thence south to latitude 41°33′54″, longitude 71°21′48″.

(b) The regulations: (1) No vessel shall at any time, under any circumstances, anchor or fish or tow a drag of any kind in the prohibited area because of the extensive cable system located therein.

(2) Orders and instructions issued by patrol craft or other authorized representatives of the enforcing agency shall be carried out promptly by vessels in or in the vicinity of the prohibited area.

(3) The regulations in this section shall be enforced by the Commander U.S. Naval Base, Newport, R.I., and such agencies as he may designate.

PART 205—DUMPING GROUNDS REGULATIONS

205.10 New York Harbor, its adjacent and tributary waters, and Long Island Sound. (a) General provisions for dumping. (1) Dumping in New York Harbor, its adjacent and tributary waters, and Long Island Sound is under the supervision of the Supervisor of New York Harbor, Room 303, 17 Battery Place, New York 4, New York. Prior permit must be obtained from the Supervisor of New York Harbor for all dumping.

NOTE: The following types of "forbidden matter or substance" are referred to in the act of June 29, 1888, as amended, and may not be transported or dumped in the waters covered by this section without a permit: "Refuse, dirt, ashes, cinders, mud, sand, dredgings, sludge, acid, or any other matter of any kind, other than that flowing from streets, sewers, and passing therefrom in a liquid state" (33 U.S.C. 441); "dredgings, earth, sand, mud, cellar dirt, garbage, or other offensive material of any description" (33 U.S.C. 445); "sludge, acid, or other injurious material" (33 U.S.C. 446); "mud, dirt, sand, dredgings, and

material of every kind and descripton whatever taken, dredged, or excavated from any slip, basin, or shoal in the harbor of New York, or the waters adjacent or tributary thereto" (33 U.S.C. 449).

(2) All material originating in New York Harbor, Hudson River south of Hastings, New York, and East River west of Throgs Neck is required to be dumped at sea. Material originating east of Throgs Neck is required to be dumped in Long Island Sound.

(3) The dumping areas described in paragraphs (b), (c), and (d) of this section are those generally designated in dumping permits issued by the Supervisor of New York Harbor. Dumping grounds are sounded periodically to determine whether excessive shoaling has occurred, and their location is subject to change. Upon consultation with the Supervisor, special dumping areas will be designated if the circumstances in specific cases warrant a change from the established areas.

(b) Dumping grounds at mouth of New York Harbor—(1) Dumping ground for mud, one-man stone, steam ashes, and clean soil. Not less than four nautical miles SE by S (magnetic) from Scotland Lightship, with Ambrose Channel Lightship bearing NE ¾N (magnetic), in not less than 15 fathoms.

(2) Dumping ground for derrick stone. To a point not less than six and one-fourth nautical miles SE ¼S (magnetic) from Scotland Lightship, with Ambrose Channel Lightship bearing N ¼E (magnetic) four and one-fourth nautical miles, in not less than 17 fathoms.

(3) Dumping ground for sewage sludge. To a point not less than eight nautical miles ESE (magnetic) from Scotland Lightship, with Ambrose Channel Lightship bearing NW ¼W (magnetic) four nautical miles, in not less than 12 fathoms.

(4) Dumping ground for wrecks. To a point not less than 15 nautical miles SSE Southerly (magnetic) from Scotland Lightship, in not less than 25 fathoms.

(5) Dumping ground for waste acid— (i) Summer season. To an area south of latitude 40°20′ and east of longitude 73°40′.

(ii) Winter season. To an area south of latitude 40°20′ and east of longitude 73°43′.

(c) Dumping grounds in Long Island Sound—(1) Stamford dumping ground. An area two nautical miles long (44° true) and one nautical mile wide (316° true) from the center of which The Cows Lighted Bell Buoy 32 bears N by W (magnetic) 2,700 yards, Stamford Harbor Light bears NNW ¼W (magnetic) 4,650 yards, and Greens Ledge Light bears NE ⅞E (magnetic) 9,450 yards; depths ranging from 87 to 130 feet at mean low water.

(2) Eatons Neck dumping ground. An area two nautical miles long (60° true) and one nautical mile wide (337° true) with its center bearing NNW ⅛W (magnetic) from Eatons Neck Light 6,300 yards, and W ⅜N (magnetic) from Eatons Point Lighted Bell Buoy 11B 3,875 yards; depths ranging from 103 to 150 feet at mean low water.

(3) Norwalk dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Greens Ledge Light bears N by E ½E (magnetic) 3,400 yards, and Stamford Harbor Light bears W by N ¼N (magnetic) 8,800 yards; depths ranging from 71 to 99 feet at mean low water.

(4) Southport dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Southport Light bears N by E (magnetic) 7,100 yards, and Cockenoe Island Shoal Lighted Bell Buoy 24 bears NW by W ¼W (magnetic) 4,300 yards; depths ranging from 60 to 64 feet at mean low water.

(5) Bridgeport dumping ground. An area two nautical miles long (true east-west) and one nautical mile wide (true north-south) from the center of which Penfield Reef Light bears N (magnetic) 5,500 yards, and Pine Creek Lighted Bell Buoy 22 bears NW ¾N (magnetic) 6,500 yards; depths ranging from 65 to 70 feet at mean low water.

(6) Smithtown Bay dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Old Field Point Light bears SE by E ½E (magnetic) 9,500 yards, and Stratford Shoal (Middle Ground) Light bears ENE (magnetic) 13,000 yards; depths ranging from 81 to 109 feet at mean low water.

(7) Port Jefferson dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Port Jefferson East Breakwater Light bears S ¾E (magnetic) 4,875 yards, and Old Field Point Light bears SSW (magnetic) 4,000 yards; depths ranging from 97 to 155 feet at mean low water.

(8) Milford dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Charles Island Rocks Lighted Bell Buoy 16 bears N (magnetic) 8,850 yards, Stratford Point Light bears NW ¼N (magnetic) 8,150 yards, and Stratford Shoal (Middle Ground) Light bears SW by W ⅛W (magnetic) 9,150 yards; depths ranging from 61 to 67 feet at mean low water.

(9) New Haven dumping ground. An area two nautical miles long (true east-west) and one nautical mile wide (true north-south) from the center of which Southwest Ledge Light bears N ¼W (magnetic) 10,750 yards, and Townshend Ledge Lighted Gong Buoy 10A bears NNE ¼E (magnetic) 7,400 yards; depths ranging from 64 to 70 feet at mean low water. A flashing white buoy marks the eastern limit of the major axis.

(10) Branford dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Branford Reef Light bears N (magnetic) 6,100 yards, and Townshend Ledge Lighted Gong Buoy 10A bears NW ⅛N (magnetic) 8,000 yards; depths ranging from 63 to 72 feet at mean low water.

(11) Falkner Island dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which

Falkner Island Light bears ENE ½E (magnetic) 5,900 yards, and Branford Reef Light bears NW ¾W (magnetic) 9,700 yards: depths ranging from 64 to 75 feet at mean low water.

(12) Mattituck dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Mattituck Breakwater Light bears S by W (magnetic) 6,000 yards, and Horton Point Light bears E (magnetic) 11,000 yards; depths ranging from 75 to 111 feet at mean low water.

(13) Clinton Harbor dumping ground. An area one nautical mile square (sides running truth north-south and east-west) from the center of which Kelsey Point Breakwater Light bears NNE ½E (magnetic) 3,050 yards, and Long Sand Shoal West End Lighted Bell Buoy bears E ⅜S (magnetic) 5,400 yards; depths ranging from 79 to 114 feet at mean low water.

(14) Cornfield Shoal dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Saybrook Breakwater Light bears N by E (magnetic) 4,900 yards, and Cornfield Point Lightship bears W ⅜S (magnetic) 2,875 yards; depths ranging from 114 to 121 feet at mean low water.

(15) Orient Point dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Orient Point Light bears S by E ½E (magnetic) 3,350 yards, and Plum Island Light bears SE (magnetic) 3,200 yards; depths ranging from 120 to 210 feet at mean low water

(16) Niantic dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which Bartlett Reef Lighted Whistle Buoy 2A bears ESE (magnetic) 4,050 yards, and Bartlett Reef Light bears E (magnetic) 4,300 yards; depths ranging from 66 to 94 feet at mean low water.

(17) New London dumping ground. An area one nautical mile square (sides running true north-south and east-west) from the center of which New London Harbor Light bears N (magnetic) 5,800 yards, and New London Ledge Light bears N by E (magnetic) 4,425 yards; depths ranging from 63 to 72 feet at mean low water.

(18) North Dumpling dumping ground. An area one-fourth nautical mile square (sides running true north-south and east-west) from the center of which North Dumpling Light bears W ¾S (magnetic) 1,700 yards, and Seaflower Reef Light Bears W by N ⅞N (magnetic) 2,950 yards; depths ranging from 63 to 75 feet at mean low water.

(19) Stonington dumping ground. An area one-fourth nautical mile square (sides running true north-south and east-west) from the center of which Latimer Reef Light bears WNW ⅝W (magnetic) 2,050 yards, and Stonington Outer Breakwater Light bears NNE (magnetic) 1,600 yards; depths ranging from 61 to 106 feet at mean low water.

(d) Dumping grounds in Hudson River—(1) Kidds Point dumping ground. From Kidds Point to Fish Island, in the middle of the river; depths ranging from 77 to 84 feet.

(2) Con Hook dumping ground. From Con Hook to East Gable, in the middle of the river; depths ranging from 89 to 125 feet.

(3) Gees Point dumping ground. From Garrison to Gees Point, in the middle of the river; depths ranging from 68 to 175 feet.

(4) Storm King dumping ground. From Storm King to Breakneck Point, in the middle of the river; depths ranging from 59 to 79 feet.

(5) Danskammer Point dumping ground. From Roseton to Danskammer Point, in the middle of the river; depths ranging from 51 to 60 feet.

(6) Crum Elbow dumping ground. From Crum Elbow to Greer Point, in the middle of the river; depths ranging from 68 to 139 feet.

(7) Dinsmore Point dumping ground. From Dinsmore Point to the south end of Middle Grounds, in the center of the channel; depths ranging from 50 to 100 feet.

#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 nonfloatable 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, Caribbean Sea Frontier and Western Sea Frontier, and such agencies as they may designate.

(b) Dumping grounds.

(1) to (3) do not include areas covered by this Coast Pilot.

(4) The waters of the Atlantic Ocean off Newport, R.I., within an area 1 nautical mile square, bounded by the following lines: Beginning at latitude 41°22′49″, longitude 71°19′15″; thence to latitude 41°22′49″, longitude 71°17′55″; thence to latitude 41°21′49″, longitude 71°17′55″; thence to latitude 41°21′49″, longitude 71°19′15″; and thence to the point of beginning.

(5) 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

207.20 Cape Cod Canal, Mass.; use, administration, and navigation. (a) Limits of canal. The canal, including approaches, extends from the eastern extremity of the northerly stone breakwater in Cape Cod Bay through dredged channels and land cuts to Cleveland Ledge Light in Buzzards Bay, about 4 statute miles southwest of Wings Neck.

(b) Supervision. The movement of ships, boats, and craft of every description through the canal and the operation and maintenance of the waterway and all property of the United States pertaining thereto, shall be under the supervision of the Division Engineer, New England Division, Corps of Engineers, Boston, Massachusetts, or his authorized representatives.

(c) Vessels allowed passage. The canal is open for passage to all adequately powered vessels properly equipped and seaworthy, of sizes consistent with safe navigation as governed by the controlling depth, widths, and clearances of the bridges on the waterway. The granting of permission for any vessel to proceed through the waterway shall not relieve the owners, agents and operators of full responsibility for its safe passage. No vessel having a greater draft forward than aft will be allowed to transit the canal. Craft of low power and wind driven are required to have and use auxiliary power during passage through the canal land cut and will continue to use this power between the State Pier, Buzzards Bay and Cleveland Ledge Light if it is necessary for the craft to navigate the Federal Improved Channel. Low powered vessels should await slack water or favorable current for canal transit.

(d) Tows. (1) Tows shall be madeup outside the canal entrances. All vessels engaged in towing other vessels not equipped with a rudder shall use two tow lines or a bridle and one tow line. If the vessel in tow is equipped with a rudder, one tow line may be used. All tow lines or hawsers must be hauled as short as practicable for safe handling of the tows. No towboat will be allowed to enter the waterway with more than two barges in tow unless prior approval is granted by the Vessel Dispatcher.

(2) The maximum length of pontoon rafts using the canal will be limited to 600 feet, and the maximum width to 100 feet. Pontoon rafts exceeding 200 feet in length will be required to have an additional tug on the stern to insure that the tow is kept in line. The tugs used must have sufficient power to handle the raft safely.

(3) Dead vessels are required to transit the canal during daylight hours and must be provided with the number of tugs sufficient to afford safe passage through the canal.

(e) Explosives. Vessels or tows carrying explosives must notify the Vessel Dispatcher prior to entering the canal so that arrangements can be made for a clear canal passage. Transportation of explosives through the canal shall be in strict accordance with regulations prescribed by law.

(f) Clearance priority. Ordinarily, vessels will be given clearance in the order of arrival, but when conditions warrant one-way traffic, or for any reason an order of priority is necessary, clearance will be granted in the following order:

(1) First. To vessels owned or operated by the United States, including contractors' equipment employed on canal maintenance or improvement work.

(2) Second. To passenger vessels.

(3) Third. To cargo vessels, towboats, commercial fishing vessels, pleasure boats and miscellaneous craft.

(g) Obtaining clearance. Vessels over 25 feet in length, with or without radar, are cautioned not to transit the canal until clearance by traffic lights, radio, radiotelephone, megaphone, or Corps of Engineers' patrol boat has been obtained. If a vessel of any type is delayed at the mooring basins, State Pier, Buzzards Bay or the Sandwich bulkhead, a second clearance must be obtained prior to continuing passage through the canal.

(1) Traffic lights. Traffic lights, red, green and amber yellow are located at the easterly canal entrance, Sandwich; the easterly side of the Sandwich Control Station 35; at the westerly entrance of the Hog Island Channel at Wings Neck and apply to all vessels over 65 feet in length that desire to transit the canal as follows:

(i) West bound traffic. When the green light is on at the eastern (Cape Cod Bay) entrance, properly equipped vessels may proceed westward through the canal. When the fixed red light is on, any type of vessel over 65 feet in length drawing more than 25 feet, and towboats with any type of craft in tow must stop clear of the Cape Cod Bay entrance approach channel. When the amber yellow light is on, vessels drawing less than 25 feet may proceed as far as the East Mooring Basin where they must stop, and from that point clearance must be granted by radiotelephone, contact with the Corps of Engineers' patrol boat, or other reliable means. When the red light is flashing, clearance to enter the canal may be expected within a reasonable time, not to exceed 30 minutes. If, on receiving the green light, the ship does not get under way within 30 minutes, the priority to pass through the canal may be forfeited. Anchorage of vessels drawing more than 25 feet is prohibited between Buzzards Bay Buoy No. 7 (FLW & BELL) and the easterly entrance to the canal channel.

(ii) East bound traffic. When the green light is on at Wings Neck, properly equipped vessels may proceed eastward through the canal. When the fixed red light is on, vessels over 65 feet in length drawing less than 25 feet, and towboats with any type of craft in tow must keep southerly of Hog Island Channel Entrance Buoys Nos. 1 and 2 and utilize the general anchorage areas adjacent to the

improved channel. Vessel traffic drawing 25 feet and over are directed not to enter the canal channel at the Cleveland Ledge Light entrance and shall lay-to or anchor in the vicinity of Buzzards Bay Buoy No. 7 (FLW & BELL) until clearance is granted by the Canal Dispatcher by a green traffic light at Wings Neck or by radio or radiotelephone communication. When the amber yellow light is on, vessels may proceed through Hog Island Channel as far as the West Mooring Basin or the State Pier, where they must stop and from that point clearance shall be controlled by the traffic lights located approximately 1,000 feet west of the railroad bridge, or clearance granted by the Corps of Engineers' patrol boat, or by radiotelephone or other reliable means. When the red light at Wings Neck is flashing, clearance to enter the canal may be expected within a reasonable time, not to exceed 30 minutes. If, on receiving the green light, the ship does not get underway within 30 minutes, the priority to pass through the canal at that time may be forfeited. In the daytime when sunshine partially obscures the traffic lights at Wings Neck, a red ball or shape, will be suspended from a pole 60 feet south of the lights. When this ball is so suspended it indicates that a red light is on and the canal is closed to east bound traffic. The supplementary traffic lights located approximately 1,000 feet west of the railroad bridge are for controlling east bound traffic that has passed in by Wings Neck, in the event of emergencies for dispatching traffic from the West Mooring Basin and State Pier, and for indicating that the railroad bridge is in a closed (down) position. When the green light is on, vessels may proceed eastward through the canal. When the red light is on, all vessels over 25 feet in length are directed not to pass east of the State Pier.

(2) Small craft. Vessels under 65 feet in length may proceed against a red light to the East Mooring Basin or the East Boat Basin when west bound and as far as the West Mooring Basin or the State Pier when east bound, at which points they must obtain clearance from the Corps of Engineers' patrol boat or from personnel at the Sandwich Observation Station or the Administration Building at Buzzards Bay, as the case may be. In order to check on the safety of small vessels transiting the canal land cut (Cape Cod Bay to State Pier at Buzzards Bay), all craft are required to make a complete passage through the canal between the above points in order that traffic checks may be made at the Sandwich Observation Station and the Administration Area, Buzzards Bay. When the railroad bridge span is in the closed (down) position, all motorboats and other small craft are cautioned not to proceed beyond the points designated by stop signs posted east and west of the railroad bridge. Small craft proceeding with a fair tide (with the current) should turn and stem the tide at the designated stop points until the railroad bridge is in the raised (open) position.

(3) Procedure when traffic lights are extinguished. When traffic lights are extinguished, all vessels over 65 feet in length are cautioned not to enter the canal until clearance is obtained by a radio, radiotelephone, or Corps of Engineers' patrol boat.

(4) Procedure in thick weather. When signal lights are obscured by poor visibility, all vessels over 65 feet in length are cautioned not to enter the canal until clearance is obtained by radio, radiotelephone, or Corps of Engineers' patrol boat. All ships which have obtained clearance shall sound three long blasts of a whistle or horn when passing in by Wings Neck or the Sandwich breakwater. Ships may transit the canal in thick weather by use of radar with the understanding that the United States Government will assume no responsibility, and provided that clearance has been obtained from the Vessel Dispatcher and that radio contact on 2350 kc. is maintained throughout the passage.

(h) Railroad bridge signals. The following signals at the Buzzards Bay railroad bridge should be given strict attention:

(1) The vertical left span on the railroad bridge is normally kept in the raised (open) position, except when it is lowered for the passage of trains, or for maintenance purposes. Immediately proceding the lowering of the span, the operator will sound two long blasts of an air horn. Immediately preceding the raising of the span, the operator will sound one long blast of an air horn. When a vessel or craft of any type is approaching the bridge with the span in the down (closed) position and the span cannot be raised immediately, the operator will so indicate by sounding danger signals of four short blasts in quick succession.

(2) When the lift span is in the down (closed) position in foggy weather or when visibility is obscured by vapor, there will be four short blasts sounded from the bridge every two minutes.

(i) Speed. All vessels are cautioned to pass mooring and boat basin facilities and all floating plant engaged in maintenance operations of the waterway at a minimum speed consistent with safe navigation. In order to coordinate scheduled rail traffic with the passage of vessels and to minimize erosion of the canal banks and dikes from excessive wave wash and suction, the following speed regulations must be observed by vessels of all types, including pleasure craft. Pilots are warned that continued violations of the speed regulations will be referred to the Bureau of Marine Inspection, United States Coast Guard. The minimum running time between the Sandwich Observation Station, Station 35, and the Administration Office, Buzzards Bay, Station 388, is prescribed as follows:

Head tide, 60 minutes;
Fair tide, 30 minutes;
and Slack tide, 45 minutes.
The minimum running time
between the Administrative Office,
Station 388 and Hog Island Channel
entrance buoy No. 1, Station 661,

is prescribed as follows:
Head tide, 46 minutes;
Fair tide, 23 minutes;
and Slack tide, 35 minutes.
The running time at slack water will apply to any any vessel which enters that portion of the canal between Stations 35 and 662 within the period of one-half hour before or after the predicted time of slack water as given in the United States Coast and Geodetic Survey publication, "Current Tables, Atlantic Coast, North America".
The minimum running time during a head tide or a fair tide shall apply to any vessel which enters that portion of the canal between Stations 35 and 661 at any time other than designated above for time requirements at slack tide.

(j) Management of vessels—(1) Pilot Rules. (i) The canal is an inland waterway of the United States and the pilot rules for such waterways as contained in the United States Coast Guard publication "Pilot Rules" are applicable concerning matters not otherwise covered in this section.

(ii) The Masters of all vessels with a length overall of 200 feet and over are directed to notify the Canal Dispatcher prior to entering the waterway, of the name of the Pilot handling the vessel through the canal by the media outlined below:

(a) Direct communication with the Cape Cod Canal office is available at all hours by means of telegraph, telephone, and radio. The telephone number is Buzzards Bay Plaza 9-4431 or Plaza 9-4432. The nearest ship-to-shore telephone station is at Scituate, Mass. (call letter WOU). The nearest radio telephone station (call letters WUA-21) is located at the Cape Cod Canal Office, Buzzards Bay, Mass., operating on a frequency of 2350 kc.

(b) Vessels equipped to communicate on 2350 k.c. are requested to keep their radio telephones tuned to that frequency during the entire passage through the canal.

(2) Right of way. All vessels proceeding with the current shall have the right of way over those proceeding against the current. All craft up to 65 feet in length shall be operated so as not to interfere with the navigation of vessels of greater length.

(3) Passing of vessels. Restricted passing of vessels in the canal is permissible in emergencies, particularly when a leading, low-powered ship is unable to maintain normal speed, but extreme caution must be observed to avoid collision, and consideration given to the size of the ship to be overtaken, velocity of wind and atmospheric conditions.

(4) Unnecessary delay in canal. Vessels and other type craft must not obstruct navigation by unnecessarily idling at low speed when entering or passing through the canal. Anchoring in the improved Cape Cod Canal channel is prohibited except in an emergency.

(5) Stopping in the waterway. Anchoring in the Cape Cod Canal Channel is prohibited except in emergencies. For the safety of Canal operations it is mandatory that the Masters of all vessels anchoring in the Canal Project Channel (Cape Cod Bay to Cleveland Ledge Light) because of mechanical deficiencies—groundings in or adjacent to the channel limits, or for any other reason, immediately notify the Canal Dispatcher by media outlined in subparagraph (1) (ii) of this paragraph.

(6) Utilization of mooring and boat basins and the Sandwich Bulkhead. Vessels or boats mooring or anchoring in the mooring or boat basins and at the Sandwich bulkhead must do so in a manner not to obstruct or impede vessel movements to and from the basins. Mooring in the West Boat Basin at Buzzards Bay, near the railroad bridge, is not permitted except in an emergency. Fishing boats, yachts, cabin cruisers and other craft utilizing the East Boat Basin on the south side of the canal at Sandwich, Massachusetts, are not permitted to tie up at the Corps of Engineers' landing float or anchor in a manner to prevent canal floating plant from having ready access to the float. All vessels or barges left unattended must be securely tied with adequate lines or cables. The United States assumes no liability for damages which may be sustained by any craft using the bulkhead at Sandwich or the canal mooring or boat basin facilities.

(k) Grounded, wrecked or damaged vessels. In the event a vessel is grounded or is so damaged by accident as to render it likely to become an obstruction in the waterway, the Division Engineer or his authorized representative shall supervise and direct all operations that may be necessary to move the vessel to a safe locality.

(l) Commercial statistics. Masters of vessels shall furnish the local authorized representative of the Division Engineer on each passage through the canal their own names, the pilot's name and an accurate oral or written statement of passengers, freight, and other pertinent vessel data as required.

(m) Deposit of refuse. No oil or other allied liquids, ashes, or materials of any kind shall be thrown, pumped, or swept into the canal or its approaches from any vessel or craft using the waterway, nor shall any refuse be deposited on canal grounds, marine structures or facilities.

(n) Trespass or injury to property. Subject to the provisions of paragraph (o) of this section, trespass upon the canal property or injury to the canal, lands, banks, revetment, bridges, breakwaters, dikes, dolphins, fences, culverts, trees, light, telephone or power lines, or any other property of the United States pertaining to the canal is prohibited.

(o) Fish, game and recreation. Persons at their own risk may fish with rod and line from the banks

of the canal at such locations as may be designated by the Division Engineer or his authorized representative and under the same conditions use specified areas for recreational purposes. Fish and game laws of the United States and the Commonwealth of Massachusetts will be enforced. Fishing and lobstering by boat in the Cape Cod Canal between the east entrance (Cape Cod Bay) and the State Pier, Buzzards Bay are prohibited. Fishing by boat is permitted in the area west of the State Pier, Buzzards Bay, provided that all craft stay out of the channel, as defined by United States Coast Guard buoys and beacons. Skin diving in the canal between the westerly entrance of the Hog Island Channel and Cape Cod Bay is prohibited unless authorized by the Canal Dispatcher. Visitors may park automobiles at their own risk in unrestricted Government areas while engaged in recreational activities. No open fires will be allowed at any time except by special permission and then shall be in compliance with State or Town laws. No overnight tenting or camping on Government land will be permitted.

207.30 Block Island Sound southeast of Fishers Island, N.Y.; naval restricted area. (a) The area. The waters of Block Island Sound southeast of Fishers Island, New York, described as follows: Beginning at latitude 41°15′42″, longitude 71°56′26″ thence to latitude 41°15′18″, longitude 71°54′50″; thence to latitude 41°15′10″, longitude 71°54′10″; thence to latitude 41°15′15″, longitude 71°56′53″; and thence to the point of beginning. A training dummy minefield has been established in this area, the corners of which are marked by orange and white horizontal striped can buoys. The mines are moored at depths in excess of 40 feet.

(b) The regulations. (1) In order to prevent fishing and other vessels from interfering with training operations in this area by the possible disturbance of the mines and to prevent damage to fishing gear, all vessels except naval vessels using the area for training purposes are prohibited from passing through or operating within the area.

(2) The regulations in this section shall be enforced by the Commander, Submarine Force, United States Atlantic Fleet, and such agencies as he may designate.

207.35 Manhasset Bay, N.Y.; seaplane restricted area. (a) The restricted area. An area in Manhasset Bay between the shore at Manorhaven on the north and the southerly limit line of the special anchorage area in Manhasset Bay, west area at Manorhaven (described in 202.60 of this chapter), on the south; its axis being a line bearing 166°50′ true from latitude 40°50′17.337″, longitude 73°43′03.877″, which point is on the south side of Orchard Beach Boulevard at Manorhaven; and being 100 feet wide for a distance of 380 feet in a southerly direction from the south side of Orchard Beach Boulevard, and thence flaring to a width of 300 feet at the southerly limit line.

(b) The regulations. (1) Vessels shall not anchor or moor within the restricted area.

(2) All vessels traversing the area shall pass directly through without unnecessary delay, and shall give seaplanes the right-of-way at all times.

(3) The regulations in this section shall be enforced by the Captain of the Port of New York and such agencies as he may designate.

207.36 Flushing Bay near La Guardia Airport, Flushing, N.Y.; restricted area. (a) The area. An area in the main channel in Flushing Bay extending for a distance of 300 feet on either side of the extended center line of Runway No. 13-31 at La Guardia Airport.

(b) The regulations. (1) All vessels traversing in the area shall pass directly through without unnecessary delay.

(2) No vessels having a height of more than 35 feet with reference to the plane of mean high water shall enter or pass through the area whenever visibility is less than one mile.

207.37 Jamaica Bay, Long Island, N.Y., seaplane restricted area. (a) The restricted area. An area in Jamaica Bay bounded as follows; Beginning at latitude 40°36′22″ N., longitude 73°52′47″ W.; thence 157° True, 1,125 yards to latitude 40°35′52″ N., longitude 73°52′30″ W.; thence 113° True, 3,020 yards to latitude 40°35′17″ N., longitude 73°50′42″ W.; thence 194° True, 250 yards to latitude 40°35′10″ N., longitude 73°50′44″ W.; thence 238° True, 3,270 yards to latitude 40°34′18″ N., longitude 73°52′31″ W.; thence 326° True, 465 yards to latitude 40°34′29″ N., longitude 73°52′42″ W.; thence 30° True, 875 yards to latitude 40°34′52″ N., longitude 73°52′25″ W.; thence 344° True, 3,000 yards to latitude 40°36′17″ N., longitude 73°52′58″ W.; and thence 60° True, 325 yards to the point of beginning; excluding therefrom Nova Scotia Bar defined by lines connecting the following: From latitude 40°35′33″ N., longitude 73°52′12″ W.; thence 112° True, 1,500 yards to latitude 40°35′17″ N., longitude 73°51′17″ W.; thence 163° True, 235 yards to latitude 40°35′10″ N., longitude 73°51′14″ W.; thence 236° True, 1,650 yards to latitude 40°34′43″ N., longitude 73°52′08″ W.; thence 345° True, 1,350 yards to latitude 40°35′22″ N., longitude 73°52′21″ W.; and thence 34° True, 440 yards to the point of beginning.

(b) The regulations. (1) Vessels shall not anchor or moor within the restricted area.

(2) All vessels traversing the area shall pass directly through without unnecessary delay, and shall give seaplanes the right-of-way at all times.

(3) The regulations in this section shall be enforced by the Commander, Third Coast Guard District, and such agencies as he may designate.

207.40 Ambrose Channel, New York Harbor, N.Y.; navigation. (a) The use of Ambrose Channel (formerly and before improvement called "East Channel") is hereby restricted to navigation by vessels under efficient control with their own motive power and not having barges or other vessels or floats in tow. Sailing vessels and vessels carrying tows are not permitted to use this channel ex-

cept under permit as provided in paragraph (b) of this section.

(b) The district engineer in charge of the improvement of Ambrose Channel may, by written permit, authorize vessels under tow to use Ambrose Channel in special cases when, in his judgement, the draft of such vessels or other conditions may render unsafe the use of other channels.

(c) Vessels permitted to use Ambrose Channel under paragraphs (a) and (b) of this section must proceed through the channel at a reasonable speed such as not to endanger other vessels and not to interfere with any work which may become necessary in maintaining, surveying, or buoying the channel; and they must not anchor in the channel except in cases of emergency, such as fog or accident, which would render progress unsafe or impossible.

(d) This section is not to be construed as prohibiting any necessary use of the channel by any Government boats while on Government duty, nor in emergencies by pilot boats whether steam or sail, nor by police boats.

(e) This section shall remain in force until modified or rescinded, and shall supplant all prior regulations governing the use of Ambrose Channel, which are hereby revoked.

207.50 Hudson River Lock at Troy, N.Y.; navigation. (a) Authority of lockmaster. The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He shall see that all laws, rules and regulations for the use of the lock and lock area are duly complied with, to which end he is authorized to give all necessary orders and directions in accordance therewith, both to employees of the Government and to any and every person within the limits of the lock or lock area, whether navigating the lock or not. No one shall cause any movement of any vessel, boat, or other floating thing in the lock or approaches except by or under the direction of the lockmaster or his assistants.

(b) Signals. Steamboats or tows desiring lockage in either direction shall give notice to the lock tenders, when not more than three-fourths mile from the lock, by one long blast of (10 seconds' duration), followed by one short blast (of three seconds' duration), or a whistle or horn. When the lock is ready for entrance a green light will be shown from the river wall. An amber light will indicate that the lock is being made ready for entrance. A red light will indicate that the approaching vessel must wait. Whenever local conditions make it advisable the visual signals will be supplemented by sound signals as follows:

(1) One long blast of a horn to indicate that the vessel must wait.

(2) One short blast of a horn to indicate that the lock is being made ready for entrance.

(3) Two short blasts of a horn to indicate permission to enter the lock.

(4) Four short and rapid blasts to attract attention, indicate caution, and signal danger.

(c) Draft of boats. Deep-draft boats must clear the miter sills by at least 3 inches. Boats drawing too much water will not be allowed to lighter cargo in the entrances.

(d) Precedence at the lock. The vessel arriving first at the lock shall be first to lock through; but precedence shall be given to vessels belonging to the United States and to commercial vessels in the order named. Arrival posts or markers may be established ashore above or below the lock. Vessels arriving at or opposite such posts or markers will be considered as having arrived at the lock within the meaning of this paragraph. If the traffic is crowded in both directions; up and down lockages will usually be made alternately, but the lock tender may permit two or more lockages to be made at one time in the same direction when this will not cause unreasonable delay. In case two or more boats or tows are to enter for the same lockage, they shall enter as directed by the lock tender. No boat shall run ahead of another while in the lock. The boat that enters first shall leave first.

(e) Lockage of pleasure boats. The lockage of pleasure boats, house boats or like craft shall be expedited by locking them through with commercial craft (other than barges carrying gasoline or highly hazardous materials) in order to utilize the capacity of the lock to its maximum. Lockage of pleasure craft may be made with commercial craft carrying petroleum products other than gasoline provided a clear distance of at least 100 feet between such vessels can be maintained in the lock. If, after the arrival of such craft, no separate or combined lockage can be accomplished within a reasonable time, not to exceed the time required for three other lockages, then separate lockage shall be made.

(f) Stations while waiting. Boats waiting their turn to enter the lock must lie at a sufficient distance from the lock and in such a position as to leave sufficient room for the passage of boats leaving the lock.

(g) Unnecessary delay. (1) Boats must not cause delay in entering or leaving the lock. Masters and pilots will be held to a strict accountability in this matter, and those with tows must provide enough men to move barges promptly. Boats failing to enter the lock with reasonable promptness after being signaled will lose their turn.

(2) Tugboats arriving with their tows in a condition which will delay locking shall lose their turn if so ordered by the lock tender. Leaking boats may be excluded until put in shape to be passed through safely.

(h) Mooring. Boats in the lock or waiting in the entrance shall be moored where directed by the lock tender, by bow, stern, and spring lines, to the snubbing posts or line hooks. Tying boats to the lock ladders is strictly prohibited.

(i) Protection of lock gates. Boats will not be permitted to enter or leave the lock until the lock

gates are at rest in the gate recesses and the lock tender has directed the boat to start.

(j) Damage to walls, etc. All craft passing through the lock must be free from projections or sharp corners which might scar the walls or injure other parts. Steamboats must be provided with suitable fenders, etc. One man shall be kept at the head of every tow till it has cleared the lock and guide walls, and shall use the fender to prevent scarring the walls.

(k) Handling machinery. None but employees of the United States will be allowed to move any valve, gate, or other machinery belonging to the lock.

(l) Refuse in lock. Throwing ashes, refuse, or other obstruction in the entrances or in the lock, or on the walls thereof, and passing coal from flats or barges to a steamboat while in the lock is prohibited.

(m) Commercial statistics. Masters or clerks of boats shall furnish in writing to lock tenders such statistics of passengers and cargoes as may be required.

(n) Trespass on United States property. Trespass on United States property, or willful injury to the banks, masonry, fences, trees, houses, machinery, or other property of the United States at or near the lock is strictly prohibited.

(o) Penalties. In addition to the penalties prescribed by law, boats which fail to comply with the regulations in this section will thereafter be refused lockage until assurances have been received, satisfactory to the District Engineer, Corps of Engineers, New York, New York, that the regulations will be complied with.

207.60 Federal Dam, Hudson River, Troy, N.Y.; pool level. (a) Whenever the elevation of the pool created by the Federal dam at Troy, N.Y., shall fall to a point level with the crest of the main spillway, the elevation of which is +14.33 feet mean sea level, the operation of the power plant shall cease and further operation thereof shall be suspended until such time as the water level rises to or above +14.43 feet mean sea level.

(b) Flashboards may be maintained on the section of the spillway of the dam having an elevation of +14.33 feet mean sea level in order to increase the elevation of this section to an elevation equal to that of the auxiliary spillway, or +16.33 feet mean sea level: Provided, That the flashboards are so erected as to drop automatically when the pool level rises to an elevation of +18.5 feet mean sea level, and conform in other respects to the plans attached thereto.

(c) The tide staff to be used in determining the elevation of the pool shall be the ceramic tide staff now located on the westerly face of the east lock wall north of the northerly gates, the zero of which is set 2 feet below mean sea level.

(d) The regulations of the pool level and the maintenance of flashboards shall be subject to the supervision and approval of the District Engineer, New York City.

207.900 Restricted areas in vicinity of Maritime Administration Reserve Fleets. (a) The regulations in this section shall govern the use and navigation of waters in the vicinity of the following National Defense Reserve Fleets of the Maritime Administration, Department of Commerce:

(1) [Reserved]

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

(3) [Reserved]

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

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

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

(7) [Reserved]

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

(b) No vessels or other watercraft, except those owned or controlled by the United States Government, shall cruise or anchor between Reserve Fleet units, within 500 feet of the end vessels in each Reserve Fleet unit, or within 500 feet of the extreme units of the fleets, unless specific permission to do so has first been granted in each case by the enforcing agency.

(c) The regulations in this section shall be enforced by the respective Fleet Superintendents and such agencies as they may designate.

3. CAPE COD TO SANDY HOOK

The Atlantic coast from Cape Cod to Sandy Hook embraces part of the coast of Massachusetts and all of the coasts of Rhode Island, Connecticut, and New York. To the mariner this area presents problems of unusual difficulty because of the offlying shoals, strong and variable currents, large amounts of fog, and turbulence of wind and sea in the great storms that so frequently sweep it. Additionally, the mariner is faced with the great volume of waterborne traffic that moves through the area to and from the Port of New York.

Prominent features.—The principal geographic features include Georges Bank, Nantucket and Vineyard Sounds, Buzzards Bay, Narragansett Bay, Long Island Sound and tributaries, and New York Harbor and tributaries including the Hudson River.

Cape Cod, a long peninsula jutting eastward from the mainland of Massachusetts, may be likened to an arm bent upward at the elbow. It was originally formed by the last great glacier and has been refashioned by the seas and wind. The outer end of The Cape, as it is called by eastern New Englanders, is a barren region of sand dunes with long yellow beaches, while much of the remainder of the forearm is bleak grassy country. The southern side of the delta-like plain of Cape Cod has been cut along high bluffs by the surf and waves. This section of the coast is covered with growth of pitch pine and scrub oak.

Nantucket, Martha's Vineyard, the Elizabeth Islands, and numerous smaller islands were also formed by the glacier. The plains of Martha's Vineyard and Nantucket are broad grassy heaths. The Elizabeth Islands are hilly, partly wooded and generally the shores are low bluffs.

The western shore of Buzzards Bay is of moderate height, very gently sloping, cleared, and cultivated with occasional groves of trees. Several towns and the city of New Bedford are visible along the shores.

Between Buzzards and Narragansett Bays the coast is a mass of sand dunes with steep faces forming a line along the shore. Several headlands along this stretch of coast have fine sand beaches between them.

The boundary line between Massachusetts and Rhode Island strikes the coast just westward of Quicksand Point.

Among the islands in Narragansett Bay are Rhode (Aquidneck) Island, Conanicut, and Prudence. These rather large islands are gently sloping, undulating, and covered with cultivated fields and orchards, and occasional groves of trees.

Westerly from Point Judith to Napatree Point is a continuous line of beaches behind which are many salt ponds. These ponds have been formed by the sea breaking through the outer sand barrier, and then depositing sand to close the opening. The shore near the water is low, grassy, and nearly level, but gradually rises with a series of gentle curves to higher wooded lands some distance back.

Block Island is another formation of the glacier. A prominent feature of the island is the entire absence of trees. The surface when viewed from eastward has a grassy undulating appearance, and the hills in many places show steep sandy faces. Near the shoreline the land is low, but rapidly rises toward the center of the island to steep hills covered only with grass and dotted occasionally with houses.

The boundary line between Rhode Island and Connecticut follows the Pawcatuck River to above the head of navigation.

The coastline of Connecticut is rock-bound and rugged, with numerous sandy beaches, and occasional salt meadows or marshland. The surface is mildly rolling near the shore. The depression of small valleys along the shore has created a number of good harbors. The shoreline has been well developed commercially and residentially. It is lined with seaside resorts, State parks, and bathing beaches.

The boundary line between Connecticut and New York follows the Byram River for slightly over 1 mile.

Long Island, originally formed by the glacier and thrusting about 105 miles eastward from New York Bay to a point abreast of New London, faces the New England coast across Long Island Sound on the north. The long, narrow outline of the island resembles that of a whale. Its eastern end is split by Peconic Bay and the 35- and 25-mile peninsula thus formed are the north and south flukes. The island is almost a plain. On the north coast bluffs rise to a height of 200 feet. South of these, extending well into the island's midsection, run several chains of hills. The south shore is a barrier beach from about 30 miles west of the eastern extremity to the western end, which has been developed into a series of bathing resorts.

Dumping grounds.—Dumping grounds are located in Rhode Island and Long Island Sounds, off the entrance to New York Harbor, and in the Hudson River. (See Dumping Ground Regulations in **Part 205**, chapter 2, for limits and regulations.)

Aids to navigation.—Lights, a lightship, radiobeacons, and buoys are the principal guides that mark the approaches to the important harbors. Many of the light stations have fog signals and radiobeacons, particularly those in the vicinity of the larger ports.

(See the Light List for a complete description of navigational aids.)

Loran-A and Loran-C stations provide the mariner with good navigation coverage along this section of the coast.

Radar is an important aid in most of this area but should not be relied upon for ranges to the beach in areas such as the south coast of Long Island which offer a relatively low relief. Many of the coastal buoys are equipped with radar reflectors. Radar is of particular importance in detecting other traffic and in the prevention of collisions during 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 entrances.—The entrances to most of the harbors have dredged channels marked with navigational aids and are easy of access. In some cases jetties and breakwaters extend offshore from the entrances. The entrances to the inlets along the south shore of Long Island are subject to frequent change due to the shifting sand bars.

Channels.—Federal project depth is the dredging depth of a channel as authorized by an Act of Congress upon recommendation of the Chief of Engineers, U.S. Army. **Controlling depth** in a channel is its least depth; it restricts use of the channel to drafts less than that depth.

Where deepwater channels are maintained by the Corps of Engineers and the controlling depths are printed on the charts in tabular form, the Coast Pilot usually gives only the project depths. Owing to constant shoaling in places, depths may vary considerably between maintenance dredgings; consult the Notice to Mariners for channel depths subsequent to charted information.

Where secondary channels are maintained regularly by the Corps of Engineers, the Coast Pilot gives the controlling depths together with the dates of the latest surveys.

In the case of other channels, the controlling depths printed in the Coast Pilot are from the latest available reports which may, however, be several years old.

Anchorages.—There are numerous anchorages in Nantucket and Vineyard Sounds, Buzzards, Narragansett, and Gardiners Bays, and Long Island Sound, where vessels with good ground tackle can ride out any gale. Between Cape Cod and Sandy Hook, the more important harbors, either commercially or as harbors of refuge, are New Bedford, Newport, Providence, New London, New Haven, and Bridgeport on the mainland, Greenport and Port Jefferson on Long Island, City Island, New York, and vast New York Harbor. (See **110,** chapter 2, for limits and regulations.)

Dangers.—The most important dangers confronting the navigator when approaching the area are the great banks and shoals in the eastern approach. The remainder of the isolated dangers throughout the area and in the approaches to the harbors are for the most part well marked and charted.

Charts 612, 1107.—Georges Bank is an extensive bank with depths of less than 50 fathoms, extending for over 150 miles northeastward from the offshore end of Nantucket Shoals.

In heavy weather the danger area may be considered to be the oval-shaped top of the bank which is about 80 miles long in a northeast and southwest direction and which has a maximum width of about 50 miles. The bottom within 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 generally of sand, sometimes with shell, and in places pebbles. Bottom samples as obtained during surveys are shown 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.

Georges Shoal is a ridge about 13 miles long on which are several shallow depths of 1½ to 3 fathoms.

Cultivator Shoal, about 20 miles westward 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 on the north side by a whistle buoy.

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 very little or no indication of their existence is given by soundings. 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 cur-

rents 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 National Ocean Survey charts.

A navigator must bear in mind while in an area of this character that it is impossible for the surveyor, without a vast expenditure of time, to determine and locate all of the shoalest spots on the many dangerous shoals found. Sudden shoaling on such a bank must be considered an indication of possibly dangerous water. This bank has not been wire-dragged.

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 40 miles southeastward from Nantucket Island. They are shifting in nature and the depths vary from 3 to 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. 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.

The tidal current over the shoals is rotary, turning clockwise. Observations in the area indicate an average velocity at strength of about 2.5 knots, but this probably varies appreciably from place to place. Similarily the direction of the current at strength probably depends on the orientation of channels between shoal areas.

Since the current is rotary, there is no true slack. Observations in the area show an average minimum of about 0.5 knot.

The tidal current near Nantucket Lightship is rotary, turning clockwise. The average velocity at strength is 0.8 knot; the average minimum is 0.6 knot.

Hourly average velocities and directions for Davis Bank and the area near Nantucket Lightship, referred to predicted times of maximum flood at Pollock Rip Channel, are furnished in the Tidal Current Tables. However the tidal currents are appreciably influenced by winds.

Nantucket Shoals should be entirely avoided by deep-draft vessels when possible and by light-draft vessels without local knowledge, on account of the treacherous currents. There are, however, channels through these various shoals which can be negotiated with local knowledge and caution. In calm weather at slack water 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 which limits visibility.

Should it become necessary to anchor in this area, open sea anchorage may be had anywhere that depths permit. Due consideration should be given to the close proximity of shoals and possibility of dragging due to the 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.

Nantucket Shoals Lightship (40°30′ N., 69°28′ W.), the leading mark for vessels passing southward of Nantucket Shoals, is moored about 48 miles south-southeastward of Nantucket Island. The vessel has a red hull with the name NANTUCKET in large white letters on the sides. A light, 67 feet above the water, is shown from the foremast. The radiobeacon and fog signal are synchronized for distance finding. The code flag signal and radio call is NNBN. **Storm warning signals are displayed** daytime only.

Nantucket Shoals is made up of the following parts:

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 with 5¾ fathoms, is at the southern end. The wreck of the SS OREGON, covered 3¼ fathoms, is at 40°45′ N., 69°19′ W., 3 miles south-southeastward of Asia Rip. A lighted gong buoy is about 1 mile southward of the wreck.

Middle Rip, with a least-found depth of 4 fathoms and lying north-northwest of Phelps Bank, is about 13.5 miles long and 4.5 miles wide. This shoal consists of two large parts with depths of 4 fathoms on the east and $6^1/_4$ fathoms on the west, separated by a channel with a depth of 7 fathoms and four outlying shoals of 8 to 10 fathoms. A lighted whistle buoy is about 12 miles eastward of Middle Rip.

Fishing Rip, bow-shaped, with depths of 3 to 10 fathoms, is about 26 miles long north and south and 6.5 miles wide at its widest point. The north point is 20 miles 073° and the south point is 27.5 miles 136°, respectively, from Sankaty Head Light. A wreck is reported to lie about 5 miles northeast of the southernmost part of the shoal and on the outer edge of the rip.

The unmarked channel westward of Fishing Rip is obstructed by three shoals in the northern section which have least-found depths of 7½, 4½, and 10 fathoms. In the southern part of this channel are four shoals with depths of 8 to 10 fathoms.

Davis Bank, the innermost of the outer Nantucket Shoals, is bow-shaped and has depths of 2¾ to 10 fathoms of water over it. The bank is about

30 miles long north and south and has a greatest width of 4 miles. The wreck of the vessel PROGRESS is off the inner edge of the bank about 13 miles north-northeastward of the southern end of the bank.

The channel westward of Davis Bank is marked at each end by a lighted buoy. The use of this channel should be restricted to clear weather due to the strong currents encountered throughout this area.

Chart 1107.—The inner Nantucket Shoals all lie within the 10-fathom curve. The area is very foul. Only a few of the shoals are described. **Davis South Shoal**, about 20 miles south-southeast of Sankaty Head, consists of two spots of 2¾ and 2½ fathoms about 1.5 miles apart. A buoy is about 4 miles westward of the 2¾-fathom spot, and another buoy is about 1 mile north-northeastward of the 2½-fathom spot. A lighted whistle buoy is about 15 miles southward of the shoal.

Old South Shoal, consisting of two spots 2½ fathoms with a 2-fathom spot and foul ground between them, is about 13.5 miles southeast of Sankaty Head. This shoal is unmarked.

Charts 1107, 1209.—Great Rip, about 13 miles east-southeast of Sankaty Head, has depths of 1 to 2¾ fathoms. This shoal is about 7 miles long north and south from 1 to 2 miles wide. A lighted buoy marks its southern end. About 1.5 miles westward of Great Rip and separated from it by depths of 14 to 19 fathoms is an unnamed and unmarked shoal of 1½ to 2½ fathoms. Breakers are usually observed on the shoal.

Rose and Crown is a boot-shaped shoal with its southern end about 10.5 miles east of Sankaty Head. The shoal extends about 5 miles northward and then 3 miles westward. Depths of 1¼ and 1½ fathoms are found in the leg of the boot, a depth of ½ fathom and marked by a lighted whistle buoy northeastward of it forms the heel, and a depth of 1¼ fathoms is found in the toe. Northward of the toe of Rose and Crown is a shoal with foul ground and spots of 1½ and 2½ fathoms. Rose and Crown breaks heavily.

Bass Rip, about 2.5 miles eastward of Sankaty Head, is about 3.5 miles long north and south. A depth of ½ fathom is 3 miles 115° from the light. The northern end of the shoal has a depth of 2½ fathoms. **Old Man Shoal** extends 4.5 miles southwestward from a point 1.5 miles off the southeastern end of Nantucket Island. Depths of 1¼ to 2¾ fathoms are found on this shoal.

McBlair Shoal (chart 1209), the northernmost of the Nantucket Shoals and marked on its northern side by buoys, forms part of the southern side of Great Round Shoals Channel. Depths on this shoal vary from 2¼ to 3½ fathoms.

Great South Channel (charts 612, 1107) is the passage across Georges Bank between the easternmost of the Nantucket Shoals and the westernmost shoal spots of Georges Bank. It is about 30 miles wide and has a least-depth of 25 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 continental shelf. The navigator who has available some means of echo sounding should have in mind the various canyons found 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.

The names of some of the most important submarine canyons are shown on the charts. The longitude following the name is approximate and only given to assist in locating the feature on the chart. **Corsair Canyon**, 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, having 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, having a northerly trend, are **Hydrographer Canyon**, 69°00′. W.; **Veatch Canyon**, 69°35′ W.; and **Atlantis Canyon**, 70°15′ W. **Block Canyon**, 71°20′ W., is south-southeasterly of Block Island Sound and has a north-northwesterly trend. **Hudson Canyon**, 72°20′ W., extends northwestward to the mouth of the Hudson River. The inshore section of this canyon is called **Mud Gorge**.

Wrecks.—Many vessels have been wrecked along this coast as a result of collision, foundering, and other causes. Most of the offshore wrecks have been located and wire dragged to determine the least depth over the highest projecting part. Dangerous wrecks for the most part are marked by buoys of various colors and shapes and often show a quick-flashing or an interrupted quick flashing light.

Many vessels have grounded in fog on the south side of Long Island and on Block Island. Probably many of these wrecks could have been avoided if frequent soundings had been taken in approaching the coast. Vessels equipped to do so should make good use of the electronic aids to navigation systems along the coast to check their position frequently.

Lobster pots.—The coastal waters 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 wooden stick or bottle and difficult to see, is attached to the lobster pot. These buoys extend from shore out to, and in many cases across, the sailing routes. Small yachts and motor boats are cautioned against fouling them, which is liable to result in a sprung shaft or lost propeller. Fishtraps and fish havens are discussed in chapter 1.

Fishweirs are numerous along the outside coast and inside waters. The stakes often become broken off and form a hazard to navigation, especially at night. Regulations limiting the areas within which fishweirs may be established have been prescribed by the Chief of Engineers, U.S. Army. The areas within which fishweirs are permitted are shown on charts of 1:80,000 scale and larger. The exact locations of the weirs within the designated areas are not shown. Strangers should proceed with caution when crossing areas of possible fishweirs, and should avoid crossing such areas at night.

Danger zones have been established within the area of this Coast Pilot. (See **Part 204,** chapter 2, for limits and regulations.)

Drawbridges.—(See **117.78 through 117.225,** chapter 2, for the general and/or special regulations and opening signals for the drawbridges within the area of this Coast Pilot.) 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. (See **117.1** and **117.1a,** chapter 2, for additional information of a very general nature that applies to all drawbridges.)

ROUTES.—Approaching this section of the coast is dangerous for all vessels because of the off-lying banks and shoals, the strong and variable currents, frequency of fog, and the broken nature of the bottom. Soundings alone are of little value in establishing the position of a vessel, but the depth should be checked frequently to insure that the vessel clears all dangers.

In thick weather especially, the greatest caution is necessary, and vessels equipped to do so should make good and timely use of the electronic aids to navigation systems to check their position frequently. The depth should never be shoaled to less than 15 fathoms, without an accurate fix having been obtained, and it is advisable to remain offshore in depths of 20 fathoms or more.

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 southward of the dangerous part of Georges Bank should keep in 30 fathoms or more. Approaching this part of the bank from eastward or southward, the water shoals gradually. Approaching from the 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 or canyons.

Approaching New York from the vicinity of Nantucket Shoals Lightship, a slight allowance should be made for a southwesterly set of the current. Should the wind be easterly, it is customary to allow, in order to make a course good, a set of the current with it of at least 0.5 knot.

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 Qcean, N.O. 16 (formerly H.O. 1400) and on the back of the Track Chart of the World, N.O. 65 (formerly 1262).

Deep-draft vessels coming from Cape Hatteras, Chesapeake Bay, Delaware Bay, or New York usually make Nantucket Shoals Lightship, thence through Great South Channel to Cape Cod or the Gulf of Maine.

Vessels of medium draft coming from the southward, or southbound from Boston or ports farther east, may use Cape Cod Canal, or Vineyard and Nantucket Sounds via Pollock Rip Channel. Great Round Shoals Channel is also available, but seldom used, as an entrance to or exit from Nantucket Sound. The controlling depth for these passages is from 27 to 32 feet. They avoid Nantucket Shoals and are used by coasting vessels. Small vessels and pleasure craft usually pass through Long Island Sound when proceeding coastwise.

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. It must be borne in mind that the current to which a vessel is subjected at any time is the combination of tidal current, wind current, and other currents such as those due to drainage or oceanic circulation.

Away from the immediate vicinity of the shore, the tidal currents are generally rotary. They shift direction, usually clockwise, at an average rate of about 30° an hour. They attain velocities of 1 to 3 knots or more throughout the Nantucket Shoals-Georges Bank area, the larger velocities occuring generally over the shoaler parts of the area. Between Nantucket Island and Sandy Hook their velocities generally do not exceed 0.5 knot except in the vicinities of the entrances to the larger bays and inland waterways, where the velocities increase as the entrances are approached. For con-

siderable distances from the entrances strengths of flood and ebb set, respectively, toward and away from those entrances, and minimums of velocity, corresponding to the slacks of reversing currents, set at right angles to the directions of the flood and ebb strengths.

Offshore and away from the influence of the tidal flow into and out of the Gulf of Maine and the larger bays, the tidal current maintains an approximate uniform velocity. Shifting its direction continuously to the right, it sets in all directions of the compass during each tidal cycle of 12.4 hours.

In the offshore area between Cape Cod and Sandy Hook there is a resultant southward drift which is stronger in winter than in summer and has an average velocity less than 0.1 knot.

Wind currents.—Wind currents are very complicated. Their velocities and directions depend upon a number of factors such as velocity, direction, and duration of the wind, the proximity of the coast and the direction of the coastline. Generally in the Northern Hemisphere the wind-driven current sets somewhat to the right of the wind, but in coastal waters there are many exceptions to this general rule, the current often setting to the left of the wind, due to the tendency of the current to follow the direction of the coastline or to other local conditions.

The velocity of the current relative to that of the wind also varies with the location. It follows, therefore, that local wind current information is desirable. Such information based upon extensive current and wind observations at a number of stations is given in the Tidal Current Tables.

The largest current velocities likely to occur during storms at a number of locations offshore and in the sounds are given as follows: Pollock Rip Entrance Lighted Horn Buoy PR, 2.5 knots; Stone Horse Shoal, 4 knots; Great Round Shoal Channel Lighted Whistle Buoy GRC, Nantucket Entrance, 2.5 knots; 3 miles north-northeast of Nantucket Shoals Lightship, 2.5 knots; Cross Rip Shoal, 2.5 knots; Hedge Fence Lighted Gong Buoy 22, Nantucket Sound, 2.5 knots; 3.3 miles southwestward of Cuttyhunk Light, 2 knots; Brenton Reef, 1.5 knots; 0.5 mile south of Bartlett Reef, Long Island Sound, 2.5 knots; 3 miles southward of Cornfield Point, 4 knots; 3 miles north of Nantucket Sea Lane Lighted Whistle Buoy NB, 1.5 knots; Ambrose Light, 2 knots.

WEATHER.— Climatological tables for coastal localities 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. National Weather Service offices and government radio stations which transmit weather information are given in the appendix.

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 15 cents a copy from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

General.—The area covered in this Coast Pilot lies in the "prevailing westerly belt" of the middle latitudes on the east coast or leeward side of the continent. The daily weather, which makes up the climatic pattern, moves generally from west to east; consequently, the region is influenced more by land mass to the west than by the ocean to the east. The proximity of the ocean nevertheless, does exert its influence on the wind, temperature and precipitation enough to modify the typical continental regime. Therefore, the climate on all but the outlying islands can best be described as modified continental.

Superimposed on the general westerly circulation are the frequent wind shifts and changes in weather associated with **extratropical cyclones.** In the winter, the center of the mean tracks followed by extratropical cyclones traverses the area covered in this Coast Pilot. Usually the cyclones enter the area from the west, passing through the northeastern states and down the St. Lawrence Valley, or they move from the southwest with the center offshore.

The coastal storms which move northeastward are likely to be of greater severity from having passed over considerable water. Before the storm center passes it may bring heavy rain or snow. Strong winds, sometimes of hurricane force, accompany it. If the center passes to the east of a vessel, the wind will back from northeast through north to northwest as the cyclone moves out of the region. The northwesterly winds in the western half of the storm, having come directly from the interior of the cold continent, will often be bitterly cold. For cyclones whose centers move northeastward and northward over the northeastern states and down the St. Lawrence Valley, vessels will encounter winds that veer from southeast through south to west and northwest.

In late summer or autumn **tropical cyclones** occasionally move northward into the area covered by this Coast Pilot. The storm centers generally move through the region on northeastward courses toward Nova Scotia, or over the adjacent ocean. Some severe hurricanes have moved northward across Long Island, with reported windspeeds of 70 to 80 miles per hour. As a rule, these tropical storms are much more violent than the extratropical storms of the same season. Many of them take on some extratropical characteristics prior to reaching the area, and are less intense than in more southerly latitudes.

The cold Labrador Current which flows parallel to the coastline, and the warm Gulfstream farther eastward, pass through the sea approaches to this area and exert considerable influence on the climate. The cooling of warm moist air brought

northward by the prevailing southwesterlies during the warm months causes fog which reaches the approaches to New York.

Pressure.—During the winter, when the area is between the Icelandic Low and the North American Continental High, the mean isobars are oriented in a general northwest-southeast direction. This indicates the pressure pattern of the prevailing northwesterly winds of winter.

With the coming of spring, the Icelandic Low starts to fill and its southern boundaries retreat northward. At the same time the Azores or Bermuda High starts to build up, and moves northward and westward. By summer its northwestern quadrant covers the Northeastern States. The mean isobars now are oriented in a northeast-southwest direction, indicating the prevailing southwest winds of the warmer months.

There is little seasonal variation in the mean pressure, which ranges from a high of about 1018 millibars (30.06 inches) in January to a low of about 1013 millibars (29.91 inches) in July. There are, however, great day-to-day variations in these means, primarily due to the numerous cyclones and anticyclones that traverse the area. Daily variations are much greater in winter than in summer. Occasionally, large variations are experienced when a tropical cyclone passes through in late summer or fall.

Winds.—From October to March, the prevailing winds over the ocean areas are between west and north. After March until the summer regime is established, the wind is variable. From June to September the prevailing winds are between west and south.

The wind force averages between 4 and 5 from December through March, and in the warmer months, May through August, it decreases to force 3 or 4. The summertime prevailing southwesterlies are more persistent than the wintertime northwesterlies, because of the lack of extratropical cyclone activity during the warmer months. However, at times the quiet periods of summer are disturbed by tropical cyclones and severe thunderstorms.

Gales (force 8 or higher) are encountered in about 8 percent of the observations during winter. They are most likely to arrive with westerly or northwesterly winds. Gales are rare in summer, but may be encountered in tropical cyclones or thunderstorms.

In general, the wind regime at coastal stations is similar to that of the ocean areas; west to north winds predominating in the winter, and south to west winds in summer. The average force of the winds reported at the coastal stations, however, is less, because wind speeds over the open sea are nearly always higher than over land. Topography may cause local changes from the general regime.

At the coastal stations, the hot summer afternoons often are relieved by a refreshing sea breeze blowing onshore from the cooler waters adjacent to the coast. This breeze seldom penetrates more than 10 miles inland.

Temperatures.—The maritime influence affects temperatures. In spring and summer the sea breeze tends to reduce temperatures, but in winter, when the water temperatures are warmer than those of land, quite the opposite occurs.

Temperatures over this coastal area are generally moderate. Mean annual temperatures range from 47.6° F. at Albany (well inland) to 54.5° F. at New York. The lowest mean monthly temperature is 22.7° F. at Albany in January; the highest is 76.8° F. at New York in July. Maritime influences along the southern New England coast are well illustrated by Nantucket data, where the lowest monthly temperature is 31.4° F. in February and the maximum is 68.1° F. in August.

In any season, a change in wind direction can cause a large fluctuation in temperature. In wintertime, southerly and southwesterly winds may bring in mild weather, while northwesterly winds bring in extreme cold. In summertime, southwesterly and westerly winds will be warming, but northeast winds may be cooling and sometimes chilly.

Air temperatures at sea average about 4° F. to 8° F. higher in January and 2° F. to 6° F. lower in July, than at the land stations.

Relative humidity.—In this region throughout the year relative humidity is rather high with annual early morning averages from 70 to 80 percent, and evening averages from 60 to 80 percent. There is some seasonal variation, with highest readings during the summer months. Early morning observations in summer average more than 85 percent; afternoon readings are usually 10 to 20 percent lower at most places. Humidity variations, like temperatures fluctuations, are dependent on the wind patterns. Humidities are usually higher with onshore winds (blowing from sea toward land) and lower with offshore winds.

Precipitation.—Although amounts of precipitation at sea are not measured, reporting ships' observations show a maximum in winter ranging from a high of 25 percent in February to a low of 10 percent in July. Snow may be encountered from November to April, and is reported on more than 5 percent of the observations from December through March.

A cyclone passing off the coast in winter will generally bring snow; almost all of New York City's major snowstorms have been associated with this type of cyclone. Qn rare occasions freezing rain may fall, and it will coat all objects with a layer of ice which can cause damage to rigging if prolonged.

At coastal stations, precipitation amounts are fairly evenly distributed throughout the year. Normal monthly totals range from about 2.5 to 3.0 inches in February and June to about 4.0 to 4.5 inches in March and August. Annual totals range from 40 to 46 inches.

Showers and thunderstorms, which provide most of the rainfall from May through September, are localized and tend to be spotty. Thunderstorms

come most frequently in the late afternoon and evening, and usually are brief. However, rainfall from thunderstorms can be very intense and may seriously restrict visibility at sea. Thunderstorms hit New York City an average of 30 days a year, mostly during June, July, and August. Their frequency and severity decrease over the ocean.

Cloudiness.—At sea in winter, overcast skies (cloud amount 0.8 or more) are recorded on about 50 to 60 percent of the observations, while clear skies (cloud amount of 0.2 or less) are reported on about 25 percent of the observations. The summer conditions are better, with about 30 percent of the observations showing overcast and 30 percent clear skies. At the coastal stations, overcast conditions range from about 45 to 60 percent in winter to about 30 to 45 percent in summer.

Visibility.—Although fog, haze, rain, and snow are causes of poor visibility, in this area visibility at sea is most commonly restricted by advection fog. This type of fog occurs most frequently in late spring and early summer when the winds are from the south or southwest and the warm humid air is cooled to its dewpoint by the still cold Labrador Current. Over the open ocean during the warm months, more than 30 percent of the observations report restricted visibility. These fogs, which may happen in any season, often set in without warning, and have been known to persist for several weeks without interruption.

The frequency of fog is fairly uniform throughout the year over land stations, except at marine exposures like Block Island and Nantucket. For this reason, figures for fog at some inland or sheltered harbors cannot be regarded as a guide to conditions at sea or in the approaches. Areas along the coast, at the heads of bays and within rivers, will often be comparatively clear while outside there is very thick fog. The fog usually lifts during the middle of the day over the interior waters.

Steam fog (sea smoke) occasionally forms in the winter during very cold weather when the air temperature is much lower than that of the water. It is usually quite shallow, and at times may hide the hull of a ship while leaving the masts and upper parts plainly visible.

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 or persists with winds of gale force.

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 U.S.), 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 predominantly oceanic, they merit the special attention of all mariners, whether professional or amateur.

Rarely does the mariner who has experienced a fully developed tropical cyclone (hurricane) at sea wish to encounter a second one. He has learned the wisdom of avoiding them if possible. The uninitiated may be misled by the deceptively small size of a tropical cyclone as it appears on a weather map, and by the fine weather experienced only a few hundred miles from the reported center of such a storm. The rapidity with which the weather can deteriorate with approach of the storm, and the violence of the hurricane, are difficult to visualize if they have not been experienced.

As a tropical cyclone moves out of the tropics to higher latitudes, it normally loses energy slowly, expanding in area until it gradually dissipates or acquires the characteristics of extratropical cyclones. At any stage, a tropical cyclone normally loses energy at a much faster rate if it moves over land. As a general rule, tropical cyclones of the North Atlantic Region move with the prevailing winds of the area. In small hurricanes the diameter of the area of destructive winds may not exceed 25 miles while in some of the greatest storms the diameter may be as much as 400 to 500 miles.

At the center is a comparative calm known as the "eye of the storm." The diameter of this "eye" varies with individual storms and may be as little as 7 miles but is rarely more than 30 miles. The average is 15 to 20 miles. This center is the region of low atmospheric pressure around which winds blow in a more or less circular course, spiraling inward in a counterclockwise direction. Winds at the outer edge of the storm area are light to moderate and gusty, and often increase toward the center to speeds too high for instrument recording. Although the air movement near the center of the hurricane is usually light and fitful, the seas in this area are in most cases very heavy and confused, rendered so by the violent shifting winds which surround it. Furthermore, after the center has passed a vessel, she may expect a sharp renewal of the gales, with winds from a more or less opposite direction. The hurricane may 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. Longrange 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 appears only 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, mist-like 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 inch and a half or two 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 pass 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 aboard ship, to obtain a sufficiently close approximation to enable the vessel to maneuver to the best advantage.

As previously stated, the presence of an exceptionally long swell is usually the first visible indication of the existence of a tropical cyclone. In deep water it approaches from the general direction of origin (the position of the storm center when the swell was generated). However, in shoaling water this is a less reliable indication, because the direction is changed by refraction, the crests being more nearly parallel to the bottom contours.

When the cirrus clouds appear, their point of convergence provides an indication of the direction of the storm center. If the storm is to pass well to one side of the observer, the point of convergence shifts slowly in the direction of the storm movement. If the storm center will pass near the observer, this point remains steady. When the bar becomes visible, it appears to rest upon the horizon for several hours. The darkest part of this cloud is in the direction of the storm center. If the storm is to pass to one side, the bar appears to drift slowly along the horizon. If the storm is heading directly toward the observer, the position of the bar remains fixed. Once within the area of the dense, low clouds, one should observe their direction of movement, which is almost exactly along the isobars, with the center of the storm being 90° from the direction of cloud movement (left of direction of movement in the northern hemisphere).

The winds are probably the best guide to the direction of the center of a tropical cyclone. The circulation is cyclonic, but because of the steep pressure gradient near the center, the winds there blow with greater violence and are more nearly circular than in extratropical cyclones.

According to Buys Ballot's law, an observer who faces into the wind has the center of the low pressure on his right (northern hemisphere) and somewhat behind him. If the wind followed circular isobars exactly, the center would be exactly eight points, or 90°, from dead ahead when facing into the wind. However, the track of the wind is usually inclined somewhat toward the center, so that the angle dead ahead varies between perhaps 8 and 12 points (90° to 135°). The inclination varies in different parts of the same storm. It is least in front of the storm, and greatest in the rear, since the actual wind is the vector sum of that due to the pressure gradient and the motion of the storm along the track. A good average is perhaps ten 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, how-

ever, 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.

Manuevering 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 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 sould try to make a harbor, or to stand out of the straits to obtain sea room. Vessels unable to reach a port and having sea room to maneuver usually observe the previously discussed general rules for avoiding the storm center, which, for power-driven vessels, are summarized as follows:

Right or dangerous semicircle.—Bring the wind on the starboard bow (045° relative), hold course and make as much way as possible. If obliged to heave to, do so with head to the sea.

Left or navigable semicircle.—Bring the wind on the starboard quarter (135° relative), hold course and make as much way as possible. If obliged to heave to, do so with stern to the sea.

On storm track, ahead of center.—Bring wind two points on the starboard quarter (157½° relative), hold course and make as much way as possible. When well within the navigable semicircle, maneuver as indicated above.

On storm track, behind center.—Avoid the center by the best practicable course, keeping in mind the tendency of tropical cyclones to curve 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 three to ten 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 three or four feet of this is due to the decrease of atmosphere pressure, and the rest to winds. Like the damage caused by wind, that due to high seas, the storm tide, and the storm surge is greatest in the dangerous semicircle, near the center. The fourth source of water damage is the heavy rain that accompanies a tropical cyclone. This causes floods that add to the damage caused in other ways.

When proceeding along a shore recently visited by a hurricane, a navigator should remember that time is required to restore aids to navigation which have blown out of position or 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.—Refer to discussion under ports affected.

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 to inform 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 are published annually in Local Notices to Mariners of the First and Third Coast Guard Districts and in the Notice to Mariners issued by the Defense Mapping Agency Hydrographic Center (DMAHC).

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, New York. The report can usually be made via the nearest Coast Guard station.

Principal ports.—The principal deep-draft commercial ports within the area of this Coast Pilot are: New Bedford, Fall River and Tiverton, Mass.; Providence, R.I.; New London and Bridgeport, Conn.; New York, Albany and Port Jefferson, N.Y.; and Elizabeth and Newark, N.J.

Other deep-draft facilities are located on Cape Cod Canal; Narragansett Bay; off Northville and Northport, N.Y., on Long Island Sound; and on the Hudson River between New York City and Albany, N.Y.

Pilotage, with few minor exceptions, is compulsory for all foreign vessels and U.S. vessels under register entering and departing the Port of New York and New Jersey and other ports within the area of this Coast Pilot, and for all such vessels transiting Block Island Sound, Narragansett Bay, and Long Island Sound. (See **207.20,** chapter 2, for Pilotage Regulations on the Cape Cod Canal.)

Pilotage is optional for coastwise vessels who 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. New York is the only port at which the pilot boat remains on station. Detailed information on pilotage procedures is given in the text for the ports concerned.

Towage.—Tugs are available at all major ports; they can usually be obtained for the smaller ports on advance notice if none are available locally. Arrangements for tugs should be made in advance through ships' agents or the pilots. (See the text for the ports concerned as to the availability of tugs.)

Harbormasters where appointed are mentioned in the text. They usually have charge of the anchorage and berthage of vessels.

Supplies.—General supplies, including fuel oil, diesel oil and fuel, gasoline, fresh water, and marine supplies are available at the principal ports. Similar items but in more limited quantities can be obtained at many places mentioned under descriptions of the different ports.

Repairs—salvage—wrecking. Complete facilities for large vessels are available in New York Harbor. The extent and types of facilities at other places are shown in the text under the description of the ports.

Small-craft facilities.—There are numerous places where fuel, supplies, repairs, slips for dockage, and launching ramps are available for small craft. For the various towns and isolated places, the Coast Pilot includes generalized information about marine facilities; details are given in the series of small-craft charts published for many places.

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).

Standard Time.—The area covered by this Coast Pilot uses eastern standard time (75°W.), which is 5 hours slow of Greenwich mean time. Example: When it is 1000 at Greenwich it is 0500 at New York.

Daylight saving time.—Throughout the area of this Coast Pilot, clocks are advanced one hour on the last Sunday in April and are set back to standard time on the last Sunday in October.

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, the following holidays are also observed in the states covered by this Coast Pilot:

Lincoln's Birthday, February 12: Connecticut, New Jersey and New York.

Evacuation Day, March 17: Massachusetts, Boston and Suffolk County only.

Good Friday: Connecticut and New Jersey.

Patriots Day, third Monday in April: Massachusetts.

Rhode Island Independence Day, May 4: Rhode Island.

Bunker Hill Day, June 17: Massachusetts, Boston and Suffolk County only.

Victory Day, second Monday in August: Rhode Island.

General Election Day, first Tuesday after the first Monday in November: New Jersey, New

York, and Rhode Island.

4. OUTER CAPE COD AND NANTUCKET SOUND

This chapter describes the outer shore of Cape Cod and Nantucket Sound including Nantucket Island and the southern and eastern shores of Martha's Vineyard. Also described are Nantucket Harbor, Edgartown Harbor, and the other numerous fishing and yachting centers along the southern shore of Cape Cod bordering Nantucket Sound.

Chart 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, then extends northward for over 20 miles. This cape forms the southern and eastern shores of Cape Cod Bay, the northern shore of Nantucket Sound, and the eastern shore of Buzzards Bay. The northern trend of Cape Cod, forming what is sometimes called 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. The portion of Cape Cod between Chatham and Cape Cod Canal is known as the Upper Cape. This region is wooded and is well settled by numerous towns and villages.

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. Strengths of flood and ebb set northward and southward, respectively, along the coast. The time of current changes rapidly, the strength of flood or ebb occurring about 2 hours later off Nauset Beach Light than off Chatham Light.

Chart 580.—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. Supplies and repair facilities are available in Provincetown.

The U.S. Public Health Service maintains a **contract physician's office** in Provincetown. (See appendix for address.)

The approach and entrance to the harbor are free of dangers and are marked by three lights, and by Pilgrim Monument, a slim stone structure 348 feet above the water; a standpipe is about 0.2 mile westward and a steel tank is 1.5 miles northeastward of the monument. In 1971, a 2,500-foot stone breakwater was under construction about 300 yards southeastward of the end of the town pier (MacMillan Wharf). The breakwater will extend northeastward from a point in 42°02′45″ N., 70°10′55″ W., approximately parallel to the shoreline. The southwest end is marked by a lighted bell buoy. Strangers should exercise caution when operating in the area. Numerous fishing vessels work out of Provincetown during the year. During the summer, floats are set out that are capable of mooring vessels up to 40 feet. Larger vessels must tie up at permanent piers.

Boundary lines of inland waters.—The lines established for Massachusetts Bay are described in **82.10**, chapter 2.

Cape Cod Canal is described in chapter 5. Complete information about the harbors and ports in Cape Cod Bay is contained in United States Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod.

Chart 1208.—Race Point Light (42°03.7′ N., 70°14.6′ W.), 41 feet above the water, is shown from a white tower on the northwest point of Cape Cod. A fog signal is sounded from the light station. A Coast Guard station is 1.5 miles northeast of the light.

Three underwater towers are northward of Race Point Light. The two outermost towers are reported covered 185 and 194 feet and are about 2.2 and 2.8 miles, respectively, northward of Race Point Light; each is marked by a group of three special purpose buoys painted in orange and white horizontal bands, and the outer buoy in each group is lighted. Submerged cables from these towers extend shoreward and converge onshore in about 42°04.8′ N., 70°13.3′ W. The third tower, covered 3 feet and closer inshore, is about 1.4 miles north-northeastward of Race Point Light and is marked by two black rubber buoys. Fishing interests are advised not to drag in these areas. In July 1971, the NOAA Ship PEIRCE reported that the third tower and the buoys marking it could not be located.

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. This area should be given a berth of at least 2 miles. A lighted whistle buoy is about 2.5 miles off the 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.

From Race Point Light the shore of Cape Cod curves northeastward, eastward, and then southeastward for about 9 miles to the **Highlands**, and is composed of bare sand dunes of various heights. The sand dunes begin to be covered with a

brownish-looking growth of grass and the land is higher as the Highlands are approached. The water shoals somewhat abruptly within 0.5 mile of the shore and care must be taken not to go inside the 10-fathom curve.

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 on a high bluff of the Highlands. The light station has a fog signal and radiobeacon.

Prominent objects include a stone crenellated tower, a red brick stack, a red and white steel skeleton tower, and three spherical radar domes on the summit of a ridge, 0.5 mile south of Highland Light.

The shore southward from the Highlands for 12 miles to Nauset Beach Light has a slight curve. The terrain continues hilly with narrow valleys at intervals. From Highland Light to near the Chatham entrance the water continues to shoal abruptly within 0.5 mile of the shore.

Two spires at **Truro**, 2.5 miles south of Highland Light, are prominent. A tank stands out near the shore about 9 miles south-southeastward of Highland Light in **South Wellfleet**.

Nauset Beach Light (41°51.7′ N., 69°57.2′ W.), 114 feet above the water, is shown from a 48-foot conical tower, the upper part red and the lower part white, on the beach at **Eastham**. A lighted whistle buoy is 5 miles northeastward of the light. The buildings of a former Coast Guard station, about a mile south of the light, are conspicuous.

The coast from Nauset Beach Light turns gradually southward to Chatham, a distance of 11 miles, and becomes lower and less steep. The terrain slopes gently back from the beach and is covered with a scanty growth of grass.

Nauset Harbor, 3.3 miles south of Nauset Beach Light, is used by small local craft. The area offshore of the harbor is a chain of shifting sandbars. Breakers are present in this vicinity at all stages of the tide and even during the calmest weather. The area is extremely dangerous for any vessel larger than a runabout or for anyone without local knowledge. Strangers should never attempt to enter. A cluster of houses is on Nauset Heights south of the entrance, where the ground is somewhat higher than the land just northward.

The harbor has three arms extending northward into **Nauset Bay**, northwestward into **Salt Pond Bay** and **Salt Pond**, and westward into **Town Cove** which is about 2 miles long in a southwesterly direction. A marina is on the west bank about 0.5 mile from the head of the cove. Gasoline, water, ice, marine supplies, berthage, and a concrete ramp are available. Craft up to 17 feet can be hauled out for hull or engine repairs, or dry open or covered storage.

The outer coast is eroding from east of **North Chatham** northward for about 3 miles. Waves wash across the beach barrier into the sound in several places at high water. A conspicuous standpipe with a red and white checkered band around the top is about 0.6 mile southward of **Chatham Port**.

Charts 270, 1208.—Chatham, about 11.5 miles southward of Nauset Beach Light, is on fairly high ground on the west side of **Chatham Harbor. Chatham Light** (41°40.3′ N., 69°57.0′ W.), 80 feet above the water, is shown from a 48-foot white conical tower on the west side of the harbor; a radiobeacon is at the light. **Storm warning signals are displayed.** (See chart.)

Buildings and signal tower of a former Coast Guard station, about 1.8 miles northeastward of Chatham Light, and several spires and a tall stack at Chatham are prominent.

Chatham Bar, about 1.6 miles southward of Chatham Light, is the eastern entrance to Chatham. The bar is quite extensive and extends across the entrance to Chatham Harbor. The channel across the bar is marked by buoys which are not charted since they are shifted in position with changing conditions. The buoys should be used only with local knowledge because they may not always mark the best water. In 1971, there was reported to be 3 to 4 feet of water over the bar at times. The channel is used by small local fishermen and pleasure craft with a smooth sea; strangers should not attempt it. This bar is dangerous in thick weather, and vessels in the vicinity should stay in depths of 8 fathoms or more.

The passage inside the barrier beach from Chatham Bar to the head of navigation at **Orleans**, on the west side of Meeting House Pond, is about 10.5 miles long and used by small craft. The passage, marked by private seasonal buoys, leads northerly from the bar through Chatham Harbor, Pleasant Bay, The Narrows, Little Pleasant Bay, and The River to Meeting House Pond. The channel requires local knowledge.

A small-craft facility is in a protected boat basin in the cove between Morris Island and the mainland, about 0.5 mile southward of Chatham Light. Gasoline, water, ice, a 40-foot marine railway, limited marine supplies, launching ramp, berths, and storage facilities are available; hull and engine repairs can be made.

A boat basin is in **Aunt Lydias Cove**, between **Tern Island** and Chatham. In 1971, it was reported that the basin and the channel leading to the basin had depths of 6 feet. A fish pier is in the basin. Commercial and party fishing boats operate from Aunt Lydias Cove.

Bassing Harbor, at the north end of Chatham Harbor, is the entrance to **Ryder Cove** and **Crows Pond**. A small-craft facility is on the south side of Ryder Cove, about 0.5 mile inside the entrance. A town launching ramp is close westward of the facility. Gasoline, water, ice, marine supplies, a 25-foot marine railway, moorings, and storage facilities are available; hull and engine repairs can be made. In October 1971, a reported depth of 6 feet could be carried to the small-craft facility.

Nickersons Neck, on the north side of Crows Pond and the south side of Pleasant Bay, has a

country club on the north side and concrete ramps of an old seaplane base at its eastern end.

Pleasant Bay, 7 miles north of Chatham Bar, is used only by small local craft.

Round Cove at the southwest end of Pleasant Bay has a town pier and launching ramp. A flagpole on the west bank of the cove is conspicuous.

The Narrows is a passage between Sipson Island and the mainland and connects Pleasant Bay with Little Pleasant Bay. The passage is marked by private seasonal buoys.

Little Pleasant Bay extends about 1.5 miles northward to Barley Neck. A launching ramp is on the west bank of the entrance to **Paw Wah Pond** on the south side of **Namequoit Point**.

Namequoit River leads westward from the head of Little Pleasant Bay to **Areys Pond**. In 1971, depths of 2 feet were reported in Namequoit River, and the channel into the pond was reported dredged to 3 feet. A small-craft facility, on the north side of the pond, has a 50-foot marine railway, a 1½-ton crane, launching ramp, and storage facilities; hull engine repairs can be made.

An arm, known as **The River**, extends northward from the entrance to Namequoit River for about a mile to **Meeting House Pond**, Private seasonal buoys partially mark the channel from The River to the pond. A town landing and launching ramp are on the north side of the channel leading to the pond. A small-craft facility is on the north side of the pond. Berths and moorings in depths of 6 to 10 feet, gasoline, water, ice, 50-foot marine railway, 2-ton crane, launching ramp, and storage facilities are available; hull and engine repairs can be made. A town ramp is on the east side of the pond southeastward of the small-craft facility.

Chart 1209.—Nantucket Sound is between the south coast of Cape Cod on the north, Nantucket Island and part of Martha's Vineyard on the south, and joins Vineyard Sound on the west to provide an inside passage. Nantucket Sound has a length of about 23 miles in an east-west direction and a width of 6 to 22 miles. At the eastern entrance and within the sound are numerous shoals. Between these shoals are well-marked channels making the navigation of these waters comparatively easy for powered vessels and also sailing vessels with a fair wind. The shoals at the eastern entrance are subject to considerable shifting while those inside are somewhat stable. Boulders are along the shores.

The channel through Nantucket Sound and Vineyard Sound has a controlling depth of about 30 feet and provides an inside passage for vessels of medium draft to avoid Nantucket Shoals. This route is used principally by coastwise vessels and pleasure craft. The navigational aids are colored and numbered for passing through the sound from the eastward.

Monomoy and Nantucket Shoals are eastward and southeastward of the eastern entrance to Nantucket Sound. Owing to the great extent and distance offshore of some parts of these shoals, and the strong and baffling tidal currents which set over them, their navigation in thick or foggy weather is hazardous. In clear weather the lights and buoys render navigation of the two principal channels, Pollock Rip and Great Round Shoal, comparatively easy. For the purpose of description Great Round Shoal Channel will be considered as the dividing line between Monomoy and Nantucket Shoals.

Boundary lines of inland waters.—The lines established for Nantucket Sound are described in **82.15**, chapter 2.

Chart 250.—Monomoy Shoals consist of numerous detached shoals extending about 5.5 miles in an easterly direction and 9.5 miles in a southeasterly direction from **Monomoy Point**, the northeast entrance point of Nantucket Sound. Narrow sloughs separate the many parts of the shoals. It should be remembered that the shoals are shifting in character and are subject to change in location and depth.

Bearse Shoal and **Pollock Rip**, extending about 5 miles eastward of Monomoy Point, are a series of sand shoals and ridges with little water over them in places. Pollock Rip Channel is between the shoals.

Broken Part of Pollock Rip, covered 10 to 18 feet, is eastward of Pollock Rip.

Stone Horse Shoal, Little Round Shoal, and **Great Round Shoal** are portions of a continuous series of sand shoals and ridges covered 4 to 18 feet. These shoals are directly eastward of the entrance to Nantucket Sound and between the two main channels. Southward and eastward of these shoals are numerous shoal spots, including **Orion Shoal**, covered 16 to 19 feet.

Handkerchief Shoal, extending for 5 miles southwestward from Monomoy Point, is covered 2 to 18 feet. On the northwest side the water shoals gradually and soundings will indicate an approach to danger, but on the southeast side the shoal rises abruptly from the deeper water. Handkerchief Shoal is uneven and shifting in character. Vessels should not attempt to pass northward of the buoys marking the southern end and southeast side of the shoal.

Chart 1209.—Nantucket Shoals is the general name of the numerous broken shoals which extend 23 miles eastward and 39 miles southeastward of Nantucket Island. These extremely dangerous shoals are described in chapter 3; caution must be exercised in this area.

Halfmoon Shoal, near the center of Nantucket Sound, is covered 9 feet. Its southern end is marked by a lighted bell buoy. Depths of 17 and 22 feet are 2.5 and 1.5 miles, respectively, southeastward of the shoal. Deep-draft vessels should use care to avoid them. A lighted gong buoy is 1.3 miles eastward of the 22-foot spot.

Cross Rip Shoal, about 2.5 miles west-southwestward of Halfmoon Shoal, has a least depth of 11

feet. Its northern edge is marked by a lighted horn buoy. A shoal covered 24 feet extends 1.2 miles eastward of the buoy. Caution must be exercised in passing between this shoal and the shoal making out southwestward from Halfmoon Shoal.

Horseshoe Shoal, about 7.5 miles long, bares in places at extreme low water. Its western side is marked by two buoys and its northern and southeastern sides by lighted buoys. The main channel passes between the southeastern lighted buoy and the lighted horn buoy marking Cross Rip Shoal.

L'Hommedieu Shoal, covered 3 feet, and **Hedge Fence**, covered 5 feet, lie in an east-west direction in the western end of Nantucket Sound and the eastern end of Vineyard Sound. The water deepens abruptly at the edge of these shoals, and soundings will give little warning of approaching dangers. The main channel passes southward of Hedge Fence shoal. L'Hommedieu Shoal is marked by buoys at its east and west ends. Hedge Fence is marked by a lighted gong buoy and a buoy on its southeastern side, and a buoy on its western end. The wreck of the steamer PORT HUNTER is on the southwestern side of Hedge Fence.

The numerous other shoals in Nantucket Sound are discussed with the land features near them.

Channels.—Two principal channels lead from the eastward into Nantucket Sound. The northerly one is through Pollock Rip Channel and Butler Hole, and the southerly one through Great Round Shoal Channel. Between the numerous shoals in Nantucket Sound are two well-marked channels leading to the eastern end of Vineyard Sound. Muskeget Channel, discussed later in this chapter, leads into the sound from the southward, eastward of Chappaquiddick Island.

Chart 250.—Pollock Rip Channel and **Butler Hole** form the most direct channel leading from points northward of Cape Cod to Nantucket Sound. The channel leads between Bearse Shoal and Pollock Rip, thence eastward of Handkerchief Shoal, and has a least known depth of 27 feet. Since large vessel traffic may be encountered in this channel, fishing vessels and small craft should avoid the area during thick or foggy weather. The channel is well marked by navigational aids and is generally used in preference to Great Round Shoal Channel.

Pollock Rip Entrance Lighted Horn Buoy PR (41°36.1′ N., 69°51.1′ W.), replacing Pollock Rip Lightship, is about 3 miles northeastward of the eastern entrance to Pollock Rip Channel.

A lighted horn buoy, about 1.5 miles eastward of Monomoy Point (41°32.8′ N., 70°01.1′ W.), marks the site of the former Stone Horse Shoal Lightship. Submerged piling, the remains of the former Monomoy Point Light structure, may exist about 0.6 mile southward of Monomoy Point. The buildings of a former Coast Guard station are about 0.6 mile northeastward of the point.

Great Round Shoal Channel, about 10 miles southward of Pollock Rip Channel, is used mostly by medium draft vessels passing through Nantucket Sound and sometimes by sailboats that are headed by the wind so as to prevent their working through Pollock Rip Channel. The buoyed channel has a controlling depth of about 27 feet between Great Round Shoal and Nantucket Shoals.

Chart 1209.—The **Main Channel** of Nantucket Sound leads southward of Halfmoon Shoal, through **Cross Rip Channel**, southward of Horseshoe Shoal, through the fairway between Hedge Fence and Squash Meadow, and thence into the eastern end of Vineyard Sound. The channel is used by most of the vessels bound through Nantucket Sound and is well marked by navigational aids. With care a least depth of 30 feet can be carried through the channel, but the draft of the vessels using it seldom exceeds 24 feet.

Cross Rip Lighted Horn Buoy 21 (41°26.9′ N., 70°17.5′ W.), replacing Cross Rip Lightship, marks the northern edge of Cross Rip Shoal.

North Channel leads along the north side of Nantucket Sound, on either side of Bishop and Clerks, northward of Horseshoe Shoal, between Wreck Shoal and Eldridge Shoal, northward of L'Hommedieu Shoal, and through one of the openings in the shoals westward of L'Hommedieu Shoal into Vineyard Sound. This channel is used mostly by craft bound to points on the north shore of Nantucket Sound and by vessels bound through the sound during northerly winds or in winter when the prevailing northerly winds keep the north shore of the sound free from drift ice. The least depth in the channel is about 16 feet. Lighted and unlighted buoys mark the channel.

Anchorages.—Sailing vessels working through the sound against a head wind usually anchor during the night, or if becalmed and drifting toward the shoals it is best to anchor and wait for a favorable current or change of wind. The only anchorages for vessels of over 10-foot draft that afford shelter from all winds are Nantucket Harbor, Hyannis Harbor, and Edgartown inner habor. Vineyard Haven, the anchorage most used by coasters, is exposed to northeasterly winds. In northerly winds the best anchorages are off Dennis Port, Hyannis Port, and along the north shore. The anchorage off Falmouth is used in most winds by vessels with good ground tackle. In easterly winds vessels sometimes anchor in smooth water westward of Handkerchief Shoal or inside Great Point. Good shelter from easterly winds can also be found in Chatham Roads and Edgartown outer harbor. In southerly and westerly winds Edgartown Harbor and Vineyard Haven are the best anchorages. With the aid of the chart and the directions given under the discussion of these harbors, strangers can enter the anchorages.

Several anchorage areas have been designated in Nantucket Sound and its eastern approaches. (See **110.140 (c) (3) through (c) (7) and (d)**, chapter 2, for

limits and regulations.)

Routes.—Because of the numerous shoals, strong tidal currents, thick fog at certain seasons, and vessels which may be encountered in the narrow parts of the channel through Nantucket Sound, the navigator must use more than ordinary care when in these waters.

In clear weather, day or night, the aids are readily distinguished and sufficiently numerous to enable a stranger to follow the channel without difficulty. The strongest currents will be encountered in Pollock Rip Channel, between Pollock Rip Channel Lighted Horn Buoy 8 and Handkerchief Shoal Buoy 14, and off East and West Chops. In some places the current sets directly on the shoals and in a calm, sailing vessels are sometimes obliged to anchor to prevent going aground. Most of the shoals rise abruptly from deep water and the bottom is very irregular, so soundings alone cannot be depended upon to keep clear of danger. Sailing vessels with a favorable current and with some local knowledge beat through the sound against a head wind in clear weather. If they find they are losing ground, they come to anchor within the prescribed anchorages under the lee of one of the shoals, or in one of the harbors until the wind or current changes.

In thick weather or fog when the aids cannot be seen, vessels in the vicinity of Pollock Rip Channel are cautioned against anchoring in the channel or near any of the aids. Steamers and tows passing through the channel in thick weather depend almost entirely on the sound signals of the aids, making it necessary for them to pass close to the aids.

Vessels off Pollock Rip Channel entrance desiring to anchor, wind and sea permitting, should stand westward and anchor west of a line joining Pollock Rip Channel Buoy 2 and Chatham Bar Lighted Gong Buoy 1. Anchorage may also be had in depths of 5 to 7 fathoms about 3 miles south-southwestward of Pollock Rip Entrance Lighted Horn Buoy PR and northeastward of Broken Part of Pollock Rip.

In Great Round Shoal Channel the danger of collision is not as great as in Pollock Rip Channel. In thick weather a vessel may anchor, wind and sea permitting anywhere in the channel and wait for clear weather. The bottom is generally sand, gravel, or pebble. The tidal currents are not as strong as in Pollock Rip Channel. Easterly winds make high tides and strong westerly currents. Westerly winds make low tides and strong easterly currents.

Pollock Rip Channel and Great Round Shoal Channel are subject to change; vessels of deep draft should wait for a favorable tide.

The Main Channel through Nantucket Sound is well marked, and strangers should experience little difficulty in navigating it. Vessels must take care to avoid the 24-foot shoal extending 1.2 miles eastward of the buoy marking Cross Rip Shoal and the 17- to 22-foot shoals 2.5 and 1.5 miles, respectively, southeastward of Halfmoon Shoal.

The North Channel through Nantucket Sound has broken ground with depths of 16 to 17 feet in some places. Strangers should not attempt this channel at night.

Currents.—The Tidal Current Tables and the Narraganset Bay to Nantucket Sound Tidal Current Charts contain detailed current information for many locations in this area.

At the eastern entrance to Pollock Rip Channel the flood current sets about 055° and the ebb 225° or at an angle of approximately 20° to the axis of the channel.

Daily predictions for Butlers Hole at the western end of Pollock Rip Channel are published in the Tidal Current Tables.

In the vicinity of Great Round Shoal Channel Lighted Whistle Buoy GRC, off the south end of Great Round Shoal, the tidal current is rotary, turning clockwise. The strength of flood sets 065° with a velocity of about 1.5 knots. The strength of ebb sets 250° with a velocity of about 1.5 knots. There is no true slack since the current is rotary. Minimum velocities before flood and ebb average about 0.5 knot and set approximately 315° before flood and 160° before ebb.

From the eastern entrance of Nantucket Sound to the lighted gong buoy off Hedge Fence, the time of current becomes gradually later; the average velocity at strength varies from about 1 to 2 knots, the flood setting eastward and the ebb westward.

Weather.—Fogs may occur at any time but are more frequent from April to October than during the remainder of the year. The fogs come more frequently with easterly and southerly winds; northerly winds clear them away. Southwesterly winds are usually accompanied by haze.

In mild winters ice does not usually interfere with the movement of vessels in Nantucket Sound. In severe winters drift ice accumulates and renders the movement of sailing vessels hazardous and sometimes almost completely obstructs their progress for periods of as much as 6 weeks. Powered vessels force their way through the ice.

During northerly winds which prevail in winter the passage along the north shore will be clear when other parts of the sound are unsafe. Sailing vessels, if caught in a floe while entering Pollock Rip Channel, are almost certain to be carried on the shoals. Vessels should keep in mind that the floating aids to navigation are liable to be moved out of their positions by drift ice.

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 not compulsory for vessels passing through Nantucket Sound; it is only compulsory for foreign and U.S. vessels under register entering or clearing ports. Pilots for the sound or Monomoy and Nantucket Shoals may be obtained at Boston by vessels coming from northward, or at New York by vessels coming from westward.

Vessels requiring a tow usually take a tug from the port of their departure.

Monomoy Island, on the northeastern side of Nantucket Sound, is a low, narrow spit covered with sand dunes. Vessels sometimes anchor off the east shore of the island in depths of 4 to 6 fathoms to await a favorable current for entering the sound. Off Monomoy Point, the south end of the island, shoals make off up to 5 miles eastward.

Tidal currents average about 2 knots at strength in the channel 0.2 mile west of Monomoy Point. The flood current sets 170° and the ebb 345°.

The large bight formed by Monomoy Island and the north shore of Nantucket Sound, eastward of Point Gammon, has extensive shoals scattered throughout and bordering the shores. Not all of the shoals are marked by buoys.

Charts 257, 114-SC.—Chatham Roads, at the northeast end of Nantucket Sound, is between the extensive shoals which extend northwestward from the northern end of Monomoy Island and the shoals extending 1.6 miles from the shore of Cape Cod at Harwich Port. The roads is the approach to **Stage Harbor** and the prominent summer resort of **Chatham** on the hilly ground at the northeast shore of Nantucket Sound.

Stage Harbor Light (41°39.5′ N., 69°59.1′ W), 48 feet above the water, is shown from a white skeleton tower with a small white house on the northeast side of Chatham Roads and on the north side of the entrance to Stage Harbor.

Among the conspicuous landmarks approaching Chatham Roads and Stage Harbor are the domes of the National Weather Service's installation on the eastern side of Morris Island, a radio tower at South Chatham, church spires, Chatham Light, and Stage Harbor Light and an old abandoned lighthouse tower near it.

A dredged channel, marked by buoys and protected on its northwesterly side by a 500-foot jetty, 150 yards southward of Stage Harbor Light, leads from Chatham Roads for 1.1 miles into Stage Harbor. In August 1971, shoaling to 6 feet was reported in the channel; greater depths can be carried with local knowledge.

A narrow channel, marked by private seasonal buoys, leads northerly from Stage Harbor through Mitchell River to Mill Pond, and has a depth of about 6 feet. This channel is crossed by a highway bridge that has a 14-foot hand-operated bascule span with a clearance of 8 feet. In the summer, the bridge is opened upon reasonable advance notice to the town highway department; telephone (617-945-0757).

Good **anchorage** for vessels up to 18-foot draft can be had in Chatham Roads in depths of 21 to 30 feet, good holding ground. This anchorage is insecure for small craft in heavy southwesterly gales. Small craft can find a well-sheltered anchorage in Stage Harbor.

Routes.—Vessels approaching Chatham Roads from the southward should pass westward of Handkerchief Shoal and the extensive shoals westward of Monomoy Island. Approaching from the westward pass either side of Bishop and Clerks and thence southward of the lighted whistle buoy off **Kill Pond Bar**, a shoal covered 4 to 11 feet off the northwest entrance to Chatham Roads. When off the entrance to Chatham Roads, steer **063°** with Stage Harbor and Chatham Lights in range. This course will lead about 500 yards southeastward of Chatham Roads Bell Buoy 1 and north of the buoy marking **Common Flat**, the shoal on the eastern side of the roads, to the Stage Harbor approach buoy about 0.8 mile west-southwestward of Stage Harbor Light. An anchorage may be had northward of the approach buoy in depths of about 28 feet. Boats continuing to Stage Harbor will pick up the channel entrance buoys about 800 yards southwestward of Stage Harbor Light. The channel is well marked.

The harbor is closed by **ice** for short periods each winter. Local fishermen will act as pilots for craft desiring one.

The commercial fish piers in Stage Harbor are on **The Neck** at the head of the dredged channel opposite **Stage Island** and on the west bank of Oyster Pond River just above the first bend about 0.7 mile above the entrance to the river.

There are a marina and boatyard on the north side of Stage Harbor adjacent to the fish piers, and a marina on **Mitchell River** just west of the bridge. The marine railway at the boatyard can haul out craft up to 50 feet for hull and engine repairs or dry open or covered storage. Storage is also available at the bridge. Gasoline, diesel fuel, water, ice, marine supplies, ramps, berthage, and moorings are available at Stage Harbor and at the bridge. Launching ramps are at the bridge and on **Sears Point**.

The U.S. Public Health Service maintains a **contract physician's office** in Chatham. (See appendix for address.)

Oyster Pond River extends from Stage Harbor for about 0.7 mile in a northwesterly direction, thence for 0.8 mile in a northeasterly direction into **Oyster Pond**. On the west bank at the bend there is a town wharf, a launching ramp, and a fish wharf. At 0.3 mile and 0.5 mile above the bend on the west bank are two boatyards and marinas. The largest marine railway at the yards can haul out craft up to 44 feet for hull and engine repairs or dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, launching ramps, berthage, and moorings are available.

Bucks Creek, 1.6 miles northwestward of Stage Harbor Light, is used only at high water by small local craft. The entrance between the jetties was reported to have 1½ feet in 1964. The tall radio tower of Chatham Radio Station WCC is prominent about 0.4 mile west of the jetties. **Cockle Cove** has been entered by small boats through one of the breakthroughs in the sandbar.

Saquatucket Harbor, is entered about 3.5 miles

westward of Stage Harbor Light. A dredged channel leads from Chatham Roads to an anchorage basin at the head of the harbor. A jetty, marked at its seaward end by a light, extends southward from the easterly entrance point to the harbor. In October 1971, the controlling depth was 3 feet over the bar to the dredged channel, thence 6 feet on the centerline in the dredged channel to the anchorage basin, with 5 feet in the basin except for shoaling near the edges. Buoys mark the approach over the bar and the channel. A marina is on the north side of the anchorage basin. Berthage and a launching ramp are available. The **harbormaster** here also supervises **Wychmere Harbor, Allens Harbor, Herring River,** and **Round Cove** in **Pleasant Bay.** He can be reached by telephone (617-432-2562).

Storm warning signals are displayed. (See chart.)

Wychmere Harbor, 3.7 miles westward of Stage Harbor Light, is a circular basin with a bulkheaded entrance protected by two jetties. The west jetty is hook-shaped and marked on the end by a light. The east jetty is short. The harbor is used by fishing and pleasure craft. The village of **Harwich Port** is west of the harbor. A church spire about 0.5 mile westward of the harbor and a hotel on the west bank of the entrance are conspicuous.

In October 1971, the controlling depth over the bar was 3 feet. Inside the jetties, the channel has a depth of 6 feet to the harbor. The channel is subject to shoaling. The outer anchorage basin, known locally as Harwich Port Harbor, has a depth of about 8 feet with good holding ground.

There is a large summer club-hotel and wharf on the west side of the jettied entrance. A town wharf and natural ramp are on the east side. A boatyard is at the inner end of the channel. Gasoline, diesel fuel by truck, a 45-foot marine railway, water, ice, marine supplies, berths, launching ramps, lifts, and storage facilities are available; hull and engine repairs can be made. A radio-equipped patrol boat enforces a **speed limit** of 5 m.p.h. The **harbormaster** who supervises Wychmere Harbor has his office at Saquatucket Harbor. He can be reached by telephone (617-432-2562) for advice on moorings or local conditions.

Allens Harbor, about 4.8 miles west of Stage Harbor Light, has a narrow entrance between two jetties into **Doanes Creek**. Allens Harbor is at the head of the creek. The west jetty is marked by a private seasonal light. An elevated water tank north of the harbor is a good landmark.

In October 1971, the controlling depth in the entrance channel was reported to be about 6 feet. Private seasonal buoys mark the channel. The harbor affords good shelter for small craft.

Allens Harbor Yacht Club is at the head of the harbor at the east end of the highway bridge. The pier and float were reported to have 6 feet alongside. A town landing and launching ramp at the west end of the bridge were reported to have about 6 feet alongside. A marina and boatyard on the west side at the head of the harbor has a marine railway that can haul out craft up to 30 feet for hull and engine repairs and dry open and covered storage. Gasoline, diesel fuel, water, ice, marine supplies, and berthage in 6 feet of water are available. The **harbormaster** who supervises Allens Harbor has his office at Saquatucket Harbor. He can be reached by telephone (617-432-2562) for local information.

Herring River, 6 miles west of Stage Harbor Light, has a large prominent hotel on the west side and windmill on the east side of the entrance. The entrance, between two small jetties, is subject to shoaling. A reported depth of about 2 feet can be carried through the entrance. A basin dredged in the river just below the bridge has moorings for craft drawing up to 3 feet. The fixed bridge, about 0.3 mile above the mouth, has a 14-foot fixed span with a clearance of 10 feet. State Route 28 highway bridge about 0.8 mile above the mouth has a 20-foot fixed span with a clearance of 7 feet. Limited supplies may be obtained at **Dennis Port** about 0.7 mile westward of the river.

Swan Pond River, about 1.9 miles west of Herring River, is a narrow shallow creek bordered by marsh, which drains **Swan Pond**. Fishermen and pleasure craft enter at high water. Fish wharves are on the east bank at the bridge about 0.3 mile above the mouth. No services were available on the river in October 1971.

Charts 258, 114-SC.—Bass River, 9.6 miles westward of Stage Harbor Light, is entered between two jetties. A light is on the west jetty. A gong buoy, 1.1 miles southward of the jetty light, marks the approach. A private buoyed channel leads over the bar from about 0.4 mile southward of the jetty light through the jetties to an anchorage basin in the lower part of the river, and thence to the highway bridge at South Dennis, 3.1 miles above the mouth. The bridge has a 25-foot fixed span with a clearance of 10 feet. The entrance to the anchorage basin and the channel over the bar are subject to shoaling. In 1971, it was reported that the entrance channel between Buoys 4 and 10 had shoaled to a depth of 2 feet and that a depth of 4 feet could be carried from Buoy 10 to a point about 300 yards southward of the bridge at South Yarmouth. Above this point, a depth of about 2 feet is reported to the bridge at South Dennis.

Private seasonal buoys mark the channel to the fixed bridge at **South Dennis**. State Route 28 highway bridge crossing the river between **West Dennis** and **South Yarmouth**, about 1.5 miles above the mouth, has a 30-foot fixed span with a clearance of 15 feet.

About 0.8 mile above the mouth, a channel leads eastward to a lagoon; a dredged depth of 10 feet was reported in the channel and lagoon. West Dennis Yacht Club is at the head of the lagoon.

Bass River Yacht Club is on the west side about 0.5 mile below the first highway bridge. A marina and boatyard adjacent to the club has a marine railway that can haul out craft up to 40 feet for hull

and engine repairs or dry open and covered storage. Gasoline, diesel fuel, water, ice, moorings, berthage in 3½ feet of water, and a launching ramp are available. Town landings and launching ramps are on both sides of the river at and below the bridge.

Rental boats, gasoline, bait, and tackle can be obtained at a fishing pier just north of the east end of the bridge. A marina, above the pier, has gasoline, launching ramp, a 9-ton hoist, berths, water, and storage facilities; hull and engine repairs can be made.

Two fixed bridges, railroad and highway, cross the river about 0.7 mile above the highway bridge at South Dennis. Least clearances are: 25 feet horizontal, and 8 feet vertical.

In 1971, it was reported that about 4 feet could be carried at high water to a marina and boatyard on **Kellys Bay**, about 0.3 mile above the railroad and highway bridges. A mobile lift at the yard can haul out craft up to 30 feet for hull and engine repairs or dry open or covered storage. Gasoline, water, ice, moorings, and berthage are available.

Dogfish Bar, an extensive shoal area off Bass River entrance, is covered 1 to 6 feet. A small breakwater, formerly used as a shelter for small craft, is on the easterly end of the bar, about 1 mile southeastward of Bass River West Jetty Light. The area around the breakwater and northeasterly of it has shoaled. Rocks awash at low water are about 0.4 mile northwestward of the breakwater. These rocks are marked by a private seasonal buoy.

Parkers River, about 1.2 miles west of Bass River, extends 1.3 miles northward to **Seine Pond**. Prominent when approaching the entrance are a motel on the east side of the entrance and a movie screen on the west side of the river, about 0.9 mile above its entrance. Local knowledge should be obtained before entering the river. In October 1971, the entrance channel had a reported controlling depth of about 1 foot. The entrance channel is reported to shoal quickly after dredging. A fixed highway bridge crosses the river about a mile above the entrance.

Local fishermen and pleasure craft enter and moor in dredged slips on the east side of the river. An unnamed creek, about 0.2 mile above the mouth, leads westward 0.5 mile to **Lewis Pond**. Small craft moor in the pond, but there are no services available. A marina is on the east side of the river just below the highway bridge; gasoline, diesel fuel, water, ice, and berths with electricity are available.

Point Gammon, 12 miles west-northwestward of Monomoy Point, is the eastern entrance point to Hyannis Harbor. The point, prominent and wooded, is marked by an abandoned lighthouse tower. A reef, partly bare at low water, extends about 0.3 mile south of the point. Extensive flats with rocks awash at low water extend a mile northwestward of the point. **Gazelle Rock**, covered 5 feet and marked by a buoy, is about 0.5 mile south-southeastward of the point. **Senator Shoal**, covered 11 feet and unmarked, is about a mile southeastward of the point. **Hallets Rock**, covered 15 feet and marked by a buoy, is about a mile south of the point.

Bishop and Clerks, about 2.2 miles southward of Point Gammon, is an extensive shoal area. The center of the shoal is marked by a daybeacon on a group of rocks where a lighthouse tower was formerly located. Several rocks awash at low water are on the arm of the shoal that extends about 0.9 mile south of the daybeacon. A rock, covered 5 feet, is 0.7 mile south-southeastward of the daybeacon. The rest of the shoal is covered 10 to 18 feet. A lighted gong buoy, 0.8 mile southward, an unlighted buoy, 0.9 mile south-southeastward, and a lighted bell buoy, 0.6 mile northeastward of the daybeacon, mark the limits of the shoal area. Caution should be exercised when in the vicinity of this shoal.

Broken Ground, a shoal area westward of the south end of Bishop and Clerks, has depths of 14 to 18 feet. **West Southwest Ledge**, 1.6 miles southwest of Point Gammon and northwest of Bishop and Clerks, has depths of 15 to 18 feet. A lighted bell buoy is westward of the ledge. Three dangerous rocks are on the edge of the flat which extends northwestward from Point Gammon and into the approach to Hyannis Harbor. **Great Rock** is marked by a daybeacon; **Gardiners Rock**, covered 11 feet, is marked by a buoy. **Halftide Rock**, awash, eastward of Gardiners Rock and southeastward of Great Rock, is unmarked.

Hyannis Harbor, protected by a breakwater, is used as a harbor of refuge by coasting vessels and pleasure craft of less than 14-foot draft. A light is on the end of the breakwater. The harbor is the approach to Hyannis Port, on the west side of the harbor, Lewis Bay, and Hyannis at the head of the northwest arm of Lewis Bay.

The most prominent objects when approaching the harbor are: the daybeacon on Great Rock; a red and white checkered globe-shaped tank; the breakwater light; the abandoned lighthouse tower on Point Gammon; and the square gray stone church belfry on the hill overlooking Hyannis Port to the westward.

Depths of 13 to 16 feet are in the approach channel and the protected basin northward of the breakwater light, but the approach is somewhat obstructed by the flats extending westward from Point Gammon and an extensive shoal with numerous rocks on the west side of the approach.

Routes.—Vessels approaching Hyannis Harbor from the eastward should shape a course to pass about 250 yards south of the buoy marking Hallets Rock, thence northwestward to a point about 0.5 mile southwestward of Great Rock Daybeacon, and thence about north by east to pass 50 yards or more eastward of the breakwater light. Anchor 300 yards northeastward or northward of the east end of the breakwater in depths of 15 to 20 feet, soft bottom. Small craft can anchor in the northern por-

tion of the harbor in depths of 6 to 12 feet, but care must be taken to keep clear of the area around a former wharf as submerged piling may be encountered.

Approaching from the westward, from a position about midway between Horseshoe Shoal Buoy 7 and Wreck Shoal Buoy 8 (chart 1209), steer **054**°to pass 100 yards east of West-Southwest Ledge Lighted Bell Buoy, and thence **014**°to pass about 100 yards eastward of the breakwater light in entering the harbor. **Ice** seldom interferes with the movement of vessels in Hyannis Harbor; the prevailing northerly winds keep the harbor clear. **Hyannis Port** is a summer resort with many prominent homes. A channel privately dredged to 7 feet leads to the Hyannis Port Yacht Club landing on the west shore of the harbor. A buoy maintained by the club marks the channel.

Lewis Bay, with depths of 2 to 11 feet, extends northeastward from Hyannis Harbor. In the northwest corner of the bay is the channel to the summer resort of **Hyannis**. The town has a hospital.

A dredged channel leads from Hyannis Harbor into Lewis Bay, thence to an anchorage basin north of **Harbor Bluff**, thence to the town wharf at Hyannis. In February 1972, the controlling depths were 8 feet (12 feet at midchannel) from the entrance to the town wharf with depths of 12 feet in the anchorage. The channel is well marked but is subject to shoaling. A riprap jetty extends 1,000 feet southerly from **Dunbar Point**.

Vessels entering Lewis Bay must be guided by the buoys marking the dredged channel and by the color of the water, deepest where it is darkest. The bay is closed by ice for about 2 months during severe winters.

Several small-craft facilities and launching ramps are along the northwestern arm of Lewis Bay northward of Harbor Bluff. Gasoline, diesel fuel, berths, moorings, water, storage facilities, marine railways up to 80 feet, lifts up to 25-tons, and marine supplies are available; hull and engine repairs can be made. Berths are also available at the town landing at the bulkhead on the west side at the head of the arm. A **dockmaster** is usually in attendance at this landing, and can be reached by telephone (617-775-1707) for local information on moorings and berthing. A Town of Barnstable police boat patrols the harbor during the summer season.

Seasonal ferries to Nantucket and Martha's Vineyard berth at the town landing. Hyannis has taxi, bus, and railroad freight service. Barnstable Municipal Airport is just north of the town.

Westward of Hyannis Harbor breakwater the water is shoal with numerous rocks extending well offshore. **Eddie Woods Rock**, covered 5 feet and unmarked, is 0.6 mile southwestward of the breakwater light.

Squaw Island, 1 mile westward of Hyannis Harbor Breakwater Light, is marked by a tower. **Hyannis Point**, the southerly tip of the island, is on the eastern side of Centerville Harbor.

Southward of Hyannis Point and Centerville Harbor are numerous shoals and rocks. **Southwest Ground**, the area about 1.5 miles south of Hyannis Point, has numerous rocks and shoal spots necessitating extreme caution for vessels navigating the area. **Southwest Rock**, about 1.1 miles south of Hyannis Point, is marked by a daybeacon. Unmarked rocks, some awash at low water and others covered 2 to 6 feet, are between the daybeacon and Hyannis Point.

Hodges Rock, covered 5 feet and marked by a buoy, is 1 mile southward of Southwest Rock Daybeacon. An unmarked rock covered 8 feet is 300 yards east of Hodges Rock. **Bearse Rock**, covered 5 feet and marked by a buoy, is 0.5 mile southwestward of Southwest Rock Daybeacon. **Channel Rock**, covered 5 feet and marked by a buoy, is 0.4 mile west of Bearse Rock. **Gallatin Rock**, covered 4 feet and marked by a buoy is 0.4 mile southwestward of Bearse Rock. **Collier Ledge**, 1.5 miles west-southwestward of Southwest Rock Daybeacon, is awash at low water. It is marked by a lighted buoy in the summer and an unlighted buoy in the winter.

Gannet Ledge, covered 5 feet and marked by a buoy, is 1.1 miles southwest of Hyannis Point. **Gannet Rocks**, 0.3 mile north of Gannet Ledge, include two unmarked rocks 7 and 3 feet high and a rock covered 4 feet. **Spindle Rock**, awash at low water and marked by a buoy, is near the head of Centerville Harbor. A rock awash at low water and a rock covered 2 feet are 200 yards north of the buoy. Two unmarked rocks covered 6 feet are 1.7 miles southwestward of Hyannis Point.

Centerville Harbor is a bight 2 miles wide in the north shore of Nantucket Sound westward of Hyannis Point. A church spire and an elevated tank in **Centerville**, the village inland from the head of the harbor, are used as guides for entering the harbor. **Craigville Beach**, on the north side of the harbor, is a popular bathing beach. The approach to Centerville Harbor is obstructed by the previously mentioned rocks and shoals. The natural channel with depths of 9 to 10 feet leads to the anchorage. Anchorage with good holding ground may be had in depths of 15 to 21 feet; however, vessels seldom anchor here for shelter as the harbor is exposed to southerly winds. The shoals off the entrance somewhat break the force of the seas from southward, but not sufficently to make it a safe anchorage. Strangers should not enter except in the daytime with clear weather. Ice closes the harbor in the winter.

East Bay, on the west side of Centerville Harbor, has depths of 1 to 5 feet. The bay is used principally by oyster boats. Pleasure boats and small yachts enter the bay enroute to Centerville River. The entrance to East Bay, protected by a jetty on the southwestern side, was privately dredged to 7 feet in August 1971, but is subject to shoaling. **Centerville River**, which enters the northeast side of the bay, has been privately dredged to a depth of 5 feet for a width of 40 feet practically to the

head of navigation. A reported depth of about 5 feet can be taken over the bar into Centerville River. The footbridge crossing the river about 0.3 mile above East Bay has a 26-foot bascule span with a clearance of 9 feet. Small boats anchor in the river off Centerville or tie up to private piers.

A conspicuous stone tower with a mushroom-shaped top is on the north side of the river about 0.5 mile above the footbridge. A town landing is on the north side just above the tower. A launching ramp is on the west shore of East Bay. A conspicuous wooden tower with a balcony on top is 0.3 mile southwestward of the jetty.

Charts 259, 114-SC.—Cotuit Anchorage, 6.5 miles west of Point Gammon (chart 258), is an anchorage for small craft between the shoals which make off the shore. The anchorage is exposed to southerly winds and is seldom used except by local craft. The channel to the anchorage is marked by buoys, and vessels of less than 6-foot draft should experience no difficulty in keeping in the best water. **Lone Rock**, covered 4 feet and marked by a buoy, is near the southern side of the anchorage. A long shoal, covered 4 feet and marked by a buoy at its southeast end, is 0.5 mile northeastward of Lone Rock. A private seasonal lighted float buoy is 0.5 mile west-northwestward of Lone Rock.

West Bay, on the north side of Cotuit Anchorage and 19 miles west of Stage Harbor, has a jettied entrance about 150 feet wide and is the approach to the village of **Osterville**, on the east side of the bay. A private seasonal light marks the end of the east jetty. A lighted bell buoy 1.7 miles southward and a seasonal lighted buoy 1 mile southeastward of the entrance mark the approaches, and a private seasonal buoy is reported to mark the entrance. An elevated water tank, about 0.7 mile northward of the bridge at Osterville, is conspicuous. In 1971, a reported depth of 6 feet was available in the channel to the highway bridge.

Anchorage in depths of about 7 feet may be found in the bay just northward of the highway bridge. **Ice** closes the bay for about 2 months each year. The wharves at Osterville have reported depths of 6 to 10 feet alongside.

Small-craft facilities are on either side of the channel north of the highway bridge. Gasoline, diesel fuel, marine railways up to 60 feet, lifts up to 20 tons, berths, moorings, water, ice, marine supplies, storage facilities, and launching ramps are available; hull and engine repairs can be made. The Wianno Yacht Club is on the east side of the channel at the highway bridge. Berths are available on **Baxter Neck**, on the channel at the head of North Bay leading to **Prince Cove**.

Little Island, about 1 mile northward of the entrance to West Bay, separates West Bay from **North Bay** to the northward. In 1971, a reported depth of 6 feet was available in the narrow channel eastward of Little Island into North Bay. Strangers should obtain local information before navigating in North Bay, which has depths of about 6 to 17 feet. The **harbormaster** at Osterville can be contacted for local information on moorings and berthing; telephone (617-428-2017 or 617-428-2607).

The highway bridge across the channel between Osterville and Little Island has a 31-foot bascule span with a clearance of 15 feet. It is reported that the bridge will be opened on signal during the following periods: During June, 0800 to 1800 daily; July through September 14, 0730 to 2000 daily; September 15 to November 1, 0800 to 1600 daily. During the rest of the year, the bridge is unattended and arrangements for its opening must be made in advance through the harbormaster.

Cotuit Bay, northwestward of Cotuit Anchorage, is separated from West Bay by **Osterville Grand Island**. **Cotuit** is a village on the west side of the bay. A church spire and two elevated water tanks are prominent. A town wharf, with a depth of about 5 feet at its face, and a small-craft launching ramp are at the village. A privately dredged channel, with a reported depth of 4 feet in 1971, leads from Cotuit Anchorage to off **Cotuit Highlands**, thence the channel, with a reported depth of 5 feet, curves between **Sampsons Island** and **Bluff Point** into Cotuit Bay. The channels into Cotuit Bay and North Bay are marked by private seasonal buoys. A reported depth of about 8 feet was in the channel from Cotuit Bay to North Bay in 1971. **Seapuit River**, south of Osterville Grand Island, connects Cotuit Bay and West Bay. The privately dredged channel in the river had a reported controlling depth of 4 feet in 1971. Cotuit Bay is usually closed by **ice** each winter.

Popponesset Bay, west of Cotuit Anchorage, is shoal with depths of 1 to 4 feet in the greater part of the bay. In 1971, a depth of 2 feet was reported in the entrance north of **Thatch Island**.

A small marina is on **Daniels Island** near the bridge to Popponesset Island. A launching ramp, berthage, moorings, and some services are available.

Wreck Shoal, about 3 miles south of Cotuit Anchorage, is about 1.4 miles long in an east-west direction and about 0.3 mile wide. Depths on the shoal range from 4 to 13 feet. A bell buoy marks the east end of the shoal and a lighted bell buoy southwestward of the shoal marks the channel between Wreck Shoal and Eldridge Shoal. An unmarked shoal covered 8 to 15 feet is about 1.5 miles northeast of Wreck Shoal and southward of Cotuit Anchorage approach. Broken ground with a least known depth of 13 feet is between this shoal and Wreck Shoal.

Eldridge Shoal, about 0.9 mile south of Wreck Shoal, is about 1 mile long in a northeasterly direction and about 0.2 mile wide. Depths on the shoal range from 5 to 14 feet. A buoy marks the northern side. A channel between Eldridge and Wreck Shoals has depths of 23 to 41 feet. A channel between Eldridge and Horseshoe Shoals has depths of 21 feet or more.

Succonnesset Shoal extends about 2.4 miles westward from Wreck Shoal to the shoal area off the shore southwestward of **Succonnesset Point**. Depths of 1 to 5 feet are on the shoal. A lighted buoy is off the west end. Between Succonnesset and Wreck Shoals is a narrow unmarked channel. Between Succonnesset and L'Hommedieu Shoals, a shoal area with a least depth of 9 feet is marked by a buoy.

Waquoit Bay, 5 miles southwestward of Cotuit Anchorage, has depths of 1 to 8 feet. The entrance, about 250 feet wide, is between two stone jetties. A daybeacon marks the seaward end of the westerly jetty, and a light marks the end of the easterly jetty. In 1971, the controlling depth in the entrance channel was reported to be 4 feet. A lighted bell buoy, about 0.6 mile west-southwestward of the jetties, marks the approach, and buoys mark a 5-foot channel for about 0.8 mile through the bay. The Waquoit Yacht Club is on the west side at the head of the bay.

Great River and **Little River** empty into the southeasterly side of Waquoit Bay. A marina is on the west side of Little River, about 0.5 mile above its junction with Great River. Gasoline, berths, a 35-foot marine railway, limited marine supplies, and storage facilities are available; hull and engine repairs can be made. A reported depth of about 3 feet can be carried to the marina.

Between Waquoit Bay and Falmouth Inner Harbor (chart 260), about 3.6 miles to the westward, are several ponds formed by the barrier beach, some of which have outlets. Many jetties or groins are built out from the shore for beach erosion control.

Eel Pond, about 0.8 mile westward of the entrance to Waquoit Bay, is entered through a narrow jettied entrance. A lighted bell buoy 0.6 mile off the entrance and a midchannel buoy 500 yards off mark the approach. Private seasonal buoys mark the channel into the pond. In 1971, the reported controlling depth through the entrance was 3 feet.

A boatyard is on the west side of the northeasterly arm of Eel Pond at the mouth of **Childs River**. In 1971, a depth of 5 feet was reported available from inside the jetties to the boatyard. Gasoline, diesel fuel, water, moorings, limited berthage, a 45-foot marine railway, storage facilities, and marine supplies are available at the boatyard; hull and engine repairs can be made.

Seapit River, about 0.8 mile southward of the mouth of Childs River, connects the northeasterly arm of Eel Pond with the upper part of Waquoit Bay. A reported depth of about 3 feet can be carried in Seapit River.

Menauhant is a summer resort on the west side of Eel Pond and the east side of **Bournes Pond**. Menauhant Yacht Club is on the west side of Eel Pond. The entrance to Bournes Pond is reported closed to navigation by a fixed highway bridge.

Green Pond, about 1 mile westward of Eel Pond and 4.2 miles eastward of Nobska Point (chart 260), has a narrow jettied entrance, which in 1971 had a reported controlling depth of 7 feet. The entrance is reported to shoal rapidly after dredging; local knowledge is advised. A private seasonal light marks the west jetty. A buoy, about 0.9 mile south-southwestward of the entrance, marks the approach, and private seasonal buoys mark the channel above the jetties.

The village of **Davisville**, on the east side of Green Pond, and the village of **Acapesket**, on the west side of the pond, are principally summer resorts.

Menauhant Road highway bridge crossing Green Pond about 0.3 mile inside the entrance has a 23-foot fixed span with a clearance of 5 feet. In 1964, it was reported that 7 feet could be carried to a marina and boatyard on the east side at the bridge. The boatyard has a 10-ton mobile hoist that can handle craft up to 35 feet for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel by truck, moorings, berths, water, ice, marine supplies, and launching ramps are available at both facilities.

Moorings, berths, water, and a launching ramp are also available at an outboard marina at the northwest end of the bridge.

Chapter 5 describes other ports on the south side of Cape Cod westward of Green Pond.

Chart 265.—Nantucket Island, on the southeast side of Nantucket Sound, is about 13 miles long, hilly, and partly wooded, and covered with vegetation that flourishes in sandy soil. The highest part of the island, about 100 feet high, is in the eastern part; the eastern and southern sides have steep sand bluffs. The northern shore is fringed with shoals for a distance of about 1 mile. The island was for more than a century a principal seat of the whaling industry and since has become a famous summer resort.

Great Point, the northeastern end of Nantucket Island, is a long, low, sandy point marked by **Nantucket (Great Point) Light** (41°23.4′ N., 70°02.7′ W.), 70 feet above the water, and shown from a white tower near the end of the point.

Point Rip is a shoal extending 3.8 miles east-northeastward of Great Point. For 2 miles from the point, the shoal has little water over it; farther eastward the depths range from 12 to 18 feet. Buoys mark the northeasterly and easterly sides of the shoal. Shoal water with depths of 16 to 22 feet extends about 1 mile northward from these buoys; a lighted bell buoy marks the northern side of the shoal water. A rock, covered 11 feet, is 2.2 miles southeastward of Nantucket Light.

Squam Head is a summer resort on the east side of Nantucket Island, about 5 miles south of Great Point. Several large houses show prominently from seaward.

Sesachacha Pond, 6.3 miles southeastward of Great Point, has a nonnavigable cut into it through the shore. From seaward, breakers mark the cut. In the winter the entrance fills in, and each spring

it is cut through for drainage purposes.

Sankaty Head Light (41°17.0′ N., 69°58.0′ W.), 158 feet above the water, is shown from a 70-foot white tower, with a red band in the middle, on a high bluff on the east side of the island.

Siasconset, a village on the southeast end of the island, is marked by a prominent standpipe. The village has seasonal bus service with Nantucket.

The south shore of Nantucket Island has no harbors and is frequented only by local fishermen. Loran towers, about 0.6 mile southward of Siasconset, and several towers along the south coast are prominent from offshore.

The thorofare between **Smith Point**, the western point of Esther Island, and Tuckernuck Island, is full of shifting unmarked shoals. The passage is used only by small fishing vessels and a few pleasure craft. Private seasonal aids mark the channel.

Tuckernuck Island, **Esther Island**, and **Muskeget Island** are low sandy islands extending westward from Nantucket Island. They are separated by sand bars, some bare at low water, which are constantly shifting. A privately maintained seasonal light is on the southeastern side of Tuckernuck Island.

Madaket Harbor and **Hither Creek**, immediately to the southward, are on the western side of Nantucket Island. Madaket Harbor is shoal with depths of 2 to 10 feet. The northerly approach to the harbor and creek is through a channel, marked by private seasonal buoys, floats, and markers, that leads southward from over the bar in Nantucket Sound. With local knowledge, a depth of about 5 feet can be carried over the bar and channel to Hither Creek. Local knowledge is also required to enter the harbor from the southwest. A public boat landing and a boatyard are in Hither Creek. Gasoline berths, a 30-foot marine railway, storage facilities, water, and marine supplies are available at the boatyard; hull and engine repairs can be made.

Chart 343.—Nantucket Harbor is near the middle of the north shore of Nantucket Island. A shallow lagoon about 5 miles long extends northeastward from the harbor. The harbor is the approach to the town of **Nantucket** on the western shore. The principal industry is fishing. Small coastal tankers carry fuel to Nantucket. The ferry from Woods Hole, and the seasonal ferry from Hyannis, carry passengers, vehicles, and general cargo. A passenger ferry also operates from Falmouth and Oak Bluffs during the summer.

Prominent from offshore are: a standpipe (chart 265) about 1.5 miles west of Nantucket; a gilded cupola atop a church clock tower, and a church belfry about 500 yards northwestward of it; the spire of a large white church in the town; a brick chimney near the waterfront; and the navigational lights at the entrance to Nantucket Harbor.

Brant Point Light (41°17.4′ N., 70°05.5′ W.), 26 feet above the water, is shown from a white cylindrical tower connected to the shore by a footbridge on the west side of the entrance to the harbor. A fog signal is sounded at the light. A Coast Guard station is on the point.

Channels.—A dredged channel leads from Nantucket Sound to an anchorage area in Nantucket Harbor. In November 1971, the controlling depth was 11 feet or 15 feet in midchannel.

Shoal water extends about a mile offshore on both sides of the entrance, which is protected by two breakwaters. The breakwaters are partially submerged at half tide; the east breakwater for almost all its length. An opening for small craft is in the east breakwater about 300 yards off **Coatue Point**. A light and fog signal mark the outer end of the east breakwater, and a buoy marks the outer end of the west breakwater.

A lighted bell buoy about 900 yards off the breakwater light marks the approach and the channel is marked by a **162°** lighted range and buoys. The range structures are difficult to pick up in the daytime.

Anchorages.—Anchorage in Nantucket Harbor may be had in depths of 6 to 17 feet off the south and southwest sides of Brant Point or in depths of 12 to 17 feet in the designated anchorage area south of Brant Point. (See **110.142**, chapter 2, for limits and regulations.) In general, the bottom is sticky. Although shelter is afforded to vessels it is advisable for small craft to use heavy tackle as the harbor becomes choppy with easterly winds. Caution should be exercised to avoid anchoring in the fairway and maneuvering area to the ferry wharf or the cable area northeast of Brant Point.

The long sweep of strong northeast winds down the harbor makes anchorage for small craft off the wharves dangerous and uncomfortable. Small craft may find more sheltered anchorage under these conditions in Head of the Harbor (chart 265) or, with local knowledge, in Polpis Harbor (chart 265).

Routes (chart 1209).—Vessels approaching Nantucket Harbor form Pollock Rip Channel can set a direct course from Handkerchief Shoal Buoy 14 (41°29.2′ N., 70°05.1′ W.) to the lighted bell buoy off the entrance. Approaching from the channel northward of Cross Rip Lighted Horn Buoy 21 (41°26.9′ N., 70°17.5′ W.), pass to the eastward of Tuckernuck Shoal Lighted Bell Buoy 1, and then head for the lighted bell buoy off the entrance to Nantucket Harbor.

Tides and currents.—The mean range of tide at Nantucket Harbor is 3 feet. The tidal current off the entrance has a velocity of 0.3 knot; the flood setting eastward and the ebb westward. The tidal current in the entrance channel sets into the harbor at a velocity of 1.2 knots and outward on the ebb at a velocity of 1.5 knots.

Weather.—The climate of Nantucket is influenced directly by the proximity of the ocean and is characterized by cool summers and comparatively mild winters. Extremes of either maximum or minimum temperatures are very rare. The mild temperatures of the winter season are neutralized to a degree by sustained periods of high wind.

The summers, though cool, are very humid. Heavy fogs are frequent, particularly during the spring and summer. There is a marked lag in the seasons as compared with inland areas.

July and August are relatively cool with average maximum temperatures in the mid-seventies. January and February are the coldest months, having normal mean temperatures near freezing.

The average wind velocity is between 13 and 14 m.p.h., with the highest monthly averages during January through April. Coast storms are frequent during the winter with winds of 45 m.p.h. or more. Hurricanes, during the late summer and fall, may cause high winds.

Precipitation is fairly evenly distributed throughout the year. Total snowfall for the winter season averages about 30 inches; however, melting is usually rapid and snow cover rarely lasts more than a very few days.

Except in severe winter, the harbor is seldom closed by local formation of ice. However, the harbor is frequently closed by drift ice from the sound which packs and remains across the entrance during northerly winds.

(See appendix for **Nantucket climatological table.**)

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

The U.S. Public Health Service maintains a **contract physician's office** in Nantucket. (See appendix for address.)

Nantucket Boat Basin, on the west side of Nantucket Harbor, is entered about 0.4 mile south-southwestward of Brant Point Light. The basin is enclosed on the north and south sides by Straight Wharf and Commercial Wharf, respectively, and its entrance is protected by two long bulkheads on the east and southeast sides. Depths in the basin range from 2 to 7 feet. About 180 slips are available in the basin, and yachts 100 feet long and larger can be accommodated. The outer end of the north side of Straight Wharf is used by excursion boats. Gasoline, diesel fuel, and ice can be obtained on the south side of Commercial Wharf. Water and electricity are available at each slip. The basin's dockmaster has his office on the outer end of Commercial Wharf.

The Woods Hole-Martha's Vineyard and Nantucket Steamship Authority Wharf is about 0.1 mile northward of the boat basin. A private light is shown from the roof of a shed on the northeast end of the wharf, and is operated only when Authority vessels are approaching the wharf in fog. The submerged ruins of a pier which uncover at low water are between the boat basin and the Steamship Authority Wharf. Unpainted pile dolphins mark the former pierhead. Mariners are advised to exercise caution in this area.

North of the steamship wharf is a long finger pier and several float landings of the Nantucket Yacht Club. Craft up to 4 feet in draft come alongside the yacht club pier. The depth at the float is about 9 feet. Guest moorings and various services are available at the club.

A boatyard, about 0.2 mile southward of Nantucket Boat Basin, has berths, moorings, gasoline, diesel fuel, 20-ton mobile hoist, storage facilities, water, ice, and marine supplies; hull and engine repairs can be made.

Nantucket maintains ferry service with the mainland and daily airline service with New York and Boston. Seasonal bus service is also available.

Chart 265.—A narrow unmarked channel leads through the lagoon northeast of Nantucket Harbor to **Polpis Harbor** and **Head of the Harbor.** A reported depth of about 3 feet can be carried with local knowledge as far as the village of **Wauwinet** on the southeast shore of Head of the Harbor. Unmarked shoals and foul areas extend off the several points.

Charts 261, 264, 265, 1209.—Muskeget Channel is an opening 6 miles wide on the south side of Nantucket Sound between Muskeget and Chappaquiddick Islands. The opening is full of shifting shoals. The best water is found close to the eastward of Wasque Shoal and about 1.5 miles eastward of the eastern shore of Chappaquiddick Island. Although this channel is partly buoyed, strangers should never attempt it as tidal currents with velocities of 2 to 5 knots make navigation dangerous. The currents through the channel are strong, having a velocity of 3.8 knots on the flood and 3.3 knots on the ebb about 1.5 miles east of Wasque Point. The flood sets north-northeastward and ebbs south-southwestward.

Wasque Shoal extends southward of **Wasque Point**, the southeastern extremity of Chappaquiddick Island. The shoal, which dries about 2 miles south of Wasque Point, rises abruptly from the deep water of Muskeget Channel.

Mutton Shoal, 0.6 mile east of Wasque Shoal, has a least depth of 5 feet and is marked on its western side by a lighted bell buoy. The best water in Muskeget Channel is between Mutton and Wasque Shoals. Eastward of Mutton Shoal are numerous shoals covered 2 to 6 feet.

Between Muskeget Channel and the main channel north of Cross Rip Shoal are numerous shoals, some of which are separated by unmarked channels. **Tuckernuck Shoal**, northeast of Muskeget Channel, has a least depth of 2 feet; it is marked on the northeastern end by a lighted bell buoy and a buoy on the northern side. **Shovelful Shoal**, westward of Tuckernuck Shoal, is covered 3 to 17 feet. **Long Shoal**, northwestward of Shovelful Shoal, is covered 3 to 16 feet. **Edwards Shoal**, south of Cross Rip Shoal, has a least known depth of 10 feet. **Norton Shoal**, southwestward of Cross Rip Shoal and covered 8 feet, is marked by a buoy on its north side. **Hawes Shoal**, westward of Norton Shoal, has a least depth of 1 foot; buoys mark its northwestern and southern ends.

Charts 261, 264.—Martha's Vineyard and **Chappaquiddick Island** have a combined length of 18 miles, the two islands being separated by Edgartown Harbor, Katama Bay, and the narrow slough connecting them. The northern extremity of Martha's Vineyard is about 3 miles southeastward of the western end of Cape Cod. Martha's Vineyard is well settled, especially along its northern shore, and is popular as a summer resort. Along the northern shore the island presents a generally rugged appearance. The southern shore is low and fringed with ponds, none of which has navigable outlets to the sea. Approaching from the south, the principal landmarks are a standpipe at Edgartown, an aerolight near the center of the island, a church spire near **Chilmark** in the western part, a tall radar tower north of Chilmark, and Gay Head on the west side.

Communication with the mainland is by ferry, airline, cable, and telephone. The principal towns are Edgartown, Oak Bluffs, and Vineyard Haven.

Cape Poge, the northeastern point of Chappaquiddick Island, is a bare, bluff, precipitous head, which may appear from a distance to be a small island. **Cape Poge Light** (41°25.2′ N., 70°27.1′ W.), 65 feet above the water, is shown from a white conical tower on the cape.

Cape Poge Flats, extending about 1.5 miles northeastward from Cape Poge, are marked at the northeast end by a bell buoy. The southerly edge of the white sector of West Chop Light is about 1 mile north of the buoy. Shoal water extends about 0.4 mile offshore westward and northwestward of Cape Poge. A buoy, 1 mile west-northwestward of Cape Poge Light, marks the western side of the shoal water.

Cape Poge Bay, a lagoon of considerable size in the northern part of Chappaquiddick Island, is entered from Edgartown Harbor. The unmarked entrance is used mostly by local pleasure and fishing craft. In 1971, it was reported that 4 feet could be carried through the entrance channel with local knowledge.

Edgartown Harbor, on the eastern side of Martha's Vineyard and westward of Cape Poge, is divided into an outer and an inner harbor. The outer harbor is used principally as a harbor of refuge in southerly and easterly winds and as a night anchorage. At the head of the outer harbor, a narrow arm makes southward into Katama Bay, forming the inner harbor. The inner harbor affords good anchorage and is the approach to **Edgartown**, a fishing and resort town on the western shore. Many yachts and pleasure craft use the harbor during the summer.

Katama Bay, used by local fishermen and small pleasure craft, is large and shallow. Extensive shoaling has been reported in the southerly end of the bay.

Prominent features.—Edgartown Light (41°23.4′ N., 70°30.2′ W.), 45 feet above the water, is shown from a white conical tower on the west side of the head of Edgartown outer harbor. Also prominent are: a wooden tower and several flagpoles, about 0.2 mile northwestward of the light; a church belfry in the town, and a microwave tower 1.3 miles to the southwestward; a standpipe, about 1 mile southwestward of the light; and the numerous beach cabanas on Chappaquiddick Point.

Channels.—The buoyed channel through the outer harbor is free from dangers and has depths of 20 to 37 feet until nearly up to Edgartown Light. Near the light the channel narrows and makes a sharp bend westward, leading to the wharves at the town. In 1964, the controlling depth was 16 feet from the outer harbor to off the town. Abreast the town, the channel narrows and has depths of 13 to 35 feet. The channel then curves southward to Katama Bay, its eastern side being marked by buoys in the vicinity of Middle Ground Shoal. Depths of 13 to 28 feet are found for about 1.2 miles south of the town. The southern half of Katama Bay is full of shoals. A channel is sometimes cut through the beach between **Norton Point** and Wasque Point to the ocean; however, the head of the bay is subject to frequent changes. In October 1971, it was observed that a bar had formed sealing off the channel between the southern part of Katama Bay and the ocean.

Anchorages.—Anchorage with good shelter from easterly gales is found westward of Cape Poge on the eastern side of the outer harbor. In westerly and southerly gales vessels find shelter in the southern end of the outer harbor about 0.4 mile eastward or east-southeastward from Edgartown Light. In northerly or northeasterly gales vessels usually go to Woods Hole or Tarpaulin Cove for sheltered anchorage. Vessels should not anchor in the channel abreast the town where the bottom is hard sand, the channel narrow, and tidal currents strong. Southeast of the town, anchorage may be found south of Middle Ground Shoal in depths of 24 to 30 feet, sticky bottom.

Small pleasure craft usually anchor on Middle Ground Shoal eastward of the buoys marking the shoal. A **special small vessel anchorage** has been designated for this area. (See **110.1** and **110.38**, chapter 2, for limits and regulations.)

Dangers.—On the western side of the outer harbor is a shoal area extending 2.8 miles northward of Edgartown Light. A bell buoy marks two 11-foot spots at the northern edge of the shoal; vessels entering or leaving the harbor pass eastward of this buoy. The depths over the remainder of the shoal are irregular, and there are a rock awash and several rocks covered 3 to 5 feet. Strangers should never attempt to pass across this shoal. The channel into Edgartown Harbor is marked by a seasonal lighted buoy and unlighted buoys.

Sturgeon Flats, covered 2 to 18 feet, extend about 600 yards off the southeastern shore of the outer harbor between the narrow entrance to Cape Poge Bay and the entrance to the inner harbor.

A sand bar is making off eastward from Edgartown Light. A buoy is on the eastern end of the shoal. Except for this shoal, the entrance to the

inner harbor is not difficult to navigate. **Middle Ground Shoal**, in the inner harbor south of the town, has a least depth of 10 feet.

Routes (chart 1209).—Vessels approaching Edgartown Harbor from the eastward, from a position about 400 yards north of Cross Rip Lighted Horn Buoy 21, can steer **267°**, heading for the standpipe on Martha's Vineyard southward of Oak Bluffs, passing northward of Cape Poge Flats Bell Buoy 7. When Cape Poge Light bears 155°, head south-southwestward into the harbor.

Vessels approaching from the westward and passing northward of Squash Meadow can head on a **180°** course from a position about 0.5 mile southward of Hedge Fence Lighted Gong Buoy 22 to enter the harbor. In the daytime, the channel southward of Squash Meadow is sometimes used. Strangers in sailing vessels seldom enter the inner harbor as a fair wind is necessary to keep in the channel.

Tides and currents.—The mean range of tide is 1.9 feet. The tidal current in the narrow part of the channel inside Edgartown Light and off the town has a double flood and a double ebb, and in general follows the direction of the channel. Near the middle of each flood or ebb period there is an approximate slack preceded and followed by maximum of velocity. The average velocity is about 1 knot. (See the Tidal Current Tables for predictions.)

Fogs are prevalent during the summer and at times appear without warning. Drift ice from the sound, driven into the entrance by the wind, obstructs the entrance to sailing vessels during a part of the winter. It is reported that the harbor is normally closed by ice during January and February. The Chappaquiddick ferry channel is usually kept open. The tidal currents keep the inner harbor open except for a few days at a time during severe winters.

Storm warning signals are displayed. (See chart.)

There are no pilots for Edgartown Harbor. Tugs are seldom used, and none is available. Fishing craft will act as tugs in an emergency.

The **harbormaster** has control of the anchorage of vessels in the harbor. He will usually be found at the Town Wharf or can be reached by telephone (617-627-4740). Copies of harbor regulations may be obtained from the harbormaster.

The U.S. Public Health Service maintains a **contract physician's office** in Edgartown. (See appendix for address.)

The depth at the Town Wharf is 25 feet. Depths at the other wharves are about 11 feet. A marina, boatyard, and a yacht club are at Edgartown. The boatyard has a marine lift that can handle craft up to 38 feet for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, moorings, and berths are available.

A small ferry operates between Edgartown and Chappaquiddick Island. No schedule is maintained, but the ferry runs on call. There is seasonal bus service to Oak Bluffs, Vineyard Haven, and other island points. Ferries connect Oak Bluffs and Vineyard Haven with Woods Hole, Falmouth, and Hyannis.

Sengekontacket Pond, about midway between Edgartown and Oak Bluffs, has two entrances which are shoal. The southerly entrance had a reported controlling depth of 3½ feet in 1967. Both entrances are crossed by fixed highway bridges with clearances of 5 feet.

Squash Meadow is a shoal south of the main channel through Nantucket Sound and about 4 miles northwest of Cape Poge. The hard sand shoal has depths of 5 to 16 feet and is marked on its southeastern end by a bell buoy and on its western end by a buoy.

Harthaven is a small pond northward of Sengekontacket Pond. The entrance is through a privately dredged channel between two short jetties. A reported draft of about 3 feet can be taken through the entrance. The pond has depths of 2 to 6 feet.

Lone Rock, covered 4 feet and marked by a buoy, is 350 yards offshore about 750 yards southeastward of Oak Bluffs wharf.

Schoolship Rock, covered 9 feet and marked by a buoy, is 425 yards 060° from the wharf. Several 11- and 12-foot spots are in the vicinity of this rock.

Rhode Island Rock, covered 9 feet and marked by a buoy is about 700 yards northward of the breakwater light.

Oak Bluffs Harbor, 4.8 miles northwestward of Edgartown Harbor Light, is a landlocked basin frequented by pleasure craft and some fishing vessels. The entrance is protected by two breakwaters. A light is on the end of the north breakwater. **Oak Bluffs** is a summer resort and fishing village on the harbor. A church dome and several church belfries are prominent.

In 1971, depths of about 11 feet were reported in the entrance and harbor. East Chop Yacht Club is on the north side of the harbor, and several private piers are on the west side. The town wharf extends along the bulkhead on the south and east sides of the harbor. The town maintains berths with electricity, a launching ramp, and free guest moorings. Gasoline, diesel fuel, water, ice, and some marine supplies are available.

The U.S. Public Health Service maintains a **contract physicians's office** in Edgartown. (See appendix for address.) Martha's Vineyard hospital is on the beach road close westward of the town. A **harbormaster** is at the town wharf; telephone (617-693-0920 or 617-693-0737).

Oak Bluffs Wharf, about 0.2 mile southward of the breakwater light, is reported to have a depth of 13 feet at the head. A private seasonal light and fog signal are operated from the seaward end of the wharf when ferry vessels are approaching the wharf in fog. There is seasonal ferry service from the wharf to Woods Hole and Nantucket. Seasonal ferry service is also maintained between Falmouth and Hyannis. The ferries from Falmouth and

Hyannis berth alongside the bulkhead on the east side of the harbor. Seasonal bus service connects most places on the island. There is air service from Martha's Vineyard Airport about 4.5 miles southwestward of the town.

Other ports on the north side of Martha's Vineyard westward of Oak Bluffs Harbor are described in chapter 5.

5. VINEYARD SOUND AND BUZZARDS BAY

This chapter describes Vineyard Sound and Buzzards Bay following the Massachusetts coast of Vineyard Sound, the northwestern shore of Martha's Vineyard, the eastern shore of Buzzards Bay, the Cape Cod Canal, and the western shore of Buzzards Bay. Also described are Woods Hole, Cuttyhunk, Onset, Wareham, and the port of New Bedford, as well as the numerous fishing and yachting centers along the sound and bay.

Charts 249, 1209, 1210.—Vineyard Sound and Buzzards Bay are deep and easily navigated day or night. Vineyard Sound, together with Nantucket Sound, provides an inside route from New York to Boston which avoids Nantucket Shoals. Buzzards Bay, together with Cape Cod Canal and Cape Cod Bay, provides the shortest deep-draft route between New York and Boston.

Vineyard Sound is bounded on the north by the southwestern part of Cape Cod and the Elizabeth Islands, and on the south by part of Martha's Vineyard, which presents a rugged and generally inaccessible shoreline. It joins Nantucket Sound on a line between Nobska Point and West Chop and provides an inside passage clear of Nantucket Shoals. The navigational aids are colored and numbered for passing through the sound from the eastward. The channel through the sound is well marked and generally free of dangers.

Anchorages.—Woods Hole is the only anchorage providing shelter from all winds for vessels drawing more than 10 feet. In northerly and westerly winds, good anchorage may be had in Tarpaulin Cove. In southerly winds, shelter can be had in Menemsha Bight, although Vineyard Haven is generally used. Several anchorage areas are in Vineyard Sound. (See **110.140 (c) (1), (c) (2), and (d)**, chapter 2, for limits and regulations.)

With southerly or westerly gales, there is a heavy sea in the westerly entrance to the sound, and a heavy sea occurs at times off the entrance of Quicks Hole. To avoid this, Quicks Hole is frequently used, especially by sea tows.

Tides and currents.—The mean range of tide in Vineyard Sound varies from 1.4 feet at West Chop to 2.9 feet at Gay Head. The time of current becomes somewhat earlier from Hedge Fence westward through Vineyard Sound. The current velocity increases from 1.3 knots at Hedge Fence Lighted Gong Buoy 22 to 3 knots off West Chop Light, and then gradually diminishes to 1.2 knots off Gay Head Light. (See "Current Diagram-Vineyard and Nantucket Sounds" in the Tidal Current Tables, and the Tidal Current Charts, Narragansett Bay to Nantucket Sound, for the hourly velocities and directions of the current.)

At Vineyard Sound Junction Lighted Whistle Buoy VS the tidal current is rotary, turning clockwise. The velocity is only 0.2 to 0.5 knot. The strength of flood sets about 335°, and the strength of ebb about 160°. Since the tidal current is weak, winds greatly affect it, and the current frequently sets approximately with the winds.

Charts 261, 264, 114-SC.—East Chop and West Chop are prominent points on the north side of Martha's Vineyard and on the east and west side of the entrance to Vineyard Haven. Both points terminate in high wooded bluffs which show prominently from the sounds; each is marked by a light.

West Chop Light (41°28.8′ N., 70°36.0′ W.), 84 feet above the water, is shown from a white conical tower at the summit of West Chop. A fog signal is sounded from the light station.

A lighted gong bouy, 0.5 mile northeastward of the light, and a buoy, 0.5 mile eastward of the light, mark shoal water and rocks awash to the eastward of West Chop.

Alleghany Rock, covered 6 feet and marked by a buoy, is 700 yards northward of West Chop Light.

East Chop Light (41°28.2′ N., 70°34.1′ W.), 79 feet above the water, is shown from a brown tower on the east side of the entrance to Vineyard Haven. **East Chop Flats**, covered 5 to 18 feet, extend 0.2 mile northward and 0.5 mile eastward of East Chop. A bell buoy, about 0.5 mile east-northeastward, and a buoy, about 350 yards northward of the light, mark the flats.

Vineyard Haven Harbor is a funnel-shaped bight in the northern side of Martha's Vineyard between East Chop and West Chop, about 1.4 miles long in a southwest direction and about 1.3 miles wide at the entrance. This haven, easy of access, is the most important harbor of refuge for coasters between Provincetown and Narragansett Bay. The depths range from 46 feet at the entrance to 15 feet near the head of the harbor.

Although Vineyard Haven Harbor is exposed to northeasterly winds, vessels with good ground tackle can ride out most blows. The greatest danger encountered by vessels at anchor in a northeast gale is from vessels with poor ground tackle, which are likely to drift and foul other vessels and then go ashore.

The harbor is the approach to the village of **Vineyard Haven**. A detached breakwater, marked on its southeastern end by a light, is on the flats on the western side of the harbor near the head; a privately maintained fog signal is at the light. The fog signal, and a privately maintained light, on the northeast corner of the ferry wharf at the head of the harbor, are activated when a ferry is ap-

proaching the slip in a fog.

Channels.—The natural channel is clear; soundings are the best guide for finding anchorage. When well inside the entrance, the water shoals gradually toward the western shore, but the eastern shore is steep and should be given a berth of about 0.2 mile. Channel depths of 16 feet or more are available to the ferry wharf at Vineyard Haven.

Anchorage.—Vessels anchor according to draft, anywhere from the points at the entrance to the head of the harbor. Shallow-draft vessels favor the western shore.

Vessels entering the harbor with a head wind or light breeze, at the end of a favorable current through the sound, should continue on in the channel until the harbor is well opened before standing in for the anchorage. This will help clear the entrance points. Approaching from the eastward, vessels will keep clear of Squash Meadow and East Chop Flats by keeping in the white sector of West Chop Light. Good anchorage is northeastward of the breakwater buoy in 20 to 23 feet. The anchorage basin behind the breakwater has depths of 5 to 12 feet, and is usually filled to capacity during the summer. When anchoring in the harbor, care must be taken to avoid obstructing the approach to the ferry slip and the approach to the oil wharves on the southerly side of the harbor.

Dangers.—Flats partly bare at low water make off 300 yards from the eastern shore of the harbor about 1 mile inside East Chop Light, and are marked by a buoy. A rock, covered 9 feet and marked by a buoy, is 0.3 mile northward of the breakwater light.

Tides and currents.—The mean range of tide is 1.7 feet. The tidal currents have little velocity in the harbor; however, care should be taken on the ebb, which sets westward, not to approach too closely to West Chop as the current in that vicinity sets on the ledges eastward and northward of the point.

Storm warning signals are displayed. (See chart.)

The **harbormaster** has control of the anchoring of vessels in the inner harbor; he will usually be found at the boatyard on the southeast side of the harbor or can be reached by telephone (617-693-0400).

Pilots are not available at Vineyard Haven. A twin screw, 500-hp. tug, also equipped for salvage work, is based in the harbor.

The ferry wharf at the head of the channel has a depth of 24 feet reported at the outer face. The ferry slip is on the north side and inshore end of the wharf. A private light is on the northeast corner of the wharf. The light, and a private fog signal, on the southeastern end of the breakwater, are activated when a ferry is approaching the slip in a fog. Several other wharves, two marinas, and a boatyard are in the harbor. A yacht club is on the west side of the harbor, about 0.3 mile northward of the breakwater.

Gasoline, diesel fuel, water, ice, marine supplies, and berths are available at the wharves, marinas, and boatyard. The largest marine railway in the area can handle craft up to 50 feet; a 20-ton lift is also available; hull and engine repairs can be made.

Free guest moorings, maintained by the town, are available off the municipal wharf, 200 yards northward of the ferry wharf; other moorings can be hired from the boatyard and marinas.

The Martha's Vineyard Hospital is on the beach road near Oak Bluffs. The U.S. Public Health Service maintains a **contract physican's office** in Edgartown. (See appendix for address.)

The Woods Hole-Martha's Vineyard and Nantucket Steamship Authority maintains year-round ferry service from Woods Hole. Air service is available from Martha's Vineyard Airport, about 4 miles south of the town.

Lagoon Pond, eastward of the town of Vineyard Haven, has its entrance about 0.5 mile northeastward of Vineyard Haven Breakwater Light. A short jetty extends from the northwestern end of the jutting point on the northerly side of the entrance. The approach is constricted by a row of dolphins which lies close westward of the highway bridge that crosses the entrance. With local knowledge, and by avoiding the dolphins, a depth of 4 feet was available through the entrance in 1966. The pond, used by local and fishing craft, has depths of 5 to 25 feet with shoaler depths near the shore. **Robbins Rock** is off the west shore, about 1 mile above the bridge. The highway bridge across the entrance has a 30-foot bascule span with a clearance of 15 feet. The bridge will be opened day or night. A drawtender is in attendance during July and August, Monday through Friday, between the hours of 0800 to 1700. At any other time prior arrangements are necessary. The drawtender can be reached by telephone (693-0272, days; 693-0120, nights).

Charts 249, 260, 114-SC.—Falmouth Harbor, the open roadstead off the south shore of Cape Cod eastward of Nobska Point Light, affords an anchorage for vessels in 24 to 36 feet about 0.8 mile from shore. Smaller vessels can anchor closer to the shore in 15 to 18 feet. The bottom is generally sticky and good holding ground; the depths shoal gradually toward the shore. The anchorage affords a lee in northerly winds; in southerly winds the sea is somewhat broken by L'-Hommedieu Shoal and the shoals westward of it so that a vessel with good ground tackle can ride out a gale in comparative safety. (See **110.140 (c)** (5), **and (d)** chapter 2, for limits and regulations of the anchorage area.)

Falmouth Harbor is frequently used by vessels with good ground tackle that prefer this anchorage to the anchorage in Vineyard Haven Harbor, which may be crowded in bad weather. Vessels approaching the anchorage are cautioned to stay clear of the two shoal areas with depths of 10 to 16 feet marked by buoys which extend westward of

L'Hommedieu Shoal.

Vessels can enter Falmouth Harbor from the southward on a course of 344° with West Chop Light astern, and pass about 0.1 mile westward of East Shoal Buoy 17. Vessels in the vicinity of Nobska Point Light can pass 0.4 mile eastward of the light on a north-northeasterly course, and when Tarpaulin Cove and Nobska Point Lights are nearly in range, stand eastward to an anchorage.

Falmouth Heights, about 3 miles east-northeast of Nobska Point Light and east of the town of **Falmouth**, is a prominent yellow bluff on the summit of which are numerous homes and a large hotel.

Falmouth Inner Harbor, westward of Falmouth Heights, is a dredged tidal basin about 0.7 mile long and less than 0.1 mile wide, on the north side of Falmouth Harbor. A tall green standpipe, about 1.5 miles westward of Falmouth, is one of the most prominent landmarks in this vicinity. The yacht club dock and flagpole, just inside the entrance on the east side of the harbor, are conspicuous from close inshore. The harbor is entered through a dredged channel between two jetties; a light marks the end of the west jetty. In 1963, the controlling depth was 8½ feet to and in the basin.

Tides and currents.—The mean range of tide at Falmouth Heights is 1.3 feet. The tidal current in the sound about 1.5 miles south of the harbor sets east-northeastward on the flood at a velocity of 2.3 knots, and west-southwestward on the ebb at 1.7 knots.

There are several small-craft facilities in Falmouth Inner Harbor. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, marine railways up to 75 feet, and lifts up to 25 tons are available; hull, engine and electronic repairs can be made. The Falmouth Marina, operated by the town, is on the west side halfway up the harbor; slips, moorings, launching ramp, and water are available. A **dockmaster** is at the marina; telephone (Falmouth-548-9796). A ferry operates in the summer to Oak Bluffs from the wharf at the head of the harbor.

Nobska Point, about 29 miles westward of Monomoy Point, is a bluff with **Nobska Point Light** (41°30.9′ N., 70°39.4′ W.), 87 feet above the water, shown from a white tower, at the south end. A radiobeacon and fog signal are at the station. **Nobska Point Ledges**, partly bare at low water, extends 150 yards eastward and southwestward from the point.

Storm warning signals are displayed. (See chart.)

Charts 264, 114-SC.—Middle Ground, covered 4 to 17 feet, is the easterly half of a narrow, somewhat shifting ridge that extends for about 9 miles westward from a point about 0.5 mile northwestward of West Chop Light. A buoy is at the northeast end and a lighted bell buoy off the southwestern end.

Lucas Shoal, covered 12 to 18 feet, is the southwestern end of the ridge. It is separated from the Middle Ground by a natural channel with a depth of 31 feet. A buoy marks the southwestern end of the shoal.

Lake Tashmoo, a landlocked pond on the northwest side of Martha's Vineyard, is entered through a narrow jettied entrance which had a reported controlling depth of 2 feet in 1971. The lake, only used by local craft, has general depths of 3 to 10 feet. Private seasonal buoys mark the channel through a shoal area just inside the entrance. A small boatyard is on the easterly side of the lake; a flatbed trailer can handle craft up to 30 feet for hull and engine repairs.

Norton Point and **Cape Higgon** are prominent bluffs on the northwest side of Martha's Vineyard about 3 and 8 miles, respectively, southwestward of West Chop Light.

Menemsha Bight, on the northerly side of the western end of Martha's Vineyard 2.5 miles east of Gay Head, affords shelter from southerly and easterly winds in depths of 25 to 60 feet, sticky bottom. (See **110.140 (c) (2) and (d)**, chapter 2, for limits and regulations for the anchorage area.) There are no dangers in the bight if the shore is given a berth of 0.3 mile.

Menemsha Creek, on the northwestern shore of Martha's Vineyard and about 3 miles eastward of Gay Head Light, is entered from Menemsha Bight through a dredged channel that leads southward to **Menemsha Basin**, on the north shore just inside the entrance, and thence to Menemsha Pond, about 1 mile above the entrance. The entrance to the creek is protected by two stone jetties which are reported to cover occasionally during periods of extreme tides and winds. The east jetty is marked by a light. A bell buoy, about 300 yards northwestward of the light, marks the channel approach, and buoys and a daybeacon mark the channel.

In May 1970, the controlling depths were 10 feet in midchannel to Menemsha Basin, thence 2 feet to Menemsha Pond; depths of 9 feet were available in the larger northwestern part of Menemsha Basin and 5 feet in the smaller southeastern part. The channel, about 0.3 mile above the entrance, is reported to shoal rapidly after dredging; mariners are advised to seek local knowledge before attempting to go beyond Menemsha Basin.

Menemsha is a small fishing village on Menemsha Basin. **Menemsha Pond**, a rectangular basin about 1 mile long and 0.7 mile wide, has general depths of 2 to 18 feet, with the deepest water in the southern half of the pond.

Tides and currents.—The mean range of tide in Menemsha Bight is 2.7 feet. The tidal currents through the entrance have an estimated velocity of 3 knots or more. Slacks are reported to occur 45 minutes after local high and low waters.

In summer, transient pleasure craft on application to the harbormaster, may obtain moorings in Menemsha Basin or they may anchor in the pond. Berths are also available at the public facilities at Ducher Dock, on the northeast side of the basin.

Commercial fishing and charter boats berth at the dock or at the private piers at the head of the basin. A Coast Guard station is on the south side of the basin. The **harbormaster** can usually be found at Ducher Dock; telephone (617-645-2641).

A boatyard is on the east side of Menemsha Creek, about 0.3 mile above the channel entrance. Craft up to 45 feet in length can be hauled out on a hydraulic flatbed trailer for hull and engine repairs. Gasoline, diesel fuel, water, ice, launching ramp, and marine supplies are available.

Seasonal bus service is available from Menemsha to Vineyard Haven and to other points on the island.

Gay Head, the westerly end of Martha's Vineyard, is a prominent high bluff. It is marked by **Gay Head Light** (41°20.9′ N., 70°50.1′ W.), 170 feet above the water, shown from a 51-foot red brick tower on top of the head. A lighted gong buoy is 1.6 miles northwestward of the light.

Devils Bridge is a reef making off 0.8 mile northwestward of Gay Head. The reef has a depth of 2 feet about 0.4 mile offshore and 17 feet at its end, which is marked by a buoy.

Nomans Land, about 5.5 miles southward of Gay Head, is a prominent, high, and rocky island. Except for a small section on its northwestern side, the shore consists of clay and gravel cliffs 10 to 18 feet high with boulders lining the shores. In the interior of the island are many hills, the highest over 100 feet high, with considerable marshy area between the hills. A **danger zone** surrounds Nomans Land. (See **204.5**, chapter 2, for limits and regulations.)

Several sunken rocks and ledges are in the passage between Nomans Land and Martha's Vineyard. **Lone Rock**, covered 8 feet, and **Old Man**, a ledge covered 4 feet, are marked by buoys. A buoyed channel about 0.7 mile wide between the islands may be used by small vessels in the daytime. Shoal water extends 0.5 mile southward of **Squibnocket Point**, the southernmost point of Martha's Vineyard.

Charts 249, 114-SC.—Elizabeth Islands, including Nonamesset, Uncatena, Weepecket, Naushon, Pasque, Nashawena, Penikese, and Cuttyhunk Islands, extend about 14 miles west-southwest from the southwest end of Cape Cod. The islands, forming part of the northern shore of Vineyard Sound, separate the sound from Buzzards Bay. They are hilly and partly wooded; the shores are, in general, low bluffs. Westward of Woods Hole are several buoyed channels between the islands, but Quicks Hole is the only one recommended for strangers.

Charts 348, 260, 114-SC.—Woods Hole is that water area lying between the southwest tip of Cape Cod and Uncatena and **Nonamesset Island**, the easternmost of the Elizabeth Islands, with Buzzards Bay on the northwest and Vineyard Sound on the southeast; it includes Great and Little Harbors in the eastern part, and Hadley Harbor in the western part. Woods Hole is also the approach to the town of **Woods Hole** on the northeastern shore of Great Harbor. The town is a busy commercial center and a transshipping point for passengers and freight to and from Nantucket and Martha's Vineyard. During the summer it is an active resort and frequently a port of call by yachts passing through to Vineyard Sound or Buzzards Bay. The deepest draft entering Great Harbor in 1971 was 14 feet. There is considerable waterborne commerce in seafood products, petroleum products, and general cargo.

Prominent features.—The most prominent landmark approaching Woods Hole is Nobska Point and light. A light marks the south end of **Juniper Point**, the finger of land separating Little and Great Harbors. Also prominent is the house high on Juniper Point, a standpipe 2.2 miles northward of Nobska Point, a water tower and stacks in the town, the cupola of the Woods Hole Oceanographic Institution, and the buildings of the National Marine Fisheries Service and the Marine Biological Laboratory.

Channels.—Woods Hole Passage, a dredged section through the northern part of Woods Hole, connects Vineyard Sound and Great Harbor with Buzzards Bay, and consists of **The Strait** and a spur channel known as the **Branch** at the western end of The Strait, and **Broadway**, the southerly entrance to The Strait from Vineyard Sound. In June-October 1969, the controlling depths were 13 feet in The Strait, 12 feet in the Branch, and 13 feet in Broadway. The northerly entrance from Great Harbor into The Strait is preferred over Broadway with its sharp turn, which is difficult in strong currents, especially for low-powered vessels and vessels under sail.

The passage through Woods Hole, between numerous ledges and shoals, is marked by navigational aids. However, tidal currents are so strong that the passage is difficult and dangerous without some local knowledge. Buoys in the narrowest part of the channel sometimes are towed under, and a stranger should attempt passage only at slack water.

The entrance to **Great Harbor** from Vineyard Sound, between Great Ledge and Nonamesset Shoal, has depths of over 20 feet. A **344°** lighted entrance range leads into the harbor from Vineyard Sound to the wharves at Woods Hole in Great Harbor. A lighted bell buoy marks the entrance and lighted and unlighted buoys mark the channel. When entering on the range mariners should guard against the current from Buzzards Bay, which has a tendency to set vessels eastward.

The deepest draft using the passage is 11 feet. These channels are marked by buoys and lights, but extreme caution and slack water are required to safely navigate them with drafts greater than 8 feet. Mariners entering from Buzzards Bay should keep in mind that the buoys are colored and marked for passage from Vineyard Sound to Buzzards Bay.

Anchorages.—(See **110.140 (c) and (d)**, chapter 2, for limits and regulations of the deepwater anchorages in the vicinity of Woods Hole.) An

anchorage about 0.2 mile square, with poor holding ground and irregular depths ranging from 20 to 60 feet is at the head of Great Harbor. Shoals covered 5 to 9 feet are northwest of the anchorage. Good anchorage in depths of 30 to 48 feet is also available about 200 yards northwest of the National Marine Fisheries Service's wharf. Small craft can find good anchorage in Little Harbor and Hadley Harbor.

Dangers.—Numerous ledges and shoals border the channel through Woods Hole. **Great Ledge**, an extensive rocky shoal awash at low water with a full northwest gale, lies between the entrances to Little and Great Harbors; it is marked by a daybeacon. **Coffin Rock**, eastward of Great Ledge and covered 6 feet, is marked by a lighted buoy 120 yards eastward of it. **Nonamesset Shoal**, covered 11 feet, extends about 0.2 mile eastward from Nonamesset Island, at the entrance to Great Harbor. **Parker Flats** extend as much as 150 yards off the eastern shore of Great Harbor northward of Juniper Point. Most of these dangers are marked by buoys.

Fringing the passage westward of Great Harbor are many other ledges and shoals. **Red Ledge**, grassy, and **Grassy Island**, with its surrounding ledge marked by a light, are on the western side of Great Harbor Channel. **Middle Ledge**, which uncovers 1 foot in places and is marked by two daybeacons and a buoy, is on the south side of The Strait. A ledge, awash at low water and marked by a light, is about 250 yards westward of Middle Ledge. **Hadley Rock**, covered 5 feet, is some 500 yards west-southwestward of the light west of Middle Ledge. A rocky shoal area extends more than 0.3 mile westward of **Penzance Point**, the southern extremity of **Penzance**, which is the curving peninsula sheltering the west and northwest sides of Great Harbor. Most of the dangers adjoining the passage channel are marked by navigational aids.

Tides and currents.— The mean range of tide is 1.4 feet off Little Harbor, about 1.8 feet off Woods Hole Oceanographic Institution, and 3.6 feet off Hadley Harbor. Strong northwesterly winds may lower the water in the passage as much as 2 feet.

The velocity of the current is about 3.5 knots in The Strait southward of Penzance Point. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay to Nantucket Sound, for the hourly velocities and directions of the current.) Both the velocity of the current and time of slack water are affected by strong winds. At the north entrance to Woods Hole in Buzzards Bay, the velocity of the tidal current is 0.8 knot, while at the eastern entrance to The Strait in Great Harbor, it is about 1.3 knots. In the upper part of Great Harbor, near the National Marine Fisheries Service's wharf, the currents are barely perceptible, and vessels at anchor lie head to wind.

Drift ice is brought through from Buzzards Bay, but seldom interferes with navigation except in unusually severe winters, when it may close the entrance from the bay. Small craft may experience difficulty in severe winters, but powered vessels usually proceed through the ice. The strong tidal currents usually keep Great Harbor open.

Storm warning signals are displayed. (See chart.)

Routes.—The following directions are good for medium-draft vessels entering Woods Hole at slack water. Approaching from the eastward, pass about 0.3 mile southward of Nobska Point on a west-southwesterly course until on Great Harbor Lighted Range, or from a point close to Nobska Point Lighted Bell Bouy 26, steer 279° until on the entrance range. Approaching from the westward in Vineyard Sound, give the south side of the Elizabeth Islands a berth of about 0.5 mile and steer for Nobska Point Light on any bearing between 045° and 051° until on the entrance range.

Wharves.—The ferry pier of the Woods Hole-Martha's Vineyard and Nantucket Steamship Authority is on the eastern side of Great Harbor. A private quick flashing white light is displayed from the southwest corner of the pier when a ferry is approaching in foggy weather. The buildings and the wharf of the Woods Hole Oceanographic Institution are just northward of the ferry pier; private amber lights and a flashing red light are displayed from the wharf when a ferry or other vessel is expected in foggy weather. Northwestward are the wharves of the Marine Biological Laboratory; the wharf, basin, and buildings of the National Marine Fisheries Service; the town pier; and several private buildings.

Depths at the principal piers vary from 11 to 30 feet. A breakwater extends about 90 yards southwestward from the south end of the National Marine Fisheries Service wharf. The front entrance range light is near the end of the breakwater. A buoy marks foul ground that extends about 50 yards northwestward of the outer end of the breakwater.

Eel Pond, an extension of Great Harbor to the northeastward, is a basin with depths of 10 of 20 feet. In 1971, the narrow entrance to the pond had a reported controlling depth of 8 feet. A highway bridge over the entrance channel has a 31-foot bascule span with a clearance of 5 feet. Except in emergencies, local authorities keep the span closed from May 16 through October 14 between the hours of 2100-0600, 0800-0830, 1145-1245, and 1630-1715, and from October 15 through May 15 between the hours of 1700-0800 and 1200-1300. The piers of the Marine Biological Laboratory are along the southwest side of the pond.

There is a boatyard in Eel Pond and a service wharf and a yacht club just north of the ferry pier. The ferry to Naushon Island lands at the service wharf. The boatyard has a marine railway that can haul out craft up to 70 feet in length for hull and engine repairs.

Gasoline, diesel fuel, water, ice, marine supplies, limited berthage, and moorings are available at the boatyard and service wharf. The **harbormaster** can be found at the boatyard; telephone (617-548-0861).

Bus service is available from Woods Hole throughout the year.

Little Harbor, the easternmost cove in Woods Hole, is a base for Coast Guard operations. A dredged buoyed channel leads from Vineyard Sound to a turning basin off the Coast Guard wharf on the west shore. In October 1969, the controlling depth was 16 feet in the channel, with depths of 17 feet in the basin, except for a depth of 13 feet on the western edge of the channel in 41°31'06"N., 70°40'00"W., and a depth of 15 feet along the eastern edge of the basin in 41°31'14"N., 70°39'57"W. A small private wharf with about 7 feet at its end is north of the Coast Guard facilities.

Hadley Harbor, in the western portion of Woods Hole at the northwest end of Nonamesset Island, is suitable only for small craft. It is reached by a narrow, crooked channel. The deeper entrance, marked by buoys, is between ledges on both sides; the northern ledge is marked by a privately maintained daybeacon. The inner harbor forms a well-sheltered anchorage for small craft.

Two wharves, with depths of about 9 feet at their ends, are on the western side of Hadley Harbor. A private wharf, with a depth of about 7 feet at its end, is at the western end of Nonamesset Island.

Charts 264, 249, 260, 114-SC.—Naushon Island, the largest of the Elizabeth Islands, extends west-southwestward from Uncatena and Nonamesset Islands.

Weepecket Islands, in Buzzards Bay off the northeastern part of Naushon Island, are bare and rocky.

Weepecket Rock, on a rocky ledge about 0.7 mile northeastward of the northernmost of the Weepecket Islands, is covered 10 feet, and is marked by a buoy.

Lackeys Bay, between Nonamesset Island and **Jobs Neck**, the southeastern extremity of Naushon Island, is shoal with numerous bare rocks.

Tarpaulin Cove, about 5 miles west-southwest of Nobska Point, is a bight about 0.5 mile in diameter, in the south shore of Naushon Island. The cove affords shelter from northerly and westerly winds, and is frequently used. A light is on the southwest side of the cove. Anchorage in depths of 14 to 18 feet, good holding ground, is in the cove with the light bearing between 212° and 189°. Deep-draft vessels should anchor farther out in depths of 36 feet or more. The eastern and northern shores should be given a berth of 200 yards. Rocks are near the western shore and should be given a berth of over 300 yards; buoys mark the dangers.

Charts 263, 264, 249, 114-SC.—Robinsons Hole is a narrow buoyed passage from Vineyard Sound to Buzzards Bay between the western end of Naushon Island and the eastern end of Pasque Island. It has numerous rocks and ledges, and strong tidal currents. The buoys often tow under, and the passage should never be attempted by strangers; it is used occasionally by local fishermen. It has been reported that currents sometimes reach a velocity of 5 knots in the passage. The velocity in the narrow part is about 3 knots. The flood sets southeastward and the ebb northwestward into Buzzards Bay. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay to Nantucket Island, for the hourly velocities and directions of the current.)

Quicks Hole, between Pasque Island and **Nashawena Island**, is the only passage between Vineyard Sound and Buzzards Bay eastward of Cuttyhunk available for vessels of over 10-foot draft. The clearly defined entrance from Vineyard Sound, about 0.6 mile wide, is about 4 miles westward of Tarpaulin Cove and about 5 miles north of Gay Head. The passage is used considerably by tows, especially during westerly or southerly winds, to avoid the very heavy sea in the entrance to Vineyard Sound, and also because a secure anchorage from these winds can be had, if necessary, on the north side of Nashawena Island. The passage is considered unsafe for a long tow at night, but otherwise it may be used by steamers either night or day.

Vessels should follow a midchannel course through the passage. The channel is nearly straight with a width of about 0.2 mile. General depths are 30 feet or more, but there are several spots of 16 to 18 feet and others of 21 to 27 feet. Because of the broken nature of the bottom, the passage is not recomended for a stranger drawing more than 21 feet. Buoys mark the channel.

The aids in Quicks Hole are colored and numbered for passage from Vineyard Sound to Buzzards Bay.

The eastern side of Quicks Hole is foul, and no attempt should be made to pass eastward of the lighted buoy. **Felix Ledge**, 0.2 mile off the eastern shore of Nashawena Island, is covered 16 feet and marked by a buoy.

Lone Rock, covered 6 feet and marked by a lighted buoy, is off the northern entrance, about 0.7 mile northward of **North Point**, the northeastern extremity of Nashawena Island.

Tides and currents.—The mean range of tide is 2.5 feet at the south end and 3.5 feet at the north end of Quicks Hole. The tidal currents have considerable velocity in Quicks Hole, about 2 to 2.5 knots, and a sailing vessel should not attempt to pass through unless with a strong favorable wind on a favorable current. Deep-draft vessels should be careful not to be set off their courses. With a strong westward current through Vineyard Sound, there is a northward current through Quicks Hole; with a strong eastward current in Vineyard Sound, the current sets southward through Quicks Hole. Strong winds affect the regularity of the currents. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay to Nantucket Sound, for the hourly velocities and directions of the current.)

Penikese Island, grassy and hilly, is about 1.3 miles northwestward of **Knox Point**, the northwestern extremity of Nashawena Island. Shoal water extends from Penikese Island to **Gull Island**, a small islet 0.5 mile southeastward. No attempt should be made to pass between them. Rocky ledges extend southward and westward from Gull Island; buoys are on the southern edge of this area. The channels to Cuttyhunk Harbor from Buzzards Bay are southward of the ledges.

Cuttyhunk Harbor is formed by the bight between Nashawena Island and **Cuttyhunk Island**, the western-most of the Elizabeth Islands. Northward of the harbor are Penikese and Gull Islands and several ledges, which shelter the harbor from winds from that direction. The harbor is exposed to winds from the northeastward. Weather-bound coasting vessels and fishermen sometimes use the anchorage in the harbor. The harbor is the approach to the town of **Cuttyhunk** and to **Cuttyhunk Pond**; the latter is entered through a dredged cut in the eastern part of Cuttyhunk Island.

Prominent from offshore are a light on the western end of Cuttyhunk Island, and a monument 50 feet high on **Gosnold Island**, which is a small island in **Gosnold Pond** on the western end of the island. **Copicut Neck** forms the northerly side of Cuttyhunk Pond.

Cuttyhunk Light (41°24.8′N., 70°57.0′W.), 63 feet above the water, is shown from a 45-foot white skeleton tower with white daymark on the southwestern side of Cuttyhunk Island.

Vessels bound for Cuttyhunk Harbor generally approach from Buzzards Bay. The principal dangers are marked by buoys. Strangers should not enter except in the daytime with clear weather. If entering from the northwestward, a greater draft than 10 feet should not be taken in. The approach from northeastward is deeper.

Canapitsit Channel, between the east end of Cuttyhunk Island and Nashawena Island, is used by small boats and is partially marked by buoys. In 1968-69, the channel had a controlling depth of 3½ feet; greater depths can be carried with local knowledge. The buoys at this entrance are often dragged off station by strong currents and heavy seas. The channel should never be used during a heavy ground swell. With southerly winds, heavy seas will break across the entrance.

Channels.—A dredged channel leads from Cuttyhunk Harbor into Cuttyhunk Pond to a turning basin at the western terminal in the pond and an anchorage basin in the eastern part of the pond north of the channel. In 1968, the controlling depth in the entrance channel was 4 feet (6½ feet at midchannel), thence depths of 10 feet in the turning basin. The jettied entrance is marked by a light on the north jetty and by a daybeacon on a rock off the end of the submerged south jetty. A buoy marks the entrance to the channel.

Anchorages.—Small craft can anchor in the anchorage basin in Cuttyhunk Pond in depths of 8 to 11 feet. Anchorage may be had in depths of 10 to 24 feet in Cuttyhunk Harbor. The shores on both sides of the harbor are foul, and the anchorage is in the middle.

Dangers—Shoals extend 0.6 mile northeastward of Cuttyhunk Island. **Whale Rock** and **Pease Ledge** uncover at low water. **Middle Ground**, covered 9 feet, is 0.5 mile north of **Copicut Neck** in the northwestern approach to the harbor. **Middle ledge**, covered 15 feet, is about 0.4 mile east of Middle Ground. **Edwards Rock**, covered 7 feet, is 250 yards northeastward of Whale Rock. These dangers are buoyed. An unmarked rocky shoal, covered 12 feet, is 250 yards northeastward of Whale Rock. These dangers are buoyed. An unmarked rocky shoal, covered 12 feet, is in the middle of the northwestern approach about 0.2 mile southeastward of Middle Ledge. Numerous other rocks and ledges covered 4 to 12 feet are between Cuttyhunk Island and the ledges southwestward of Penikese and Gull Islands. The eastern point at the entrance and the eastern shore of the harbor should be given a berth of over 300 yards.

Routes.—In approaching Cuttyhunk Harbor from eastward in Buzzards Bay, take care to avoid Lone Rock, 0.7 mile northward of the northeastern end of Nashawena Island. Thence pass eastward of Gull Island Lighted Bell Buoy 7, and thence to anchorage according to draft in the harbor.

In approaching from westward, from a position midway between Ribbon Reef Buoy and Cuttyhunk Light, steer 051° until abeam of Middle Ground Buoy 1, distance 600 yards. Pass midway between Middle Ground and Penikese Island, passing northward of Middle Ledge and the 12-foot spot southeastward of it, and then swinging southeasterly to the harbor anchorage, or southward to the entrance to Cuttyhunk Pond.

Tides and currents.—The mean range of tide at Cuttyhunk Pond entrance is 3.4 feet. The current velocity in Canapitsit Channel is 2.6 knots on the flood which sets southward, and 1.7 knots on the ebb which sets northward. In the channel southward of Penikese Island, the flood sets eastward and the ebb westward at about 0.8 knot. (See Tide Tables and Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay to Nantucket Sound, for the hourly velocities and directions of the current.)

Drift **ice** is carried into Cuttyhunk Harbor with northerly winds and closes the harbor during severe winters.

Small-craft facilities.—There is a service wharf on the south side of the channel at the entrance to the pond and a marina on the south side of the basin at the head of the channel in the pond. A yacht club and a fishing club are on the island. Gasoline, diesel fuel, water, ice, berthage, and moorings are available. Limited lodging in cottages is available on the island. The harbormaster can be reached by telephone (617-966-9295). There is daily launch service with New Bedford in the summer and twice weekly in the winter; seaplane service is

also available.

Charts 1210, 237, 249, 114-SC.—Buzzards Bay is the approach to New Bedford, many small towns and villages, and the entrance of Cape Cod Canal. The bay indents the south shore of Massachusetts in a northeasterly direction north of the Elizabeth Islands which separate the bay from Vineyard Sound.

The shores are irregular, rocky in character, and broken by many bays and rivers. Large boulders are common, in places extending considerable distance from shore, thus making close approach to the shore dangerous.

The bottom in the main part of the bay and approach is very broken with boulder reefs in places. Vessels should proceed with caution when crossing shoal areas in the tributaries of the bay where the depths are not more than about 6 feet greater than the draft. Caution must also be exercised in the vicinity of the wrecks shown on the chart. Deep water prevails as far as Wings Neck, above which the bay is full of shoals.

Buzzards Bay has six entrances but two of these are so narrow and dangerous as to exclude their use except by small craft with local knowledge. The four major entrances are the main channel, from westward, passing north of Cuttyhunk Island; Cape Cod Canal from northeastward, and Quicks Hole and Woods Hole from the southward. The two hazardous entrances are Canapitsit Channel, between Cuttyhunk and Nashawena Islands, and Robinsons Hole, between Pasque and Naushon Islands.

The western entrance has a clear width of 4.3 miles between Sow and Pigs Reef and Hen and Chickens. The bottom in this entrance is irregular and rocky, and there are spots with depths of 17 to 34 feet. Because these shoal areas are surrounded by deeper water, vessels of 16-foot draft or more must excercise extra caution when entering the bay. In heavy southwest gales the sea breaks over some of these spots.

The best guides for entering the bay from westward are Buzzards Bay Entrance Light, Cuttyhunk Light, and the lighted buoys in the entrance. Gay Head Light and Cuttyhunk Light are the guides for vessels approaching from the southward.

Buzzards Bay Entrance Light (41°23.8′N., 71°02.0′W.), 101 feet above the water, is shown from a tower on a red square superstructure on floodlighted black piles about 4 miles 256° from Cuttyhunk Light. The name BUZZARDS is painted in white on the sides. A fog signal and radiobeacon are at the light.

Anchorages.—New Bedford Inner Harbor affords anchorage for vessels of 25-foot draft. Cuttyhunk Harbor affords anchorage in depths of 10 to 24 feet; except for the small-craft inner harbor, it is exposed to northerly winds. A good anchorage sheltered from all southerly winds may be had off the north shore of Nashawena Island eastward of Penikese and Gull Islands in depths of 40 to 48 feet. This anchorage, frequently used by tows, is available for vessels of any draft; however, care must be taken to stay clear of the fishtrap area in the vicinity. Two anchorage areas are off the western entrance to Cape Cod Canal. (See **110.140 (b) (1), (b) (2), and (d)**, chapter 2, for limits and regulations.)

Dangers.—Hen and Chickens, extending 1.4 miles southward of Gooseberry Neck, is a reef consisting of many large boulders, most of them baring a foot or less. The reef is in two large groups, the southerly group being the larger. Numerous covered rocks are well away from the visible part of the danger. A narrow ledge covered 5 to 14 feet extends about 0.4 mile northward from the visible part of Hen and Chickens. A buoy is north of the ledge.

Small boats sometimes pass over this shoal instead of going outside the reef, but strangers should not attempt it. **Old Cock**, a rock awash marked by a daybeacon, and **The Wildcat**, covered 5 feet and unmarked, are in the southern shoal area. Strangers are advised to stay outside the 5-fathom curve in this vicinity.

Sow and Pigs Reef, much of which is dry or awash, extends about 1.5 miles west-southwestward from Cuttyhunk Island. Its outer end is marked by a bell buoy. An unmarked rocky shoal, covered 20 feet, is 0.9 mile westward of Cuttyhunk Light.

Ribbon Reef, a detached ledge covered 18 feet and marked by a buoy, is 1.5 miles northwestward of Cuttyhunk Light. **Coxens Ledge**, covered 23 feet and marked by a lighted bell buoy, is 1.2 miles northward of Ribbon Reef.

Mishaum Ledge, a group of several rocky spots with a least depth of 8 feet, extends about 1.7 miles southward of Mishaum Point. It is marked by a lighted gong buoy off its southeast end. A lighted bell buoy marks a rocky shoal covered 22 feet about 1 mile north-northwestward of the north end of Penikese Island. An unmarked rocky shoal covered 19 feet is 0.5 mile north of the island.

Tides and currents.—The mean range of tide varies from 3.0 feet at Westport Harbor to 4.2 feet at Bird Island near the head of the bay. The tidal currents in the passages between Buzzards Bay and Vineyard Sound have considerable velocity and require special attention. At Hen and Chickens Lighted Gong Buoy 3, the tidal current is rotary, turning clockwise. Tide rips occur when a sea is running against the current. Strengths of flood and ebb have velocities of about 0.5 knots and set northeastward and southwestward, respectively. Minimum velocities before flood and ebb average about 0.2 knot and set northwestward and southeastward, respectively. (See the Tide Tables and Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay to Nantucket Sound, for the hourly velocities and directions of the current.)

Ice.—The head of Buzzards Bay and the harbors in that vicinity are generally closed to navigation

during the winter. The approaches to the harbors on the eastern shore are rendered dangerous by drift ice. In severe winters the drift ice extends across the bay and joins the local formations on the western shore, forming an impassable barrier for short periods. Ice forms more rapidly in the bay with winds from north to west as the western shore forms a shelter from such winds. When the field ice extends sufficiently out toward the channel as to be affected by the winds from north to west, the outer edges are broken up and carried off to the eastern or southern shore where they form drift ice. Under ordinary circumstances a northeast wind, if continued for 48 hours, will clear the bay of ice. Southerly winds, especially southeastern, diminish the extent and weaken the strength of the pack. Some of the lighted buoys are removed from station or replaced by unlighted buoys when endangered by ice.

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Chart published by the National Weather Service.

The southern side of Buzzards Bay from Cuttyhunk to Woods Hole has been discussed previously in this chapter.

Charts 260, 249, 114-SC.—Quissett Harbor, 1.7 miles northeastward of the western entrance to Woods Hole, is used by small pleasure craft. **The Knob**, a small hillock on the north point of the entrance, and the homes on the eastern shore of the harbor, are prominent. A standpipe, 1.2 miles northeastward of the entrance, is conspicuous.

A seasonal lighted buoy marks the entrance, and buoys mark the entrance channel. In 1971, a depth of about 8 feet was reported available in the channel. Anchorage can be found in the middle of the harbor in depths of 11 to 18 feet, sticky bottom. Local craft generally moor in the northeastern part of the harbor off the boatyard at the town of **Quissett**. The boatyard has an L-shaped pier, and a float which was reported to have about 15 feet alongside. Gasoline, water, ice, berths, moorings, some marine supplies, storage facilities, and marine railways up to 50 feet are available; hull and engine repairs can be made. The **harbormaster** can usually be found at the boatyard.

Hamlin Point, 2 miles north-northeastward of Quissett Harbor, is marked by a prominent hotel with twin cupolas. A shoal, covered 12 feet near its outer end, extends about a mile westward of the point, where it is marked by a buoy. **Gifford Ledge**, covered 10 feet, is 1.4 miles north-northwestward of Hamlin Point. **Great Sippowesset Rock**, awash and marked by a private seasonal daybeacon, is 0.4 mile offshore about 1.1 miles northward of Hamlin Point. A shoal area, foul with rocks awash and covered, extends 0.3 mile offshore eastward of the daybeacon. Westward and northward of Gifford Ledge is the dumping ground for material dredged from Cape Cod Canal.

West Falmouth Harbor, 5 miles northward of Woods Hole, has depths of 1 to 6 feet and bares in places at low water. The entrance is protected by a breakwater extending about 700 feet southward of **Little Island**, the north point of the entrance, and by a short jetty on the northwest end of **Chappaquoit Point**.. A tower and the summer homes on Chappaquoit Point are prominent. The entrance is marked by a lighted bell buoy on the south side and by an unlighted buoy on the north side; these buoys mark reefs that extend westward from both entrance points.

In 1971, it was reported that 6 feet could be taken through the narrow, privately marked channel in the harbor to the anchorage basin off the town wharf at the village of **West Falmouth** on the east shore of the harbor. Depths of 6 feet were reported alongside the wharf in 1971; gasoline is available.

Routes.—To enter, steer east from the lighted bell buoy off the entrance and follow the privately maintained buoys that are reported to mark the channel in summer. Once inside the breakwater, favor the south shore to about 425 yards east of the tower on Chappaquoit Point. Thence steer south-southeast and round the narrow point that extends 0.2 mile southward from the north shore. This point should be given a berth of at least 100 yards, as a reef extends about 70 yards south of it. Thence, bear up to the eastward for the town wharf, or anchor midway between the point and the wharf.

Charts 251, 114-SC.—Wild Harbor (41°38.3′ N., 70°38.9′ W.), 7 miles northward of Woods Hole, is a small cove on the south side of **Nyes Neck** affording anchorage in northerly or easterly winds. A tower on Nyes Neck is prominent. The entrance is clear in midchannel, with depths of 13 to 20 feet inside. A seasonal lighted buoy marks the entrance, and buoys mark the shoals extending from the entrance points. The shores are foul, and the easterly part of the harbor is shoal. The reported depth in the privately dredged channel into **Silver Beach Harbor** to a small basin is about 6 feet but is subject to shoaling. A stone jetty extends off the south side of the entrance to the basin. The basin is a **special anchorage area.** (See **110.1 and 110.40**, chapter 2, for limits and regulations.)

A town wharf and surfaced ramp are in the basin. Water, ice, and provisions are available.

Megansett Harbor, the approach to the towns of **North Falmouth**, **Megansett**, and **Cataumet**, is entered between Nyes Neck on the south and **Scraggy Neck** on the north. The natural channel is buoyed as far as the rock breakwater at Megansett. A yacht club and a town wharf are just inside the breakwater. The harbor has extensive shoals and ledges, but by following the buoyed channel a draft of about 8 feet can be carried to an anchorage in depths of 10 to 22 feet. **Cataumet Rock**, covered 7 feet and marked by a buoy, is on the south side of the entrance; Seal Rocks are on the north side.

Fiddler's Cove (41°38.9′ N., 70°38.2′ W.) is a small-craft harbor on the south shore of Megansett Harbor, about 0.5 mile east-southeastward of Cataumet Rock. A channel, privately dredged to a reported depth of 6 feet, leads southward to a marina and boatyard in a dredged basin on the east side of the cove. A private seasonal light marks the entrance, and private seasonal red and black pile beacons mark the channel. Gasoline, diesel fuel, water, ice, berthage, moorings, and marine supplies are available. There is a surfaced ramp, and craft up to 40 feet in length can be hauled out on a flatbed trailer for engine repairs and storage. In 1971, there was reported to be 6 feet in the basin at the bulkhead and at the berths.

Halftide Rock, awash at low water, is about 500 yards southwestward of the end of the Megansett breakwater.**Rands Harbor**, about 0.3 mile east of Fiddler's Cove, is a private boat basin with little or no water. There were no facilities in Rands Harbor in 1971.

Squeteague Harbor, northward of Megansett, is entered through a narrow channel from the head of Megansett Harbor. The privately marked channel had a reported depth of about 4 feet in 1971; local knowledge is advised. The village of **Catumet** is on the northerly shore of the harbor.

Seal Rocks, about 0.3 mile southwestward of Scraggy Neck, on the north side of Megansett Harbor entrance, are partly bare at half tide and marked by a seasonal lighted buoy about 300 yards southwest of their southern end. Part of an old concrete bridge is aground on the rocks. **Southwest Ledge**, extending about 0.7 mile westward of Seal Rocks, consists of two patches of shoals covered by 2 to 17 feet and marked by buoys. A rock awash is in the northerly shoal.

Pocasset Harbor and Red Brook Harbor share a common entrance between Scraggy Neck and Wings Neck. **Bassetts Island** separates Pocasset Harbor from Red Brook Harbor. Broken ground with depths of 17 to 19 feet in places extends across the entrance. Entering about 250 yards north of buoys marking the north side of Southwest Ledge, vessels of about 14-foot draft can anchor westward of Eustis Rock Buoy in depths of 20 to 30 feet. This anchorage is exposed to westerly winds. **Eustis Rock**, about 0.2 mile north of Scraggy Neck, is covered 5 feet and marked by a buoy. The area eastward of Eustis Rock to Bassetts Island is shoal.

A narrow buoyed channel with a depth of about 6 feet leads north of Bassetts Island to Pocasset Harbor. **Barlows Landing**, at the northeast end of the harbor, has a depth of 1½ feet. A small-craft launching ramp is just south of the landing.

Hospital Cove, about 0.2 mile southward of the southern end of Bassetts Island, is entered through a natural buoyed channel that leads southeastward from a point about 0.4 mile east-southeastward of Eustis Rock to a small anchorage in the cove. A depth of about 6 feet can be carried in the channel, and there are depths of 8 to 14 feet in the anchorage. A boulder reef extends northeastward from Scraggy Neck in the approach to the cove. Several private piers with depths of 5 to 8 feet alongside are in the cove.

Red Brook Harbor, eastward of Bassetts Island, is approached from the northward through the channel that leads through Pocasset Harbor, and from the southward through the channel that leads through Hospital Cove. **Hen Cove** is immediately northward of Red Brook Harbor. The channels are buoyed, and depths of about 6 feet can be carried. Two rocks, bare at halftide and marked by a buoy close northeastward, are 0.2 mile northwestward of **Long Point**, on the south side of Red Brook Harbor.

A conspicuous tower resembling a lighthouse is at a marina on the east shore of Red Brook Harbor about 500 yards southeastward of **Handy Point**. A 60-foot marine railway and a 16-ton mobile crane are available at the marina. A boatyard with a 45-foot marine railway is on the east side of the small cove, about 300 yards south of the marina.

Both facilities have berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and storage facilities, and can make hull and engine repairs. Depths of 9 feet are reported at the marina berths and 7 feet at the boatyard berths.

Storm warning signals are displayed. (See chart.)

Wings Neck, 9 miles northward of Woods Hole, extends about 2 miles in an east-southeast direction into Buzzards Bay. The neck is a prominent peninsula, irregular, and hilly. The anchorage areas southwestward of the neck are discussed with the Cape Cod Canal. A yacht club and private piers are on the east shore of the neck. Traffic signals for the Cape Cod Canal are displayed from a tower on Wings Neck. (See **207.20**, chapter 2, for details.)

Storm warning signals are displayed. (See chart.)

Pocasset River, between the northeastern end of Wings Neck and **Bennets Neck**, is entered from the north side of Wings Neck through a privately dredged channel that leads southward between two jetties to a highway bridge about 0.4 mile above the entrance. In 1967, a depth of 6 feet could be carried to the bridge. The bridge has a fixed span with a clearance of 7 feet. Only very small boats go above the bridge. A boatyard is on the south side of the river at the bridge. Gasoline, water, some marine supplies, storage facilities, and a 40-foot marine railway are available; hull and engine repairs can be made. A town wharf and floats are on the north side of the river at the bridge. Berthage and water are available at the floats.

Tobys Island, just northward of the entrance of Pocasset River and on the south side of Phinneys Harbor, is connected to the mainland by a causeway.

Phinneys Harbor, between Tobys Island on the east and **Mashnee Island** on the west, is approached from Buzzards Bay through a buoyed channel that leads along the northerly side of Wings Neck to another buoyed channel into the

harbor. A seasonal light is at the bend of the approach channel. Depths of about 10 feet can be carried in the inner channel, and greater depths are available in the approach channel. The harbor is used as an anchorage by small boats. Mashnee Island, once an island, is now connected with the mainland by a landfill causeway. A group of rocks awash, marked by a buoy, is 0.2 mile off the east shore of the harbor, and another rock, covered 4 feet, and marked by a buoy, is 0.1 mile north of Tobys Island.

The village of **Monument Beach** is on the east shore. A marina is at the long town pier in the cove in the southeastern corner of the harbor. Berthage in 8 to 10 feet is available at the pier. Gasoline, diesel fuel by truck, water, ice, marine supplies, moorings, and a surfaced ramp are available.

Back River, a stream which is nearly bare except near its entrance, empties into the north side of Phinneys Harbor. Small craft sometimes anchor in the entrance. A railroad bridge and a highway bridge crossing the river about 0.2 mile above the mouth have fixed spans with a minimum clearance of 4 feet. A boatyard is on the south bank between the bridges. In 1971, a depth of about 2 feet was reported available in the river to the boatyard. A fork lift is used to haul out boats up to 26 feet at the yard, while boats up to 37 feet in length can be hauled out on a flatbed trailer at a paved ramp at Barlows Landing and then brought to the yard for hull and engine repairs or dry open or covered storage. A launching ramp and marine supplies are available at the yard.

Gray Gables is on the south side of the cove across the Cape Cod Canal from Taylor Point. A small craft launching ramp is at the head of the cove.

Cape Cod Canal is a deep-draft sea level waterway connecting Buzzards Bay and Cape Cod Bay. The waterway is 15 miles long from Cleveland Ledge Light to deep water in Cape Cod Bay. The canal shortens the distance between points north and south of Cape Cod by 50 to 150 miles and provides an inside passage to avoid Nantucket Shoals. The canal is maintained by the Federal Government as a free waterway. (See **207.20, chapter 2, for the regulations governing the use, administration, and navigation of the Cape Cod Canal.**)

Traffic lights.—Traffic lights (red, green, and amber yellow) are located at the easterly canal entrance, Sandwich; the easterly side of the Sandwich Control Station 35; and at the westerly entrance of Hog Island Channel at Wings Neck. These signals apply to all vessels over 65 feet in length that desire to transit the canal. (See **207.20** (g) (1), chapter 2, for detailed information on signals.)

Prominent features.—Cleveland Ledge Light (41°37.9′ N., 70°41.7′ W.), 74 feet above the water, is shown from a white cylindrical tower and dwelling on a white caisson on the east side of the entrance channel approaching Cape Cod Canal from Buzzards Bay. A radiobeacon and fog signal are at the light station. The abandoned lighthouse on Bird Island, the railroad bridge over the canal at the village of Buzzards Bay, and the highway bridge at Bourne are also prominent.

Canal Breakwater Light (41°46.8′ N., 70°29.4′ W.), 40 feet above the water, is shown from a red skeleton structure on the end of the north breakwater at the east entrance to Cape Cod Canal from Cape Cod Bay. A fog signal is at the light, and a radiobeacon is near the Coast Guard station on the south side of the entrance. The most prominent landmark when approaching from Cape Cod Bay is the tall red and white horizontally striped stack of the powerplant about 1.1 miles west-southwestward of Canal Breakwater Light. The high-level highway bridge across the canal at Sagamore, 2.5 miles west of the breakwater light, is also prominent. The breakwaters at the east entrance to the canal should not be confused with the smaller jetties at Sandwich Harbor, 1 mile to the southeastward, nor should the two white church spires back of Sandwich Harbor be mistaken for the range structure marking the entrance to the canal.

Channels.—A Federal project provides for a channel 32 feet deep through the Cape Cod Canal. (See Notice to Mariners and latest editions of the chart for controlling depths.) Deep-draft vessels should obtain the latest information as to available depths so as to pass through the canal during maximum stages of high water if the draft of the vessel is near the controlling depth.

The approach channels from both the west and the east are marked with lighted ranges and other navigational aids. The canal itself is lighted at night on both banks by mercury vapor lights, yellow on the north bank and white on the south bank, and generally 500 feet apart.

Anchorages.—Anchorage areas are on each side of Cleveland Ledge Channel between Cleveland Ledge Light and Wings Neck. (See **110.140 (b)** and **(d)**, chapter 2, for limits and regulations.) In 1971, a dangerous sunken rock was reported just inside the easterly edge of Anchorage D in about 41°40′05″ N., 70°40′17″ W.

Mooring basins, with tieup dolphins, are at both ends of the canal. One is on the east side of Cleveland Ledge Channel abreast of Hog Island, and the other is just inside the eastern entrance to the canal. A small boat basin is on the south side of the channel just inside the eastern entrance to the canal; depths of 8 to 13 feet were available in the basin in June 1969.

Bridges.—The Cape Cod Canal is crossed by three bridges. The railroad bridge at the village of Buzzards Bay, 7.8 miles above Cleveland Ledge Light, has a vertical-lift span with a clearance of 7 feet down and 135 feet up. The span is normally maintained in the raised position and lowered for the passage of trains. (See **117.78,** chapter 2, for drawbridge regulations and opening signals.) The highway bridge at Bourne, 9 miles above Cleve-

land Ledge Light, has a fixed span with a clearance of 135 feet. The highway bridge at Sagamore, 11.8 miles above Cleveland Ledge Light, has a fixed span with a clearance of 135 feet.

The minimum clearance of the overhead power cables across the canal is 160 feet.

Tides and currents.—The mean range of tide is 3.5 feet at the railroad bridge near the Buzzards Bay entrance and 8.7 feet at the Cape Cod entrance. The large differences in range and timing of the tide between Buzzards Bay and Cape Cod Bay cause strong currents in the canal. Tides may lower the canal level 2 feet below mean low water or even more if attended by heavy offshore winds.

Daily predictions for the tidal current in Cape Cod Canal at the railroad bridge are given in the Tidal Current Tables. Under ordinary conditions, the tidal current has a velocity of 4.0 knots on the flood, which sets eastward, and 4.5 knots on the ebb, which sets westward.

Due to the strong tidal currents in the canal, especially during spring tides, low-powered vessels should await slack water or favorable current. Navigators are warned to be on the alert for possible "bank suction" and "bank cushion," the effects of which may cause a vessel to take a sudden and decided sheer.

Weather.—Fog is said to be less dense over Cape Cod Canal than outside, but at times a water vapor rises from the canal to such an extent that traffic has to be suspended. The canal proper never has been closed by ice, but occasionally Buzzards Bay becomes so congested with ice that navigation through the canal is prevented.

Storm warning signals are displayed. (See chart.)

Pilotage.—The masters of all vessels with an overall length of 200 feet and over are directed to notify the Canal Dispatcher, prior to entering the waterway, the name of the pilot handling the vessel through the canal. Pilots meet vessels off the eastern entrance to the canal between the sea buoy and the breakwater, and off the west end of Cleveland Ledge at the western entrance. Pilots will also meet vessels at Brenton Reef Light or Block Island on special request.

Services of licensed pilots may be obtained by radio, telegraph or radiotelephone from any of the various commercial pilotage associations in Boston, New York, Warwick, R.I., Providence, R.I., Wareham, Mass., and Buzzards Bay, Mass., or through the dispatcher at the Cape Cod Canal Office. (See Communications, Cape Cod Canal, this chapter.) Pilot boat service is available at each end of the canal by calling Wareham, Mass., telephone (617-295-3714), or at Buzzards Bay Midchannel Bell Buoy BB by calling New Bedford, Mass., telephone (617-993-3891). Advance notice is desirable. (See **207.20** (j) Management of vessels, chapter 2, for Corps of Engineers directive on Cape Cod Canal Pilotage.)

Towage.—By special arrangements, tugs up to 2,200 hp. can be obtained from New Bedford to assist vessels in Cape Cod Canal.

Wharves.—The Massachusetts Maritime Academy Pier, site of the **Massachusetts Maritime Academy**, on the north side of Cape Cod Canal, 0.6 mile below the railroad bridge at the village of Buzzards Bay, is 600 feet long with about 25 feet alongside the berthing face. In May 1969, the controlling depth on the channel side of the pier was 25 feet. The BAYSTATE, the academy training vessel, is usually berthed alongside. Permission to berth at the pier must be obtained from the academy Officer of the Day. Vessels should not attempt to go alongside or leave the pier except at periods of slack water. Passing vessels are requested to proceed slowly to avoid damage to lines and other equipment at the pier.

The New England Petroleum Company mooring platform, on the south side of Cape Cod Canal, 1.2 miles westward of Canal Breakwater Light, provides berthing for tank vessels up to 750 feet in length with drafts of 32 feet. Vessels normally moor portside-to during daylight only. Petroleum products are pumped to storage tanks ashore.

Supplies.—Gasoline, diesel fuel, water, ice, and a concrete ramp are available at the boat basin just inside the Cape Cod Bay entrance to the canal. Temporary berthage and anchorage are also available at the basin. A seafood freezer plant and wharf are just inside the westerly side of the basin; depths of about 13 feet were reported alongside the wharf in 1970.

Communications.—Information on operating conditions, widths, depths, or other data on the canal is available at all hours, day or night, as follows: telephone Buzzards Bay, 617-759-4431; ship to shore telephone station at Scituate, Mass. (call letters WOU); radiotelegraph station on Chatham (call letters WCC) thence messages are relayed by telephone to the canal authority.

Direct communications by radiotelephone may be made with the Cape Cod Canal Office, Buzzards Bay, Mass., operating on VHF-FM channel 13 (156.65 MHz), (call letters WUA-21).

Vessels equipped to communicate on VHF-FM channel 13 (156.65 MHz) are requested to keep their radiotelephones tuned to that frequency during the entire passage through the canal.

Information Bulletin.—A monthly bulletin giving controlling depths and other information about the conditions in the Cape Cod Canal may be obtained from the Division Engineer, Corps of Engineers, Waltham, Mass.

Buttermilk Bay, at the northeast end of Buzzards Bay, has depths of about 1 to 7 feet. A narrow buoyed channel, partially dredged across the sand bar in the southern part, and **Cohasset Narrows** connect the bay with Cape Cod Canal. In October-November 1970, the controlling depths were 4 feet at midchannel to Buoy 7, thence 6 feet to the railroad bridge, about 1.1 miles above the channel entrance. Two bridges cross Cohasset Narrows; the railroad bridge has a bascule span with a clearance of 6 feet but is kept in a closed position

and used as a fixed bridge. The highway bridge, immediately above, has a fixed span with a clearance of 9 feet. Several small piers for shallow-draft boats are the only facilities in Buttermilk Bay. Gasoline is available in the bay.

Butler Cove, on the western side of Cohasset Narrows southwesterly of the bridges, has depths of 3 to 5 feet.

Onset Bay, between **Sias Point** on the north and **Hog Neck** on the south, is the approach to the village of **Onset**. A dredged marked channel leads westward from Cape Cod Canal along the southerly side of the bay to a turning basin off the village. Two anchorage areas, one on each side of the channel, are at the head of the channel. In October 1970, the midchannel controlling depth was 12 feet to the turning basin, thence 14 feet in the basin except for shoaling along the edges; depths of 8 feet were available in the anchorage areas except for shoaling in the southwest corner of the easterly anchorage area, and shoaling along the westerly and southerly sides of the southerly anchorage area.

Wickets Island, marked by a large dwelling, is a high and wooded islet in the middle of the bay. The buoys in the entrance channel are frequently towed under because of the strong currents. A rock, covered 8 feet, is near the channel entrance about 75 yards northeast of Hog Island Channel Light 11.

A **special anchorage area** is in the northern part of Onset Bay. (See **110.1** and **110.45**, chapter 2, for limits and regulations.) Additional anchorages are available at the head of the dredged channel.

The Onset town wharf, on the north side of the turning basin, has depths of about 14 feet at its face. The **harbormaster** has an office at the wharf. Several small-craft facilities are on the north side of the bay along the southwesterly side of Long Neck. Gasoline, diesel fuel, water, ice, and marine supplies are available. One facility can haul out craft up to 65 feet on a flatbed trailer for hull and engine repairs or storage. Onset has bus service.

East River empties into Onset Bay southeast of Onset. A draft of 3 feet can be taken to an anchorage just above the highway bridge which connects Onset and Long Neck. The bridge has a fixed span with a clearance of 11 feet.

Stony Point Dike, a sandspit breakwater about 5 feet high and marked at its southern end by a light, extends about 1.8 miles south-southwesterly from **Cedar Island Point** to Abiels Ledge. The breakwater protects Hog Island Channel. **Abiels Ledge**, between the channel and the south end of the dike, is covered 3 feet. **Dry Ledge**, a mile northwestward of Abiels Ledge, bares at half tide; it is marked by a buoy. **Little Bird Island**, 0.8 mile northward, is surrounded by uneven bottom with depths of 2 to 19 feet between it and the northerly shore of Buzzards Bay.

Wareham River, which empties into the northern end of Buzzards Bay, is the approach to the town of **Wareham** on the west bank. **Great Hill**, wooded, 124 feet high, and about 1.5 miles southward of **Long Beach Point**, is prominent when approaching the river. An elevated tank, a brick stack, and a standpipe in Wareham are conspicuous. The buoyed channel to the town is crooked and twisting; it has a reported depth of about 6 feet. A shoal makes off southeasterly from **Cromeset Point**, 0.6 mile southward of Long Beach Point. The section near **Quahaug Bar**, north of Long Beach Point, is subject to shoaling. Depths shoal to 2 and 3 feet close to the buoyed channel. Small craft sometimes anchor just north of Long Beach Point. Highway and railroad bridges over the river above the wharves have 28-foot fixed spans vith a clearance of 2 feet.

The mean range of the **tide** at the entrance to Wareham River is about 4 feet. The velocity of the current is not great enough to materially interfere with a sailing vessel having a good breeze. During the first half of the ebb the current below the wharves of the town sets across the flats westward of the channel, and during the whole of the ebb it sets across the flats eastward of the channel below Long Beach Point. (See the Tidal Current Tables for predictions.) The river **ices** over for short periods during most winters.

Vessels approaching Wareham River from Buzzards Bay pass 0.8 mile east of the abandoned tower on Bird Island and steer **351°** to the buoyed channel. Strangers should obtain local information regarding channel depths before navigating the river.

The depths at the wharves at Wareham are 5 to 11 feet. The Wareham police patrol the harbor during the summer boating season and enforce a **speed limit** of 5 knots. A boatyard, on the western side of Wareham Neck about 0.3 mile below the bridges, has a marine railway that can handle craft up to 40 feet for hull and engine repairs or storage. Gasoline, diesel fuel, water, and marine supplies are available. In 1971, depths of about 6 feet were reported alongside the boatyard service float. Wareham has bus service.

Marks Cove, on the west side of the channel to Wareham River between **Swifts Beach** on the north and **Cromeset Neck** on the south, has depths of 2 to 5 feet. The cove is used by small boats. In 1961, a 6-foot channel was dredged by the State through the cove from the 6-foot contour to **Cedar Island** at the entrance to **Cedar Island Creek**.

Weweantic River, entered southward of Cromeset Neck, has a narrow and crooked channel partly obstructed by rocks. A reported depth of about 3 feet can be carried past the rocks and as far as the highway bridge, with local knowledge. The channel is marked by private seasonal buoys to about 2 miles above the bridge. An overhead power cable crossing the river about 1.4 miles above the mouth has a clearance of 51 feet. The highway bridge, which is 1.7 miles above the mouth, has two fixed spans with a clearance of 5 feet. The channel is through the northeasterly 45-foot span. The river is navigable for 2 miles above

the highway bridge by small craft drawing less than 2 feet. Two small outboard boat marinas are just above the bridge. Gasoline and bait are available at these facilities.

From Wareham River to New Bedford the shore is indented sharply by rocks and ledges extending offshore nearly 2 miles in places.

Wings Cove, between **Great Hill Point** southeast of Great Hill, and **Piney Point** on the eastern side of **Sippican Neck**, has depths of 8 to 17 feet in its outer section. The cove affords protection from westerly winds; it is used only by small local craft.

Butler Point is at the southern tip of Sippican Neck. Shoal water extends about 0.4 mile southward from the point to **Bird Island**, a round, low, flat island. The 36-foot abandoned white lighthouse tower on the island is a prominent landmark.

Southward and westward of Bird Island are several buoyed dangers. **Bird Island Reef**, covered 15 to 18 feet, is about 0.4 mile east-southeastward. About 0.5 mile southwestward is **Centerboard Shoal** covered 12 feet. **The Bow Bells**, isolated shoals covered 11 to 18 feet, are about 0.9 mile southwest of Centerboard Shoal. **Bird Island South Shoal** (41°39.1′ N., 70°42.8′ W.), an isolated 17-foot spot about 1 mile southward of Bird Island, is marked by a gong buoy about 150 yards to the southward. A submerged obstruction, covered 17 feet, is close westward of the gong buoy.

Sippican Harbor, scene of much pleasure-boat activity, makes into the north shore of Buzzards Bay about 3 miles southward of Wareham River. The harbor is the approach to **Marion**, a small town on the western shore. It is entered between Bird Island on the east and **Converse Point** on the west. Prominent features include the abandoned lighthouse on Bird Island and the conspicuous house and flagpole on Converse Point. The standpipe on Sippican Neck can also be seen for a considerable distance.

The town wharf at Marion has depths of about 5 feet reported alongside. Two boatyards with marine railways, gasoline, diesel fuel by truck, water, ice, marine supplies, and storage facilities are at Marion. The largest marine railway can handle craft up to 50 feet. The **harbormaster** can usually be found at the boatyard just south of the town wharf.

Storm warning signals are displayed. (See chart.)

Mendells Rock and **Seal Rocks** are shoal, rocky areas, northward of Converse Point extending up to 0.2 mile off the west shore of the harbor. **Planting Island**, a peninsula extending about 0.6 mile northwesterly from Sippican Neck, is on the eastern side of the harbor. At **Ram Island**, off Marion, the passage between the island and the western shore is less than 275 yards wide. The currents in the narrow portion of the channel have considerable velocity at times. **Little Island** lies on the western side of the channel about 0.2 mile northwestward of Ram Island. The buoyed channel has a reported depth of about 12 feet from the entrance to Marion.

Blankinship Cove and **Planting Island Cove**, on the eastern side of Sippican Harbor, have a common entrance northward of Ram Island. They have general depths of 3 to 5 feet. **Meadow Island** separates the two coves. **Gibbs Rock**, marked by a private daybeacon, is 50 yards off the north point of Ram Island. A rock awash is charted 120 yards north of the daybeacon.

Hammett Cove in the northeastern part of Sippican Harbor has a small marine railway that can haul out craft up to 50 feet for hull and engine repairs and to which a draft of about 4 feet can be taken at high water, with local knowledge. The best water is usually marked by private seasonal aids.

The mean range of **tide** in Sippican Harbor is 4.0 feet. **Ice** usually closes the harbor about a month or more each winter.

Aucoot Cove, about 0.8 mile southwestward of Sippican Harbor, has depths of 10 to 17 feet. The harbor is protected from all winds except southeast. A channel to a boatyard west of **Haskell Island**, marked by private daybeacons, has a reported depth of less than 1 foot. Local knowledge and a high tide are required to navigate to the boatyard, which can haul out craft up to 40 feet in length. The yard does general repairs and machine work. Gasoline, diesel fuel by truck, and marine supplies are available. The other coves between Sippincan and Mattapoisett Harbors are foul and seldom entered.

Charts 252, 114-SC.—Mattapoisett Harbor, about 3.5 miles southwest of Sippican Harbor and 5 miles northeastward of New Bedford Harbor, is the approach to the town of **Mattapoisett**. The harbor is used by numerous yachts during the summer. Although exposed to southeasterly winds, the ledges at the entrance somewhat break the sea from that direction. A light on **Ned Point** marks the approach. A standpipe is in the town. Vessels anchor between Ned Point and the wharves in 13 to 17 feet.

The entrance between **Angelica Point** and **Strawberry Point** on the east and **Mattapoisett Neck** on the west, is about 1.5 miles wide. A buoyed natural channel leads through the numerous rocks and ledges in the entrance to the anchorage area off the town. The channel has a depth of about 14 feet, but because of the broken bottom, vessels should proceed with caution over areas where the charted depths are not more than 6 feet greater than the draft. Strangers should not attempt to enter at night.

There are many shoals and rocks, most of them buoyed, off the points and in the entrance. Off the west side of the entrance, **Mattapoisett Ledge** extends about a mile southeasterly from Mattapoisett Neck. **Nye Ledge**, covered 7 to 17 feet, about 0.4 mile southeastward of Mattapoisett Ledge, is marked by a lighted bell buoy. In or near the entrance channel are **Gallatin Rock**, covered 10 feet;

Sunken Ledge, covered 3 feet; **Snow Rock**, covered 5 feet, and **Barstow Rock**, covered 8 feet. Near the town wharf, a rock, covered 3 feet, is marked by a buoy.

The mean range of **tide** in the harbor is 3.9 feet. The stone wharf at the town has a depth of 5 feet at its face and 7 feet alongside. Diesel fuel, gasoline, oil, water, ice, marine supplies, and a surfaced ramp are available. A boatyard has facilities for hauling out craft up to 50 feet for general repairs and machine-shop work.

Ram Island, about 1.5 miles southwestward of Mattapoisett Harbor, is a low, grassy island connected to Mattapoisett Neck by a narrow shoal. Rocks and shoal water surround the island.

Cormorant Rock, 0.9 mile southeastward of Ram Island, bares at half tide, and is marked by a daybeacon. Ledges with very little water over them surround the daybeacon at a distance of 150 yards. A rock, covered 14 feet, is about 0.2 mile northeastward of the daybeacon; depths of 18 to 21 feet extend 0.2 mile southward. The channel between the rock and Ram Island has depths of about 15 feet.

Nasketucket Bay is entered between Cormorant Rock on the east and **West Island** on the west. Northward and westward of West Island the bay is greatly obstructed by rocks and small islands. Because of these obstructions, only small craft proceed through the bay to **Little Bay**, at the head, or up **Nasketucket River**. Numerous rocks, including **Whale Rock**, are on the east side of West Island at the entrance. A causeway connects the western side of West Island with **Long Island**. A fixed span in the causeway has a clearance of 5 feet. The depth at the bridge is 6 feet. The approach from southward to the west side of West Island runs among many sunken rocks and shoals, and is very dangerous. The causeway between Long Island and **Sconticut Neck**, the neck of land forming the east side of New Bedford Harbor, completely blocks passage between the two.

Bare rocks and shoaling extend about a mile southerly of West Island, and from there to the New Bedford Harbor entrance there are numerous isolated rocks and ledges, the most dangerous of which are buoyed. **Mosher Ledge**, about 1.1 miles south of **Wilbur Point**, has a least depth of 6 feet. Strangers should stay south of the buoys marking these dangers.

New Bedford Harbor, a tidal estuary at the mouth of **Acushnet River** on the northwestern side of Buzzards Bay, is the approach to the city of New Bedford and the town of Fairhaven. The harbor is about 166 miles from The Battery at New York via Long Island Sound, and 83 miles from Boston via Cape Cod Canal. The harbor includes all the tidewater lying northerly of a line from Clarks Point at the southern extremity of New Bedford to Wilbur Point at the southern end of Fairhaven and extends to the head of navigation on Acushnet River at Acushnet. The outer harbor consists of the area south of the hurricane barrier at Palmer Island, and the inner harbor consists of the area north of the barrier to a short distance above the New Bedford-Fairhaven Bridge.

New Bedford is a manufacturing city on the west side of the Acushnet River. **Fairhaven** is on the east side of the river. Principal shipping includes receipts of petroleum, lumber, fish, and textiles; exports are flour, general cargo, and frozen fish. Commercial fishing craft operate from the ports. The deepest draft entering is about 30 feet at high water.

The approach from Buzzards Bay and the entrance to New Bedford Harbor are much obstructed by ledges and shoals, between which are several channels leading to the dredged entrance. The bottom is very broken, characterized by large boulders; vessels should proceed with caution when crossing areas off the general track when the charted depths are not more than 6 to 8 feet greater than the draft.

Prominent Features.—From the main channel numerous landmarks can be seen on the westerly side. Dumpling Rocks Light off Round Hill Point, about 3 miles west of the channel, is conspicuous. About 0.5 mile westwestward of the radar dome on Round Hill Point is a radio tower. **Clarks Point**, on the west side of the channel, is marked by a granite fort. About 0.7 mile northeast of the point is Butler Flats Light near the edge of the shoal. A group of four large white cement stacks are on the west side of the inner harbor. Although there are no landmarks on Sconticut Neck, **Fort Phoenix** is a promontory fairly conspicuous just east of the channel, almost opposite Palmer Island. Several church spires are prominent in Fairhaven. Tall radio towers are on **Popes Island** and **Crow Island** in the inner harbor. The lights marking the eastern and western sides of the hurricane barrier are also prominent.

Butler Flats Light (41°36.2′ N., 70°53.7′ W.), 53 feet above the water, is shown from a white conical tower on a black cylindrical pier, about 0.7 mile north-northeastward of Clarks Point. A radiobeacon and fog signal are at the station.

Channels.—A Federal project provides for a 30-foot deep channel from Buzzards Bay to the turning basin just above the New Bedford-Fairhaven Bridge. (See Notice to Mariners and latest edition of charts for controlling depths.) The 350-foot-wide channel is constricted to 150 feet by a hurricane barrier across the inner harbor, protecting New Bedford Harbor, extending from the western shore over Palmer Island to Fort Phoenix on the east. The 150-foot gated opening will be kept in the open position during fair weather, but, is closed during periods of high winds, high tides, or when a hurricane is expected. Lights marking the eastern and western sides of the opening are shown from the top of each of the two gate operations houses, 48 feet above the water. A fog signal is sounded from the west barrier light.

It is reported that lights are displayed from the

old granite fort on Clarks Point and near the northern end of Palmer Island to indicate whether the hurricane barrier gate is opened or closed. Green lights are displayed from these locations when the gate is open, and red lights are displayed from 20 minutes before the gate closing commences until it is reopened. Flashing red lights are also reportedly displayed from the barrier when the gate is closed or closing.

The controlling depth above the turning basin to the Coggeshall Street Bridge is about 15 feet. Above that point in Acushnet River there is little traffic except by launches and small craft.

Routes.—The main channel to New Bedford Harbor is from Buzzards Bay Midchannel Lighted Bell Buoy BB (41°30.8′ N., 70°50.1′ W.) through the buoyed channel eastward of **Negro Ledge**.

There are several other passages with least depths of about 21 feet that lead from Buzzards Bay to New Bedford Harbor west of the main channel. However, they are not as well marked as the main channel; unmarked shoals with depths of 9 to 18 feet are near the course lines.

From a position about 0.3 mile south of Mishaum Ledge Lighted Gong Buoy 3A (chart 249), a course can be set to pass about 500 yards east of Dumpling Rock Light to about 500 yards northwest of Decatur Rock Buoy 8, thence on a **006°** course to join the main channel near Butler Flats Light.

An alternate approach can be made from a position about 0.3 mile south-southeastward of Wilkes Ledge Buoy about 0.5 mile south-southeastward of Wilkes Ledge Buoy 5 on a course of **006°** to join the main channel near Butler Flats Light. The high elevated tank at Fairhaven is a good leading mark for this leg.

Strangers should not attempt to enter New Bedford Harbor except in clear weather when the aids are visible. Vessels should proceed with caution where the charted depths are less than 6 to 8 feet greater than the draft, because of the broken character of the bottom.

Anchorages.—Before proceeding into New Bedford Harbor, vessels occasionally anchor in depths of 20 to 30 feet about 0.7 mile south of Clarks Point. Two anchorage areas have been established in the outer harbor. (See **110.140 (a) and (d)**, chapter 2, for limits and regulations.) In the inner harbor vessels may anchor in the two dredged anchorage areas on either side of the channel in depths of 25 to 30 feet.

Dangers.—The entrance to New Bedford Harbor is full of rocks and ledges, some covered 3 feet or less. Obstructions near the entrance passages are marked with buoys. The chart is the guide.

Dumpling Rocks, bare and covered, extends 0.4 mile southeastward from Round Hill Point. A light is on the easterly rock. A buoy marks the southeastern portion of the shoal area around the rocks, and a gong buoy is about 400 yards east of the light.

Wilkes Ledge, 1.8 miles southeastward of Round Hill Point, is the southernmost danger at the entrance to the harbor. It is covered 9 feet with a wreck near the easterly part; a buoy is close southeastward of the wreck.

Bridges.—Three bridges cross Acushnet River at New Bedford. The first, the New Bedford-Fairhaven Bridge, has a swing span with a clearance of 6 feet. (See **117.80**, chapter 2, for drawbridge regulations and opening signals.) About 1 mile above this drawbridge is the Coggeshall Street Bridge which has a fixed span with a clearance of 8 feet. About 1.3 miles above the Coggeshall Street Bridge is a fixed bridge with a clearance of 6 feet.

Tides.—The mean range of tide is 3.7 feet.

Currents.—Tidal currents are weak. From a series of current observations, conducted by the Corps of Engineers over a 2-day period in October 1965 at the center of the navigation opening of the New Bedford Hurricane Barrier, it was revealed that the maximum flooding and ebbing velocities were about 2.4 knots; average flood setting 344° and the ebb 144°. During flooding or ebbing a slight set towards the east barrier abutment may be experienced. During this same period it was further revealed that the time of slack water occurred about 30 minutes before the time of low or high water; that the maximum ebbing velocity occurred about 2 hours after the time of high tide; that the maximum flooding velocity occurred about 4 hours after the time of low tide; and that generally, the maximum current occurred at about the same time as the most rapid change in the vertical height of the tide was taking place.

Weather.—The prevailing winds during the winter are from north to west, and during the summer from south to southwest. Thick fog is reported to close in quickly with little warning in New Bedford Harbor. **Storm warning display locations** are listed on the NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Ice.—The channels and anchorage area usually are navigable throughout the year, although in prolonged periods of extreme cold weather the harbor as well as all of Buzzards Bay may be closed to navigation because of ice. Such conditions are infrequent and of short duration. Steamers generally can make their way through the ice in the harbor.

Pilotage.—Pilotage is compulsory for foreign vessels and U.S. vessels under register. Pilots usually board vessels off Buzzards Bay Midchannel Lighted Bell Buoy BB (41°30.8′ N., 70°50.1′ W.). Pilot services are generally arranged for in advance through ships' agents or directly by shipping companies; 24 hours' advance notice is requested. The pilots recommend that vessels, delayed because of weather or other reasons, anchor about 0.5 mile southward of the lighted bell buoy.

Pilot boat service is available by calling New Bedford, Mass., 617-993-3891.

Towage.—Oceangoing vessels usually require tug assistance when docking and undocking. Tugs up to 2,200 hp. are based at New Bedford, and ar-

rangements for their services are usually made through ships' agents. Tugs monitor VHF-FM channel 13 (156.65 MHz) when expecting a vessel, and use channel 18A (156.90 MHz) as a working frequency.

New Bedford is a **customs port of entry.**

Immigration officials are stationed in Providence, R.I., and **agricultural quarantine** officials in Warwick, R.I. (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 regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The U.S. Public Health Service maintains a **contract physician's office** in New Bedford. (See appendix for address.) New Bedford has several hospitals.

The Coast Guard maintains a **vessel documentation office** in New Bedford. (See appendix for address.)

Harbor regulations.—The New Bedford Harbor Development Commission, through the **harbormaster,** enforces the harbor regulations. The State Pier Traffic Manager is the State authority who directs anchoring, berthing, and movement of vessels, and discharging operations at the State Pier. Vessels are expected to proceed slowly in the vicinity of the piers. State laws forbid pollution and dumping of refuse and rocks inside the harbor. The harbormaster has an office just north of the State Pier.

Wharves.—The New Bedford waterfront has many piers and wharves. The fishing industry uses most of these facilities. Only the deep-draft facilities are described, and the alongside depths for these facilities are reported; for information on the latest depths contact the operator. All of the facilities described have highway connections, and most have rail connections. Fresh water is available at most piers and wharves. Cargo in the port is usually handled by ship's tackle. A 250-ton floating "A" frame derrick is available for heavy lifts.

New Bedford South Terminal Wharf: 500 yards westward of Palmer Island; 1,600 feet long; 30 feet alongside; 250,000 cubic feet of refrigerated storage; receipt of seafood products; owned by New Bedford Harbor Development Commission.

New Bedford Gas and Edison Light Co. Pier; 300 yards northward of South Terminal Wharf; north side 740 feet long, with dolphins; 30 feet alongside; receipt of petroleum products and natural gas; vessels usually berth with bow inshore; owned by New Bedford Gas and Edison Light Co., and operated by New Bedford Gas and Edison Light Co., and New England Petroleum Corp.

State Pier: 500 yards northward of New Bedford Gas and Edison Light Co. Pier; face 450 feet long, north side 600 feet long, south side 775 feet long; 30 feet alongside; 90,000 square feet covered storage, 240,000 square feet of open storage; receipt and shipment of general cargo; owned and operated by the Commonwealth of Massachusetts, Division of Waterways.

Maritime Terminal Wharf: westward of Fish Island; 600 feet long; 31 feet alongside; 2.5 million cubic feet of refrigerated storage; receipt of frozen food, fish, and horsemeat; shipment of general cargo; owned and operated by Maritime Terminal, Inc.

Frionor Bridge Freezer Wharf: northeast side of Fish Island; 450 feet long; 28 feet alongside; 45,000 square feet of refrigerated space; receipt of seafood; owned and operated by Frionor Bridge Freezer Co.

New Bedford North Terminal Wharf: 400 yards northwest of Fish Island; 1,000 feet long; 30 feet alongside; 14 acres of open storage; owned by New Bedford Harbor Development Commission and operated by various tenants.

Supplies.—Gasoline, diesel fuel, water, provisions, and marine supplies of all kinds are available. Diesel oil and marine bunker fuels are available by truck. The water is excellent for drinking and boiler use; a water boat services craft at anchor.

Repairs.—There are several boatyards at Fairhaven and one at New Bedford that can make hull, engine, and electronic repairs; storage facilities are also available. The largest marine railway in the area can handle vessels up to 130 feet, 500 tons, and 13 feet in draft. Several repair firms in New Bedford are available for above-the-waterline repairs and engine repairs. Derrick lighters, some with air compressors and diving equipment, are also available.

Communications.—There is only rail freight service to Boston and frequent bus service to Providence, Newport, and Fall River. A mail boat makes trips to Cuttyhunk twice weekly in the winter and daily in the summer.

The coast between New Bedford Harbor and the entrance of Sakonnet River is fringed with extensive shoals, many of them rocky and a considerable number of them well offshore. The entrances to several inlets are shoal and are used only by local fishing and pleasure boats.

Clarks Cove, between New Bedford Harbor and Apponagansett Bay, affords anchorage in depths of 12 to 22 feet. It is exposed to southerly weather and is seldom used. Several small piers can accommodate small craft. A small boatyard with a 40-foot marine railway is in the cove; gasoline and diesel fuel are available. Several rocks are off **Moshers Point** on the west side of the cove.

Apponaganset Bay, about 2 miles southwestward of Clarks Point, shelters numerous pleasure craft and a few fishermen in the summer, but the bay is insecure in southeasterly gales. **Nonquitt** and **Bayview** are villages on the south side of the entrance and **South Dartmouth** is on the northerly

shore. **Padanaram Breakwater** is marked on the southern end by a light. The approach to the bay is obstructed by numerous ledges and rocks, and strangers should enter only in the daytime with clear weather. Inside the breakwater the channel is marked by buoys. **Dartmouth Rock**, covered 4 feet, is on the northeast side of the channel. Private seasonal anchorage buoys mark the area off South Dartmouth, which is usually very crowded in the summer. A highway bridge at the village has a swing span with a channel width of 31 feet and a clearance of 8 feet. (See **117.81**, chapter 2, for drawbridge regulations and opening signals.) Above the bridge, small craft anchor in a narrow channel near the eastern shore.

The **harbormaster** controls anchoring and berthing in the harbor and can usually be found at the larger boatyard. The **speed limit** in the harbor off the piers is 5 m.p.h.

Southward of the bridge are the two principal piers with depths of 7 to 11 feet off their faces. One pier is the landing of the New Bedford Yacht Club, and the other a commercial wharf. Diesel fuel, gasoline, water, ice, and some marine supplies are available. Two nearby boatyards and a marina perform general repairs and some machine work. The largest marine railway can haul out craft up to 55 feet.

Storm warning signals are displayed. (See chart.)

Round Hill Point, about 3.5 miles southwestward of Clarks Point, is marked by a prominent round hill on which is a white tower and a radar installation. Care should be taken not to confuse this tower with Dumpling Rock Light. Westward of the hill is a radio tower.

Between Round Hill Point and **Salters Point**, 1.1 miles southwestward, **Hunts Rock Breakwater** extends 270 yards in a northeast-southwest direction.

Mishaum Point, 1.9 miles southwestward of Round Hill Point, is the southern point of **Smiths Neck**. Shoal water extends about 0.2 mile off the point.

Chart 237.—Slocums River, westward of Mishaum Point, has a bar at the entrance nearly bare at low water. The channel inside is narrow and unmarked, and little used. **Slocums Ledge**, extending 0.6 mile westward of Mishaum Point, covered 2 to 7 feet, is marked by a buoy. **Pawn Rock** uncovers 3 feet and is 0.2 mile easterly of **Barneys Joy Point**, the point on the west side of the river entrance.

Gooseberry Neck, about 4 miles southwestward of Mishaum Point, is marked by a prominent watch tower. The neck, irregular and elongated, extends about 1 mile southward from **Horseneck Beach** to which it is joined by a narrow roadway over rock fill. The water surrounding the neck is very foul.

Hen and Chickens and the dangers southward of it have been previously discussed under the entrance to Buzzards Bay.

In addition to Hen and Chickens, numerous rocks and reefs surround Gooseberry Neck. Shoal water extends 0.6 mile southwestward of the neck to **Lumber Rock**, covered 4 feet and marked by a buoy, and over 0.5 mile westward to **Browing Ledge**, covered 6 feet. **Little Southwest Rock**, 0.3 mile northeastward of Lumber Rock, is marked by a daybeacon.

Westport River empties into the large bight between Gooseberry Neck and Sakonnet Point (chart 353). The mouth of the river is between **Horseneck Point**, 2.7 miles northeast of Gooseberry Neck, and **The Knubble**, a protruding mound of granite marked by a light about 0.2 mile south of Horseneck Point. The river is the approach to **Westport Harbor**, the area just inside the entrance; the village of **Westport Point**, on the north shore of the east branch of the river; and the village of **Acoaxet**, westward of The Knubble. Fishing and pleasure boats used the river as far as Westport Point.

The channel is narrow and crooked, and marked by buoys. The depth over the bar is reported to be about 9 feet and about 8 feet in the buoyed channel to Westport Point. Depths over the bar are continually changing, and local information should be obtained as to depths and the best water. No vessel should try to enter at night.

Boats should not try to enter during strong southerly winds as heavy seas break over the entrance bar. About a mile above the entrance the river divides into two branches. The west branch is shallow with a narrow, unmarked channel, and is little used. Above Westport Point bridge the east branch is marked by private seasonal buoys as far as the Hix Bridge, 4.7 miles above Westport Point. A reported depth of about 4 feet can be carried to this bridge with local knowledge.

A highway bridge with a 49-foot bascule span and a clearance of 21 feet at the center crosses the river at Westport Point, about 2 miles above the mouth. Hix highway bridge, about 6 miles above the mouth, has a 35-foot fixed span with a clearance of 3 feet. An overhead power cable on the north side of Hix bridge has a clearance of 37 feet.

Approaching Westport River, boats must take care to pass westward of the dangers off Gooseberry Neck and eastward of the dangers off the river entrance. Numerous rocks and ledges are southward of the entrance to the river. **Twomile Rock**, 1 mile southeastward of Westport Harbor Entrance Light on The Knubble, is marked by a daybeacon. Shoals with depths of 5 to 18 feet are southeasterly of the rock. Buoys mark the shoals. **Halfmile Rock**, 3 feet high, is 325 yards southeast of the light on The Knubble. The shoal water surrounding the rock is marked by a buoy. The area south of The Knubble is very foul. Other unmarked dangers include **Twomile Ledge**, extending 1 mile south of The Knubble, and covered 2 to 12 feet; **Joe Burris Ledge** covered 14 feet, midway between Halfmile Rock and Twomile Rock, and **Pinetree Ground**, about a mile south of Twomile

Rock, covered 25 to 30 feet.

The shore in this vicinity should be given a berth of about 1.3 miles to avoid numerous rocks and ledges extending about 1 mile offshore for 2.5 miles westward of Westport Harbor.

The mean range of **tide** is 3.0 feet. The tidal current in the entrance has a velocity of 2.5 knots, and caution is recommended when navigating the river. (See the Tidal Current tables for predictions.)

Two piers, used by fishing and pleasure boats, are at Westport Point. These piers have reported depths of 6 feet at their faces. A small yacht club is on the south shore of the river westward of the village. The club dock has a depth of about 8 feet.

There are two boatyards and a marina. The largest marine railway can haul out craft up to 50 feet for hull and engine repairs and dry open or covered storage. There are 10-ton and 1-ton cranes and surfaced ramps. Gasoline, diesel fuel, water, ice, marine supplies, berthage, and moorings are available.

Quicksand Point is about 1.5 miles west of The Knubble. The boundary line between Massachusetts and Rhode Island is near the point. **Cutty Wow Rock**, awash at low water, is 1 mile southwestward of the point.

Briggs Point, 2 miles southwestward of Quicksand Point, is surrounded by shoals and rocks. **Halfway Rock**, 2 feet high, is 0.4 mile southeastward of the point.

6. NARRAGANSETT BAY

This chapter describes the Sakonnet River, Narragansett Bay, Mount Hope Bay, and Taunton and Providence Rivers. Also discussed are the ports of Newport, Fall River, and Providence, as well as the numerous other yachting and fishing centers in this area.

Charts 353, 1210.—Narragansett Bay, 17 miles westward of Buzzards Bay entrance, is the approach to the cities of Newport, Providence, Fall River, and Taunton, as well as numerous towns and villages. **Rhode Island**, the largest island in the bay, forms the eastern shore of the bay proper. The entrance is between Brenton Point, the southwestern part of Rhode Island, on the east, and Point Judith Neck on the west. The bay is about 18 miles long from the entrance to the mouth of Providence River. Navigation of the bay is easy during day or night in clear weather as it is marked by navigational aids. The large **Conanicut Island** and **Prudence Island**, and several smaller islands, divide the bay into two passages. Sakonnet River, although not a part of Narragansett Bay, is included with it in the following discussion.

East Passage is good for a least depth of about 60 feet for about 11 miles up the marked channel to the entrance of the dredged channel to Providence. West Passage is the approach to Dutch Island Harbor, Wickford, Greenwich Bay, and Providence River. Vessels of over 16-foot draft rarely go above Dutch Island Harbor without a pilot, but vessels of 16-foot draft or less should have no difficulty in going to the head of the bay and Providence River. Sakonnet River is good for a depth of 18 feet from the mouth to Mount Hope Bay.

Caution.—Submarine operating areas and transit lanes are in the approaches to Narragansett Bay. These areas are indicated on the area charts. Mariners navigating these waters are advised to consult the charts and to obtain the latest information as published in Notice to Mariners.

Anchorages.—The principal anchorages for vessels seeking shelter are Newport Harbor in the East Passage, and Dutch Island Harbor in the West Passage. These harbors afford anchorage with good holding ground for deep-draft vessels, and are sometimes used by coasting vessels on the passage between Vineyard Sound and Long Island Sound. Good anchorage will be found almost anywhere in the bay under the lee of islands or the shore, where vessels becalmed or at night frequently anchor. Point Judith Harbor of Refuge is just west of Point Judith. Anchorage areas have been designated for Narragansett Bay. (See **110.145**, chapter 2, for limits and regulations.)

Routes.—Vessels approaching Brenton Reef Light from eastward should keep the light bearing northward of 268° to avoid Seal Ledge and the other dangers. In clear weather, vessels may pass two miles eastward of the light. Brenton Reef and other dangers on the easterly side of the entrance will be avoided by keeping Castle Hill Light bearing eastward of 003° and passing westward of the lighted whistle buoy and the gong buoy off Brenton Reef and the bell buoy off Butter Ball Rock. Approaching from westward, from a position with Point Judith Light bearing 344° distant 2 miles, vessels may steer **028°** for about 9 miles to a position 0.5 mile west of Castle Hill Light, thence follow the navigational lights in the bay.

Tides.—The tidal movement in Narragansett Bay with its vertical and horizontal constituents—tide and current, respectively—is a continuation of the tide wave of the Atlantic Ocean. This wave sweeps into the three entrances between Sakonnet Point and Point Judith and continues up the bay and into each of its tributaries until stopped by rapids or other obstructions. As is usual when oceanic tidal movements enter inland waterways, the nature of the movement is modified by the hydrographic features encountered. In this area the local features are such that the current movement in particular is subject to considerable distortion. The mean range of the tide varies from about 3.5 feet at the entrance to 4.6 feet at Providence. (See the Tide Tables for predictions.)

Currents.—The flood current in Narragansett Bay frequently has two maximums of velocity separated by a minimum velocity which at times becomes an ebb flow. Over the greater part of the bay, the usual maximum flood or ebb velocity is from 0.5 knot in the broad portions of the waterways to 1 knot in the more constricted sections. Velocities of about 1.4 knots occur at the bridges in Seekonk River, a velocity of about 1.7 knots in the narrows at the mouth of Kickamuit River, and a velocity of about 2.2 knots at the bridges in Sakonnet River. In Sakonnet River, from the highway bridge to its mouth, current velocities are small, being generally less than 0.5 knot. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.)

At Brenton Reef Light the tidal current is practically reversing. The strengths of flood and ebb have velocities of about 0.5 knot setting northward and southward, respectively.

Weather.—In the entrance to the bay and its approaches, **fogs** are more prevalent from April to October. The fogs are brought in by winds from east through south to southwest and are cleared off by northerly and westerly winds. The usual duration of the fog is 4 to 12 hours, but periods of 4

to 6 days have been known with only short clear intervals. The head of the bay will sometimes be free from fog while the entrance is completely shut in.

Navigation of the bay and its tributaries is sometimes impeded by floating **ice** and in severe winters by packs of field ice. The ice which breaks up in Providence River and Mount Hope Bay is set by north and northeast winds down the bay through East Passage; if there is much ice, a gorge is sometimes formed at Fort Adams, but it is of short duration. The passages are rarely closed for any length of time below Gould Island in the East Passage and Dutch Island in the West Passage. During January and February, Mount Hope Bay, Bristol Harbor, Warren, Providence River, Greenwich Bay, and Wickford are usually closed to sailing vessels unaided by power. The inner harbor of Newport is also sometimes closed during these months with the exception of a channel kept open by vessels.

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Pilotage is compulsory in Narragansett Bay for foreign vessels and U.S. vessels under register when proceeding north of a line extending from Point Judith to Sakonnet Point. State pilots are available on request in the vicinity of Brenton Reef Light (41°25.6′ N., 71°23.4′ W.), Block Island North Reef Lighted Bell Buoy 1B1 (41°15.5′ N., 71°34.6′ W.), Block Island Southeast Lighted Whistle Buoy (41°05.8′ N., 71°30.0′ W.), or about 2 miles south of Point Judith Lighted Whistle Buoy 2 (41°20.0′ N., 71°28.5′ W.).

Pilot services are generally arranged for at least 24 hours in advance through ships' agents or directly by shipping companies. Pilots board from launches; 24-hour service is available. The pilots' boats are equipped with VHF-FM and medium frequency radiotelephones and can be reached on 2182 kHz, 2738 kHz, and channel 16 (156.80 MHz).

Chart 353.—Sakonnet River, on the easterly side of Narragansett Bay, is between the mainland and the eastern shore of Rhode Island. The width of the river varies from 0.7 to 2 miles except at its northern end where a least width of 0.3 mile is found. The river is little used except by fishing vessels and small craft. The easterly side of the southerly entrance is marked by a tower of a former lighthouse on the west side of the shoal area.

The channel of Sakonnet River is good for a depth of 18 feet from the mouth to Mount Hope Bay. There are numerous shoals and outlying rocks, but the dangers are well marked by buoys. Except for the breakwater light off Sakonnet Harbor, no lighted aids are in the river, and strangers should not attempt to navigate it at night.

Good anchorage for vessels drawing up to 17 feet can be had in midriver just below High Hill Point in depths of 21 to 28 feet. Although open to the southward, a heavy sea seldom reaches as far as this anchorage. In southeasterly gales the water is comparatively smooth inside the mouth of the river. Fishermen seeking shelter frequently anchor on the flats in the bight northward of Fogland Point in depths of 10 to 14 feet.

Sakonnet Point, at the eastern entrance to Sakonnet River, is surrounded by bare and sunken rocks. Several islets and islands are south of the point. **Schuyler Ledge**, with a least depth of 8 feet, is about 0.8 mile southward of the point, and is marked by a bell buoy.

Cormorant Rock, a bare dark rock off the western side of the entrance to the river, is about 0.8 mile south of **Sachuest Point**, the southeastern extremity of Rhode Island. Vessels should not pass between Cormorant Rock and **Cormorant Reef**, 0.3 mile southward of the rock. The least depth on the reef is 4 feet; it is marked by a bell buoy.

The mean range of **tide** at Sakonnet Point is 3.1 feet. (See the Tide Tables for predictions.)

The two bridges and the remains of the abandoned highway bridge at the north end of Sakonnet River act as dams to maintain the water at different levels on either side of them, causing dangerous **currents** through the openings. The currents change with great rapidity both in velocity and in direction, and are characterized by a double flood. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.) Vessels usually pass through the draws near the times of slack water.

The river north of Fogland Point is usually closed by **ice** for short periods each winter. Ice packs occur at the railroad bridge.

Vessels proceeding up Sakonnet River should follow a midriver course to the constricted part of the river, thence follow the channel marked by buoys into Mount Hope Bay.

Sakonnet Harbor, a small-boat harbor on the northerly side of Sakonnet Point, about 2 miles northeastward of the entrance lighted whistle buoy, is protected by an 800-foot breakwater extending in a northerly and easterly direction from **Breakwater Point**. A light marks the outer end. In 1968, the harbor had a dredged depth of 8 feet. A yacht club wharf on the east shore of the harbor had a reported depth of about 5 feet alongside.

The western shore of Sakonnet River from the entrance to Sandy Point should be given a berth of 0.4 mile to avoid shoals with depths of 7 to 17 feet. Rocks extend up to 500 yards offshore between Sachuest Point and **Flint Point**, about 1 mile northward. **Flint Point Ledge**, about 0.5 mile north-northeast of Flint Point, has a least depth of 7 feet; a buoy marks the ledge. **Black Point** is a rocky bluff on the western side of the river, 2.6 miles northward of Flint Point. **Sandy Point** and **McCurry Point**, low and backed by high land, are 3.9 and 5.4 miles, respectively, northward of Flint Point.

The channel passes eastward of **Gould Island**, a high wooded island, 2.5 miles north-northeastward

of McCurry Point. This Gould Island should not be confused with one of the same name in East Passage. A rock with a depth of 1 foot is northwestward of the island and is marked by a buoy.

The eastern side of Sakonnet River is bolder than the western side. The east shore should be given a berth of 0.7 mile from Sakonnet Point to **Church Point**, a flat point with bluffs at the water, about 2.8 miles northward of Sakonnet Point. **Old Bull**, with a depth of 1 foot, is about 0.5 mile southward of Church Point and marked by a buoy. A church spire at **Little Compton**, about 1.7 miles east of Church Point, is prominent. **High Hill Point**, about 3 miles north of Church Point, is a prominent small hill with bluffs at the water. **Fogland Point**, about 0.9 mile northward of High Hill Point, is a projecting prominent point; the westerly and northerly sides should be given a berth of over 200 yards. **Almy Rock**, bare at low water, is 0.3 mile southwest of Fogland Point. The broad bights between Fogland Point and the bridge are shoal.

Nannaquaket Pond, on the east side of Sakonnet River eastward of Gould Island, has a narrow entrance 8 feet deep crossed by a fixed bridge with a clearance of 12 feet. The deeper water in the entrance is along the northern shore; several rocks are off the southern shore. The currents have considerable velocity. The northern part of the pond has depths up to 26 feet; the remainder has depths of about 3 feet.

The Cove, on the western side of the river south of the bridges, has a depth of about 9 feet in the entrance; the 31-foot-wide fixed highway bridge across the entrance has a clearance of 25 feet. Depths are generally 3 to 4 feet in the cove.

Tiverton is a town on the eastern bank of Sakonnet River north and south of the bridges. Oil tankers call at Tiverton. The oil piers northward of the bridges have reported depths of about 35 feet alongside.

Small-craft facilities at Tiverton and on the west side of Sakonnet River across from Tiverton can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and hull and engine repairs. The largest marine railway at Tiverton, about 0.6 mile southward of the fixed highway bridge, can handle craft up to 55 feet.

The channel at the north end of Sakonnet River, 0.6 mile above Gould Island, is restricted to a width of 100 feet between the abutments of a former highway bridge. The fixed highway bridge, 0.8 mile to the northward, has a clearance of 65 feet. About 200 feet north of the highway bridge, a railroad bridge across the river has a swing span with a clearance of 12 feet in the west opening. (See **117.85**, chapter 2, for drawbridge regulations and opening signals.) The overhead power cable at the railroad bridge has a clearance of 81 feet.

Chart 236.—The southern shore of Rhode Island is rocky with numerous offlying rocks and ledges. Numerous prominent residences are on the eastern side of **Newport Neck**, the southwestern part of Rhode Island. A large brick residence with several towers is on the southeastern point of Newport Neck. **Easton Point** is about 1.3 miles eastward of Newport Neck. A stone tower with a short spire at each corner can be seen from offshore, about 0.7 mile northward of Easton Point. Westward of Easton Point is a bathing beach with a prominent pavilion. Several private landings are northward of **Gooseberry Island**, a small islet south of Newport Neck. Local knowledge is required to proceed to the landings.

East Passage, the principal passage in Narragansett Bay, extends between Rhode Island on the east and Conanicut and Prudence Islands on the west. It is the most direct route to Newport, Bristol, Providence, Mount Hope Bay, and Taunton River.

A **dumping ground** (chart 1210) is located in the waters off the entrance to East Passage southeastward of Brenton Reef Light. (See **205.80(a)** and **(b)(4)**, chapter 2, for limits and regulations)

A fixed highway suspension bridge crosses East Passage about 3.6 miles above the entrance, between Jamestown and Newport. Clearances through the 1,500-foot center span are 213 feet at the center, 205 for the mid 1,000 feet, and 194 feet for the remainder of the center span. A privately maintained fog signal is sounded at the bridge.

Brenton Reef Light (41°25.6′ N., 71°23.4′ W.), 87 feet above the water, is shown from a red house on a black square superstructure on four black piles. The name **BRENTON**, in large white letters, is on each side, and the piles are floodlighted at night. A fog signal and a marker radiobeacon are at the light.

Brenton Point is the southwestern extremity of Rhode Island and the eastern entrance point of East Passage.

Brenton Reef, bare in places, extends 0.5 mile south-southwestward of the point and is marked by a gong buoy. Another reef extends 0.5 mile offshore just eastward of the point; **Seal Rock** is at the southeastern end of the reef.

Seal Ledge, about 0.5 mile south of Seal Rock, has depths of 12 to 30 feet, and is marked by a bell buoy. **Haycock Ledge**, 0.4 mile eastward of Seal Rock, has a least depth of 11 feet. A 21-foot spot, in general depths of 35 feet or greater, is about a mile south-southwestward of Brenton Point; a lighted whistle buoy is southward of the spot.

Beavertail Point is the southern extremity of Conanicut Island, on the western side of the entrance to East Passage. **Beavertail Light** (41°27.0′ N., 71°24.0′ W.), 64 feet above the water, is shown from a square granite tower, upper half white, attached to a white dwelling at Beavertail Point. A fog signal is sounded from the light station. **Newton Rock**, a covered rock, is about 0.1 mile southward of the point; a bell buoy is about 0.2 mile southwestward of the rock.

Hull Cove, about 1 mile northeastward of

Beavertail Light, is rocky and exposed to southerly winds. **Castle Hill**, the westernmost point of Rhode Island, is marked by Castle Hill Light; a fog signal is at the light. **Butter Ball Rock**, about 0.2 mile south of the light and marked by a bell buoy, uncovers 1 foot.

Mackeral Cove indents the southern shore of Conanicut Island about 1.6 miles northeastward of Beavertail Light. A house with a cupola is prominent on **Southwest Point**, the eastern entrance point of the cove. The cove is exposed to southerly weather and is seldom used. The Jamestown Bridge shows prominently over the bar at the head of the cove on entering East Passage. **Kettle Bottom Rock**, about 0.2 mile southeastward of Southwest Point, is bare, and marked by a gong buoy.

Bull Point, the southeastern point of Conanicut Island, is rugged and rocky, and fringed by shoals which are marked by buoys. **Fort Wetherill** is on the point. **The Dumplings**, northeast of Bull Point, are numerous bare and covered rocks and islets. The most southerly islet has a tall house on it, covering almost the entire islet.

Fort Adams is on a peninsula off the north side of Newport Neck. The buildings and masonry of the fort are prominent on the western slope of the peninsula. A dock extending northward from the fort is marked by a light and fog signal.

Newport Harbor, on the western shore of Rhode Island and the eastern side of East Passage, 3.5 miles above Beavertail Light, is an important harbor of refuge for coasters, tows, and yachts. Its approach is well marked by navigational aids, and the harbor is of easy access day and night. **Goat Island**, 0.6 mile long in a north-south direction, is a major pleasure boating center and divides Newport Harbor into an outer and inner harbor. The outer harbor, on the western side of Goat Island, is northward of The Dumplings and southward of Gould Island. The inner harbor is on the eastern side of Goat Island and extends along the western front of Newport.

A marina, hotel, recreational and service facilities, and marine supplies are available on Goat Island.

Newport, a city on the inner harbor, is one of the principal summer resorts on the Atlantic Coast. Some coastwise traffic uses the port, but few foreign vessels enter it. A naval operating base is here.

Prominent features.—The following objects are prominent when approaching Newport Harbor either from the southward or northward: A hotel on Goat Island; a white building of the yacht club near Ida Lewis Rock in the southerly part of the harbor; a stack near the southerly end of the waterfront which is the tallest object on the waterfront; church spires in the town; the buildings of the naval station and Naval War College on Coasters Island in the north part of the harbor; and a tank on Rose Island. To the westward on Conanicut Island are several large hotels and a standpipe. Numerous navigational aids mark the passages through the harbor.

The entrance to the outer harbor from the southward is unobstructed; the entrance from northward, passing either side of Gould Island, is clear, but the passage eastward of Rose Island is partly obstructed by the rocks and ledges between Rose and Coasters Harbor Islands.

The inner harbor has two entrances north and south of Goat Island. A fixed highway bridge with a 40-foot span and a clearance of 14 feet connects the Newport mainland to the northern part of Goat Island. This bridge limits the size of vessels that can enter the inner harbor from the northern approach.

Anchorage areas have been designated in the outer and inner harbor and, except in emergencies, vessels must anchor in these areas. (See **110.145, (a) (1), (a) (3) through (a) (7), and (d)**, chapter 2, for limits and regulations.) Vessels of more than 18-foot draft anchor in the outer harbor in depths of 36 to 100 feet with good holding ground.

Good anchorage is in **Brenton Cove**, the bight eastward of Fort Adams, which is used frequently by yachts. The docks and piers along the westerly shore of the cove are for use of military craft. When entering, the western shore should be given a berth of 200 yards.

Shoals with little water over them make out nearly 300 yards from the southern shore of the inner harbor to **Ida Lewis Rock** and **Little Ida Lewis Rock**, the latter marked by a daybeacon.

Goat Island is marked by a light at its northern end and a light and fog signal at its southern end. Buoys mark the shoals along the southeasterly and southerly sides of the island.

Rose Island, a military reservation marked by a tall water tank, is surrounded by a shoal with little water over it. The shoal extends about 0.4 mile northeastward of the island where it rises abruptly from deep water. A rocky area extends southward from Rose Island and is marked by a buoy. **Mitchell Rock**, with a depth of 14 feet, is 0.1 mile southeast of the dock on the southeast side of the island. **Citing Rock**, 2 feet high, is 350 yards east of the north end of the island and on the edge of the shoal surrounding Rose Island. **Tracey Ledge**, covered 10 feet, is about 0.3 mile eastward of Rose Island.

Gull Rocks are about midway between Rose Island and Coasters Harbor Island. Buoys mark the ends of the shoals and rocks that extend northward and southward of the rocks. There is deep water between Gull Rocks, Rose Island, and Coasters Harbor Island. A rock, covered 17 feet and marked by a buoy, is about 0.3 mile north-northwestward of Gull Rocks.

Off the northern and southern sides of **Coasters Harbor Island** are numerous rocks and ledges. Two lights mark the channel south of the island. **St. Patrick Rock**, covered 5 feet, is about 0.3 mile southeastward of the island. The island has numerous buildings. Two highway bridges connecting

the island to Newport have 31-foot fixed spans with clearances of 3 feet.

The western portion of the outer harbor is generally free of dangers northward of The Dumplings.

Tides.—The mean range of tide is 3.5 feet. (See the Tide Tables for predictions.)

Currents.—In the entrance off Bull Point the flood current is often irregular. There may be a long period of slack water preceding the flood, or there may be a double flood. The flood reaches a strength of about 1.2 knots; the ebb is regular and averages 1.5 knots at strength.

Northward of Bull Point tidal current velocities seldom exceed 1 knot. In the inner harbor they are usually less than 0.5 knot. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.)

Weather.—The prevailing winds are southwesterly in the summer and northwesterly in the winter. The heaviest gales are usually from the northwest and northeast.

The harbor and its approaches are navigable throughout the year, although in severe winters **ice** may interfere with navigation in the inner harbor for short periods. Vessels and tugs keep ice well broken up in the main channel through the inner harbor.

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Service Charts published by the National Weather Service.

Pilotage.—Pilotage for Narragansett Bay is discussed at the beginning of this chapter.

Quarantine officials are stationed in Boston, Mass., **immigration** officials in Providence, R.I., and **agricultural quarantine** officials in Warwick, R.I. (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. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The U.S. Public Health Service maintains a **contract physician's office** in Newport. (See appendix for address.)

Newport is a **customs port of entry.**

The Coast Guard **vessel documentation** office at Providence serves Newport. (See appendix for address.)

Harbor regulations.—The harbormaster, under the supervision of the Department of Public Safety, is charged with the enforcement of harbor regulations, the movement of vessels, and assignment of berths. The harbormaster may be contacted through the Police Department. The **speed** limit inside the harbor is 5 knots.

Wharves.—Facilities include a city wharf and numerous private and Government piers. The depths alongside the principal piers range from about 11 to 18 feet.

Supplies.—Gasoline, diesel oil, diesel fuel, water, provisions, and marine supplies may be obtained at Newport.

Repairs.—Newport has several boatyards and marinas. The largest marine railway can haul out vessels up to 180 feet and 500 tons displacement. Mobile hoists up to 30 tons are available. Complete small-craft hull and engine repairs can be made.

Communications.—Newport has bus and rail transportation. In the summer the ferry between Block Island and Providence calls at Newport.

Jamestown is a town on the east side of Conanicut Island in a bight on the west side of East Passage. A standpipe in the southern part of the town and a hotel near the waterfront are prominent. A ferry wharf is in the center of the bight. Jamestown has two boatyards. The largest marine railway can handle craft up to 80 feet; berths, electricity, gasoline, water, ice, some marine supplies, and complete hull and engine repairs are available.

Storm warning signals are displayed. (See chart.)

Potter Cove is about a mile above the ferry wharf just north of **Taylor Point**. This cove should not be confused with the Potter Cove off Prudence Island. About a mile north of Taylor Point are the ruins of a pontoon pier.

Coddington Point is about 0.5 mile northward of Coasters Harbor Island on the east shore of East Passage. **Bishop Rock Shoal**, 0.6 mile southwestward of the point, is covered 9 feet and marked by a lighted bell buoy. **The Sisters**, rocks awash westward of the point, are marked by a buoy.

Coddington Cove, eastward of Coddington Point, is protected on its north side by a curving breakwater 0.7 mile long, marked at its end by a light and fog signal. Two long finger piers used by the Navy are inside the cove; a depth of 33 feet is alongside. Several tanks and Navy buildings on shore are conspicuous. A Navy-maintained lighted range in the cove provides ships a guide for making the north side of the inner berth of Pier 2.

Danger Zone.—A prohibited area is in the vicinity of Bould Island. (See **204.10**, chapter 2, for limits and regulations.)

Gould Island, a military reservation, is about 2 miles north of Rose Island and 0.8 mile east of Conanicut Island. Navigational lights are on the south end and the east side of the island. The island is sparsely wooded; a prominent tall water tank with a red light on top is near the center of the island.

The naval degaussing station in the channel west of Gould Island lies within a prohibited area. Vessels are advised to remain within the limits of the buoyed channel through East Passage when navigating in this area.

Halfway Rock and **Fiske Rock** are about 1.8 miles northeastward of Gould Island, on a small ledge bare at its southern end. Buoys mark this danger. Strangers should not pass between these buoys.

An elevated tank on the high ground near the southerly end of Prudence Island is prominent from East Passage.

Dyer Island, about 0.8 mile eastward of the southern portion of Prudence Island, is low and brush covered. A reef, partly bare, extends 0.4 miles southward and southwestward of the island, and is buoyed. Between the shoal area south of Dyer Island and Rhode Island is a bar with depths of 9 to 17 feet over it. A depth of 15 feet can be carried over the bar by steering on the Navy-maintained lighted Melville range. North of Dyer Island is a reef with depths of 6 to 18 feet.

Melville, a naval fueling facility, is on the west shore of Rhode Island, east of Dyer Island. Depths alongside the fuel piers range from 17 to 40 feet. An elevated spherical tank, about 0.6 mile south-southeastward of the fuel facility, is prominent.

Near **Arnold Point**, about 2 miles north of Melville on Rhode Island, is a large prominent lumber mill with a conspicuous stack. A privately dredged channel with a reported depth of about 29 feet in 1971, leads to a 600-foot pier at the mill.

Chart 278.—Hog Island, about 1 mile north of Arnold Point, lies in the entrance to Bristol Harbor, dividing the waters into two channels. The island has a rolling wooded terrain on which are a few houses and cottages. Shoal water surrounds the island extending as much as 0.4 mile southward and 0.8 mile northward. The shoal area is marked by lights and buoys.

About 0.6 mile east-northeastward of Hog Island Shoal Light is **Musselbed Shoals**, marked on the outer end by a light. From the light structure a directional light is shown to mark the channel to Mount Hope Bay.

Charts 353, 350.—Mount Hope Bay, in the northeastern part of Narragansett Bay, is the approach to the city of Fall River and **Taunton River**. There are two approaches to the bay. The approach from the Sakonnet River, previously discussed, is little used. The approach from East Passage is well marked and has depths of about 30 feet in the channel into the bay.

Fall River, on the eastern shore of the mouth of Taunton River and head of Mount Hope Bay, is an important manufacturing center as well as a distribution point of petroleum products. Principal products handled through the port are petroleum products, latex, shellac, cotton, and some lumber.

Somerset, about 5.3 miles, and **Dighton**, about 7.5 miles above the Fall River, are towns on the west side of Taunton River. **Taunton**, a manufacturing city, is at the head of navigation about 12.5 miles above Fall River.

Mount Hope Bridge crosses the entrance to Mount Hope Bay between **Bristol Point** and Rhode Island. The bridge has two lighted towers which are visible for many miles in clear weather and a fog signal. It is a high-level suspension highway bridge with a clearance of 135 feet.

Mount Hope, is a prominent hill on the western side of the bay 2 miles northeastward of the suspension bridge. The eastern and western slopes are wooded. **Spar Island** is a small, low island near the center of Mount Hope Bay.

Borden Flats, the shoal area northward of the channel in Fall River Harbor, is marked by a light.

Three shallow streams that empty into the northern part of Mount Hope Bay are entered only by local small craft. **Kickamuit River**, the westerly one, has a narrow buoyed entrance through which the currents have considerable velocity. The buoyed channel has a depth of about 6 feet. **Cole River**, the middle of the three, is buoyed on the east side of the entrance. **South Swansea**, on the west shore of **Gardners Neck**, has a boatyard with a 25-ton mobile hoist and a marine railway that can handle craft up to 50 feet for hull, engine, and electronic repairs or storage. Berths, electricity, gasoline, water, ice, and marine supplies are available.

A highway bridge, about 1.5 miles above the entrance, has a 41-foot fixed span with a clearance of 7 feet. **Lee River**, the easterly stream, is navigable to a fixed bridge about 1.2 miles above the entrance. A shoal in midchannel just north of the narrow opening through the fill, 0.8 mile above **Brayton Point**, has a depth of 1 foot.

Channels.—A Federal project provides for a channel 35 feet deep through Mount Hope Bay to about 0.9 mile above the Brightman Street Bridge across Taunton River at Fall River. (See Notice to Mariners and latest editions of the charts for controlling depths.)

A dredged side channel, about 0.2 mile north of **Common Fence Point** (41°39.3′ N., 71°13.3′ W.) at the north end of Rhode Island, leads eastward from the main channel, thence along the Tiverton waterfront. In 1960-65, the channel had a controlling depth of 35 feet.

A privately dredged side channel, about 3.3 miles northeastward of Common Fence Point and marked by buoys and a **326°** private lighted range, leads northwestward from the main channel to a powerplant wharf on the east side of Brayton Point. In September 1970, the channel had a controlling depth of 35 feet.

The controlling depth in the channel in Taunton River above Fall River is reported to be 7 feet to **Peters Point**, 6.7 miles above the Brightman Street Bridge, thence 4 feet to Taunton, 12.5 miles above Fall River. Local knowledge is required for craft with drafts greater than 4 feet from Somerset to Dighton and for all craft from Dighton to Taunton. Buoys mark the channel to about a mile beyond the Berkley Bridge, about 3.5 miles below Taunton.

Anchorages.—Fall River Harbor has no designated anchorages. Vessels may anchor on either side of the dredged approach channel in the outer harbor or at any locality in Mount Hope Bay where depth and bottom are suitable; the chart is the best guide.

Bridges.—At Fall River, two highway bridges cross Taunton River. The first, a fixed bridge at State Pier, has a clearance of 135 feet; a privately maintained fog signal is sounded from the bridge. The second, Brightman Street Bridge, about 1.1 miles above the fixed bridge at State Pier, has a bascule span with a clearance of 27 feet. Between Fall River and Taunton the river is crossed by three bridges. The highway bridge at Berkley, about 5 miles above Fall River, has a swing span with a clearance of 7 feet. Weir Bridge, the fixed highway bridge at Taunton, has a clearance of 10 feet; the fixed railroad bridge, about 0.2 mile upstream from Weir Bridge, has a clearance of 9 feet. (**See 117.87**, chapter 2, for drawbridge regulations and opening signals.) The overhead power cables crossing Taunton River have least clearances of 145 feet at Fall River and 65 feet near Taunton.

Tides.—The mean range of tide is 4.4 feet at Fall River and 2.8 feet at Taunton. (See the Tide Tables for predictions.)

Currents.—In Taunton River the currents generally follow the direction of the channel and, except at bridges, do not hinder navigation. The ebb is usually stronger than the flood. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.)

Weather.—The prevailing winds are northeasterly for all but the summer months, when the direction is southwesterly. The heaviest gales are usually from the northwest. The approach channel and harbor are generally free from **ice** and are navigable throughout the year. Taunton River is commonly closed from December to March. During severe winters the harbor and Mount Hope Bay are occasionally frozen over, but the channels to the principal wharves are kept open by vessels and tugs operating in the harbor.

Pilotage.—Pilotage for Narragansett Bay is discussed at the beginning of this chapter.

Towage.—Tugs up to 1,800 hp. are available at Fall River. Vessels are usually met 2 miles below their berth. Large vessels normally require tugs for docking and undocking. Arrangements for tug service should be made 24 hours in advance, and usually through ships' agents or directly by shipping companies. The tugs monitor VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz), and use channel 18A (156.90 MHz) as a working frequency.

Quarantine officials are stationed in Boston, Mass., **immigration** officials in Providence, R.I., and **agricultural quarantine** officials in Warwick, R.I. (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.

Fall River is a **customs port of entry.**

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.) Fall River has several hospitals.

The Coast Guard **vessel documentation** office at New Bedford, Mass., serves Fall River. (See appendix for address.)

A **harbormaster** is at Fall River.

Wharves.—The piers and wharves at Fall River are along the Taunton and Sakonnet Rivers and in Mount Hope Bay. Only the deepdraft facilities are described. (For a complete description of the port facilities refer to the Port Series, a Corps of Engineers publication.) The alongside depths are reported; for information on the latest depths contact the operator. All the facilities described have highway connections. Fresh water is available at most of the piers and wharves. Cargo in the port is usually handled by ship's tackle.

The **speed limit** is 5 knots in the channel off the piers and wharves.

Facilities at Tiverton, R.I. (chart 353):

Curran and Burton Tiverton Terminal: (41°38′50″ N., 71°12′40″ W.); 50-foot face, 721 feet with dolphins; 35 feet alongside; deck height, 11 feet; receipt of petroleum products; owned by Texaco, Inc., operated by Curran and Burton, Inc.

Northeast Petroleum Co. Pier: about 250 yards north of Curran and Burton Terminal; 600 feet long; 35 feet alongside; receipt of petroleum products; owned and operated by Northeast Petroleum Co.

Pacific Oil Co. of Rhode Island Pier: about 250 yards north of Northeast Petroleum Co. Pier; 40-foot face, 700 feet with dolphins; 34 feet alongside; deck height, 9 feet; receipt of petroleum products; owned and operated by Pacific Oil Co. of Rhode Island.

Gulf Oil Corp. Wharf: east side of Mount Hope Bay, 1.5 miles northward of Pacific Oil Co. Pier; 50-foot face, 795 feet with dolphins; 35 feet alongside; deck height, 9 feet; rail connections; receipt of petroleum products; owned and operated by Gulf Oil Corp.

Facilities at Fall River, east side of Taunton River (chart 350):

Firestone Tire and Rubber Co. Wharf: (41°42′10″ N., 71°10′09″ W.); 380-foot face, 28 feet alongside; lower side 360 feet long, 22 feet alongside; deck heights, 10 feet; rail connections; receipt of latex and fuel oil; owned and operated by Firestone Tire and Rubber Co.

State Pier: 0.2 mile northeast of Firestone Wharf; 398-foot face, lower side 620 feet long; 35 feet alongside; deck heights, 17 feet; 85,000 square feet covered storage, 150,000 square feet of open storage; electrical shore power connections; rail connections; receipt and shipment of general cargo; owned by the Commonwealth of Massachusetts, operated by Fall River Line Pier, Inc.

The battleship **USS MASSACHUSETTS,** World War II memorial, is berthed just northward of the State Pier.

Shell Oil Co. Wharf: about 2 miles above State Pier; 520-foot face, 900 feet with dolphins; 32 feet alongside; deck height, 13 feet; electrical shore

power connections; rail connections; receipt and shipment of petroleum products, bunkering vessels, receipt of asphalt; owned and operated by Shell Oil Co.

Facilities on west side of Taunton River (chart 350):

Brayton Point Station Dock: (41°42′33″ N., 71°11′21″ W.); 1,017 feet long; 37 feet alongside; deck height, 15 feet; coal unloading tower serves conveyor belt system, unloading rate 1,000 tons per hour; electrical shore power connections; receipt of coal; owned and operated by New England Power Co.

Montaup Electric Co. Wharf: about 2.5 miles above Brayton Station Dock; 645 feet long, 34 feet alongside; deck height, 10 feet; receipt of fuel oil; owned and operated by Montaup Electric Co.

Supplies.—Oil bunkering facilities are available at the Shell Oil Co. terminal at the north end of the harbor. Provisions, marine supplies, gasoline, diesel fuel, and water can be obtained in Fall River. Water is available at most of the berths.

Repairs.—Fall River has no drydocking or major repair facilities for deep-draft vessels; the nearest such facilities are at Boston, Mass.

A shipbuilding yard at Somerset operates a marine repair plant for making above-waterline repairs and constructing small vessels. The yard has several shops and portable equipment for making repairs to vessels at their berths.

Small-craft facilities are at Fall River, **South Somerset** opposite Fall River, Taunton, and at Dighton. Berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, marine supplies, and hull and engine repairs are available. The largest marine railways, at Fall River, can handle craft up to 50 feet; mobile hoists up to 35 tons are also available.

Communications.—Fall River has railroad freight service and bus service.

Chart 278.—Bristol Harbor, between **Bristol Neck** on the east end and **Popasquash Neck** on the west, is in a cove about 2 miles long and 1.3 miles wide at its southern end, narrowing to 0.4 mile wide at its northern end. The harbor proper, the northern part of the cove, has depths of 15 to 17 feet.

Bristol is a town on the eastern side of the harbor. Approaching the harbor the most prominent mark is Mount Hope Bridge. Also prominent are the navigation lights, a stone tower, a stack, and an elevated tank on high ground back of the town. The town has freight railroad service and bus service. A ferry operates regularly from Bristol to Prudence and Hog Island.

Hog Island is in the middle of the entrance to Bristol Harbor. A natural channel with depths of 19 to 25 feet extends on each side of the island. Excellent anchorage may be found in the harbor abreast the town in depths of 15 to 17 feet, soft bottom. An **anchorage area** has been designated in Bristol Harbor. (See **110.145 (c)** and **(d)**, chapter 2, for limits and regulations.)

Usher Rocks, about 0.7 mile northeastward of Popasquash Point, are bare at low water. A buoy is eastward of the rocks and on the western side of the western passage to the harbor.

The mean range of **tide** in Bristol Harbor is 4.1 feet.

Depths alongside the piers and wharves range from 9 to 13 feet. The Coast Guard station wharf is marked by a light. **Storm warning signals are displayed.** (See chart.)

Small-craft facilities in Bristol Harbor can provide berths, electricity, gasoline, water, ice, launching ramps, marine supplies, and hull and engine repairs. The largest marine railway, on the west side of the harbor, can handle craft up to 175 feet.

The U.S. Public Health Service maintains a **contract physician's office** in Bristol. (See appendix for address.)

Potter Cove, on the northeast side of Prudence Island, is a small nearly landlocked harbor. Buoys mark the entrance channel off **Gull Point**. **Ohio Ledge**, about 2.5 miles northward of Potter Cove, has a least depth of 8 feet and is marked by a buoy.

Warren River, emptying into the head of Narragansett Bay westward of Bristol Neck, is the approach to the towns of **Warren** and **Barrington**, and **Barrington River**, which joints Warren River at Warren. A church spire and a stack in Warren are prominent.

From the bay, the channel to Warren passes between numerous shoals and rocks and is crooked and winding, but well marked. A depth of about 9 feet is in the channel to the lower wharves at Warren, and the same depth is in Barrington River to the fixed highway bridge about 0.5 mile above the entrance.

An excellent anchorage may be found at the mouth of the Warren River about 0.2 mile from the eastern shore in depths of 14 to 15 feet, soft bottom. There is not room for anchorage in the river for any but small craft. Abreast the lower end of Warren the channel is about 0.1 mile wide, with depths of 13 to 17 feet in midchannel, and small vessels can anchor temporarily at this point.

Vessels approaching the river must take care to avoid **Rumstick Shoal**, which extends nearly 0.6 mile south of **Rumstick Point**, the southernmost point of **Rumstick Neck** and the western entrance point of the river. The shoal has depths of 2 to 12 feet and is marked by buoys. **Rumstick Rock**, 6 feet high, and **Rumstick Ledge** with rocks that uncover 1 to 5 feet, are on the westerly side of the shoal.

About 0.5 mile above the mouth of Barrington River are a fixed highway bridge with a clearance of 9 feet and a railroad trestle with a 32-foot span and a clearance of 6 feet.

The mean range of **tide** at Warren is 4.6 feet. The **tidal current** off the town of Warren has a velocity of about 1 knot. Strong currents may be encoun-

tered in Barrington River.

Diesel fuel, gasoline, water, ice, and marine supplies are available in Warren. Depths alongside the major wharves range from 7 to 15 feet. A yacht club is on the point near the confluence of the two rivers. Several boatyards are in the vicinity; the largest marine railway can handle vessels up to 130 feet in length. Covered storage and complete small-craft engine and hull repairs are available. Warren is served by rail freight and bus communications.

Charts 278, 352.—Providence River, which empties into the head of Narragansett Bay between **Nayatt Point** and **Conimicut Point**, is the approach to the city of Providence, numerous towns and villages, and to Seekonk River.

Providence is at the head of navigation on the Providence River, about 7 miles above the entrance, at the junction of the Providence and Seekonk Rivers. The port area includes both sides of the upper navigable channel of the river. The port's chief waterborne commerce is in petroleum products, cement, lumber, scrap metal, general cargo, and coal.

Occupessatuxet Cove, on the west side of the river north of Conimicut Point, is a shallow bight south of **Gaspee Point**. The cove is frequented only by small craft with local knowledge.

Pawtuxet Cove, used by pleasure and fishing craft, on the west side of Providence River, is entered about 1 mile northward of Gaspee Point through a dredged channel. The channel leads northward from inside the entrance channel to a turning basin at the head of the cove. The entrance channel is marked by a private 253°30′ lighted range and buoys, and the channel to the head is marked by buoys. An anchorage basin, its limits marked by buoys, extends southward from the entrance channel. In June 1971, the controlling depths were 5 feet in the entrance channel, thence 3½ feet to the turning basin at the head of the cove with 2 to 6 feet available in the basin, thence 6 feet in the anchorage basin southward of the entrance channel. A 12-foot high protective dike along the east side of the anchorage basin, extends southward from **Marsh Island**, on the south side of the entrance channel, to **Rock Island**. **Pawtuxet** is a village on the west side of the cove.

The **harbormaster** in the cove controls anchoring and berthing; he can be contacted through the Warwick Town Hall. The largest marine railway in the cove can handle craft up to 55 feet. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and complete hull and engine repairs are available.

Bullock Cove, on the east side of Providence River 2 miles north of Conimicut Point, is the scene of considerable pleasure boat activity. A dredged channel leads from the Providence River to a mooring basin, eastward of Bullock Point, thence through the cove to a mooring and turning basin about 0.5 mile above Bullock Point. In November 1968, the controlling depths were 4½ feet in the entrance channel to the mooring basin eastward of Bullock Point, thence 6 feet in the basin, thence 4½ feet to the mooring and turning basin 0.5 mile above Bullock Point, thence 4 feet in the basin. The entrance is marked by buoys; the channel, by private daybeacons. The largest marine railway, on Bullock Neck about 300 yards northward of Bullock Point, can handle craft up to 60 feet; berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, marine supplies, a 40-ton mobile hoist, and hull and engine repairs are available.

Seekonk River, which branches off northeasterly from Providence River at Providence, is the approach to **Phillipsdale** and **Pawtucket**. The head of navigation is at Pawtucket, 5 miles above the mouth. Commerce on the river is chiefly in petroleum products.

Prominent features.—Conimicut Light (41°43.0′ N., 71°20.7′ W.), 58 feet above the water, is shown from a white conical tower on a brown cylindrical pier on the west side of the entrance to Providence River. A fog signal is sounded at the light station. An abandoned lighthouse on Nayatt Point is also prominent in the approach to the river.

Channels.—The Federal project for Providence River provides for a channel 40 feet deep from just below Prudence Island Light to **Fox Point** near the junction of Providence and Seekonk Rivers. (See Notice to Mariners and latest editions of the charts for controlling depths.) The channel is well marked with navigational aids.

A **hurricane barrier** crosses the Providence River about 200 yards above Fox Point. The barrier includes three gates which normally will be kept in the opened position until the approach of hurricane weather. The clearances at each of the three river gates are: horizontal, 20 feet; vertical (gate fully opened), 21 feet; and depth over the gate sill, 12.9 feet at mean low water.

Seekonk River empties into the easterly side of Providence River at Fox Point. A marked dredged channel leads from Red Bridge, about 1.3 miles above Fox Point, to a point about 150 yards southward of Division Street Bridge at Pawtucket, about 2.9 miles above Red Bridge. The lower section of the river, from Fox Point to Red Bridge, is crooked and winding and marked by two channel buoys about 0.8 mile above Fox Point. In 1963, the controlling depths in the dredged channel from Red Bridge to Division Street Bridge were: 8 feet (12 feet at midchannel) to Bishop Point, about 1.9 miles above Red Bridge; thence 6½ feet (7½ feet at midchannel) to just below Division Street Bridge. The lower section of the river requires local knowledge and the use of the chart to carry the best water.

A privately dredged channel leads from the main channel in Providence River, eastward of Pawtuxet, to a turning basin at the Naval Reserve Training Center southwestward of **Fields Point** (41°47.2′ N., 71°22.9′ W.). The channel is marked by buoys, and

in 1959 had a reported depth of 12 feet, with a least depth of 11 feet in the basin.

Anchorages.—Vessels anchor as directed by the **harbormaster** on the edge of the channel between Fields Point and Fox Point. Eastward of Fox Point, a few vessels may anchor in the area where a portion of **Green Jacket Shoal** was removed. Preferred small-craft anchorages are in Bullock Cove and Pawtuxet Cove.

Dangers.—Numerous rocks and ledges border Providence River channel on either side. Lights mark the shoal areas off **Bullock Point**, about 1.5 miles above the mouth; off **Sabin Point**, about 3 miles above the mouth; off **Pomham Rocks**, about 3.5 miles above the mouth; and off **Fuller Rock**, about 5 miles above the mouth.

Bridges.—There are no bridges over Providence River between the mouth and the principal wharves. Point Street Bridge, about 0.3 mile above Fox Point, has a swing span with a clearance of 9 feet. Two overhead power cables cross the river between this bridge and the Fox Point Hurricane Barrier about 300 yards to the southward; least clearance is 60 feet. A fixed highway bridge about 300 yards north of Point Street Bridge has a clearance of 26 feet.

In Seekonk River, an overhead power cable crossing at **India Point (352)**, 0.5 mile above the mouth, has a clearance of 130 feet. Just above India Point four drawbridges cross the river within 0.8 mile. The name of bridge, type, and clearance follows: India Point Bridge, swing span, 4 feet; Washington Bridge, bascule span maintained in closed position, 40 feet; Tunnel Bridge, bascule span, 17 feet; and Red Bridge, swing span, 13 feet. In 1966-67, two new fixed-span highway bridges were under construction across the river. The first, close northward of Washington Bridge, has a design clearance of 42 feet; the second, about 0.2 mile north of Red Bridge, has a design clearance of 42 feet. Just below the State Pier at Pawtucket are overhead power cables with clearance of 125 feet. (See **117.90**, chapter 2, for drawbridge regulations and opening signals.)

Tides.—The mean range of tide at Providence is 4.6 feet, and the maximum range due to the combined effect of wind and other causes may reach 8 feet or more at times. (For daily predictions, see Tide Tables.)

Currents.—Tidal currents are weak in the approach channel and the harbor, except in the constricted parts of Seekonk River. At India Street Bridge and Red Bridge the tidal currents have velocities of about 1.4 knots. In Seekonk River the double flood is very pronounced. The velocity near the middle of the flood period is generally less than 0.5 knot and is sometimes in an ebb direction. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.)

Weather.—The proximity of Narragansett Bay and the Atlantic Ocean plays an important part in determining the climate for Providence and vicinity. In winter, the temperatures are modified considerably, and a good many of the major storms drop their precipitation in the form of rain, rather than snow. In summer, many days that would otherwise be uncomfortably warm are cooled by refreshing seabreezes. At other times of the year, sea fog may be advected over land by onshore winds. In fact, most cases of dense fog are produced in this way; but the number of such days is few, averaging 2 or 3 days per month. In early fall, severe coastal storms of tropical origin sometimes bring destructive winds to this area. Even at other times of the year, it is usually coastal storms that produce the most severe weather.

The temperature for the entire year averages around 50° F. February is the coldest month, and July the hottest month. Freezing temperatures occur on the average about 120 days per year.

Measurable precipitation occurs about 1 day out of every 3, and is fairly distributed throughout the year.

Thunderstorms are responsible for much of the rainfall from May through August. They usually produce heavy, and sometimes even excessive, amounts of rainfall; but since the duration is relatively short, damage is ordinarly light. The summer thunderstorms are frequently accompanied by extremely gusty winds, which may cause some damage to property, especially small pleasure and fishing craft.

The first measurable snowfall of winter usually comes toward the end of November. The month of greatest snowfall is usually February. It is unusual for the ground to remain well covered with snow for any long period of time.

Ice.—The approach channel and the harbor are generally free of ice and navigable throughout the year. During severe winters, the harbor and several miles of Providence River and upper Narragansett Bay are occasionally frozen over, but the ice is usually broken up in the channels to the principal wharves by the traffic in the harbor.

The National Weather Service maintains an office at the T.F. Green State Airport; barometers may be compared here. (See appendix for address.) **Storm warning display** locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

(See appendix for the Providence **climatological table.**)

Pilotage.—Pilotage for Narragansett Bay is discussed at the beginning of this chapter.

Towage.—Tugs up to 1,800 hp. are available at Providence. Large vessels normally require tugs for docking and undocking. Arrangements for tug service should be made 24 hours in advance, and usually through ships' agents or directly by shipping companies.

Providence is a **customs port of entry.** Quarantine officials are stationed in Boston, Mass., **immigration officials** in Providence, R.I., and **agricultural quarantine** officials in Warwick, R.I. (See appen-

dix 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 regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The U.S. Public Health Service maintains a **contract physician's office** in Providence. (See appendix for address.) Providence has several hospitals.

Coast Guard.—The **Captain of the Port** maintains an office at the Federal Building. **Marine inspection** and **vessel documentation** offices are at the Customhouse. (See appendix for addresses.)

Harbor regulations are enforced by the **harbormaster,** whose headquarters are at the municipal wharf. The harbormaster regulates the movement and anchoring of vessels in the harbor. The **speed** limit in the harbor is 5 knots.

Wharves.—The piers and wharves of the port of Providence are along both sides of the Providence River below Fox Point. Only the deep-draft facilities are described. (For a complete description of the port facilities refer to the Port Series, a Corps of Engineers publication.) The alongside depths are reported; for information on the latest depths contact the operator. All the facilities described have highway connections, and most have rail connections. Fresh water is available at most of the piers and wharves. Cargo in the port is usually handled by ship's tackle.

Facilities on the east side of Providence River:

Mobil Oil Corp. Wharf: (41°46′56″ N., 71°22′20″ W.); 1,250-foot face; 32 feet alongside; deck height, 8 feet; pipelines to storage tanks; receipt and shipment of petroleum products, bunkering vessels; owned and operated by Mobil Oil Corp.

American Oil Co. Wharf: at Kettle Point about 0.9 mile above Mobil Oil Corp. Wharf; 500-foot face, 600 feet with dolphins; 38 feet alongside; deck height, 12 feet; receipt and shipment of petroleum products, bunkering vessels; owned by American Oil Co., operated by American Oil Co., and Atlantic Refining Co.

Gulf Oil Corp. Pier: about 1.5 miles above Mobil Oil Corp. Wharf; 90-foot face, 260 feet with dolphins; 40 feet alongside; deck height, 11 feet; receipt and shipment of petroleum products, bunkering vessels; owned and operated by Gulf Oil Corp.

Wilkesbarre Pier: about 2 miles above Mobil Oil Corp. Wharf; 135-foot face, 15 to 30 feet alongside; south side not used; north side 890 feet long, 500 feet usable, 30 feet alongside; deck height, 9 feet; receipt of petroleum products and chemicals; owned by Humble Oil and Refining Co., operated by Getty and American Minerals.

Facilities on the west side of Providence River:

Municipal Wharf: (41°47′38″ N., 71°23′06″ W.); 3,350-foot face; 30 to 35 feet alongside; deck height, 10½ feet; 136,000 square feet of covered storage; 40 acres open storage; electrical shore power connections; cruise passengers; receipt and shipment of general cargo, receipt of caustic soda, lumber, petroleum products, scrap metal, and pig iron; LASH (Lighter-abroad-ship) vessels are served at this facility; owned and operated by city of Providence.

Sun Oil Co. Wharf: about 300 yards above Municipal Wharf; 650-foot face, 32 feet alongside; deck height, 10½ feet; receipt of petroleum products; owned by city of Providence, operated by Sun Oil Co.

New England Bituminous Co. Wharf: about 500 yards above Municipal Wharf; 384-foot face, 30 feet alongside; deck height, 10½ feet; receipt of asphalt; owned by city of Providence, operated by New England Bituminous Co.

Providence Gas Co. Wharf: about 0.4 mile above Municipal Wharf; 660-foot face, 30 feet alongside; deck height, 12 feet; receipt of petroleum products and liquid natural gas; owned by Providence Gas Co., operated by Providence Gas Co., and Gulf Oil Corp.

Harbor Junction Pier: about 0.7 mile above Municipal Wharf; 80-foot face, south side 1,040 feet long, 720 feet usable; north side 1,040 feet long, 600 feet usable, 35 feet alongside; deck height, 9 feet; receipt and shipment of petroleum products, bunkering vessels; owned by Texaco, Inc., operated by Texaco, Inc., and Curran and Burton, Inc.

State Pier: about 1 mile above Municipal Wharf; 120-foot face, 37 to 31 feet alongside; south side 596 feet long, 31 to 16 feet alongside; north side 596 feet long, 36 to 19 feet alongside; deck height, 12 feet; 20 acres of open storage, 25,000 square feet covered storage; shipment of scrap metal.

American Oil Co. Pier: about 1.2 miles above Municipal Wharf; south side 600 feet long, 30 feet alongside; deck height, 11 feet; receipt of petroleum products; owned by American Oil Co., operated by Northeast Petroleum Corp. of Rhode Island.

C.H. Sprague and Son Pier: about 1.25 miles above Municipal Wharf; 37-foot face, 37 feet alongside; south side 526 feet long, 12 to 14 feet alongside; north side 526 feet long, 601 feet with dolphins, 32 feet alongside; deck height, 12 feet; 3 unloading towers serve beltconveyor system, capacity, 1,000 tons per hour; 60,000-ton open storage; receipt of petroleum products, salt, pumice, and dry bulk commodities, bunkering vessels; owned and operated by C.H. Sprague and Son Co.

Narragansett Electric Co. Wharf: about 1.4 miles above Municipal Wharf; 40-foot face, 280 feet with dolphins, 33 feet alongside; deck height, 8 feet; receipt of fuel oil; owned and operated by Narragansett Electric Co.

The principal wharves at Pawtucket have depths of 9 to 14 feet alongside.

Supplies.—Gasoline, diesel fuel, diesel oil, bunker fuels, provisions, and marine supplies of all kinds are available. Oil bunkering facilities, for

deep-draft vessels, are available at most of the petroleum companies facilities in Providence. Fuel tank barges are also available for bunkering vessels anywhere in the harbor. Water is available at most of the wharves and piers.

Repairs.—Providence has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Boston, Mass. Repairs to boilers, machinery, electrical equipment, and hull can be obtained in the port. Several well-equipped machine and welding shops are also available. Some of these concerns also maintain portable equipment for making above-waterline repairs to vessels at their berths.

Small-craft facilities at Bullock Cove and Pawtuxet have been discussed earlier in this chapter. Other facilities on the west side of Providence River between Pawtuxet and Fields Point can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and hull and engine repairs; a 20-ton mobile hoist is just westward of Fields Point.

Communications.—Providence is served by rail, bus, and air. A ferry operates daily in the summer to Newport and Block Island.

Chart 236.—West Passage, between Conanicut and Prudence Islands on the east and Boston Neck on the west, is the approach to Dutch Island Harbor, Wickford, Quonset Point, and East Greenwich. Vessels may also go to Providence by West Passage, although the route through East Passage is deeper and generally used. The following directions for West Passage to Providence River are good for a draft of 19 feet, but local knowledge is required for a draft greater than 12 feet. Approaching from the eastward, pass clear of Brenton Reef Light and steer for the lighted gong buoy off Whale Rock until southwest of Beavertail Light, and thence lay down a northerly course in midchannel with Dutch Island Light ahead. On the southward approach from off Point Judith Light, a north-northeasterly course will bring the vessel to the lighted gong buoy off Whale Rock. (See also chart 1210.) At night a careful study of the light characteristics is necessary as the lights marking East Passage will be seen on the starboard bow when approaching from Point Judith.

The course should pass westward of, and 500 yards off, Dutch Island; thence through the Jamestown-North Kingston Bridge opening, and thence northerly until about 0.8 mile westward of, and abeam, the south tangent of Hope Island. From here a north-northeasterly course will make the buoys marking the entrance of the natural channel westward of Pine Hill Point on Prudence Island. Then a heading toward Warwick Point Light until abeam the bell buoy off Northwest Point on Patience Island will bring the vessel in position to swing northeasterly and easterly to the dredged channel to Providence.

Narragansett Pier, on the west side of West Passage about 3 miles west-southwestward of Beavertail Point, is a summer resort having railroad freight communications. The large hotels and a square granite tower are prominent. A municipal bathing beach and pavilion at the Upper Pier are prominent from an easterly direction.

River Ledge, about 0.9 mile northeastward of Narragansett Pier, has a least depth of 9 feet and is marked by a buoy. **Whale Rock**, on the western side of the passage about 0.8 mile northeast of River Ledge, is marked by a daybeacon, and a lighted gong buoy is to the eastward. **Little Whale**, covered 4 feet, is about 200 yards north of Whale Rock. Strangers should pass eastward of the buoy off Whale Rock.

Bonnet Shores Beach is on the north shore of the bight formed by **Bonnet Point**, the point about 1.5 miles north of Whale Rock. A bathing pavilion at the beach is prominent from a southeasterly direction.

The Bonnet, a prominent hill with the shoreward face bold and rocky, is north of Bonnet Point. The shore between Bonnet Point and **South Ferry**, 1.3 miles northward, should be given a berth of 400 yards. Pilings extend 130 yards eastward just south of the old pier at South Ferry. A church spire inland of South Ferry is prominent from southward to north of Dutch Island.

Fox Hill, on the southern side of the entrance to Dutch Island Harbor, 2.5 miles north of Beavertail Point, is a point which terminates to the northward in Beaverhead, a bluff rocky face.

Dutch Island Harbor is in the West Passage of Narragansett Bay about 3 miles north of Beavertail Light. The harbor is a semicircular indentation 0.5 by 1 mile in extent in the west side of Conanicut Island.

A boatyard in the southeastern part of the harbor has a marine railway that can handle craft up to 50 feet for hull and engine repairs. Berths, electricity, gasoline, diesel fuel (by truck), water, ice, storage, a launching ramp, some marine supplies, and a 40-ton lift are available.

Dutch Island Light (41°29.8′ N., 71°24.3′ W.), 56 feet above the water, is shown from a white square tower, on the southern point of **Dutch Island**, about 2.8 miles north of Beavertail Point. The light is an excellent guide from southward.

Dutch Island Harbor may be approached from northward or southward. The southward entrance is good for a depth of about 28 feet; the northern entrance has an extensive shoal with depths of 15 to 18 feet. As the harbor is of easy access, it is frequently used as a harbor of refuge. Excellent anchorage may be had in depths of 12 to 48 feet, sticky bottom. Vessels of over 18-foot draft seeking anchorage should give the eastern shore of the harbor a berth of at least 0.4 mile. The eastern shore of Dutch Island should be given a berth of 100 yards.

(See **110.145 (b)** and **(d)**, chapter 2, for limits and regulations of anchorage areas designated for West Passage of Narragansett Bay.)

A bell buoy marks the shoal area off the northern side of Dutch Island. The piers off the

east side of the island are in ruins. A shoal extends about 200 yards westward and 350 yards northward of **Beaverhead**. At its northern extremity this shoal rises abruptly from depths of about 40 feet to a depth of 8 feet; a buoy marks the shoal. The southeastern part of the harbor has a shallow cove.

Tidal currents of from 1 to 1.5 knots may be encountered in the vicinity of Dutch Island. Elsewhere in West Passage velocities are usually less than 1 knot. (See the Tidal Current Tables for predictions, and the Tidal Current Charts, Narragansett Bay, for hourly velocities and directions of the current.)

Saunderstown is on the western shore of West Passage abreast Dutch Island. A former ferry dock off the town is in ruins. A yacht club is at Saunderstown.

The **Jamestown-North Kingstown Bridge** crossing the passage from just north of Plum Beach has a fixed span with a clearance of 134 feet; a fog signal is sounded from the west pier of the main channel opening.

From the bridge northward, **Great Ledge** extends along the west shore of Conanicut Island for about 1.5 miles. This ledge is from 175 to 500 yards offshore, culminating in **America Ledge** at its northern end. Numerous rocks are on Great Ledge. Between Plum Beach and **Rome Point**, on the west side of the passage, 1.2 miles north of the bridge, are several rocks, including **Red Rock** and **Old Sergeant**. Bare and covered rocks are northeastward and eastward of Rome Point.

Fox Island, 0.4 mile northeast of Rome Point and southward of Wickford Harbor, is small and low. A shoal with numerous submerged rocks including **Seal Rock** extends southward of the island. A narrow channel, suitable only for small craft, is between this shoal and the shoals extending northeastward of Rome Point. **Halfway Ledge** with a depth of 18 feet is about 0.5 mile east of Fox Island.

Wickford Harbor, on the western side of Narragansett Bay 8 miles above Beavertail Light, comprises an outer and an inner harbor. The outer harbor is a broad bight between Quonset Point on the north and **Wild Goose Point**, about 0.6 mile westward of Fox Island, on the south. The entrance is about 2 miles wide. Depths in the middle and southern parts of the outer harbor average 13 to 17 feet. The inner harbor entrance is between **Poplar Point**, 1.3 miles northwest of Fox Island on the south, and **Sauga Point**, about 0.4 mile north of Poplar Point, on the north. The harbor is used chiefly by recreational craft, and by oyster and lobster boats. The town of **Wickford** is on the southwestern side of the inner harbor.

Several prominent landmarks are visible when approaching Wickford Harbor. A stack, about 1.2 miles south of town, the North Kingston standpipe (chart 353), and a church spire in Wickford may be seen for many miles. An abandoned lighthouse on Poplar Point and the light off the point are prominent.

The channel to the inner harbor, marked by buoys, is restricted to a width of about 150 yards by the breakwaters and the shoals off Sauga and Poplar Points. The north breakwater is marked by a light and the south breakwater by a buoy off its northern end. The channel leads to the junction of three coves, **Fishing Cove** to the northward, **Mill Cove** to the northwestward, and Wickford Cove to the southwestward.

Wickford Cove is the scene of considerable pleasure-boat activity. A dredged channel in the cove extends between flats, many of which are dry at low water, to a highway bridge about 0.9 mile above the breakwaters. Numerous piles, used as moorings, border the channel for about 0.35 mile below the highway bridge. In 1967, the channel had a controlling depth of 7 feet.

A marked dredged channel in Mill Cove leads to an anchorage basin about 0.7 mile above the breakwaters. In 1967, the channel had a controlling depth of 12 feet with 6 feet in the anchorage basin.

Good anchorage may be had in the middle and southern parts of outer Wickford Harbor in depths of 14 to 17 feet. The northern part of the outer harbor has numerous rocks and ledges with a depth of 6 feet. **General Rock**, with a depth of 9 feet over it, is the southerly limit of this shoal, 0.9 mile north-northeastward of Fox Island. A rock with a depth of 8 feet over it is about 500 yards westward of General Rock. **Brig Ledge**, about 0.5 mile north of General Rock, is covered 9 feet. The southern shore of the outer harbor is foul. **Charles Rock**, with a depth of 4 feet, is just inside of the northern breakwater and marked by a buoy.

Vessels approaching Wickford Harbor from the southward, after passing through the main span of the Jamestown-North Kingston Bridge, steer **340°**. When northeastward of Fox Island, steer for Wickford Harbor Light on any bearing between 313° and 290°, anchoring 0.2 mile or more southeastward of the light in depths of 13 to 15 feet, soft bottom.

In severe winters the inner harbor is closed by ice, but the outer harbor is usually open although drift ice is occasionally encountered.

Wickford has several small-craft facilities and boatyards. The largest marine railway, on the east of Wickford Cove, can handle craft up to 60 feet. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, a launching ramp, and hull and engine repairs are available; wet and dry storage is also available.

Quonset Point, on the north side of Wickford Harbor, is marked by several radio masts, elevated tanks, and an aero light. Near the eastern end of the point are the conspicuous buildings of the power station. The Navy pier at Quonset Point and the piers at **Davisville Depot**, another Navy establishment about 1.5 miles northward, are usually approached from East Passage until north of Conanicut Island, thence through a buoyed dredged channel to a turning basin off the point

from which a channel leads to the depot. These channels and turning basins are Navy-maintained. A depth of about 33 feet can be carried in the channel to the turning basin. With the exception of 27- and 30-foot spots, depths of 32 to 35 feet are available throughout the basin; depths of 30 feet are reported alongside the pier. A fog signal is sounded from a dolphin structure off the end of the pier. In December 1965, the controlling depth in the channel to Davisville Depot was 31 feet, thence 27 feet in the turning basin or 28 feet for a middle width of 800 feet through the basin to the piers; depths of 29 feet were available on the southwest side of Pier 1 and in the slip between Piers 1 and 2.

Hope Island, about 1.6 miles north of Conanicut Point, has low grassy hills with a few trees. Bare and sunken rocks surround the island for about 0.2 mile. **Despair Island** is on the outer end of a rocky ledge extending 0.2 mile northeastward of Hope Island; a buoy is off the northeast side of the ledge. **Scup Rock** and **Round Rock Island** and **Seal Rock** are off the western side. A hazardous reef with piles and a boiler awash on it is about 0.4 mile southwestward of the southwest point of Hope Island; a buoy marks the area.

Allen Harbor, used by the Navy, is 2 miles north of Quonset Point. The harbor is entered through a buoyed channel which has a depth of about 8 feet. Depths of 8 to 10 feet are inside.

Calf Pasture Point is on the north side of the entrance to Allen Harbor. Abreast the point and for some distance northward of it, a shoal extends 0.5 mile from shore.

Chart 278.—Potowomut River, entering the west side of West Passage, 1.7 miles north of Calf Pasture Point, is separated from Greenwich Bay on the north by **Potowomut Neck**. A depth of about 4 feet can be carried over the bar at the entrance and into the narrow crooked channel inside. Caution is necessary to avoid rocks with depths of 1 foot over them in the entrance. Strangers should not enter the river.

Round Rock, about 0.7 mile eastward of Potowomut River entrance, uncovers 3 feet and is marked by a buoy close to the southeastward. Several other rocks, awash and sunken, lie between Round Rock and the entrance to the river; caution is advised.

The natural channel of West Passage extends between the shoal area eastward of Round Rock and the shoal area westward of Patience Island. The channel has depths of 21 to 70 feet. Buoys mark the entrance from the southward, and a lighted bell buoy marks the northwestward edge of the shoal off Patience Island. The channel is the approach from southward to Greenwich Bay, Warwick Point, and the channel from West Passage to Providence River.

Patience Island, 0.2 mile west of the northern end of Prudence Island, is surrounded by shoals and foul ground.

Warwick Point, the southernmost point of **Warwick Neck**, 0.7 mile northwest of Patience Island, is marked by a light and fog signal.

Greenwich Bay, at the northwestern end of Narragansett Bay, is entered between Warwick Neck and Potowomut Neck. Shoal water borders the shore of the bay, but the general depths are 10 feet or more.

Warwick Cove, between Warwick Neck and Horse Neck, is in the northeastern part of Greenwich Bay. A marked dredged channel leads from the bay to an anchorage basin at the head of the cove; other anchorage basins in the cove are on the west side of the channel, 0.5 mile above the channel entrance, and on each side of the channel 0.7 mile above the channel entrance. In 1966-67, the controlling depths in the channel and anchorage basins were 6 feet. A shoal, bare at low water, extends about 150 yards westward from the east side of the channel to the southeast end of Horse Neck. The cove is the scene of considerable pleasure boat activity.

The **harbormaster** in the cove controls berthing and anchorage; contact can be made through the Warwick Town Hall. The cove has several marinas and boatyards. Berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, marine supplies, and hull and engine repairs are available. The largest mobile hoist, on the west side of the cove about 0.8 mile above the mouth, can handle craft up to 40 feet.

Brush Neck Cove, about 0.5 mile west of Warwick Cove, is fronted by a flat with a general depth of about 2 feet. Bush stakes mark the shallow channel at the entrance. This channel is used by small local craft at high water as far as the pier at Oakland Beach. **Oakland Beach**, on **Horse Neck**, between Brush Neck and Warwick Coves, is a summer resort with bus communication.

Apponaug Cove, in the northwestern part of Greenwich Bay, is entered through a marked dredged channel that leads from the bay to a fixed railroad bridge about 0.7 mile above the channel entrance. In 1968, the channel had a controlling depth of 6 feet on the centerline; depths of less than 1 foot are above the bridge. There are several small-craft facilities in the cove, and at the west end of Greenwich Bay just southwestward the entrance channel to the cove. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, launching ramps, mobile hoists up to 35 tons, and marine supplies are available; hull and engine repairs can be made. The berths and anchorage in Apponaug Cove are under the control of a **harbormaster**; he can be contacted through the Warwick Town Hall.

Chepiwanoxet Island, on the western side of the bay northward of the entrance to Greenwich Cove, is a small neck of land with a yellow bluff facing eastward. From this island, shoals with little water over them extend about 500 yards northward and 300 yards eastward and southeastward. Shoals extend about 300 yards northward and westward of **Long Point**, the northwestern extremity of

Potowomut Neck.

Greenwich Cove, in the southwest end of Greenwich Bay, is about 1.3 miles long and 300 to 600 yards wide. On the western shore is the town of **East Greenwich**. Depths of about 7 to 11 feet are available in the cove to about 0.5 mile from the head. Good anchorage may be had off some of the small-craft facilities on the west side of the cove in depths of 8 to 11 feet.

The mean range of **tide** is 4.0 feet.

The cove has several boatyards; the largest marine railway, near the entrance to the cove, can handle craft up to 90 feet long and 9 feet in draft. Berths, electricity, gasoline, water, diesel fuel (by truck), ice, marine supplies, wet and dry storage, launching ramps, and complete engine and hull repairs are available. The **harbormaster** in the cove controls anchoring and berthing; contact can be made through the Warwick Town Hall.

From **Sandy Point**, the eastern extremity of Potowomut Neck, shoals with depths of 2 to 9 feet extend northeasterly for about 0.6 mile. Extensive shoals extend off the eastern side of Warwick Neck to Ohio Ledge. **Rocky Point** is on the eastern side of the neck, 1.7 miles north-northeastward of Warwick Point.

The natural channel between the shoals off Warwick Neck and the shoals northward of Patience and Prudence Islands has depths of 19 to 50 feet. A buoy marks the shoal off **Providence Point**, the northernmost point of Prudence Island.

Chart 1210.—The shoreline of **Point Judith Neck** between West Passage and Point Judith should be given a berth of at least 0.6 mile. From Narragansett Pier to **Black Point**, a rocky promontory 1.9 miles southward, the shoreline is a rugged rocky ledge with deep water close inshore. The waters between Black Point and Point Judith are boulder-strewn, and shoal up gradually.

Three very prominent landmarks are Point Judith Light, the elevated water tank 1.7 miles north of Point Judith, and Hazard's tower, a high, square stone tower 0.5 mile south of Narragansett Pier. Closer inshore the stone bathing pavilion at the State-operated **Scarborough Beach**, 0.5 mile south of Black Point, and an open stone tower on a house 0.4 mile north of Black Point are prominent.

7. BLOCK ISLAND SOUND

This chapter describes Block Island Sound, Fishers Island Sound, Gardiners Bay, Little Peconic Bay, Great Peconic Bay, and the ports and harbors in the area, the more important of which are Point Judith Harbor, Great Salt Pond, Stonington, Mystic Harbor, and Greenport.

Charts 1211, 271.—Block Island Sound is a deep navigable waterway forming the eastern approach to Long Island Sound, Fishers Island Sound, and Gardiners Bay from the Atlantic Ocean. The sound is a link for waterborne commerce between Cape Cod and Long Island Sound. It has two entrances from the Atlantic—an eastern entrance between Block Island and Point Judith, and a southern entrance between Block Island and Montauk Point. The sound is connected with Long Island Sound by The Race and other passages to the southwestward, and with Fishers Island Sound by several passages between rocky reefs from Watch Hill Point to East Point, Fishers Island.

The north shoreline of Block Island Sound and Fishers Island Sound from Point Judith to New London is generally rocky and broken with short stretches of sandy beach. Many inlets and harbors, especially in the vicinity of Fishers Island, afford harbors of refuge for vessels. Most of the rocks and shoals near the channels are marked with navigational aids.

The southern part of Block Island Sound is bounded by Block Island on the east, the eastern extremity of Long Island, and Gardiners Island on the west. Plum Island and Fishers Island are at the western end of the sound.

The deep water in the central part of Block Island Sound will accommodate vessels of the greatest draft.

Westward of Gardiners Island, enclosed between the northeastern and eastern ends of Long Island, are Gardiners Bay, Shelter Island Sound, Little Peconic Bay, and Great Peconic Bay. This area is well protected but generally shallow, and is not suited for deep-draft vessels. The shoreline is marked by many indentations and shallow harbors. These waters are much used by commercial fishing vessels and small pleasure craft because of the protection afforded and the many anchorages.

Block Island North Reef is a sand shoal with depths of 14 feet or less extending 1 mile northward from **Sandy Point** at the north end of Block Island. The shoal should be avoided by all vessels; its depths change frequently, and its position is also subject to a slow change. It is practically steep-to on all sides, so that soundings alone cannot be depended on to clear it. A lighted bell buoy is 1.5 miles northward of the point.

Southwest Ledge, 5.5 miles west-southwestward of Block Island Southeast Light, has a least known depth of 23 feet and is marked on its southwest side by Southwest Ledge Lighted Bell Buoy 2. Rocky patches with least depths of 27 and 29 feet extend 1.5 miles northeastward from the ledge. The sea breaks on the shoaler places on the ledge in heavy weather.

Several other dangers that must be guarded against are northward and westward of Southwest Ledge Lighted Bell Buoy 2. These dangers are: two obstructions, about 300 yards apart, covered 31 and 32 feet, and marked by a lighted horn buoy, are about 2.2 miles 280° from the lighted bell buoy; a reported unmarked submerged obstruction is about 0.7 mile 282° from the lighted bell buoy; and two obstructions, cleared to a depth of 36 feet, are about 0.75 mile north of the lighted bell buoy.

The deepest passage in the southern entrance to Block Island Sound is just westward of Southwest Ledge, and has a width of over 2 miles; this is the best passage for deep-draft vessels. In heavy weather vessels desiring to enter the sound westward of Block Island should pass westward of Southwest Ledge Lighted Bell Buoy 2, taking care to pass clear of the obstructions mentioned above.

Between the inner patch of rocks and the shoals, which extend 0.9 mile from Block Island, is a channel 1.3 miles wide, with a depth of about 34 feet. Vessels using this channel round the southwest end of Block Island at a distance of 1.5 miles. It is not advisable to use this passage during heavy weather.

The entrance between Point Judith and Block Island is used by vessels coming from the bays and sounds eastward to Long Island Sound. The route generally used is through The Race. Tows of light barges and vessels of 14 feet or less draft sometimes go through Fishers Island Sound, especially during daylight with a smooth sea. This entrance is clear with the exception of Block Island North Reef. The coast from Point Judith nearly to Watch Hill should be given a berth of over 1 mile, avoiding the broken ground with depths less than 30 feet.

(Full tidal information, including daily predictions are given in the Tide Tables.)

The effect of strong winds, in combination with the regular tidal action, may at times cause the water to fall several feet below or rise the same amount above the plane of reference of the chart. The mean range of **tide** throughout Block Island Sound varies from about 3 feet at Point Judith to 2 feet at Montauk Point.

Tidal current data for a number of locations in Block Island Sound are given in the Tidal Current Tables. Current directions and velocities

throughout the sound for each hour of the tidal cycle are shown on Tidal Current Charts, Block Island Sound and Eastern Long Island Sound.

The tidal currents throughout Block Island Sound have considerable velocity; the greatest velocities occur in the vicinity of The Race and in the entrances between Montauk Point, Block Island, and Point Judith. Soundings alone cannot be depended upon to locate the position; approaching the shores or dangers, the shoaling is generally abrupt.

In the middle of the passage between Point Judith and Block Island, the velocity is 0.7 knot. The flood sets westward, and the ebb eastward.

In the passage between Block Island and Montauk Point, the flood sets generally northwestward, the ebb southeastward. In the middle of the passage the velocity of flood is 1.5 knots, and 1.9 knots on the ebb. About 1.3 miles eastward of Montauk Point, the flood sets 346°, ebb 162°, with a velocity of 2.8 knots.

In Block Island Sound and in the eastern part of Long Island Sound, **fogs** are generally heaviest with southeast winds. In these waters the usual duration of a fog is from 4 to 12 hours, but periods of from 4 to 6 days have been known with very short clear intervals. In the autumn, **land fogs**, as they are termed locally, sometimes occur with northerly breezes, but are generally burned off before midday.

The Race may be said to be the only locality where tidal currents have any decided influence on the movements of the ice. Large quantities of flow ice usually pass through The Race during the ebb, especially if the wind is westerly, and in severe winters this ice causes some obstruction in Block Island Sound and around Montauk Point. These obstructions are the most extensive around the middle of February.

Pilotage is compulsory for foreign vessels and U.S. vessels under register in Block Island Sound and Long Island Sound. On advance request, pilots board vessels in the vicinity of Block Island Southeast Lighted Whistle Buoy (41°05.8′ N., 71°30.0′ W.), Block Island North Reef Lighted Bell Buoy 1BI (41°15.5′ N., 71°34.6′ W.), or about 2 miles south of Point Judith Lighted Whistle Buoy 2 (41°20.0′ N., 71°28.5′ W.), or in the vicinity of Brenton Reef Light (41°25.6′ N., 71°23.4′ W.). The pilot boats are equipped with VHF and medium frequency radiotelephones. Arrangements for pilots should be made through ships' agents or directly by shipping companies. Pilotage, where required for the major ports on Long Island Sound, is discussed under the name of the port.

Chart 269.—Block Island, 5 miles long, is hilly with elevations up to about 200 feet. The shore of the island is fringed in most places by boulders and should be given a berth of over 0.5 mile even by small craft; the shoaling is generally abrupt in approaching the island.

Weather.—Block Island, formed by glaciers, consists of nearly 7,000 acres and lies in the Atlantic Ocean about 12 miles east-northeast of Long Island and about the same distance south of Charlestown, R.I. Hence, the climate is typically maritime, but under conditions of extreme cold or heat the effect is felt on the island as well as on the mainland. Temperatures of -10° F. and 95° F. have been recorded.

Summers are usually dry. Recorded rainfall for any one month range from a trace to 12.93 inches. In July and August maximum temperatures average 74°. The island is too small to build up cumulonimbus clouds, and local thunderstorms do not occur. Fog occurs on one out of four days in the early summer, when the ocean is relatively cold.

Winters are distinguished for their comparative mildness, maxima average 4 to 10° above freezing and minima average 25° in February. Since the surface winds are usually easterly when snow begins it soon changes to rain or melts rapidly after it piles up. The ocean temperatures are of course always somewhat above freezing and not far off shore are relatively high.

The ocean has a dampening effect on hot winds in summer and an accelerating effect on cold winds from the mainland in the winter. Katabatic winds from Narragansett Bay and Long Island reach as high as 40 m.p.h. when anticyclonic conditions prevail on the mainland in winter. The wind velocity averages 17 m.p.h. for the year, but in the winter, the mean is 20 m.p.h., when gales are frequent. In the early fall most of the tropical storms moving up the coast affect the island to some extent.

(See appendix for **Block Island climatological table.**)

The U.S. Public Health Service maintains a **contract physician's office** at Block Island. (See appendix for address.)

Communications.—A ferry operates daily from Galilee to Great Salt Pond or Old Harbor, carrying mail, passengers, freight, and vehicles. There is summer ferry service from Old Harbor to Providence, via Newport, and from Great Salt Pond to New London. In heavy southeasterly weather, the Providence boat uses Great Salt Pond. The island has telephone service to the mainland. Air service is also available.

Block Island Southeast Light (41°09.2′ N., 71°33.1′ W.), 201 feet above the water, is shown from a red brick octagonal pyramidal tower, 67 feet high, attached to a dwelling on **Mohegan Bluffs** on the southeast point of the island. A radiobeacon and fog signal are at the station. It has been reported that the fog signal is indistinct and difficult to hear when close-to, yet plainly audible several miles away.

About 0.2 mile southeast of the light is the wreck of the large tanker SS LIGHTBURNE. At low water, parts of the main deck are awash. At **Clay Head**, on the northeast side of Block Island, is a lone white house on top of the bluff. Two nearby

silos are conspicuous.

Block Island North Light (41°13.7′ N., 71°34.6′ W.), 58 feet above the water, is shown from a black tower on a gray-granite dwelling on Sandy Point at the north end of the island.

Old Harbor, frequently used as a harbor of refuge, is an artificial harbor formed by two breakwaters on the east side of Block Island, 1.4 miles northward of Block Island Southeast Light. In 1968, the controlling depth in the entrance channel was 15 feet; depths of about 15 feet were available in the inner harbor anchorage, and in the basin in the southeast corner of the inner harbor. The harbor is occupied by pleasure craft during the summer. The eastern part of the inner harbor is left clear for the passage of the ferry to the wharf. The basin in the southeast corner of the inner harbor is usually occupied by fishing boats and local craft which tieup along the sides. Gasoline, marine supplies, and limited repairs are available.

The east breakwater extends about 300 yards northward of the entrance of the inner harbor, and is marked at its end by a light and fog signal. A bell buoy is 0.55 mile northward of the breakwater. A light marks the end of the breakwater on the west side at the entrance to the inner harbor.

Great Salt Pond (New Harbor), on the west side of Block Island, is the best harbor in Block Island Sound for vessels of 15-foot or less draft. In easterly gales when the sea is too heavy to enter Old Harbor, a landing can be made at Great Salt Pond. The entrance, about 2 miles south-southwestward of Block Island North Light, is a dredged cut through the narrow beach. The southwestern side of the entrance is protected by a jetty, marked by a light and fog signal at its outer end and by a light at the inner end.

In May 1971, the midchannel controlling depth in the entrance channel was 18 feet. A ferry landing is at the head of the pond.

The usual anchorage in Great Salt Pond is near the southeast end, off the ferry landing, in 15 to 48 feet, taking care to leave a fairway to the landing. A channel with a reported depth of about 4 feet in 1971 leads to **Trim Pond**, where local fishing craft are moored.

Small-craft facilities in Great Salt Pond can provide berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies. The marina about 0.3 mile westward of the ferry landing, with a reported depth of 16 feet at the face of the dock, can also make engine repairs.

The mean range of **tide** is about 2.6 feet.

Tidal currents in the entrance to Great Salt Pond have a velocity of 0.3 knot. (See Tidal Current Tables for predictions.)

Storm warning signals are displayed at the Coast Guard Station. (See charts.)

Measured nautical mile.—A **210°22′—030°22′ measured nautical mile** is off the west side of Block Island, just south of the entrance to Great Salt Pond. The markers are on **Grace Point** and on the sand spit of **Harbor Neck**, near the entrance jetty. In 1964, it was reported that the rear marker on Grace Point had been destroyed.

Chart 268.—Point Judith Light (41°21.7′ N., 71°28.9′ W.), 65 feet above the water, is shown from an octagonal tower, 51 feet high, with the lower half white, upper half brown. The station has a fog signal and a radiobeacon. About 100 yards north of the light is a Coast Guard station. **Storm warning signals are displayed.** (See chart.) A lighted whistle buoy is 1.7 miles southward of the light. (See chart 1210.) A prominent elevated water tank is about 1.8 miles northward of the light, and another globular water tank is about 3 miles northwestward of the light. A blue rotating beacon at a restaurant in Galilee about 0.2 mile northward of the daybeacon on the entrance jetty is prominent at night.

The area around Point Judith, including the approaches to Point Judith Harbor of Refuge, is irregular with rocky bottom and indications of boulders. Caution is advised to avoid the shoal spots, even with a smooth sea, and to exercise extra care where the depths are not more than 6 feet greater than the draft.

Point Judith Harbor of Refuge, on the west side of Point Judith, is formed by a main V-shaped breakwater and two shorearm breakwaters extending to the shore. The harbor is easy of access for most vessels except with a heavy southerly sea. It is little used by tows. The only soft bottom in the harbor is found in the southern part of the deeper water enclosed by the main breakwater. On the north side the shoaling is gradual; the 18-foot curve is about 0.3 to 0.5 mile offshore.

Near the central part of the harbor are two shoals; the northernmost one has depths of 14 to 18 feet, and the southernmost one has depths of 14 to 16 feet and is marked by a buoy.

The area within the V-shaped breakwater affords protected anchorage for small craft. The breakwater should be given a berth of 200 yards to avoid broken and hard bottom; a rocky shoal area about 100 yards wide, paralleling the west side of the main breakwater northward from the angle should be avoided. A good berth for a vessel is on a line between the East and West Main Breakwater Lights, midway between them in 22 to 30 feet. This position falls on the edge of the east-west thorofare used by pleasure craft and fishing boats.

The southern entrance to the Harbor of Refuge, known locally as the East Gap, is 400 yards wide; in 1971, it had a controlling depth of about 24 feet with deeper water in the western half of the channel. In 1971, it was reported that the breakwater on the western side of this entrance extended about 150 yards northeastward of the light.

The western entrance to the Harbor of Refuge, known locally as the West Gap, is 500 yards wide; in 1971 it had a controlling depth of about 18 feet, with lesser depths on the north side of the entrance.

Tides and Currents.—The mean range of tide in

the Harbor of Refuge is 3.1 feet. The tidal currents have a velocity of about 0.8 knot at the south entrance and 0.5 knot at the west entrance. (See Tidal Current Tables for predictions.)

Considerably stronger currents have been reported to develop especially when the tide is ebbing.

Point Judith Pond is a salt-water tidal pond entered between two rock jetties at **The Breachway** in the northwestern part of Point Judith Harbor of Refuge. The east jetty is marked near its seaward end by a daybeacon. The pond extends 3.3 miles northerly to the town of **Wakefield**. It is used extensively by small fishing vessels and pleasure craft, and numerous fish wharves are inside the entrance. The north end of Point Judith Pond affords good anchorage for boats of 4 feet draft or less during a heavy blow.

The village of **Galilee** on the east side of the entrance and **Jerusalem** on the west side at **Succotash Point** have State piers and numerous small piers chiefly used by fishermen. A Government barge, used as a floating water quality control laboratory, is moored at Jerusalem. A State pier superintendent controls the State piers at Galilee and Jerusalem; his office is at the head of the Galilee State Pier.

A channel with three dredged sections marked by buoys extends from Point Judith Harbor of Refuge along the west side of the pond to the State Pier at Jerusalem, and thence northerly to the turning basin at Wakefield. A branch channel, on the east side, extends northeasterly from the entrance to the pond to the State Pier at Galilee, and into anchorage areas westward of Galilee and southward of Little Comfort Island.

In August 1970-June 1971, the controlling depths were 15 feet to the State Pier at Jerusalem except for minor shoaling on the western edge of the channel about 0.4 mile above the entrance, thence 15 feet in the branch channel to the State Pier at Galilee, and thence in 1967, 4½ feet in the dredged sections of the channel above Jerusalem to the turning basin at Wakefield, and 5 to 6 feet in the basin. In 1959-September 1970, depths of 6½ to 10 feet were available in the anchorage areas off Galilee; the chart is the best guide.

Tides and Currents.—The mean range of tide in the pond is 2.8 feet, and occurs later than in the Harbor of Refuge by about 10 minutes just inside the entrance and 30 minutes at the north end. The tidal currents in the entrance have a velocity of 1.8 knots on the flood, 1.5 knots on the ebb, and cause slight rips and overfalls at changes of tide. Higher current velocities are reported to occur. (See Tidal Current Tables for predictions.)

The U.S. Public Health Service maintains a **contract physician's office** in Wakefield. Several boatyards and marinas are at Galilee, Jerusalem, Wakefield, and at Snug Harbor, on the west side of the pond about 0.8 mile above the entrance. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage, launching ramps, and hull and engine repairs are available. The largest marine railway in the area, at the southern end of the waterfront at Snug Harbor, can handle craft up to 150 feet in length or 385 tons.

Daily ferry service is available to Block Island from Galilee. Daily bus service is operated to Providence.

Potter Pond, shallow and landlocked, is joined with Point Judith by a narrow channel near **Snug Harbor**. Local knowledge should be obtained before using this channel, which has depths of 2 to 4 feet and is crossed by overhead power and telephone cables with a clearance of 30 feet at the channel entrance and by a fixed highway bridge with a clearance of 5 feet about 0.4 mile above the entrance. A current of more than 3 knots develops through the channel on the ebb. The mean range of **tide** in the pond is about 1 foot, and it occurs about 2.5 hours later than in the Harbor of Refuge.

Chart 271.—From Point Judith to Watch Hill the shore is low and for the most part consists of sandy beaches which are broken by several projecting rocky points. Back from the immediate shore are areas of cultivation interspersed with rolling grass-covered or wooded hills. Except for Point Judith Pond, most pond outlets are either closed or used only by rowboats at high tide. The coast is fringed by broken ground and boulders in places, which should be avoided by deep-draft vessels where the depths are less than 36 to 42 feet.

Matunuck is a summer resort about 3 miles west of Point Judith. Southwest of **Matunuck Point** is **Nebraska Shoal**, a patch of boulders covered 18 feet and marked by a buoy. The shoal is at the south end of broken ground, with depths less than 30 feet offshore; the water deepens abruptly around the patch.

Charlestown Inlet, 4.5 miles westward of Matunuck Point, is a narrow inlet which leads to **Ninigret Pond** to the westward, and the village of **Charlestown** to the northward. In 1971, a reported depth of about 2 feet could be taken in the inlet, with depths of about 3 to 6 feet inside. The southern part of Ninigret Pond is mostly mud flats. Local knowledge is required in entering and moving about inside. A small-craft facility is at Charlestown, and one at the western end of Ningret Pond; berths and launching ramps are at both facilities; gasoline and marine supplies are available at the Charlestown facility. The overhead power cable over the entrance has a clearance of 10 feet.

Quonochontaug, 10.8 miles westward of Point Judith, is a summer settlement at the outlet of **Quonochontaug Pond**. The pond is entered only by shallow-draft boats.

Weekapaug Point, 12.5 miles west of Point Judith, is bold, rocky, and prominent from the southwest and southeast. Two stone jetties, 1,500 feet long, protect the entrance to **Winnapaug Pond** just westward of the point. In 1953, a 4-foot channel was privately dredged to the pond in which the

depths vary from 2 to 12 feet. There are numerous shoals and sand bars. Southerly winds cause breakers at the ends of the jetties; extreme caution is advised. The fixed bridge over the entrance has a clearance of 6 feet.

Old Reef, with a depth of 5 feet over it, is about 1.5 miles west of Weekapaug Point and about 0.5 mile offshore. It is marked by a buoy.

Chart 358.—Watch Hill, about 17.5 miles west of Point Judith, is a high bare bluff, with several large hotels and summer houses. Communication is by bus with Westerly.

Watch Hill Light (41°18.2′ N., 71°51.5′ W.), 61 feet above the water, is shown from a square gray-granite tower, 45 feet high, attached to a white building, on **Watch Hill Point. Storm warning signals are displayed.** (See chart.) It is reported that the fog signal at the station is not easily heard eastward of the light, but from the southwest can be heard nearly to Montauk Point. A lighted whistle buoy, 2.5 miles southward of the light, marks a passage through Block Island Sound.

Gangway Rock, awash at low water, is part of a boulder reef extending about 0.2 mile southward from Watch Hill Light. A lighted bell buoy marks the south end of the reef. A sunken rock is about 50 yards northward of the buoy.

Watch Hill Passage is the principal entrance to Fishers Island Sound from eastward, and the only one used by strangers. It has a least depth of about 17 feet. A spot with 12 feet over it in the passage is marked by a buoy; the best channel is northward of this buoy, giving it a berth of about 150 yards.

Watch Hill Reef, on the southwest side of Watch Hill Passage, has rocks that bare and is marked by a gong buoy. A sunken wreck lies on the northwestern side.

Sugar Reef Passage, between Watch Hill Reef and Sugar Reef, has a width of 0.3 mile; the least depths are about 22 feet.

Sugar Reef, some 500 to 600 yards in extent, is covered 2 to 12 feet, and should be avoided; it is marked by a buoy off its north side.

Catumb Passage, between Sugar Reef and Catumb Rocks, has a width of 150 yards; its least depth is 13 feet.

Catumb Rocks, the highest of which are awash, are marked by buoys on the north, east, and west sides. Rocks covered 1 to 18 feet extend 0.8 mile westward of Catumb Rocks to the buoy that marks the east side of **Lords Passage**. This passage, about 0.3 mile wide, has a least depth of 16 feet.

Wicopesset Rock, on the northwesterly side of Lords Passage, is the easterly part of foul ground extending about 0.3 mile to **Wicopesset Island**, which is low and rocky.

Wicopesset Passage, between Wicopesset Island and East Point, is narrow and is obstructed by a rock in the middle marked by a buoy; it is suitable only for small craft and should not be used by strangers. A bell buoy marks the southern entrance. Extreme caution is recommended when using the passage as boats are apt to be set by the ebb current on the foul ground.

Information about the tides and tidal currents in the passages is given with the discussion of Fishers Island Sound.

Fishers Island, 6 miles long, is hilly and sparsely wooded. **Chocomount**, 136 feet high, is the highest point on the island. The former Coast Guard station at East Harbor, about 1 mile from East Point of Fishers Island, is prominent; numerous buildings on the western part of Fishers Island and a large yellow hotel building are conspicuous. The south side of the island is fringed with foul ground which rises abruptly from depths of 42 to 48 feet; but by giving the shore a berth of 0.5 mile, all dangers will be avoided.

The U.S. Public Health Service maintains a **contract physician's office** on Fishers Island. (See appendix for address.)

A naval **prohibited area** is southeast of Fishers Island. (See **207.30**, chapter 2, for limits and regulations.)

Race Point Ledge, partly bare at low water, extends about 0.2 mile southwestward from **Race Point**, the southwest extremity of Fishers Island, and is marked at its end by a buoy. Inside the buoy are boulders with 3 to 9 feet over them. The passage between this buoy and Race Rock Light has very irregular bottom; the least depth is about 25 feet. It is suitable only for small vessels with a comparatively smooth sea.

Race Rock, on the northeast side of The Race, is nearly 200 yards in diameter, with a depth less than 18 feet.

Race Rock Light (41°14.6′ N., 72°02.9′ W.), 67 feet above the water, is shown from a granite tower attached to a dwelling on a granite pier on the rock. A fog signal is sounded at the station. The fog signal is reported at times to be inaudible when a vessel is approaching from eastward and is close southward of Fishers Island.

Chart 362.—The Race, the main entrance to Long Island Sound from eastward, extends between Fishers Island and Little Gull Island, between which is a width of about 3.5 miles. The only dangers are Valiant Rock, nearly in the middle, and Little Gull Island with its reefs.

Current.—In the middle of The Race, the flood sets 295° and the ebb 100°, with average velocities of 2.9 knots and 3.5 knots, respectively. There are always strong rips and swirls in the wake of all broken ground in The Race, except for about 0.5 hour at slack water. The rips are exceptionally heavy during heavy weather, and especially when a strong wind opposes the current, or the current sets through against a heavy sea. (Predicted times of slack water and times and velocities of strength of current are given in the Tidal Current Tables.)

Little Gull Reef, with little depth over it and foul ground, extends 0.3 mile east-northeastward from the light. Deep-draft vessels should avoid this locality. **Little Gull Island Light** (41°12.4′ N., 72°06.5′

W.), 91 feet above the water, is shown from a gray-granite tower, 81 feet high, attached to a red dwelling on a pier. The radiobeacon and fog signal at the station are synchronized for distance finding. This light and Race Rock Light are the guides, as soundings cannot be depended upon.

In passing north of Valiant Rock, vessels should keep from 0.5 to 0.8 mile southwestward of Race Rock Light, and craft passing southward of Valiant Rock should hold to a course about a mile northeastward of Little Gull Island Light.

Cerberus Shoal, 6 miles southeast of Race Rock Light, is about 0.4 mile in diameter, with a least depth of 18 feet on a small rocky patch near its north end. The seas break on this shoal during heavy swells. It is marked by a lighted whistle buoy. Near the shoal, tide rips are unusually strong.

Great Gull Island, 1 mile southwest of Little Gull Island, was formerly a military reservation but is now privately owned. The pier on the north side is in ruins. A lookout tower on the island is conspicuous.

Valiant Rock, with a least depth of 18 feet, is surrounded by shoal area, and the 10-fathom curve surrounding the rock marks the area which should be avoided by deep-draft vessels, and preferably all vessels, on account of the heavy swirls and rips. A lighted bell buoy is northward of the rock.

The passage between Great Gull Island and Plum Island has several known dangers and very irregular bottom with boulders, and should be avoided. The velocity of the **tidal current** in the passage is 2.6 knots on the flood, and 3.2 knots on the ebb; flood sets 300°, and ebb 135°. Considerably higher velocities occur at times, and tide rips are very bad in heavy weather. Boulders covered 3 to 10 feet are between **Old Silas Rock** and Plum Island. Old Silas Rock is awash at high water. **Middle Shoal Rock**, 0.3 mile northeastward of Old Silas Rock, has a depth of 8 feet.

Bedford Reef is broken ground, on which the least found depths are 14 to 16 feet, extending about 1.5 miles southward from broken ground lying between Great Gull and Plum Islands. It should be avoided. **Constellation Rock**, on the southeasterly extension of this broken ground, has 17 feet over it, is marked by a buoy, and lies 1.9 miles southward of Little Gull Island Light.

Montauk Point, the easterly extremity of Long Island, is a high sandy bluff, on the summit of which is the light. The land is grass-covered, with a height of 165 feet at **Prospect Hill**, 2 miles westward of the point. The south side of the point is bold, the 10-fathom curve is about 0.5 mile from shore; depths of 24 feet and less extend 0.8 mile off the northeast side of the point.

Montauk Point Light (41°04.3′ N., 71°51.4′ W.), 168 feet above the water, is shown from a white octagonal, pyramidal tower, 108 feet high, with a brown band midway of its height, and a covered way to a white dwelling. The radiobeacon and fog signal at the station are synchronized for distance finding. **Storm warning signals are displayed.** (See chart.)

Surrounding Montauk Point for about 4 miles is a shoal area that has been closely developed (See also chart 271.); the bottom is very broken and extra caution should be observed where the depths are less than 10 feet greater than the draft. In general, the shoals are a series of long narrow ridges, in places only a few yards wide, and their positions are indicated by the rips over them at the strength of the tidal currents.

Montauk Shoal, about 2.5 miles south-southeastward of the light, has least depths of 30 feet. **Great Eastern Rock**, 1.5 miles east-northeast of the light, has a least depth of 24 feet and is marked by a bell buoy. **Phelps Ledge**, just northerly of Great Eastern Rock, is covered by 28 feet. **Endeavor Shoals**, about 2.3 miles northeast of the light, are covered by 19 to 24 feet on a narrow ridge about 0.4 mile long.

Vessels drawing up to 20 feet can avoid the dangers eastward and northeastward of Montauk Point in smooth weather by giving the point a berth of over a mile and avoiding Great Eastern Rock.

Broken ground with rocky bottom and boulders extends about 2 miles off the north coast west of Montauk Point. **Shagwong Reef**, with a least depth of 8 feet and marked by a lighted bell buoy, is the northern limit of this area. **Shagwong Rock**, with a least depth of 7½ feet and marked by a buoy, and **Washington Shoal**, with a least depth of 15 feet, are between the shore and Shagwong Reef. The principal danger outside Shagwong Reef is a shoal with a depth of 30 feet, 5.3 miles northwestward of Montauk Point.

Montauk Harbor, in the northern part of **Lake Montauk**, is entered through a dredged channel on the northern shore about 3 miles west of Montauk Point. The entrance is protected by jetties, each of which is marked by a light, and the west jetty has a fog signal. In June 1972, the controlling depth in the channel was 13 feet in mid-channel to the boat basin northwestward of Star Island and to the yacht basin east of the island; the boat basin had depths of 10 feet. The channel is marked by private seasonal buoys.

Star Island, just inside Montauk Harbor, is connected to the mainland by a causeway. Depths of 8 to 14 feet are reported in the yacht basin off the eastern side of the island; caution is advised in selecting anchorage because lesser depths may be found. A privately marked channel with a controlling depth of about 3 feet in June 1971 leads from the yacht basin to the southern part of Lake Montauk where there are depths of 6 to 8 feet in the center.

The mean range of **tide** is 1.9 feet.

Tidal **currents** at the entrance to Montauk Harbor have a velocity of 1.2 knots on the flood and about 0.5 knot on the ebb. They are reported to decrease rapidly after entering the harbor and are practically negligible near the yacht club landing on the east side of Star Island. (See Tidal Current

Tables for predictions.) A Coast Guard station is at the northern end of Star Island. **Storm warning signals are displayed** at the station. (See chart.)

There are several small-craft facilities on both sides of the entrance to Montauk Harbor, and a yacht club and several marinas are on the east side of Star Island. Gasoline, diesel fuel, water, ice, marine supplies, and space for transients are available. A 40-foot marine railway on the west side of the entrance can haul out craft for complete engine and hull repairs. Groceries and other supplies may be obtained at the village of Montauk.

Fort Pond Bay is a semicircular bight about 1 mile wide on the north side of Long Island, 5 miles westward of Montauk Point. The bay is free of dangers, but flats with 8 to 12 feet over them make out 0.2 mile from its eastern shore. The bay affords anchorage in 40 to 50 feet, soft bottom, but is exposed to northerly and northwesterly winds; the shoaling is abrupt on its east and south sides. The flats at the southeast corner of the bay are generally used as an anchorage by small craft during the summer. Privately maintained daybeacons which were used to moor submarines are in the southeastern end of the bay.

The 950-foot, wooden, L-shaped pier of the New York Ocean Science Laboratory is near the southeast corner of the bay. A depth of about 30 feet was reported alongside its outer face in 1971.

Montauk, a summer resort at the southeast end of the bay, is the terminus of the Long Island Railroad. In 1971, the railroad pier at Montauk was in disrepair and not used. Depths of 5 to 10 feet are reported to be alongside the small private wharves; there are no public piers available.

Napeague Bay, 8 miles westward of Montauk Point, is shallow in the western and southwestern part. **Promised Land Channel**, the buoyed passage southward of Gardiners and Cartwright Islands, has a least centerline depth of about 14 feet; however, the depth is continually changing due to the shifting shoals.

The tidal currents have a velocity of about 1.5 knots through all the channels between the shoals. It is not advisable for vessels drawing more than 10 feet to attempt the passage without local knowledge, and then only when the buoys can be seen.

Napeague Harbor, a small-craft refuge in the southwest part of Napeague Bay, can be entered through privately dredged channels northward and southward of **Hicks Island**. In 1967, the controlling depths were 14 feet in the northerly entrance, and 5 feet in the southerly entrance. Depths in the central part of the harbor range from 1½ to 7 feet; the chart is the best guide. The harbor is especially useful in northeasterly weather when the adjoining bays are unsafe. There are no landings in the harbor.

Promised Land is a fishing village on the southwest side of Napeague Bay. The depths at the wharves are 15 feet and less. A depth of about 4 feet can be carried to the landing at the yacht club, 1.3 miles westward of Promised Land.

Gardiners Island, 11 miles westward of Montauk Point, is partly wooded and has an elevation of 130 feet near its middle. An unlighted concrete tower on **Eastern Plain Point** is conspicuous. **Cartwright Island** is narrow, low, and sandy, and extends 1 mile in a southerly direction off the south tip of Gardiners Island. Its size and shape are subject to considerable change by storms.

Crow Head is the high bluff at the western end of Gardiners Island. Shoal water with depths of 9 to 16 feet extends 1.8 miles southwestward from **Cherry Hill Point**, the westerly end of the Gardiners Island, and terminates at **Crow Shoal**. The shoal has depths of 3 to 11 feet and is marked by a buoy. An obstruction covered 12 feet is 200 yards eastward of the buoy.

The bight between the southern part of Gardiners Island and Crow Shoal is **Cherry Harbor.** It has depths of 24 to 27 feet with mud bottom, and affords shelter from northeasterly winds. **Bostwick Bay** is the bight on the northwest side of Gardiners Island. It affords excellent anchorage in easterly winds in depths of about 25 feet, but is exposed to all westerly winds.

Gardiners Point, a low spit, is at the northerly end of a very shoal bar which extends 1.5 miles north-northwestward from Gardiners Island. This shoal is steep-to on its north and west sides and is marked by a lighted buoy. A rock with a depth of 2 feet over it is about 0.8 mile eastward of the north point of Gardiners Island, and is marked by a buoy.

The **Ruins**, a concrete structure on Gardiners Point, is Government property and formerly a naval aircraft bombing target; it is prohibited to the public. The Ruins and the area within 300 yards radius of it is dangerous due to the possible existence of undetonated explosives.

A **restricted anchorage area** for U.S. Navy submarines is about 3 miles eastward of Gardiners Island. (See **110.150**, chapter 2, for limits and regulations.)

Gardiners Bay is at the western end of Block Island Sound from which it is separated by Gardiners Island. The bay is an excellent anchorage easily entered day or night, and is the approach to Shelter Island Sound and the Peconic Bays. The principal entrance is northward of Gardiners Point. The entrance from Long Island Sound is through Plum Gut. The entrance southward of Gardiners Island is used by fishing vessels.

The principal guides for the entrance to Gardiners Bay from Block Island Sound are the lighted bell buoy north of Gardiners Point, Little Gull Light, and Orient Point Light. The white church spires at Orient and Sag Harbor are prominent. When past the lighted bell buoy north of Gardiners Point, vessels can select the anchorage in Gardiners Bay which affords the best lee in the prevailing winds.

The principal dangers in approaching Gardiners

Bay from the northward are the broken ground between Constellation Rock and Plum Island, and the shoal making out to Gardiners Point. In the bay, Crow Shoal should be avoided. In general, the shoaling is rather abrupt in approaching these dangers and gradual in approaching the shoals on the western side of the bay.

Some oyster stakes are in Gardiners Bay, and small craft should proceed with caution when crossing areas where they are found.

Plum Island, about 2 miles westward of Great Gull Island, is 2.5 miles long, hilly, and bare of trees except near the southwest end, and has several large buildings, and a prominent tank and flagpole. The island is a Government reservation and closed to the public. A light and fog signal are on its westernmost point.

The bight in the southeast side of Plum Island is foul to **Plum Island Rock** which is 0.5 mile from shore abreast of the middle of the island, has 1 foot over it, and is marked by a buoy.

Plum Gut Harbor, on the southwest side of Plum Island, has an entrance between jetties with lights on dolphins off the outer ends. A fog signal is at the west light. A depth of about 14 feet is in the entrance. Small yachts seeking shelter in an emergency lie alongside the wharves. The harbor is under the supervision of the Department of Agriculture and the Coast Guard, and may be used only with permission.

Plum Gut, the entrance to Gardiners Bay from Long Island Sound, is nearly 0.6 mile wide and has sufficient water for vessels of the deepest draft; in the passage are several rocks with depths of 17 to 19 feet over them. Tidal currents set through the passage with great velocity. Steamers, or sailing vessels with a strong favorable wind, should have no difficulty in passing through.

Velocities of the current on flood and ebb are 3.5 and 4.3 knots, respectively. The flood sets northwestward and the ebb southeastward. Heavy tide rips occur. Caution is recommended when using this passage.

A dumping ground is located in Long Island Sound off Orient Point in the northwesterly approach to Plum Gut. (See **205.10 (a) and (c) (15)**, chapter 2, for limits and regulations.)

Oyster Pond Reef, extending about 0.5 mile east-northeastward from **Orient Point**, is marked by a light and fog signal. Caution is recommended regarding the fog signal, as it may be difficult to hear at times, particularly with an easterly wind. Numerous boulders and little depth are between the light and Orient Point. **Midway Shoal**, about 0.5 mile east of the light, has 17 feet over it and is marked by a buoy.

When using Plum Gut it is well to give Plum Island and Orient Point Lights and the shore of Plum Island, just southward of Plum Gut Harbor, a berth of 0.2 mile. The best water in the passage will be found on a **295°** course, passing **Pine Point** and the buoy marking Midway Shoal a distance of 350 yards and passing midway between Orient Point and Plum Island Lights.

A wharf with a depth of 8 feet at its end is on the south side of Orient Point, 1 mile westward of Orient Point Light. A ferry operates between here and New London except from January through March. A small-craft facility is about 0.1 mile westward of the wharf. Berths, electricity, gasoline, diesel fuel, water, ice, lift, marine supplies, and minor engine repairs are available. A depth of about 6 feet can be carried in the privately marked channel leading to the small-craft facility. **Storm warning signals are displayed.** (See chart.)

Acabonack Harbor, at the southeast end of Gardiners Bay, is entered through a privately maintained channel with a reported depth of 3 feet in the entrance in 1963. There is deeper water inside.

Hog Creek Point, on the southerly side of Gardiners Bay, is generally flat, with bluffs approximately 25 feet in height. **Lionhead Rock**, off the point and marked by a buoy, is awash at high water. Fishtraps are westward of the point.

Threemile Harbor, on the south side of Gardiners Bay 1.7 miles southwestward of Hog Creek Point, is entered through a privately marked channel with two privately dredged sections. In 1959-65, the controlling depths were 10 feet from Gardiners Bay to a point 1.6 miles above the entrance, thence 7 feet to the basin at the head of the harbor. Each of the two jetties at the entrance is marked by a private light. A public commercial landing with reported depths of 8 feet is on the east side of the channel about 0.6 mile above the entrance.

Anchorage is available in Threemile Harbor in depths of 9 to 14 feet with soft bottom and good holding ground; this is a good anchorage during strong winds. The range of **tide** in the entrance to the harbor is 2.4 feet. The **tidal current** have a velocity of about 3 knots through the entrance.

Small-craft facilities on the east and south sides of Threemile Harbor can provide berths, electricity, gasoline, diesel fuel, water, ice, launching ramps, storage, and hull and engine repair. The largest marine railway, in the basin at the head of the harbor, can handle craft up to 40 tons. Provisions can be obtained at the town of **East Hampton**, 3.5 miles south of Threemile Harbor.

A public pier with depths of about 8 feet at its face, maintained by the town of East Hampton, is at the head of the harbor.

Storm warning signals are displayed. (See chart.)

Chart 363.—Shelter Island Sound and Peconic Bays extend westward from Gardiners Bay about 22 miles to Riverhead, the head of navigation on Peconic River. They are much frequented by yachts and other small craft in the summer. Fishtraps and oyster stakes are on many of the shoals.

A depth of about 26 feet can be carried through the channel north of Shelter Island and through Little Peconic Bay as far as Robins Island, and about 13 feet through the channel south of Shelter Island. Across the bar between Little and Great

Peconic Bays about 13 feet can be carried. With local knowledge greater depths can be carried in the channels and across the bar. A depth of about 6 feet can be taken to South Jamesport and Riverhead.

The mean range of **tide** is about 2.5 feet. The **tidal currents** have considerable velocity wherever the channel is narrowed. The velocity in the narrower places is about 1.8 knots.

Ice obstructs navigation in the coves and shallow harbors during January and February. In severe winters, drift ice is reported to interfere with navigation for short periods of time. In the south arm of Shelter Island Sound, the ice is sufficiently heavy at times to be destructive to structures exposed to it.

Diesel fuel, gasoline, ice, water, marine supplies, and other provisions can best be obtained at Greenport and Sag Harbor. Several boatyards, shipyards, marine railways, and enclosed basins with excellent repair facilities are at Greenport.

Ram Head is a prominent yellow bluff on the western shore of Gardiners Bay. A lower bluff is nearly 1.5 miles westward of Ram Head with numerous houses along the top. A shoal with 7 to 17 feet over it extends about 2.4 miles southeastward from Ram Head.

A boulder with 1 foot over it is 230 yards from shore about 0.3 mile northeastward of the northern point of the entrance to Coecles Harbor. Other boulders with little depth are between this boulder and Ram Head.

The entrance to **Coecles Harbor** is at the south end of Ram Head; the channel is marked seasonally by privately maintained buoys and a light. In 1966, the controlling depth in the privately maintained entrance channel was 10 feet. A marina and boatyard are in the harbor. A mobile hoist at the boatyard can haul out craft up to 35 tons; gasoline, water, ice, diesel fuel, marine supplies, guest moorings, and complete engine and hull repairs are available.

Extensive flats make off from Ram Head and the shore between it and **Hay Beach Point**, the northernmost point of Shelter Island, which is a low flat with a clump of scrub at its end and backed by wooded high land. **Long Beach Point** is a low spit eastward of Hay Beach Point. A bar with little depth extends southwesterly from Long Beach Point to the ruins of a former lighthouse of which only the 10-foot concrete foundation remains.

Shoals with depths of 10 to 12 feet extend 0.5 mile eastward from Long Beach Point. The south and west sides of this shoal have depths of 12 to 15 feet, and rise abruptly from the channel. The limits of the shoal south of the point are marked by buoys. The bar has extended southward enough to comprise a real danger to small craft.

Orient Harbor, about 4 miles northeastward of Ram Head, is an excellent anchorage, the depths ranging from over 20 feet in its southern part to 16 feet at its northern end. **Orient** is a village at the northeast end of Orient Harbor. At the end of the main wharf the depth is 8½ feet. The eastern part of Orient Harbor has depths of 7 to 9 feet. Fish traps are on the shoals.

About 0.4 mile northeastward of **Cleaves Point**, at the southwest end of Orient Harbor, the shore has cut through to a small pond which is used as a basin for small craft. The entrance, between two jetties, has a depth of about 3 feet over the bar, with about 6 feet in the basin. Although it is a private basin, permission for its use is not necessary. Rocks are 0.2 mile south of the entrance.

Hallock (Long Beach) Bay makes eastward from Orient Harbor on the north side of Long Beach Point. The bay is shallow and has no commercial importance. Dangers and shoaling have been reported in the bay; local information is deemed advisable prior to entering.

Greenport is an important town and the terminus of a branch of the Long Island Railroad. The white church spires, near the northern end of town, and a tank and TV radio tower in the center of town are prominent.

Greenport Harbor is formed on the northeast by a 5-foot high breakwater, which extends 0.3 mile south-southeastward from **Youngs Point**, nearly to the 18-foot curve, and is marked at its outer end by a light. The depths at the wharves range from 7 to 21 feet. The railroad wharf on the south side of the waterfront was in disrepair in 1971.

Stirling Basin, on the northeast side of Greenport, is a part of Greenport Harbor. Depths of about 7 feet are in the outer anchorage area, and about 8 feet in the channel and the inner anchorage. Two smaller channels with depths of about 9 feet, and dredged by private interests, are in the northeastern part of the basin. Bush stakes mark the edges pf the shoal areas in the basin. The **harbormaster** for Greenport Harbor controls anchoring and berthing in the basin. The **speed** limit is 6 knots.

Small-craft facilities at Greenport can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and hull and engine repairs. The largest marine railway, at a shipbuilding company at the southeast end of the waterfront, can handle craft up to 400 tons and 15 feet in draft and has a 25-ton crane. A well-equipped machine shop is also in the town.

A ferry operates between Greenport and Shelter Island. During the summer, bus service is available from Greenport to Orient Point where there is ferry service to New London except from January through March.

Dering Harbor, southward of Greenport and at the northwest end of Shelter Island, is a favorite anchorage for yachts and motorboats. The entrance to the harbor is partially constricted by a disposal area in about midentrance and shoal area with a reported depth of 4 feet in 1968 that extends from the southwestern entrance point to near the disposal area; caution is advised and the chart should be the guide in entering. Depths of 10 to 14

feet are available in the central part of the harbor, with much lesser depths around the edges. Moorings and float landings for small craft are in the bight at the southwest end of the harbor. Vessels too large to enter can anchor outside the harbor in depths of 14 to 30 feet. Small-craft facilities, on the west side of the harbor, can provide berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, marine supplies, and hull and outboard engine repairs. A launching ramp is also available. **Shelter Island Heights** is a village on the southwestern side of Dering Harbor.

Fanning Point, on the north shore at the southwest end of Greenport, is marked by several prominent oil tanks. A shoal extends 300 yards off the point, and is marked by a buoy. Three dolphins, each marked by a private light, are northward of the point. They are used by an oil terminal for the offshore mooring and unloading of barges and coastal tankers. Currents of 2 knots, running fair with the channel, have been reported in the vicinity of Fanning Point.

Conkling Point, on the north shore 1 mile southwestward of Fanning Point, is low and sandy at the end and has deep water as close as 150 yards. A marina on the southwest side of the point has an entrance 4 feet deep; berths, electricity, gasoline, water, marine supplies, storage, hull and engine repairs, and a 10-ton marine railway are available.

Mill Creek is the entrance to **Hashamomuck Pond**, about 1.1 miles westward of Conkling Point. In 1965, the privately dredged entrance channel into the creek had a controlling depth of 7 feet, thence 3½ feet for a width of 75 feet in the channel along the northwest shore of Mill Creek. About 400 yards eastward of the creek is a small bight entered through a channel with a depth of about 4 feet and marked by bush stakes.

Jennings Point, the western end of Shelter Island, is high and wooded. Rocks are off the point close-to, and it should be given a berth of over 150 yards. A lighted buoy is off the point.

The town of **Southold** is at the head of **Southold Bay**, which is the bight at the western end of Shelter Island Sound westward of Jennings Point. For about a mile northeastward of the entrance jetty, shoals with 12 feet or less extend nearly 0.4 mile from shore and are generally steep-to. The southwest part of the bay is shoal for about 0.3 mile from shore. Anchorage can be selected east-southeast of the jetty at a distance of from 0.2 to 0.4 mile, in 12 to 18 feet.

A small jettied basin is about 0.5 mile northeast of Southhold entrance. The overhead power cable crossing the entrance has a clearance of 31 feet. By passing westward of the wreck and piling at the entrance, a depth of about 2½ feet can be carried into the basin. The controlling depth is about 6 feet in the privately dredged channels in **Town Creek**, **Jockey Creek**, and **Goose Creek**. The highway bridge at the mouth of Goose Creek has a fixed span with a clearance of 9 feet.

On the shore south of Southhold entrance jetty is a prominent white tower.

There are several small-craft facilities, some with marine railways, on the creeks and along the west shore of Southhold Bay from Paradise Point to Conkling Point. The largest marine railway in the area can haul out craft up to 50 feet in length for engine and hull repairs. Berths, electricity, gasoline, water, ice, marine supplies, launching ramps, storage, lifts, and cranes are available. Provisions can be obtained at Southhold.

Paradise Point, on the west side of Shelter Island Sound, is low and wooded, and from the point a sloping sand spit extends about 0.3 mile eastward, and is marked by a lighted buoy. Southward of Paradise Point, shoals with depths of 10 to 15 feet extend from the west shore to midsound; the southeast point of the shoals is marked by a buoy. Oyster stakes are in places on the shoals.

The channel south of Shelter Island has numerous shoals, but is easily followed by vessels of 13 feet or less draft when the buoys can be seen. The channel is used by vessels going to Sag Harbor. Vessels operating between Greenport and Sag Harbor prefer the inside route around the western end of Shelter Island. The approach from Gardiners Bay is across a shoal or bar which extends in a southeasterly direction from Ram Head to the south shore, the depths on which vary from 7 to 11 feet about 1.6 miles from Ram Head, and thence 13 to 17 feet to the buoys which mark the entrance.

Dangerous Rock, awash at low water in surrounding depths of about 12 feet, is 0.2 mile south of the channel. It is marked by a buoy.

A shoal extends 0.3 to 0.4 mile north of the shore of **Cedar Point** which is marked by a light. The shoal has boulders, and its edge is marked by buoys.

Shoals with boulders and little water over them in places extend nearly 0.5 mile southeastward from Nichols Point. Buoys mark the limit of the channel in this area.

Northwest Harbor, between Cedar Island Light and **Barcelona Point**, is strewn with boulders covered by 4 to 6 feet.

Sand Spit, an extensive shoal partly bare at half-tide, is between **Mashomack Point**, the southeastern extremity of Shelter Island, and Sag Harbor. The spit is marked by buoys and a light.

A group of rocks locally known as **Gull Island**, showing bare at half-tide, is nearly 0.4 mile northeastward of the breakwater at Sag Harbor.

Sag Harbor, about 2.5 miles southwestward of the light on Cedar Point, is protected on the northeast by a breakwater marked at the outer end by a light. A spherical tank and several petroleum storage tanks are prominent landmarks.

In entering Sag Harbor, do not round the breakwater too closely, as a depth of about 6 feet is found near its end. The deepest water is near the buoy. Anchor eastward or northeastward of the end of the former ferry wharf, taking care to keep westward of the range of the end of the break-

water and the foot of the bluff on the east side of North Haven Peninsula.

In 1963, the dredged channel into Sag Harbor had a depth of 10 feet through the entrance and into the turning basin; 6 feet in the southerly anchorage area, and 7½ feet in the main anchorage area. In 1971, a wreck, visible at low water, was reported in the main anchorage area in about 41°00′20″ N., 72°17′39″ W. The channel to **Sag Harbor Cove** is about 8 feet deep; this channel and the cove are marked by seasonal privately maintained buoys. A 37-foot-wide fixed bridge at the entrance has a clearance of 20 feet. Berths, electricity, gasoline, diesel fuel, storage, marine supplies, water, ice, launching ramps, and complete engine and hull repairs are available at Sag Harbor; a 30-ton mobile hoist, near the inner end of the breakwater, can haul out craft up to about 60 feet.

Smith Cove, a small bight on the south side of Shelter Island, is a good anchorage for small craft in northerly weather. Depths range from 11 to 30 feet. A ferry operates between **South Ferry** on the southwest side of the cove to **North Haven Peninsula**.

West Neck Harbor and **West Neck Bay** are shallow bodies of water on the southwest side of Shelter Island. A depth of about 4 feet can be carried over the bar and into the harbor from Shelter Island Sound. The entrance is close eastward of the seaward end of a peninsula that separates the harbor from the sound, and the channel follows along the north side of this peninsula. The end of the peninsula is marked by a private seasonal light. The harbor has numerous private landings. A boatyard with a marine railway can handle craft up to 40 feet for hull and engine repairs. Berths, gasoline, water, ice, a launching ramp, and some marine supplies are available.

Noyac Bay is between North Haven Peninsula and Jessup Neck and southward of the western end of Shelter Island. No dangers will be encountered if the shores are given a berth of 0.4 mile.

Mill Creek, in the southern part of Noyac Bay, is entered through a privately dredged and marked channel that leads to a basin. In 1960, the controlling depths were 8 feet in the channel and 6 feet in the basin. Small-craft facilities in the creek can provide berths, electricity, gasoline, water, ice, storage, a launching ramp, marine supplies, and hull and engine repairs; a 9-ton marine railway is available.

Jessup Neck is a long narrow strip, partly high and wooded, separating Noyac Bay from Little Peconic Bay. The north end of the neck is a sandspit from which a shoal with 4 to 12 feet over it extends nearly 0.4 mile north-northwestward. A lighted buoy marks the outer end of the shoal area.

A shoal with depths of 5 to 7 feet extends 1.5 miles southwestward from **Great Hog Neck**, on the northwest side at the entrance to Little Peconic Bay; this shoal is marked by a buoy.

Heavy tide rips occur southeast of Great Hog Neck during the flood with a southwesterly wind. At such times, small craft can avoid the worst of them by favoring the shore on the northwest side of the passage.

Richmond Creek and **Corey Creek** are at the head of **Hog Neck Bay**. A depth of about 7 feet can be taken in the privately dredged channel leading to a basin in Richmond Creek; the channel is marked by bush stakes. In 1964, the dredged channel leading into and connecting with small boat channels in Corey Creek had a controlling depth of 7 feet. Controlling depths in the small boat channels inside Corey Creek were 5½ to 6 feet.

Little Peconic Bay is about 5 miles long. The southerly shore of the bay is clear if given a berth of 0.4 mile, but shoals extend 0.6 mile from the south end of the bay.

A prominent yellow bluff, known locally as **Holmes Hill**, is just west of the entrance to **North Sea Harbor**. The controlling depth through the dredged channel into the harbor in 1967 was 6½ feet. The channel is marked by privately maintained seasonal buoys and by a seasonal light at the entrance. This is an excellent harbor of refuge for small craft with drafts not exceeding 3½ feet. The bottom is soft with good holding ground.

A marina in the harbor has berths and gasoline.

Wooley Pond, a mile northeastward of North Sea Harbor is entered through a dredged channel which, in 1967, had a reported controlling depth of 7 feet. The channel is marked by private seasonal buoys and by a seasonal light on the north side of the entrance.

A marina in the pond can provide berths, eletricity, gasoline, water, ice, storage, marine supplies, and hull and engine repairs; a 45-foot marine railway is available.

Nassau Point, the long neck on the northwest side of Little Peconic Bay, has high bluffs on the eastern side. A shoal with little depth over it extends 0.5 mile southward from Nassau Point, and is marked by a lighted buoy. A radio tower, lighted on top, is prominent on the point.

Cutchogue Harbor, between Nassau Point and New Suffolk, is used by local boats drawing 6 to 10 feet. On the east shore of the harbor, northwestward of Nassau Point, three channels leading into the ponds have been dredged by private interests. At the middle of the three channels, 0.9 mile northwest of the extremity of Nassau Point, are several private wharves. The channel leads between two jetties, and a depth of about 3 feet can be carried into the pond and 1 foot to some of the wharves.

A depth of 8 feet can be taken within 100 feet of the wharves at **New Suffolk** by passing eastward and about 200 yards northward of the buoy westward of Nassau Point and steering westward for the wharves. A small basin, with a depth of about 10 feet, is northward of the wharf.

A larger basin at the north end of New Suffolk, locally known as **School House Creek**, extends to the highway. The entrance channel, is protected by a short rock jetty, covered at high water on the

south, and a sunken barge on the north. The depth to the boatyard at the head of the basin was reported to be about 6 feet in 1965. Berths, gasoline, storage, marine supplies, hull and engine repairs, and a 12-ton mobile hoist are available at the boatyard.

A marina-shipyard at New Suffolk can provide berths, electricity, gasoline, water, ice, storage, marine supplies, and hull and engine repairs; marine railways up to 80 tons and a 15-ton mobile hoist are available. The town has a launching ramp.

Wickham Creek, 0.7 mile north of New Suffolk, is entered through a privately dredged entrance channel which in 1966, had a controlling depth of 7 feet. Fishing boats tie up to slips in this basin. Private drum buoys and bush stakes mark the channel during the summer. Gasoline, diesel fuel, water, ice, and some marine supplies are available in the basin.

In southeast gales, local craft of less than 6-foot draft seek shelter in the small cove, locally known as **Horseshoe Cove**, in the northeast part of Cutchogue Harbor.

The through channel in **North Race**, northward of **Robins Island**, is marked and used only by light-draft boats. **South Race**, the channel southward of Robins Island, has a controlling depth of about 13 feet and is marked by buoys.

Tide rips occur between the mainland and the south end of Robins Island when the tidal current sets against the wind. They can be avoided to some extent by favoring the southeast side of the passage, passing about 250 yards southeast of the black channel buoys.

Great Peconic Bay, about 5 miles in diameter, is used mostly by local motorboats from Shinnecock Canal, and by yachts. The bay is generally clear, but extensive shoals make off from the shores, except on its south side. Shinnecock Canal, the entrance from the south, is described in chapter 10.

Rodgers Rock, about 1.3 miles west-southwestward of **Cow Neck** and about 1.2 miles south-southwest of Robins Island, has a depth of 6 feet over it and is marked on the northeast side by a buoy. **Robins Island Rock**, 0.8 mile westward of the south end of Robins Island, is awash at low water. It is marked by a buoy. Caution is recommended in this vicinity.

Sebonac Creek, on the southeast side of Great Peconic Bay, is used extensively by yachts, and serves as a yacht harbor for the town of Southampton. A privately dredged and marked channel leading into the creek had a controlling depth of 8 feet in 1958-68. The landings are at **West Neck**, a small settlement northeastward of **Ram Island** in **Bullhead Bay**. An obstruction buoy is locally maintained during the summer to mark a rock, covered 1½ feet, about 100 feet westward of the town landing.

Cold Spring Pond, about 1.6 miles southwestward of Sebonac Creek and 1.1 miles eastward of Shinnecock Canal entrance, is entered through a privately dredged channel which had a depth of 6½ feet in 1964. The entrance to the pond is marked by a private light and buoy.

James Creek, on the north shore of Great Peconic Bay opposite the entrance to Shinnecock Canal, is entered through a privately dredged unmarked channel with a controlling depth of 6 feet in 1965. Small-craft facilities on the creek can provide berths, gasoline, storage, launching ramps, and engine repairs.

South Jamesport is a village on **Miamogue Point**, 3.4 miles southwestward of James Creek. A wharf is on the point. Local knowledge is necessary to avoid the shoals in this area, and strangers should take soundings frequently to keep in the best water. Small boats anchor or moor to piles in the bight westward of the wharf. Small-craft facilities at South Jamesport can provide berths, electricity, gasoline, water, ice, launching ramps, storage, marine supplies, and hull and engine repairs. A 15-ton mobile hoist is available at the marina about 1.3 miles west of Miamogue Point; in 1965, a reported depth of about 6 feet could be taken to this marina. The town has railroad passenger and bus service.

Peconic River empties into the western end of Flanders Bay, about 1.5 miles westward of South Jamesport. The river is entered through a marked dredged channel that leads from Flanders Bay to the head of navigation at **Riverhead**, about 2.4 miles above the channel entrance. The dredged channel is approached from deep water in Great Peconic Bay through a marked channel. In 1964-70, the dredged channel had a centerline controlling depth of 6 feet.

Flanders Bay is the scene of considerable small boat activity. A yacht club is at Riverhead; gasoline and water are available.

Meetinghouse Creek, **Terrys Creek**, and **Reeves Creek**, which empty into the northwestern part of Flanders Bay, are entered through privately dredged channels. In 1965, the channels had controlling depths of 7 feet. A marina is on Meetinghouse Creek. Berths, electricity, gasoline, water, ice, 15-ton mobile hoist, launching ramp, storage facilities, and hull and engine repairs are available.

Reeves Bay, on the southwest side of Flanders Bay, is entered through a privately dredged channel that leads to the town of **Flanders** on the south side of the bay. In 1967, the channel had a controlling depth of 6 feet. Other dredged channels lead from the entrance channel into several arms of the bay. A boatyard at Flanders has gasoline, storage facilities, marine supplies, and a 10-ton marine railway; hull and engine repairs can be made.

Chart 358.—Fishers Island Sound extends between the mainland of Connecticut and Fishers Island, and forms one of the entrances into Long Island Sound that is used to some extent by light tows and other vessels up to 14-foot draft. The sound has numerous shoals and lobster trap buoys,

and the entire area is exceedingly treacherous, characterized by boulder patches that rise abruptly from deep water. Vessels should follow the deeper channels between the shoals and proceed with caution if obliged to cross shoal areas. In general, all shoal spots or abrupt changes of depth are indications of boulders and should be avoided as anchorages.

Dumping grounds are located in Fishers Island Sound, one just inside the eastern end and the other near the western end. (See **205.10 (a)** and **(c) (18)** and **(19)**, chapter 2, for limits and regulations.)

Tides and currents.—In Watch Hill Passage the tidal currents are strong and necessitate caution in navigating. Buoys may be towed under. The flood current sets nearly in the direction of the channel, but has a tendency to northward and the ebb a tendency to southward. The northerly and southerly set is more marked between Napatree Point and Latimer Reef Light.

In Sugar Reef and Catumb Passages the tidal currents set obliquely across the axis of the channel. The flood sets northwestward and the ebb southeastward. The tidal currents in Sugar Reef Passage are about the same velocity as in Watch Hill Passage but are stronger in Catumb Passage.

In Lords Passage the tidal currents set diagonally across the channel and have a velocity of nearly 2 knots, the ebb being greater than the flood.

In the main channel of Fishers Island Sound, the flood sets westward and the ebb eastward. In the main channel between Napatree Point and Wicopesset Island, the velocity of flood is 1.7 knots and ebb 2.2 knots. The flood sets 285° and the ebb 115°.

In the channel south of Ram Island Reef, the velocities of flood and ebb are 1.3 and 1.6 knots, respectively. The flood sets 255° and the ebb 090°. The direction and velocity of the current are affected by strong winds that may change the duration of flood or ebb.

The strong tidal currents prevent the formation of heavy local **ice**, except in shoal tributaries. The only ice to give trouble is that set in from Long Island Sound by wind and current. The ice formations in Little Narragansett Bay are sufficiently heavy to be destructive to structures exposed to it.

On the south side of Fishers Island Sound, off the north side of **East Point** on Fishers Island, are **Seal Rocks**, partly bare at low water and marked by a buoy. A rocky patch covered 11 feet is about 500 yards northeastward of Seal Rocks. **Youngs Rock**, about 0.4 mile westward of Seal Rocks, has about 1 foot over it and is marked by a buoy. A rocky patch extends about 400 yards to the east-northeastward.

East Harbor and **Chocomount Cove**, in the north shore of Fishers Island, are sometimes used as anchorages by small craft. There is considerable foul ground in East Harbor and in the approach to Chocomount Cove. The harbor and cove are exposed to northerly winds. A former Coast Guard station with a boathouse and dock is prominent near the south side of East Harbor. Several small private piers with about 6 feet at their ends are in East Harbor.

The north shore of Fishers Island from East Harbor around into West Harbor has several private landings.

East Clump is a cluster of rocks partly bare at high water about 0.8 mile north of Fishers Island. From East Clump for some 2.8 miles westward to North Dumpling, there are rocky islets and dangers which must be avoided. These are 0.5 to 0.8 mile off the Fishers Island shore, and most are buoyed. **North Dumpling**, an islet marked by a light and fog signal, is surrounded by rocks awash and foul ground. **Seaflower Reef**, marked by a light, is near the middle of the western entrance of Fishers Island Sound and 0.8 mile northwestward of North Dumpling Light.

West Harbor, on the north side of Fishers Island southeastward of North Dumpling Light, affords shelter from southerly winds. In 1965, the dredged channel leading into the harbor along the west shore had a controlling depth of 12 feet. Foul ground extends across the entrance of West Harbor to near the eastern edge of the dredged channel; the northern limits of the foul ground is buoyed.

A yacht club wharf and another small-craft facility are on the southwest side of the harbor. Gasoline, diesel fuel, water, ice, and hull and engine repairs are available. A marine railway can handle craft up to 40 feet. The head of the harbor is used by boats drawing less than 5 feet which enter by the narrow channel southward of **Goose Inlet**. The channel is privately marked by daybeacons.

Hay Harbor, at the west end of Fishers Island, is used by small craft.

Silver Eel Pond is on the west side of Fishers Island, 0.6 mile northeastward of Race Point. The entrance, about 75 feet wide and jettied, is marked by private lights and has a depth of about 13 feet, with similar depths inside. Submerged fender pilings are reported on both sides of the entrance. Dolphins are on the northeast side of the pond, and the channel is clear between them and the wharves on the southwest side. Vessels must go to the wharves as there is no room for anchorage. There is very little dockage available. The entrance is difficult with northwesterly or westerly winds. A lighted bell buoy is about 450 yards off the entrance. A ferry which operates between Fishers Island and New London lands here. A Coast Guard station is inside the entrance to the pond.

On the north side of Fishers Island Sound are: Little Narragansett Bay, and Pawcatuck River leading to the towns of Westerly and Pawcatuck; Stonington Harbor and the towns of Stonington; and Mystic Harbor leading to the towns of Noank and Mystic.

Napatree Beach, 1.3 miles long between Watch Hill Point and **Napatree Point**, is bare. **Sandy Point**,

about 1.4 miles north-northwestward of Napatree Point, is at the northwestern end of a long and narrow sand island in Little Narragansett Bay. An extensive sand spit makes off from the northeasterly and southwesterly sides of the island; give these areas a good berth. The island is subject to continual change; caution is advised.

Napatree Point Ledge, a boulder reef with little depth, extends nearly 0.4 mile southward of the point. It is marked by a lighted bell buoy.

The west side of Napatree Point should not be approached closer than 175 yards to avoid a stone jetty which is covered at high water. Between Napatree Point and the Stonington outer breakwater is an extensive flat on which the depths are 3 to 10 feet, rocky bottom. **Middle Ground**, the western part of the flat, is marked by the outer breakwater, which has a light at its western end. A fog signal is at the light.

A depth of 17 feet can be taken to an anchorage inside this breakwater, giving the light on the breakwater a berth of more than 250 yards. In anchoring, give the inside of the breakwater a berth of over 300 yards to avoid shoals and fish-weirs. This anchorage provides good shelter except in southwesterly and westerly winds, although it is seldom used.

Little Narragansett Bay, at the eastern end of Fishers Island Sound, is entered at its extreme western end southward of Stonington Point. The channel, with dredged sections, extends generally southeasterly across the bay into Pawcatuck River to Westerly. In 1965, the midchannel controlling depth in the channel was 6 feet to Westerly. The channel is well marked with navigational aids.

Caution should be exercised in entering Little Narragansett Bay. Shoal water extends for about 200 yards off **Stonington Point**, and the shoal area north of **Sandy Point** is subject to continual change. Strangers are advised to obtain local information before entering because of rocks and shoal water near the edges of the channel.

In the dredged channel northward of Sandy Point, the currents have a velocity of 1.1 knots. The flood sets eastward, the ebb westward. (See the Tidal Current Tables for predictions and Tidal Current Charts, Block Island Sound and Eastern Long Island Sound, for hourly velocities and directions.)

Watch Hill Cove, in the southeastern part of Little Narragansett Bay, is used by small craft. In 1965, the buoyed dredged channel leading to the cove had a controlling depth of 7 feet. Depths of 8 to 10 feet are inside the cove and at the wharves. A special **anchorage area** for small vessels is in the cove. (See **110.1** and **110.47**, chapter 2, for limits and regulations.)

Berths, electricity, gasoline, and water are available in Watch Hill Cove.

Pawcatuck River, entered just south of **Pawcatuck Point**, extends about 4 miles to Westerly.

About a mile above the entrance to Pawcatuck River the **tidal current** has a velocity of 0.6 knot on flood, and ebb 0.2 to 0.5 knot. The river is generally closed by **ice** from January to March.

Colonel Willie Cove, 0.5 mile above Pawcatuck Point, has a boatyard with a marine railway that can handle craft up to 45 feet for hull and engine repairs. Berths, electricity, gasoline, water, ice, launching ramp, storage facilities, and marine supplies are also available.

A special **anchorage area** for small vessels is in **Thompson Cove**, 2 miles above Pawcatuck Point. (See **110.1** and **110.48**, chapter 2, for limits and regulations.) A yacht club pier is in the cove. **Storm warning signals are displayed.** (See chart.)

Westerly, 4 miles above Pawcatuck Point, is an important manufacturing town. Depths at the wharves range from 7 to 9 feet.

There are numerous small-craft facilities along both sides of the Pawcatuck River and at the head at Westerly and Pawcatuck, just across the river. The largest marine railway in the area can handle craft up to 55 feet. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, launching ramps, lifts, and marine supplies are available.

Wequetequock Cove is a shallow cove at the northern end of Little Narrangansett Bay. A narrow unmarked channel leads eastward of **Ledwoods Island** into the cove. A depth of about 4 feet can be taken as far as **Goat Island**, about a mile above Sandy Point. A fixed railroad bridge with a clearance of 6 feet crosses the cove about 0.2 mile above Goat Island. A small-craft facility is on the west side of the cove near the head. Berths, gasoline, storage facilities, launching ramp, 2-ton crane, marine supplies, and hull and engine repairs are available.

Stonington Harbor, 3 miles northwestward of Watch Hill Point, is protected by breakwaters on each side. The controlling depth to the inner harbor is about 11 feet. Anchorage can be selected inside the west breakwater in depths of 15 to 18 feet, taking care to keep the south end of Wamphassuc Point bearing northward of 270°. Vessels drawing up to 8 feet can find anchorage in the inner harbor. A rock that bares at low water is about 50 yards southward of the fishing wharf, and is marked by a buoy. Special small-craft **anchorage areas** have been designated in Stonington Harbor. (See **110.1** and **110.50**, chapter 2, for limits and regulations.)

Storm warning signals are displayed. (See chart.)

Stonington Harbor is approached from southeastward and westward. Vessels with local knowledge sometimes cross Noyes Shoal from southwestward. The southeastern approach is best, with fewer dangers, and the navigational aids serve as excellent guides to avoid them. In daytime with clear weather, no difficulty should be experienced in entering any of the approaches.

From southeastward, the course from south of Napatree Point Ledge should be west-northwestward until off the buoy at the southwest end of Middle Ground, from which a northerly course can be shaped past the breakwater lights and into the harbor.

From southwestward, a northeasterly course can be shaped from the lighted gong buoy south of Ram Island Reef to south of White Rock, and thence eastward past the north side of Noyes Rock to the harbor.

The inner breakwater, about 400 yards northward of Stonington Point on the east side of the entrance, extends westward about 250 yards, and is marked by a light.

Stonington is a town on the railroad. Commerce is mostly in fishing. The wharves have depths of 7 to 12 feet alongside. Following southerly weather, a surge is felt by vessels tied to the southern side of the seaward pier.

There are several small-craft facilities at Stonington. Berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, 20-ton mobile hoist, marine supplies, and hull, engine and electronic repairs are available. A **harbormaster** is at Stonington.

Noyes Rock 0.4 mile southward of **Wamphassue Point**, has a least depth of 8 feet and is marked by a buoy. **Noyes Shoal**, with 8 to 17 feet over it, is nearly 1.5 miles long in a west-northwesterly direction; it is marked by a buoy near its eastern end and a buoy about 0.45 mile eastward of its western end.

Latimer Reef, about 0.6 mile south of Noyes Shoal, is a very broken and rocky area 0.4 mile long; it is marked by a light and buoys. The eastern end of the reef has a least found depth of 6 feet.

Latimer Reef Light (41°18.3′ N., 71°56.0′ W.), 55 feet above the water, is shown from a white conical tower, brown midway of its height, and brown cylinder. A fog signal is sounded at the light.

Eel Grass Ground, about 0.8 mile northwestward of Latimer Reef Light, is a shoal with a least depth of 4 feet, marked by buoys. **White Rock**, about 0.8 mile northeastward of Eel Grass Ground, is bare and prominent. **Red Reef**, covered 2 feet, is 0.2 mile north of White Rock and marked by a buoy.

Mason Island, 2.5 miles west of Stonington Harbor, is joined to the mainland by a fixed bridge with an 18-foot span and a clearance of 3 feet; the sound end of the island is strewn with boulders. A **special small-vessel anchorage** area has been established on the east side of Mason Island. (See **110.1** and **110.50**, chapter 2, for limits and regulations.) An anchorage for small craft is on the west side of the south end of Mason Island where depths range from 8 to 11 feet; caution and local knowledge are required to use this anchorage because of the boulders in the area. A dangerous rock is off the east side of **Mason Point**, the southern extremity of Mason Island, in 41°19′21.6″ N., 71°58′05.0″ W.

Baker Island, 0.3 mile eastward of the southern end of Mason Island, is connected to it by a fixed bridge with a 15-foot span and a clearance of 6 feet.

Ram Island Reef, 1.8 miles westward of Latimer Reef Light, has two detached parts: the southerly section is covered 6½ feet and marked by a lighted gong buoy, and the northerly section, covered by 1 foot, is marked by a buoy. Passage between the reef and island is unsafe because of shoals.

Ram Island, about 0.4 mile southwest of Mason Island, is wooded and grass-fringed. A shoal, on which are two rocky islets, extends about 0.2 mile northeastward from Ram Island. **Ram Island Shoal**, extending nearly 0.5 mile westward from Ram Island, has little water over it and many rocks bare at low water. **Whaleback Rock** and the islet 300 yards northwestward of it are bare.

The narrow but deep channel along the north side of Ram Island Shoal is the easterly entrance to Mystic Harbor. Between the shoal and Groton Long Point is an area of foul ground and several dangerous rocks, including **Whale Rock**, which bares at low water, at the northwesterly end of Ram Island Shoal; this rock is marked by a daybeacon. Leading across the shoal is the buoyed channel, good for about 11 feet, which is used by vessels entering Mystic Harbor from westward.

A rock covered 10 feet is 300 yards eastward of Groton Long Point, and is marked by a buoy. Vessels should keep westward of this buoy, giving it a berth of over 100 feet; about 0.4 mile southerly of that rock is **Intrepid Rock**, with 13 feet over it and marked by a buoy, which should be avoided. **Mouse Island**, marked by several dwellings, is 150 yards southwestward of Morgan Point.

Morgan Point, on the west side at the entrance of Mystic Harbor, is marked by an abandoned light tower. A privately maintained and marked channel leading to the piers in **West Cove** at Noank westward of the point has a least depth of about 3 feet.

Groton Long Point, on which is a summer settlement, is about 0.9 mile southwestward of Morgan Point. A reef extends nearly 300 yards southwestward from the point, and is marked by a buoy. About 0.3 mile to the west a rock awash at low water is 175 yards off the southwest end of Groton Long Point. It is marked by a buoy.

Venetian Harbor is a yacht basin northwest of Groton Long Point. A channel 75 feet wide leads through stone breakwaters into a basin with a depth of about 4 feet. The entrance to the harbor is marked by a lighted buoy.

Mystic Harbor, about 6 miles westward of Watch Hill Point, is the approach to the towns of Noank and Mystic. A channel with two dredged sections leads from Fishers Island Sound through Mystic Harbor to the Marine Historical Association Wharf, 0.6 mile northward of the highway bridge at Mystic on the Mystic River. In 1965, the midchannel controlling depth was 9 feet. The channel is marked by buoys, a light, and a daybeacon.

Special small-vessel **anchorage areas** are in Mystic Harbor. (See **110.1** and **110.50d**, chapter 2, for limits and regulations.)

Routes.—To enter from eastward, lay a west-northwesterly course from south of the lighted bell buoy marking Napatree Point Ledge for a little over 3 miles to about 200 yards north of the buoy marking the northerly side of Ellis Reef. From

here steer **261°** for the abandoned light tower on Morgan Point in range with the north end of the northern rocky islet off the north end of Ram Island until Mason Point is abeam. Then follow the buoyed channel.

From westward, proceed cautiously from about 100 yards or more southward of the buoy southward of Groton Long Point on an easterly course for about 0.5 mile to Mystic Harbor Channel Buoy 1. Then continue between the buoys that mark **Planet Rock** and the shoal to the westward, pass about 150 feet west of Whale Rock Daybeacon, and steer northeastward into the main channel, rounding Noank Light at a distance of about 225 feet.

Noank is a town on the west side of the channel through Mystic Harbor. The mean range of the tide is about 2.3 feet. There are several small-craft facilities at Noank and in **West Cove**. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, launching ramps, 45-foot marine railway, 25-ton mobile lift, and marine supplies are available; hull and engine repairs can be made.

Mystic River flows into Mystic Harbor from northward just below Mystic. The river is used by recreational craft, the local fishing fleet, and by transient craft visiting Mystic Seaport. An **anchorage area** with depths of about 8 feet is in the lower part of the river between Willow Point and Murphy Point. **Ice** usually closes the river during January and February.

Willow Point, 0.6 mile below Mystic, is the site of a plant for building yachts; a railway can haul out vessels up to 100 feet. A 12-ton crane is also available. The yard has facilities for boat storage and all types of repairs. A channel 12 feet deep has been dredged to the railway. Berths, electricity, gasoline, water, ice, some engine parts, and marine supplies are available.

A channel, privately marked by daybeacons, leads from the vicinity of Willow Point for 0.3 mile in an easterly direction, thence about 0.4 mile northeastward to a marina on the west side of the mouth of **Pequotsepos Brook**, just below the railroad bridge. Berths, electricity, gasoline, water, ice, storage, marine supplies, a 15-ton mobile hoist, and hull and engine repairs are available.

Several small-craft facilities are on the northern end of Mason Island. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, launching ramps, marine supplies, 25-ton mobile hoist, and hull and engine repairs are available.

The railroad bridge over Mystic River below Mystic has a swing span with a clearance of 4 feet. The highway bridge at Mystic has a bascule span with a clearance of 4 feet. (See **117.95**, chapter 2, for drawbridge regulations and opening signals.)

Mystic, a town about 2 miles above Noank, has several small-craft facilities. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage facilities, mobile hoists, and marine railways up to 110 feet are available; hull and engine repairs can be made. A **harbormaster** is at Mystic.

The **Marine Historical Association Museum** is about 0.6 mile above the highway bridge at Mystic. The whaler, CHARLES W. MORGAN, full-rigged training ship JOSEPH CONRAD, schooner AUSTRALIA, and Grand Banks fishing schooner L. A. DUNTON are permanently moored at the museum and open to the public. Along the waterfront of the museum property a mid-19th Century coastal village has been recreated with shops and lofts of that period. Collections of maritime relics are on exhibit in several formal museum buildings.

Above the Marine Historical Association wharf, the channel is very narrow and is marked by privately maintained seasonal daybeacons; boats of about 5-foot draft can be taken to the **Narrows**, and thence depths are 1 and 2 feet to **Old Mystic**. Twin fixed highway bridges crossing the Narrows have clearances of 25 feet. The stream follows the east bank to the next narrows and the west bank to a building, formerly a casino, in the bight about 0.3 mile below Old Mystic.

Chart 293.—Mumford Cove is entered about 2 miles west of Mystic Harbor. A privately dredged channel leads northward from the entrance to the head of the cove; two spur channels lead eastward from the main channel, about 0.3 mile and 0.6 mile, respectively, above the entrance. A seasonal lighted buoy marks the channel approach. The channels are marked by buoys and daybeacons. In 1966, the channels had a controlling depth of 2 feet.

Special small-vessel **anchorage areas** have been designated in the cove. (See **110.1** and **110.50c**, chapter 2, for limits and regulations.)

Horseshoe Reef, 0.5 mile southward of Mumford Cove entrance, is awash at low water, and is marked by a buoy. Broken and rocky grounds extends from the reef to the shore eastward of Mumford Point.

Vixen Ledge, with a depth of 10 feet and marked by a buoy, is about a mile west of Horseshoe Reef. **Pine Island** is bluff and grassy, about 1.3 miles west of Mumford Point. It is surrounded by shoal water and rocky bottom, and is marked off the southwest side by a buoy. A rock, covered 7 feet, in 41°18′35″ N., 72°03′17″ W., is about 3 miles northwestward of Vixen Ledge.

A special small-vessel **anchorage area** is on the north side of Pine Island. (See **110.1** and **110.51**, chapter 2, for limits and regulations.)

The cove indenting the mainland northward of Pine Island and eastward of **Avery Point**, is entered between Avery Point and westward of Pine Island. The entrance to the cove is marked by two buoys just inside and eastward of Avery Point. Depths shoal from about 10 feet in the entrance to about 1 foot at the head of the cove. A yacht club, small marina, and State launching ramp are in the cove. An unmarked rock awash is about 500 yards 060° from the former lighthouse tower at Avery Point. Gasoline, ice, and a 14-ton mobile hoist are available at the marina.

Special purpose buoys maintained by the City of Groton show a **speed limit** of 5 m.p.h. in the area.

A special small-vessel **anchorage area** is in the cove. (See **110.1** and **110.51**, chapter 2, for limits and regulations.)

8. EASTERN LONG ISLAND SOUND

This chapter describes the eastern portion of Long Island Sound following the north shore from Thames River to and including the Housatonic River, and then the south shore from Orient Point to and including Port Jefferson. Also described are the Connecticut River; the ports of New London, New Haven, and Northville; and the more important fishing and yachting centers on Niantic River and Bay, and in Westbrook Harbor, Guilford Harbor, Branford Harbor, and Mattituck Inlet.

Chart 1212.—Long Island Sound is a deep navigable waterway lying between the shores of Connecticut and New York and the northern coast of Long Island.

In this region are boulders and broken ground, but little or no natural change in the shoals. The waters are well marked by navigational aids so that strangers should experience no difficulty in navigating them. As all broken ground is liable to be strewn with boulders, vessels should proceed with caution in the broken areas where the charted depths are not more than 6 to 8 feet greater than the draft. All of the more important places are entered by dredged channels; during fog, vessels are advised to anchor until the weather clears before attempting to enter. The numerous oyster grounds in this region are usually marked by stakes and flags. These stakes may become broken off and form obstructions dangerous to small craft. Mariners should proceed with caution especially at night.

Caution.—Submarine operating areas are in the approaches to New London Harbor, Connecticut River, and off the northern shore of Long Island. As submarines may be operating submerged in these areas, vessels should proceed with caution.

Dumping grounds.—Dumping grounds are located in the eastern portion of Long Island Sound. (See **205.10 (a), (c) (7) through (14), (c) (16),** and **(c) (17)**, chapter 2, for limits and regulations.)

Anchorages.—New London Harbor is the most important of the anchorages sought for shelter in the eastern part of Long Island Sound. Niantic Bay and the approach between Bartlett Reef and Hatchett Reef are used to some extent by small vessels when meeting unfavorable weather or reaching the eastern part of the sound. Small vessels can select anchorage eastward or westward of Kelsey Point Breakwater, also in Duck Island Roads. Off Madison there is anchorage sheltered from northerly winds. New Haven Harbor is an important harbor of refuge.

Tides.—The time of tide is nearly simultaneous throughout Long Island Sound, but the range of tide increases from about 2.5 feet at the east end to about 7.3 feet at the west end. Daily predictions of the times and heights of high and low waters for New London, Bridgeport, and Willets Point are given in the Tide Tables.

The effect of strong winds, in combination with the regular tidal action, may at times cause the water to fall several feet below the plane of reference of the charts.

Currents.—In the eastern portion of Long Island Sound the current turns from 0.5 to 1.5 hours earlier along the north shore than in the middle of the sound.

Proceeding westward from The Race in the middle of the sound, the velocity of current is 1.8 knots off Cornfield Point, about 1 knot off New Haven, 1 knot off Eatons Neck, 0.5 knot between Rye Neck and Matinecock Point, and 0.5 knot eastward of Hart Island.

About 1.5 miles east-southeastward of Barlett Reef, the velocity of flood is 1.2 knots and ebb 1.6 knots. The flood current sets 285° and the ebb 062°.

At a point about 3 miles southward of Cornfield Point, the flood currents sets 255° with a velocity of 2 knots and the ebb sets 095° with a velocity of 1.7 knots.

About 1 mile north of Stratford Shoal (Middle Ground) Light, the velocity is 1.4 knots, the flood setting westward and the ebb eastward. (See Tidal Current Tables for predictions.) Current directions and velocities at various places throughout the eastern portion of Long Island Sound for each hour of the tidal cycle are shown on the Tidal Current Charts, Block Island Sound and Eastern Long Island Sound.

Fog.—In Long Island Sound the north and south shores are equally subject to fog, except that on spring and summer mornings, when there is little or no wind, fog will often hang along the Connecticut shore while it is clear offshore and to the southward.

Ice.—In ordinary winters the floating and pack ice in Long Island Sound, while impeding navigation, does not render it absolutely unsafe; but in exceptionally severe winters the reverse is true, none but powerful steamers can make their way.

Drift ice, which is formed principally along the northern shore of the sound under the influence of the prevailing northerly winds, drifts across to the southern side and accumulates there, massing into large fields, and remains until removed by southerly winds, which drive it back to the northerly shore.

In ordinary winters ice generally forms in the western end of the sound as far as Eatons Neck; in exceptionally severe winters ice may extend to Falkner Island and farther eastward.

Effects of winds on ice.—In Long Island Sound northerly winds drive the ice to the southern shore

of the sound and southerly winds carry it back to the northern shore. Northeasterly winds force the ice westward and cause formations heavy enough to prevent the passage of vessels of every description until the ice is removed by westerly winds. These winds carry the ice eastward and, if of long duration, drive it through The Race into Block Island Sound, thence it goes to sea and disappears.

In New Haven Harbor the influence of the northerly winds clear the harbor and its approaches unless the local formation is too heavy to be moved. Southerly winds force the drift ice in from the sound and prevent the local formations from leaving the harbor. Tides have little effect upon the ice. Additional information concerning ice conditions in the waters adjoining Long Island Sound is given under the local descriptions.

Pilotage is compulsory in Long Island Sound for foreign vessels and U.S. vessels under register. Pilots board in the vicinity of Brenton Reef Light (41°25.6′ N., 71°23.4′ W.), Block Island North Reef Lighted Bell Buoy 1B1 (41°15.5′ N., 71°34.6′ W.), Block Island Southeast Lighted Whistle Buoy (41°05.8′ N., 71°30.0′ W.), and about 2 miles south of Point Judith Lighted Whistle Buoy 2 (41°20.0′ N., 71°28.5′ W.). Pilot services are generally arranged for at least 24 hours in advance through ships' agents or directly by shipping companies. Pilots board from launches; 24-hour service is available. In emergencies pilots can be arranged for on 2738 kHz or on 2182 kHz. Pilotage, where required for the major ports on Long Island Sound, is discussed under the name of the port.

Charts 293, 359, 116-SC.—New London Harbor, near the east end of Long Island Sound at the mouth of the **Thames River**, is an important harbor of refuge. Vessels of deep draft can find anchorage here in any weather and at all seasons.

Waterborne commerce in New London Harbor and on the Thames River is chiefly in petroleum products, chemicals, lumber, pulpwood, and general cargo.

Security Zones of a temporary nature are frequently established in New London Harbor because of the launching of new vessels. Advance notice of such Security Zones together with limits and regulations are usually published in the Local Notice to Mariners.

New London is a city on the west bank of Thames River about 2.5 miles above the mouth. The town of **Groton** on the east bank is connected to New London by a highway bridge and a railroad bridge. The main harbor comprises the lower 3 miles of Thames River from Long Island Sound to the bridges, and includes Shaw Cove, Greens Harbor, and Winthrop Cove. It is approached through the main entrance channel extending from deep water in Long Island Sound to deep water in the upper harbor. The harbor is generally used by vessels drawing 9 to 30 feet; the deepest draft entering is about 33 feet. Petroleum products, molasses, sulphuric acid, woodpulp, hemp fiber, coconut products, and lumber are the principal waterborne products handled at the port.

Greens Harbor, a small-craft shelter just north of the entrance, has general depths of 6 to 17 feet. Special small-vessel anchorage areas have been designated in the harbor. (See **110.1** and **110.52**, chapter 2, for limits and regulations.)

Shaw Cove is a dredged basin about 0.8 mile northward of Greens Harbor. In September 1969, depths of 15 feet were available in the basin except for shoaling along the edges. The railroad bridge over the entrance has a swing span with clearances of 3 feet through the 39-foot north draw and 45-foot south draw. (See **117.105**, chapter 2, for drawbridge regulations and opening signals.)

Winthrop Cove, northward of Shaw Cove, is part of the main waterfront channel. The fixed railroad bridge near the head of this cove has a clearance of 4 feet.

Prominent features.—New London Ledge Light (41°18.3′ N., 72°04.6′ W.), 58 feet above the water, is shown from a red brick building on a square pier on the west side of New London Ledge; a fog signal is sounded at the station. **Storm warning signals are displayed.** (See chart.)

Other prominent features in approaching New London Harbor are: New London Harbor Light, on the west side of the entrance channel; the training tank at the submarine base; the globular tank at Fort Trumbull; the monument at Fort Griswold; the microwave tower atop a building in downtown New London; and the highway bridge at New London.

Channels.—A Federal project for New London Harbor provides for a channel 33 feet deep to the State Pier, and 23 feet in the waterfront channels and in Winthrop Cove. (See Notice to Mariners and latest editions of the charts for controlling depths.) A natural 354° range marks the main channel from the entrance to the railroad and highway bridges. The front range marker is formed by the opening in the railroad bascule bridge; the rear range marker is the conspicuous training tank at the submarine base.

Pine Island Channel, northeastward of New London Ledge Light, between Pine Island and Black Ledge, has a rocky and very broken bottom on which the least found depth is 10 feet. It is used some by local vessels between New London Harbor and Fishers Island Sound, but should be avoided by any vessel drawing more than 10 feet.

Anchorages.—Anchorage areas have been designated in New London Harbor. (See **110.147**, chapter 2, for limits and regulations.) Special small-vessel anchorage areas have been designated in Greens Harbor. (See **110.1** and **110.52**, chapter 2, for limits and regulations.)

Dangers.—On the west side of the approach to New London Harbor foul ground extends about a mile from shore in the vicinity of **Goshen Point**. The southerly and southeasterly limits of this area are marked by buoys. The area has numerous rocky patches and boulders, some showing above

water, and should be avoided by small craft. **Rapid Rock**, about 1.6 miles southwestward of New London Ledge Light, has a least depth of 10 feet and is the outermost shoal to the southward. **Sarah Ledge**, 0.7 mile northeastward of Rapid Rock, has a least depth of 14 feet and is the easternmost shoal on the west side of the main channel approach.

On the east side of the main channel foul ground extends about a mile offshore. **New London (Southwest) Ledge**, marked by New London Ledge Light, has a least depth of 7 feet. **Black Ledge**, just to the northeastward of New London Ledge, has a rocky islet, 2 feet high, on it. Depths are 2 to 16 feet on the ledge. Buoys mark the shoal area.

Broken ground fringes the shore southwestward of New London Harbor Light. Rocks with 2 to 11 feet over them extend about 0.2 mile from shore in the bight just southward of the light.

White Rock, an islet in Greens Harbor, is 200 yards from the 18-foot curve on the western edge of the channel. **Hog Back**, a small ledge awash at low water, is 150 yards southwestward of White Rock and nearly 0.3 mile from the western shore, and is marked by two buoys. Rocks, covered 3 to 6 feet, are in the middle of the northern part of Greens Harbor. **Melton Ledge (293)**, northward of White Rock, with one-half-foot over it, is 125 yards eastward of **Powder Island** and is marked by a buoy; a rock awash is close westward of Melton Ledge.

Bridges.—Three bridges cross the Thames River below Norwich, two near Winthrop Point and one about 0.2 miles southward of Fort Point. The first is the railroad bridge, which has a bascule span with a clearance of 30 feet. (See **117.100**, chapter 2, for drawbridge regulations and opening signals.) Just above it is the high-level fixed highway bridge with a clearance of 135 feet, and 7.9 miles farther up the Thames is a fixed highway bridge with a clearance of 75 feet.

In 1970, a fixed highway bridge with a design clearance of 135 feet was under construction just north of the first highway bridge.

Overhead power cables with a clearance of 160 feet cross the river about 5.5 miles below Norwich.

Tides and currents.—The mean range of tide at New London is 2.6 feet. Daily predictions are given in the Tide Tables.

The tidal currents follow the general direction of the channel and usually are not strong. At Gales Ferry, 4 miles above New London, the velocity is about 0.8 knot, and at Easter Point, 7 miles above New London, 0.5 knot. During freshets and when the river is high, the resulting current sometimes has considerable velocity and vessels are often embarrassed in light winds, after getting in past the light, by strong surface currents setting out even on the flood. Current directions and velocities at various places on the Thames River for each hour of the tidal cycle are shown on the Tidal Current Charts, Block Island Sound and Eastern Long Island Sound.

Ice obstructs navigation about 2 months each year above the naval station, which is some 5 miles above New London Ledge Light, but seldom forms below the station. In extremely severe winters, however, heavy ice from the sound, driven in by winds, has been known to extend about 1.8 miles above the entrance. Between New London and the mouth of the river small vessels may navigate with comparative safety in ordinary winters; and even in severe weather it is rare that navigation for small vessels stops for more than a week. Steamers can nearly always enter and leave with safety. Drift ice sometimes forms a decidedly dangerous obstruction in the approaches through Long Island Sound during severe winters, especially during February and March; and small vessels are much hindered in their movements during January, February, and March.

The prevailing winds are southwesterly in summer and northwesterly in winter. **Storm warning display** locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Freshets usually occur in the river in the spring. It is reported that they seldom exceed 2 feet above high water at Norwich.

New London Harbor and Thames River are easy of access by day or night, but local knowledge is required to take drafts greater than 20 feet above the submarine base.

Pilotage is compulsory for foreign vessels and U.S. vessels under register. Pilot services are generally arranged for in advance through ships' agents or directly by shipping companies; pilots are available on a 24-hour basis except when visibility is less than 2 miles. Pilots can be contacted on VHF-FM channel 13 (156.65 MHz). Pilots usually board vessels from a tug southeastward of Sarah Ledge Lighted Gong Buoy 1 (41°17.7′ N., 72°05.3′ W.). (Refer to discussion at beginning of chapter for other boarding places.)

Towage.—Tugs of up to 1,800 hp. are available at New London. Vessels usually proceed to the upper harbor without assistance, although a tug may be required when entering with a head wind and contrary current. Large vessels normally require tugs for docking and undocking.

New London is a **customs port of entry.** Quarantine officials are stationed in Boston, Mass., **immigration officials** in Hartford, Conn., and **agricultural quarantine** officials in Warwick, R.I. (See appendix for addresses.) Vessel 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 regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.) The U.S. Public Health Service maintains a **contract physician's office** in New London. (See appendix for address.) New London has several hospitals.

Coast Guard.—The **Captain of the Port** maintains

an office at the Coast Guard base. A **vessel documentation office** is in downtown New London. (See Appendix for address.)

Harbor regulations are in force for New London Harbor. The harbormaster has authority to berth vessels, shifting them if necessary, but occasion for doing so seldom arises.

Wharves.—New London Harbor has more than 30 wharves and piers. Most of these facilities are used as repair berths, and for mooring recreational craft, fishing vessels, barges, and government vessels. Depths alongside these facilities range from 10 to 30 feet. Only the deep-draft facilities are described. (For a complete description of the port facilities refer to the Port Series, a Corps of Engineers publication.) The alongside depths are reported; for information on the latest depths contact the private operator.

Hess Oil Dock (41°20′09″ N., 72°04′58″ W.): on the east side of the river opposite Greens Harbor; T-head pier with 60-foot face, 625 feet with dolphins; 36 feet alongside; deck height, 8 feet; pipelines to storage tanks; fresh water connection; railroad and highway connections; receipt and shipment of petroleum products and receipt of molasses; bunkering vessels; owned and operated by Hess Oil and Chemical Corp.

State Pier: the more easterly of the two long piers southwestward of the Thames River bridges, about 1.3 miles northward of Hess Oil Dock; 200-foot face, 32 feet alongside; south side 1,000 feet, 28 feet alongside; north side 1,020 feet, 36 to 38 feet alongside; deck height, 10 feet; 205,000 square feet of covered storage, 6 acres open storage; electricity and potable and feed water connections on pier, railroad and highway connections; receipt and shipment of general cargo; owned by State of Connecticut, south side operated by Connecticut Terminal Company, north side and face by U.S. Navy.

Supplies of all kinds are available. Gasoline, diesel oil, and heavy marine bunker fuels can be obtained from oil companies on 48 hours' notice by barge, tank truck, or at the Hess Oil Dock. Water is available at most of the piers, wharves, and marinas.

Repairs.—New London Harbor has two major repair facilities: one is on the east side of the river about 1 mile below the drawbridge, and the other is on the west side of the river about 1 mile above the drawbridge. The larger and more southerly facility has a floating drydock, graving dock, and a marine railway.

The floating drydock has a lifting capacity of 6,500 tons, overall length of 448 feet, length of 435 feet on the keel blocks, overall width of 97 feet, inside clear width of 70 feet, and depth of 26 feet over the keel blocks. The graving dock has a length of 515 feet, width of 70 feet, 35½-foot depth over the sill, and 34½ feet over the keel blocks.

The marine railway cradle is 330 feet long and 56 feet wide, and can handle vessels up to 2,500 tons. The floating drydock, graving dock, and marine railway are mainly used in the construction and repair of naval vessels. In extreme emergencies, these facilities can be made available to other vessels.

The more northerly repair facility has two marine railways and is equipped to build or repair steel and wooden vessels, and overhaul and repair engines and boilers. This facility specializes in repairs to large yachts and small commercial vessels. The larger of the two marine railways can handle vessels up to 1,500 tons, and has a cradle 200 feet long and 45 feet wide.

Cranes up to 70 tons and floating derricks up to 110 tons are available at New London.

Several companies in New London are in the business of wrecking, salvage, and marine contracting work. They are equipped with pumps, divers' outfits, floating equipment, and other gear.

Small-craft facilities.—Berthage with electricity, gasoline, diesel fuel, water, ice, and marine supplies are available at the many small-craft facilities located in Greens Harbor and Shaw Cove. Mobile hoists up to 25 tons and marine railways up to 1,500 tons are available; hull, engine, and electronic repairs can be made.

Communications.—New London has good railroad and bus communications. Automobile-passenger ferry service is available to Block Island, Fishers Island, and to Orient Point, Long Island. A privately operated marine taxi at Greens Harbor provides trips around the harbor and to adjacent ports.

Thames River above New London has a dredged channel to Norwich, the head of navigation. In April 1970, the controlling depth was 33 feet from above the bridges at New London to the north end of the turning basin opposite Smith Cove, thence in 1961-April 1970, depths of 25 feet to Allyn Point, and thence 19 feet to the turning basin at Norwich, and 19 feet in the turning basin. The channel is well marked by navigational aids.

Caution.—The dikes along the Thames River from Easter Point (41°28.2′ N., 72°04.5′ W.) to Norwich are submerged at half tide.

Pilots for the river are available at New London.

The **U.S. Coast Guard Academy** is on the west side of Thames River about 1 mile north of the center of New London. The administration building with its white tower and clock is very prominent but is not visible until almost abeam of the academy. Depths alongside the 450-foot-long academy pier are reported to be 16 feet at the face, 15 to 20 feet along the south side, and 12 to 17 feet on the north side.

The **U.S. Naval Submarine Base** is on the east side of the Thames River about 2 miles above New London. The submarine escape training tank at the base, 143 feet high with amber lights atop, is prominent.

Just below **Gales Ferry**, on the east side about 4 miles above the bridges, are the crew training quarters and boathouses of Harvard and Yale Universities. Opposite Gales Ferry is the town of

Bartlett, site of a prominent power plant with two tall and conspicuous stacks. A privately dredged channel with depths of about 19 feet leads to the dock and coal tipple.

At **Montville Station**, just above Bartlett, is a dock with a depth of 15 feet at the face. The northeast end of the dock is in ruins. Overhead power cables with a clearance of 160 feet cross the river 0.5 mile above the station near **Kitemaug**.

Allyn Point, on the east side about 5 miles above New London, is the site of a large private pier for receiving liquid chemicals, with a reported depth of about 20 feet alongside. It is marked by an elevated water sphere and several small tanks on the pier.

Fort Point, on the east side 8 miles above New London, has a long fuel pier marked by privately maintained red lights, and on shore is a building with several stacks. Numerous piles are in the water southward of the pier. The fixed highway bridge crossing the river about 0.2 miles south of Fort Point has a clearance of 75 feet.

The red brick buildings of the Norwich State Hospital are on a bluff just north of Fort Point and are a conspicuous landmark.

At **Thamesville**, on the west side of the river about 1 mile below Norwich, are two finger piers each with breasting dolphins used to receive petroleum products from barges. Depths of 13 to 18 feet are reported alongside the face of the piers.

Norwich, a city at the head of navigation on Thames River at its junction with **Shetucket River** and **Yantic River**, is about 11 miles above New London. In 1971, waterborne commerce to Norwich consisted of petroleum products. Small boats generally anchor in Shetucket River just above the fixed bridges at Norwich, which have a minimum clearance of 13 feet.

A small-craft facility is just inside the entrance to Yantic River, on the west side of the easterly channel. Berths, electricity, gasoline, diesel fuel, and a 16-ton portable lift are available; hull and engine repairs can be made.

Chart 214.—Bartlett Reef Light (41°16.5′ N., 72°08.2′ W.), 35 feet above the water and shown from a red square daymark on a skeleton tower, is about 3 miles southwestward of New London Ledge Light and marks the south end of **Bartlett Reef**. The reef, about 1.3 miles long in a general north-south direction and about 0.3 mile wide, is covered 2 to 12 feet and has a bare rock and two rocks awash near its northern end. The north end of the reef is marked by a buoy. A lighted whistle buoy and an unlighted buoy are about 0.9 mile southward and about 0.3 mile eastward of the light respectively.

A **general anchorage area** is about 0.8 mile northeastward of Bartlett Reef Light. (See **110.147** (**a**) (**4**), and (**b**), chapter 2, for limits and regulations.)

Twotree Island, small and bare, about 1.4 miles northwestward of Bartlett Reef Light, is surrounded by shoals. A buoy marks rocks awash that extend off the northern end of the island.

Twotree Island Channel leads northward of Bartlett Reef and Twotree Island. With an adverse current in the sound, this channel is used to some extent by light tows and sailboats with a leading wind in the daytime, as the tidal currents turn about 1 hour earlier along the north shore than in the middle of the sound. About 0.3 mile southwestward of **Seaside**, the tidal currents have a velocity of 1.2 knots, and ebb 1.6 knots. Flood sets westerly and the ebb easterly. The channel is buoyed, but strangers are advised to use it with caution and should never attempt to beat through.

From **Goshen Point** (41°18.0′ N., 72°06.8′ W.) westward, there are scattered boulders which extend offshore as much as 0.2 mile in places. A prominent water tank is about a mile west of the point. **Jordan Cove**, 1.5 miles west of Goshen Point, is foul in its northerly half, and the southerly part is obstructed by **Flat Rock**, bare at low water, and **High Rock**, which shows at high water. These rocks are buoyed.

Millstone Point, on the east side at the entrance of Niantic Bay, is occupied by the buildings of the Millstone Nuclear Power Station. A 389-foot red and white stack at the station is the most conspicuous landmark in the area. A cove with depths of 9 to 15 feet is on the west side of the point. A rock with 1 foot over it lies 60 feet off the mouth of the cove. The station maintains channel markers and a range for occasional barge traffic.

White Rock is an islet on the east side of the entrance to Niantic Bay 0.5 mile westward of Millstone Point. **Little Rock**, two rocks partly bare at low water, is 150 yards east of White Rock. A rock on which the least depth is 8 feet is about midway between Little Rock and the cove at Millstone Point. A shoal spot, covered 12 feet, is 200 yards eastward of the rock. A rock, covered 14 feet, is about 300 yards south-southeast of White Rock and is marked by a lighted bell buoy.

Niantic Bay, 4.5 miles westward of New London Harbor, is a good anchorage sheltered from easterly, northerly, and westerly winds. It is a harbor of refuge in northerly gales and can be used by small vessels and tows. The general depth of the bay is about 19 feet; the water shoals gradually northward. The entrance is 1.5 miles wide, and the dangers are marked by buoys or show above water.

Niantic and **Crescent Beach** are summer resorts with railroad communication at the north end and northwest side of the bay.

The Niantic Bay Yacht Club basin at Crescent Beach is protected on the south, east, and partially on the north side by a U-shaped breakwater; a private seasonal light is near the outer end of the breakwater.

A **special anchorage area** has been established on the west side of Niantic Bay off Crescent Beach. (See **110.1** and **110.53**, chapter 2, for limits and regulations.)

Niantic River empties into the northeast end of Niantic Bay and is entered through a dredged channel that leads from the bay, thence through a narrow passage at the entrance, and thence to a point about 300 yards northward of the entrance to Smith Cove. In August 1970, the controlling depths were 7½ feet to the highway swing bridge, about 0.4 mile above the channel entrance, thence 6 feet to the head of the channel. The channel is marked by private daybeacons. Two bridges cross the narrow passage at the entrance. The more southerly is a railroad bridge with a 45-foot bascule span and a clearance of 11 feet; the highway bridge, about 0.1 mile northward, has a swing span with a clearance of 9 feet. (See **117.110**, chapter 2, for drawbridge regulations and opening signals.)

Strangers attempting to enter Niantic River are cautioned to pass through the bridges either at slack water or against the current.

Above the head of the dredged channel, small craft can navigate for about another 1.5 miles to **East Lyme** with local knowledge. The river from westward of Sandy Point to the stone bulkhead at East Lyme is deep and clear; vessels generally follow the west bank. **Pine Grove** and **Sandy Point** are summer resorts on Niantic River.

The mean range of **tide** is about 2.7 feet in Niantic Bay.

The **tidal currents** through the bridges set fair with the channel; the flood velocity is 1.6 knots and the ebb velocity, 0.8 knot. It has been reported that much greater velocities may be expected under storm and freshet conditions. (See Tidal Current Tables for predictions.) Current directions and velocities for the entrance to the Niantic River for each hour of the tidal cycle are shown on the Tidal Current Charts, Block Island Sound and Eastern Long Island Sound.

Ice generally closes the river to navigation for about 3 months during the winter.

Smith Cove is on the west side of Niantic River about 1.5 miles above the channel entrance. A channel, marked by private daybeacons, leads westward from the river channel into the cove. In 1971, the channel had a reported depth of 5 feet.

There are several small-craft facilities just above the entrance at Niantic and **Waterford**, on the west side and east side of Niantic River, respectively. A small-craft facility is also on the north side of Smith Cove. Most of these facilities have berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and lifts; most of them can make hull, engine, and electronic repairs. The largest marine railway at Niantic can handle craft up to 45 feet; a 15-ton portable lift is available in Smith Cove. A **harbormaster** is at Niantic.

Black Point, on the west side at the entrance to Niantic Bay, is flat with bluffs at the water, and is occupied by many summer cottages. Broken ground with a least found depth of 20 feet extends 0.6 mile south of the southwest side of the point.

The bight between Black Point and Hatchet Point, about 2.3 miles to the westward, has many rocks showing above high water. **Griswold Island**, on the northeast side of the bight, is high and prominent. Rocks extend 0.2 mile southward and southwestward from the island. The ends of the reef to the southwest and south are marked by buoys. **South Brother**, in the center, and **North Brother**, in the northwestern part of the bight, are prominent bare rocks. A rock, covered 10 feet, is 250 yards off the west side of Black Point. **Blackboys**, two rocks awash and marked by a buoy on the north side, are 0.4 mile southward of Griswold Island. A rock, covered 3 feet and marked by a buoy, is about 0.2 mile southward of Blackboys. **Johns Rock**, covered 5 feet, is 0.3 mile off the northwest side of the bight, about 0.5 mile west-southwestward of South Brother; the range of South Brother well open northward of Griswold Island leads southward of Johns Rock.

Strangers entering the bight should proceed with caution, as the bottom is broken; the best route is to pass southward and westward of the buoy southward of Blackboys, and pass on either side of South Brother. **Seal Rock**, 160 yards south of the end of **Giants Neck**, is marked by a buoy on the south side.

A special small-vessel **anchorage area** is east of Giants Neck. (See **110.1** and **110.54**, chapter 2, for limits and regulations.) A rock, marked by a buoy close south-southwestward, is within the anchorage area; depth over the rock is not known.

Hatchett Point has several large dwellings. A reef extends about 0.2 mile off the southwest side of the point.

Hatchett Reef, 0.6 to 1 mile south-southwestward of Hatchett Point, has a least depth of 5 feet and is marked by buoys. Close to the southeast side of the reef the depths are 30 to 48 feet. A bar with 10 to 16 feet over it extends westward from Hatchett Reef to Saybrook Bar.

Charts 215, 266, 267.—Connecticut River rises in the extreme northern part of New Hampshire, near the Canadian border, and flows southerly between the States of Vermont and New Hampshire and across Massachusetts and Connecticut to Long Island Sound. It is approximately 375 miles long, and is one of the largest and most important rivers in New England. The head of commercial navigation is at Hartford, about 45 miles from the mouth. Waterborne commerce on the river is mostly in petroleum products, chemicals, and occasional shipments of cement.

The river water is fresh at and above Deep River. Each year after the spring freshets, shoals with least depth of 10 feet are found in places on bars in the upper river; dredging to remove such shoals is begun as soon as the water subsides.

Between the entrance and Middletown the river banks are hard and in some places rocky, but between Middletown and Hartford the river flows through alluvial bottom land, where freshets and ice jams may cause shoaling.

Channels.—A Federal project for Connecticut

River provides for a 15-foot jettied entrance channel and 15-foot dredged cuts across the bars to Hartford, 45 miles above the entrance. (See Notice to Mariners and the latest editions of the charts for controlling depths.)

The channel above the jettied entrance channel usually follows the banks on the outside of the curves of the river, except through the dredged cuts across the bars which are marked by navigational aids.

Saybrook Breakwater Light (41°15.8′ N., 72°20.6′ W.), 58 feet above the water, is shown from a white conical tower, 49 feet high, on a brown cylindrical pier on the south end of the west jetty at the entrance to Connecticut River. A fog signal and a marker radiobeacon are at the light.

Anchorages.—Secure anchorage can be had eastward or northeastward of Lynde Point Light. Farther up anchorage can be selected in the wider parts of the channel. Special small-vessel anchorage areas are at Old Saybrook, Essex, Chester, Lord Island, Eddy Rock Light 41 vicinity, and Mouse Island Bar vicinity. (See **110.1** and **110.55**, chapter 2, for limits and regulations.)

Dangers.—**Saybrook Outer Bar**, which obstructs the mouth of the Connecticut River, is shifting, with depths of 4 to 12 feet extending nearly 2 miles off the mouth; it is marked off its southeastern end by a lighted bell buoy.

Bridges.—Several drawbridges and fixed bridges cross Connecticut River between the entrance and Hartford. The distance above the mouth, type, and clearance of each bridge follows: 3 miles, railroad with bascule span, 19 feet; 3.5 miles, fixed highway, 81 feet; 14.6 miles, highway with swing span at East Haddam, 22 feet; 27.8 miles, railroad with swing span at Middletown, 25 feet; 28 miles, fixed highway, 92 feet; 41.2 miles, fixed highway near Wethersfield, 80 feet over main channel; 44 miles, fixed highway at Hartford, 81 feet for a width of 214 feet; 44.9 miles, fixed highway, 46 feet; 45.2 miles, fixed highway, 39 feet; and 46 miles, fixed railroad, 30 feet. (See **117.115**, chapter 2, for drawbridge regulations and opening signals.)

Overhead power cables across the Connecticut River have a least clearance of 100 feet, except for the one at **Laurel**, 24.2 miles above the mouth, which has a clearance of 65 feet.

Tides.—The time of tide becomes later and the range diminishes in progressing up the river. High water and low water at Hartford occur about 4.5 and 6.5 hours later, respectively, than at the entrance. At Saybrook jetty, the mean range of the tide is 3.5 feet; at Haddam, it is 2.5 feet and at Hartford 1.7 feet.

Currents.—At the entrance the currents have considerable velocity at times, and always require careful attention, as the tidal current of the sound often sets directly across the direction of the current setting out or in between jetties. This condition is reported to be especially dangerous during the first 3 hours of ebb tide. (Consult the Tidal Current Tables for times and velocities of currents at a number of locations in Connecticut River.) In addition, see Tidal Current Charts, Block Island Sound and Eastern Long Island Sound, for current directions and velocities at various places in the Connecticut River for each hour of the tidal cycle.

During the ebb, a strong current runs from the Lyme Landing toward the center of the railroad bridge. Towboats with vessels in tow should steer for the east pier of the draw and should not swing out for the draw until almost in it, to avoid being set to the west side of the channel. Because of river discharge, the ebb current usually will be considerably stronger than the flood. Ebb current velocities of 1 knot or more have been observed under normal conditions on the bars in Connecticut River between Higganum and Hartford; the velocities of the flood currents are much less.

Freshets occur principally in the spring, when the snow is melting, although occasional floods have occurred in every month of the year except July and September. At Hartford the usual rise due to spring freshets is between 16 and 24 feet. The highest freshets are generally of short duration, but the period during which the river at Hartford is at the level of 8 feet or more above mean low water averages nearly 2 months of each year. Below Middletown the height of the crest of a freshet decreases rapidly. At the mouth the variation in water level is due to the tides.

Ice closes the river to navigation a part of every winter for wooden hull boats. The duration of closing is about 2 months.

Weather.—Hartford is well inside the northern temperate climatic zone in a prevailing west to east movement of air carrying the majority of weather systems into Connecticut from the west. The average wintertime position of the "Polar Front" boundary between cold dry polar air and warm moist tropical air is just south of New England, which helps to explain the extensive winter storm activity and the day-to-day variability of local weather. In the summer, the "Polar Front" has an average position along the New England-Canada border and Hartford has a warm and pleasant climate.

The location of Hartford, relative to the continent and ocean, is also significant. Rapid weather changes result when storms move northward along the Mid-Atlantic Coast, frequently producing strong and persistent northeast winds associated with storms known locally as coastals or northeasters. Seasonally, weather characteristics vary from the cold and dry continental-polar air of winter to the warm, maritimes air of summer, the one from Canada, the other from the Gulf of Mexico, Caribbean Sea, or Atlantic Ocean.

Summer thunderstorms develop in the Berkshire Mountains to the west and northwest, and move over the Connecticut Valley and, when accompanied by wind and hail, sometimes cause considerable damage to crops. During the winter, rain often falls through cold air trapped in the valley and creates extremely hazardous ice conditions.

On clear nights in the late summer or early autumn, cool air drainage into the valley and the moisture from the Connecticut River produce steam and/or ground fog which becomes quite dense throughout the valley and temporarily hampers transportation.

Fog is reported to develop locally in the vicinity of the nuclear power plant's efflux at Haddam Neck and around Gildersleeve Island.

The National Weather Service office is at Bradley International Airport, northwest of Hartford. (See appendix for **Hartford climatological table.**)

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Routes.—To enter Connecticut River from eastward, pass southward of Hatchett Reef and Saybrook Bar, until Saybrook Breakwater Light bears 315°. Steer for Saybrook Breakwater Light on this course through the buoyed opening between the south end of Saybrook Bar and the east end of Long Sand Shoal to the entrance channel between the jetties.

To enter from westward, pass 1 mile southward of Falkner Island Light on course **076°**. This will lead about 0.4 mile northward of the lighted bell buoy on the western end of Long Sand Shoal and about 0.2 mile southward of the lighted bell buoy southward of Cornfield Point. Then steer about **067°**, with Saybrook Breakwater Light a little on the port bow to the entrance channel between the jetties.

Pilots for the Connecticut River are available at Old Saybrook; strangers are advised to take a pilot. Pilots are available 24 hours a day, except during heavy fog, but require a 24-hour advance notice. Pilot services are generally arranged for in advance through the ships' agents or directly by shipping companies. Pilots board vessels off Saybrook Point from the pilot boat "MARJAN," a 34-foot wooden vessel with a gray hull and white superstructure. Pilots can be contacted 24 hours a day on 2738 kHz.

Wharves.—The Connecticut River has more than 20 commercial piers and wharves, most of which handle petroleum products from barges or coastal tankers. Most of the facilities below Rocky Hill, about 34 miles above Saybrook Point, are marginal-type wharves, while those above Rocky Hill are finger-type piers with breasting dolphins. Depths of 11 to 15 feet are reported alongside these facilities.

Supplies and repairs.—Gasoline, diesel fuel, water, ice, and marine supplies are available at the principal towns and landings along the Connecticut River. Boatyards along the river can make engine, hull, and electronic repairs.

Charts 215, 116-SC.—Saybrook Point is a village on the west side of Connecticut River, about 1.4 miles northward of Saybrook Breakwater Light. There are several small-craft facilities along the west side of the river from Saybrook Point to **Ferry Point**, about 2 miles to the northward. Most of these facilities have berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies, and can make hull, engine, and electronic repairs. The largest lift in the area can handle craft up to 30 tons.

Storm warning signals are displayed. (See chart.)

North Cove, a dredged small-boat basin that affords excellent anchorage, is entered through a dredged channel that leads westward from the main channel about 0.4 mile northward of Saybrook Point. In 1965, the controlling depth was 10 feet in the channel, and about 10 feet in the basin.

From Saybrook Point to Hartford local knowledge is required to carry the best water. Small craft should have no difficulty in following the channel.

Lieutenant River, leading to **Old Lyme**, enters the east side of Connecticut River about 1.4 miles northward of Saybrook Point. Pipe stakes mark the south side of the channel across the bar at the entrance. A midchannel depth of about 3 feet can be carried over the bar to about 0.2 mile above the second bridge. A railroad bridge with a 33-foot fixed span and a clearance of 11 feet crosses the river 0.4 mile above the entrance. An overhead power cable with a reported clearance of about 10 feet is on the north side of the bridge. About 0.3 mile above that bridge is a highway bridge with a 24-foot fixed span and a clearance of 6 feet. A **harbormaster** is at Old Lyme.

The passage to the east and north of **Calves Island**, about 1 mile above the railroad bridge crossing Connecticut River, is used extensively by small craft in the summer, particularly when the traffic is heavy in the main channel. This passage is subject to shoaling, particularly on the north side of Calves Island; caution is advised. A sunken barge, covered 2 feet, is close off the east side of Calves Island in 41°19′31″ N., 72°20′37″ W. A small-craft facility is on the east side of the passage just above the entrance. Berths, electricity, gasoline, diesel fuel, water, ice, some marine supplies, and a 50-foot marine railway are available; hull, engine, and electronic repairs can be made.

Lord Cove has its entrance about 300 yards northward of Calves Island. In 1969, a depth of 5 feet was available through the unmarked entrance. The marshlands surrounding Lord Cove and the other coves between Essex and the river mouth at Saybrook are frequented by duck hunters in October and November. Because of danger of gunfire, mariners are cautioned not to stray too close to the numerous duck blinds that exist in this area.

The dredged section of the main channel in Connecticut River westward of Calves Island has numerous obstructions and sunken rocks close to its edges; mariners are advised to exercise caution and to avoid the edges of the channel.

Haydens Point, about 4.6 miles above Saybrook Point, is marked by a light. Foul ground is between the light and the shore.

Essex, a town on the west bank about 5 miles above Saybrook Point, is the scene of considerable small-boat activity. Depths alongside the town landing are about 6 feet. **Essex Cove** is the area off the main river channel skirting the waterfront at Essex. A dredged channel leads from the main channel through the cove, and thence rejoins the main channel to the northward. In 1965, a controlling depth of 7½ feet was available in the buoyed channel.

A privately marked small-boat channel leads westward from near the southerly end of Essex Cove and northward of **Thatchbed Island** to **Middle Cove**. In 1969, the channel had a depth of 4 feet.

Essex has excellent small-craft facilities. Most of these facilities have berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies; they can make hull, engine, and electronic repairs. Marine railways up to 85 feet and mobile lifts up to 50 tons are also available.

Special anchorage areas for small craft are at Essex. (See **110.1** and **110.55 (a)**, **(a-1)**, **(b)**, and **(c)**, chapter 2, for limits and regulations.)

Hamburg Cove and **Eightmile River**, which empties into the north end of the cove, indent the east side of Connecticut River, 6 miles above Saybrook Point. A dredged channel leads from Connecticut River to a turning basin at **Hamburg**, a village at the head of navigation. In 1965, the controlling depth was about 4 feet to and in the basin. There are boulders in places outside the dredged channel, and the entrance channel is outlined by grassy flats on each side. Privately maintained seasonal buoys and daybeacons mark the entrance channel, and private seasonal daybeacons mark the remainder of the channel to Hamburg. The center of the turning basin has piles used for moorings. A small-craft facility, on the east side of the basin, has berths, electricity, gasoline, water, ice, some marine supplies, and a 40-foot marine railway; hull, engine, and electronic repairs can be made.

Chart 266.—Eustasia Island, 8.5 miles above Saybrook Point, divides the Connecticut River into two channels. The eastern channel crossing **Potash Bar** through a dredged cut is better marked and easier to follow. The western channel leads to **Pratt Creek**, westward of the southerly end of Eustasia Island, and to the landing at **Deep River** and thence crosses **Chester Creek Bar** through a swash channel to **Chester Creek**. A sand shoal and a rocky reef, both bare at low water, lie north of Eustasia Island, between the main channel east of the island, and Chester Creek. A private seasonal light marks the north side of the entrance to Chester Creek.

There are several small-craft facilities on Pratt Creek and Chester Creek. A 35-foot marine railway lifts up to 25 tons; berths, electricity, gasoline, water, ice, storage, marine supplies, and complete hull and engine repairs are available in the area. Special anchorage areas for small craft are off Chester Creek. (See **110.1** and **110.55 (e-1)** and **(e-2)**, chapter 2, for limits and regulations.)

The Chester-Hadlyme vehicular ferry crosses the river near **Fort Hill**, 2 miles above Eustasia Island. Ferry service is sometimes suspended during January and February because of ice.

Special anchorage areas for small craft are eastward of Eddy Rock Light 41 (41°26.2′ N., 72°27.6′ W.), about 12.8 miles above Saybrook Point. (See **110.1** and **110.55 (d)** and **(e)**, chapter 2, for limits and regulations.)

On the east side of the river, the turret of the opera house at **East Haddam**, 13.3 miles above Saybrook Point, is prominent.

The shoal off the west side of the river, just north of East Haddam, is reported to be increasing.

Salmon Cove, on the east side of the river, a mile above East Haddam, is navigable for vessels of less than 6-foot draft as far as **Scovill Landing**, about 1.5 miles above the entrance, and for small craft of less than 3-foot draft about 1 mile farther. The entrance to the cove is subject to shoaling. Considerable grass in the channel and cove makes boat operation difficult.

Overhead power cables with a least clearance of 86 feet cross the cove about 1.2 miles above the mouth.

Haddam Island divides the Connecticut River about 3.2 miles above East Haddam. The main river channel leads eastward of the island through a dredged cut known as Haddam Island Bar Channel. A pinnacle rock, covered 13 feet, is in the approach to Haddam Island Bar Channel in 41°29′31″ N., 72°30′49″ W.

The passage westward of Haddam Island was found not to be navigable in 1969 and the entrance from the southward was obstructed by a bare sand shoal lying between the island's southerly tip and the westerly shore of the river.

The shoal off the east side of the river opposite **Higganum Creek**, 5.5 miles above East Haddam, is extending westward.

A rock breakwater extends southward from the east side of the river, 1 mile above Higganum Creek. In 1969, the shoal, about 200 yards southward of the breakwater, was found to be extending southward. In 1971, it was reported that the snag, a tree stump, near the middle of the shoal was not visible.

A small-craft facility is on the north side of the river at **Cobalt**, 3.5 miles above Higganum Creek. Berthage with electricity, gasoline, ice, marine supplies, and a 10-ton hoist are available.

After passing through the channel in **Paper Rock Shoal**, 9.7 miles above East Haddam, favor the south side of the river to about 300 yards southeastward of **Bodkin Rock**, then cross to the north side and pass it close-to.

Chart 267.—About 0.5 mile westward of Bodkin

Rock, a dredged section of the channel leads along the southerly shore of Connecticut River and southward of Mouse Island Bar.

Special anchorage areas for small craft are along the north and east sides of the river, between Bodkin Rock and Portland. (See **110.1** and **110.55 (f)** and **(g)**, chapter 2, for limits and regulations.)

Caution is recommended when rounding the point on the south side of the river, about 1.5 miles above Bodkin Rock, to avoid a submerged crib that extends northward from the point.

Portland, 26.3 miles above Saybrook Point, has several boatyards with marine railways; the largest railway can handle craft up to 60 feet for engine and hull repairs. Gasoline, water, ice, storage, and marine supplies are available at Portland.

The bulkhead wharves at **Middletown**, across the river from Portland, are in ruins.

A small-craft facility is on the east side of the river at **Gildersleeve**, about 2.5 miles above Portland. Gasoline, diesel fuel, water, ice, marine supplies, and a 25-ton mobile hoist are available, and hull and engine repairs can be made.

From **Belamose**, 6.5 miles above Portland, northward to Hartford, the land is much lower, and the Connecticut River narrows, the curves become more pronounced, and both of its shores have numerous wood-stake-and-rock groins.

At **Rocky Hill**, 1 mile above Belamose, a ferry crosses the river to South Glastonbury. A small-craft facility is just below the ferry landing at Rocky Hill; gasoline, ice, storage, a 25-foot marine railway, and hull repairs are available. A small-craft launching ramp is just above the ferry landing.

The cove at Crow Point, on the east side of the river about 5.7 miles above Belamose, is used to obtain land fill. Dredging in the cove is uneven, but the bottom is soft ooze. In August 1969, a depth of 5 feet could be taken through the entrance. A shoal extends 70 yards south-southeastward from Crow Point, between the cove entrance and the main river channel.

A shoal which bares is in 41°43′11″ N., 72°38′52″ W., on the west side of Connecticut River, about 1.9 miles above Crow Point.

Wethersfield Cove, on the west side of the river 14 miles above Portland, is entered through a narrow dredged channel that leads to a dredged anchorage basin about 0.3 miles above the entrance. In 1968, the channel had a controlling depth of 6 feet, and depths of 6 feet were available in the basin in 1965. The channel is marked by daybeacons. The highway bridge over the entrance has a fixed span with a clearance of 38 feet. The cove is used extensively by motorboats. The **speed limit** in the channel and cove is 5 knots. Gasoline can be obtained at the yacht club on the south side of the cove. A **harbormaster** is at the town marina on the east side of the cove; a launching ramp is available at the facility.

The only remaining commercial docks at **Hartford** are the bulk fuel handling facility of the Hartford Electric Light Company's powerplant on the west side of the river, about 0.2 mile below the Charter Oak Bridge, and the Hartford Gas Company's barge unloading facilities on the west side of the river, about 0.5 mile above the Charter Oak Bridge. A flood control dike is along the west side of the river from just north of the Charter Oak Bridge to the Bulkeley Bridge.

Connecticut River above Hartford is practically unimproved but is navigable about 30 miles to **Holyoke** for boats not exceeding 3-foot draft, when the river is not low. The channel is constantly shifting. For a distance of about 10 miles above Hartford to **Enfield Rapids**, bars with 2½ feet at low water and many other obstructions are encountered. **Windsor Locks**, 88 feet long and 19 feet wide, with depths of about 5 feet on the sill, are used by boats to pass around Enfield Rapids. The bridges across Windsor Locks Canal have a minimum clearance of 17 feet. Above Enfield Rapids to Holyoke the depth is about 4½ feet. The bridges are closed, but the overhead clearance is ample, generally about 18 feet.

Chart 1212.—Long Sand Shoal extends 6 miles westward from off the entrance of Connecticut River and has a greatest width of nearly 0.3 mile. The general depths on the shoal are 5 to 15 feet; bottom is hard and lumpy. Shoaling is abrupt on both sides but especially on the south side, where the 5-fathom curve is only 100 yards from it in places. The shoal is marked at its eastern end by a buoy, and on the south side and west end by lighted sound buoys.

A fairway lighted bell buoy is 4.5 miles south of Cornfield Point.

At the western end of Long Sand Shoal and 1 mile southward is an area about 0.6 mile long with rocky and broken bottom, and with a least found depth of 22 feet.

Sixmile Reef, about 3 miles southwestward of Long Sand Shoal, is an area of broken ground about 2.5 miles long in a west-northwesterly direction with depths of 19 to 30 feet. The bottom is rocky and shoaling abrupt in places. A lighted whistle buoy is off the southerly edge of this reef. With extreme low tides, due to northerly and westerly winds, this shoal may be dangerous to vessels with 15-foot draft. Tide rips occur on the reef whenever the direction of the tidal currents is opposed to that of the wind. This is especially true during spring tides and a southwest wind.

A ridge with depths of 24 to 36 feet is near the middle of Long Island Sound southward of Sixmile Reef and 5 miles north-northwestward of Horton Point Light. It is marked by a lighted bell buoy.

Charts 215, 116-SC.—Cornfield Point, 2 miles westward of Saybrook Breakwater Light, is marked by a large red-roofed stone building. Rocky shoals and foul ground extend about 0.5 mile southerly from this point and for about 1.9 miles westerly. **Cornfield Point Shoal**, a small

rocky patch covered 3 feet, is about 0.4 mile south of the point. Westward of this shoal are **Hen and Chickens**, bare in spots at low water, and **Crane Reef**, an area of broken ground with a least depth of 3 feet. These dangers are buoyed. About 0.5 mile westward of the point is **Halftide Rock**, which is surrounded by foul ground.

Charts 216, 116-SC.—Westbrook Harbor is the western part of the open bight between Cornfield Point and Menunketesuck Island. It has many unmarked sunken rocks and is seldom used as an anchorage; the anchorage in Duck Island Roads is better. The bight is characterized by boulders.

Westbrook, a town on the north side of Westbrook Harbor, is marked on its east side by an elevated tank. A **harbormaster** is at Westbrook.

Menunketesuck Island is the outermost of several low narrow islands connected to the mainland at low water on the west side of Westbrook Harbor. It has boulders at the south end. A boulder reef extends nearly 0.5 mile south-southeastward from the point to the 18-foot curve. Tide rips frequently occur on this reef.

Between Menunketesuck Island and Hammonasset Point, about 4 miles westward, broken ground extends about 1.5 miles offshore. A boulder reef extends 0.5 mile southward from Duck Island to the 18-foot curve, and is marked by a buoy. A rock with 1 foot over it is on this reef about 300 yards south of Duck Island. Tide rips have been reported to extend from the vicinity of these rocks to the buoy. During strong flood currents and a southwest wind, tide rips extend from the shoal water southwest of Duck Island to the vicinity of **Southwest Reef** over a mile southwestward. Caution is advised when navigating small boats in this vicinity during these conditions.

Duck Island Roads, between Menunketesuck Island and **Kelsey Point**, is a harbor of refuge protected by breakwaters 1,100 feet northward and nearly 0.5 mile westward from **Duck Island**, with the added protection of Kelsey Point Breakwater on Stone Island Reef. A prominent landmark on Duck Island is a dark house with a stone chimney. Both breakwaters extending from Duck Island are marked by lights.

The dredged anchorage enclosed by the breakwaters extending northward and westward from Duck Island is subject to shoaling. General depths of 4 to 7 feet are in the protected area, and 8 to 15 feet in the western end. In addition to the area inside the breakwaters, a small area northward and northeastward of Duck Island North Breakwater Light can be used as an anchorage in southwesterly weather.

The western entrance of Duck Island Roads is easy of access and should be used by vessels of a greater draft than 8 feet.

Routes.—Pass southward of Duck Island and keep the light on the end of Kelsey Point Breakwater bearing northward of 264° until Duck Island West Breakwater Light bears 010°, then steer northward. Approaching from westward, the only dangers are the two 16-foot spots south-southwestward of Kelsey Point Breakwater Light, the southerly of which is marked by a buoy.

The eastern entrance of Duck Island Roads is obstructed by a sand shoal with a least depth of 8 feet about 0.3 mile eastward of Duck Island, and by boulder reefs which extend about 0.2 mile off the western side of Menunketesuck Island. This entrance is easy of access for vessels drawing up to 8 feet.

Anchorage in 18 to 24 feet, bottom generally sticky, can be had between the Duck Island West Breakwater Light and the 17-foot rocky patches southeastward of Kelsey Point. This anchorage is exposed to winds southward of east and west.

Patchogue River, used chiefly by fishing and recreational craft, empties into Duck Island Roads just west of Menunketesuck Island. A channel leads from deep water in Duck Island Roads to the first fixed highway bridge, about 0.6 mile above the mouth; the channel is marked by buoys. In April 1970, the reported controlling depth was 4 feet to the highway bridge. There are several small-craft facilities on the river, most of which can provide berths, electricity, gasoline, water, ice, storage, and marine supplies, and can make hull and engine repairs. Marine railways up to 45 feet and lifts up to 12 tons are also available.

An overhead power cable with a clearance of 50 feet crosses the river about 100 yards below the highway bridge.

Menunketesuck River, sharing the same entrance channel as Patchogue River, is a shallow stream westward of Patchogue River. A depth of about 5 feet is reported to the first fixed highway bridge crossing the river above which depths of less than 1 foot are reported. Small-craft facilities on the river can provide berths, electricity, gasoline, water, ice, storage, marine supplies, and engine and hull repairs; a 12-ton mobile hoist is available. The privately maintained channel in the river is unmarked; local knowledge is required.

Kelsey Point Breakwater extends on **Stone Island Reef** over 0.6 mile south-southeastward from Stone Island and is marked by a light. The least depth on the rocky broken ground southwestward of the light is 16 feet. The outer spot is marked by a gong buoy. **Stone Island**, at the north end of the breakwater, is mostly covered at high water. Some rocks bare at low water are between the island and the shore. Tide rips frequently occur in the area southwestward from the end of the breakwater to the gong buoy. Depths of 18 feet or less near Kelsey Point Breakwater indicate areas of broken rocky bottom which should be avoided in anchoring. The broken ground east of the breakwater includes depths of 12 feet close to it; the 18-foot patch 0.2 mile east-northeast of the end of the breakwater; **East Ledge** with depths of 2 to 17 feet, which extends 0.4 mile southward from Kelsey Point; and the broken ground with depths of 8 to 17 feet which extends over 0.4 mile southeastward

from Kelsey Point.

The bight at the entrance of Clinton Harbor and westward of Kelsey Point Breakwater affords anchorage, but is exposed to southeasterly and southwesterly winds.

Clinton Harbor, the bight westward of Kelsey Point Breakwater, is the entrance to **Hammonasset River**, a stream of little commercial importance. **Wheeler Rock**, with 1 foot over it, just outside the bar, is marked by a lighted buoy. In August 1969, the midchannel controlling depth was 4 feet in the entrance channel, marked by buoys, to the turning basin at **Clinton**, thence 8 feet in the basin except for shoaling to 6 feet near the southern edge. Above the turning basin the midchannel controlling depth is about 2 feet in the Hammonasset River to the overhead pipeline and bridge crossing about 2 miles above Clinton. Bush stakes mark this section of the channel. Small-craft facilities are on the river below the overhead pipeline and bridge crossing. A marine railway here can haul out craft up to 65 feet long for engine and hull repairs; water, storage, and some marine supplies are available.

Storm warning signals are displayed. (See chart.)

Several boatyards and marinas are on the north side of the channel above Cedar Island, and on Hammock River at Clinton. The largest marine railway in the area can handle craft up to 50 feet long for engine and hull repairs; gasoline, diesel fuel, transient berths, water, ice, storage, and marine supplies are available. Mooring facilities are available by arrangement with the **harbormaster.**

Northeastward of **Cedar Island** in Clinton Harbor are two narrow crooked channels close together, with depths of about 1 foot. The eastern one is usually marked on the west side by bush stakes; it leads to a marina and boatyard just inside the mouth of **Hammock River**. The western channel, marked on the east side by bush stakes, leads into **Indian River**.

Hammonasset Point, on the southwest side of Clinton Harbor, is a low marshy area with many wooded knolls. The end of the point is a rocky knoll. **Hammonasset State Park** is marked by a conspicuous flagstaff, the buildings at the recreational center, and a prominent tank. In the summer it is an active resort. Broken ground with rocky irregular bottom and least depts of 10 to 11 feet extends 0.5 mile southward of Hammonasset Point.

West Rock is the outermost of the bare rocks which extend a short distance off the east end of Hammonasset Point. A reef, with two bare rocks and a groin on its inner part, extends 0.3 mile southwestward from the point and is marked by a buoy, northeastward of which tide rips frequently occur. When rounding the point, vessels should not pass between the buoy and Hammonasset Point.

Madison Reef, over 2 miles westward of Hammonasset Point, extends over a mile east and west. This reef consists of several rocky patches with depths of 4 to 17 feet, with deeper water between them. A buoy marks a passage across the eastern part of the reef, and another buoy marks the northwestern end of the reef. **Charles Reef**, with a least depth of 7 feet, is about 0.5 mile southwest of Madison Reef and marked by a buoy.

Kimberly Reef, about 1.9 miles southward of Charles Reef, is an area of broken ground with a least depth of 12 feet and is marked by a buoy. A bank with depths of 14 to 28 feet extends 1.5 miles westward to Falkner Island.

Vessels of 15-foot draft can anchor northward of Madison Reef but should proceed with caution to avoid the rocky patches with 4 to 17 feet over them.

Tuxis Island, northward of Madison Reef and 0.2 mile south of **Middle Beach**, is high and rocky. Between the island and the shore the water is shallow and the ground foul. Rocks awash are 200 to 600 yards eastward of the island, and an islet is 100 yards westward of the island. A steel bulkhead in ruins, the top of which is awash at high water, extends from shore to **Gull Rock**, a high bare ledge about 300 yards east-northeastward of Tuxis Island.

Madison, a town on the railroad, has two landings: the easterly one has 1 foot at its end at low water and is used by small pleasure boats; the westerly landing northwestward of Tuxis Island has about 2 feet at its end. A few small craft moor in the cove on its north side. Rocks, bare at low water, are 100 yards eastward of the landing. A beach club building, with a small stone landing, is northward of Tuxis Island. A church with a prominent tower and gilded dome is 0.8 mile northward of Tuxis Island.

Charts 217, 116-SC.—Guilford Harbor, a bight 5.5 miles westward of Hammonasset Point, is used only by small craft. **East River** and **Sluice Creek** empty into Guilford Harbor from the northward. The approach to the harbor is obstructed by rocks and foul ground. The outermost dangers are: **Half Acre Rock**, about 0.8 mile southeastward of the entrance channel, which shows at high water; scattered rocks, some bare at low water and others with 7 to 16 feet over them, extending about a mile eastward from Half Acre Rock; **Outer White Top**, about 0.6 mile southwestward of Half Acre Rock, and several rocks northward of it bare at low water; and **Indian Reef**, extending about a mile southwestward of Outer White Top, the highest part of which is covered at high water. Stakes and fish traps may exist northward of **Riding Rock**, 0.6 mile northwestward of Half Acre Rock.

The approach channel to Guilford Harbor, marked by buoys, leads along the southeasterly side of Indian Reef, thence westward of Half Acre Rock to a dredged channel about 0.5 mile northwestward of Half Acre Rock. The dredged channel leads northward through the harbor and eastward of **Guilford Point** to a junction with Sluice Creek and East River, about 0.6 mile above the

channel entrance. At the junction, the dredged channel leads northwesterly into Sluice Creek for about 0.1 mile and northeasterly into East River for about 0.4 mile to an anchorage basin. Buoys mark the dredged channel to the junction and for about 0.1 mile into East River. In July 1971, the controlling depths in the dredged channel were 3 feet to the junction with East River and Sluice Creek, thence local knowledge to and in the anchorage basin in East River, and thence 2 feet for a midwidth of 45 feet in Sluice Creek.

At high water and with local knowledge, small boats can go above the anchorage basin in East River to the fixed railway bridge, about 1.3 miles above the basin. The bridge has a clearance of 4 feet. An overhead power cable with a clearance of 45 feet is about 0.3 miles below the bridge. A town marina, just above the entrance to Sluice Creek, has berths, electricity, gasoline, water, and ice. **Storm warning signals are displayed.** (See chart.)

West River empties into the western side of Guilford Harbor 0.2 mile westward of Guilford Point. A railroad bridge about 0.7 mile above the mouth has a clearance of 6 feet. **Guilford** is the town above the railroad bridge to which a draft of 4 feet can be taken at high water.

There are two boatyards with several marine railways on West River. The largest marine railway can handle craft up to 40 feet; water, marine supplies, a 5-ton mobile crane, and complete engine and hull repairs are available.

Falkner Island and **Goose Islands**, with **Stony Island** to the southward, are about 3 miles south of Guilford Harbor. Each is surrounded by reefs and rocks that bare at low water. A depth of about 16 feet can be carried between Goose Islands and Falkner Island by staying in the middle of the passage and avoiding the 8-foot and 11-foot spots, about 0.35 mile 244° and 0.4 mile 300° from the light on Falkner Island, respectively, and the shoals and reefs extending from the islands. **Falkner Island Light** (41°12.7′ N., 72°39.2′ W.), 94 feet above the water, is shown from a 46-foot white octagonal tower attached to a dwelling near the center of Falkner Island; a radiobeacon and fog signal are at the light. A lighted bell buoy marks the shoal off the northern end of Falkner Island, and a lighted bell buoy is off the southern end of Stony Island.

From Indian Reef westward are rocky shoals and islets extending from 0.2 to 0.7 mile off **Vineyard Point** and **Sachem Head**. **Chimney Corner Reef**, about 0.3 mile south of Sachem Head, is a rocky broken area on which the least depth is 9 feet. Westward of it are **Goose Rocks Shoals**, on which are **Goose Rocks**, the northerly of which is bare and the southerly one covered at high water. The outer limit of Goose Rocks Shoals is marked by a lighted bell buoy. To ensure clearing the westerly end of Goose Rocks Shoals, care must be taken not to round the buoy too closely.

Sachem Head Harbor, an anchorage for small craft on the southwest side of Sachem Head, is 0.3 mile long and 0.1 mile wide, and has depths of 4 to 5 feet at the floats and in the moorings; it is sheltered except from westerly winds. The island forming the south point at the entrance is connected with the shore by a bridge. A yacht clubhouse is on the island. From the north point of the island a breakwater extends 100 yards in a northwesterly direction; a rock awash, marked by a private seasonal light, is off the end of the breakwater. A rock covered at half tide is 50 yards off the southeast side of the harbor, about 350 yards eastward of the end of the breakwater.

The approach to Sachem Head Harbor for small craft from eastward is along the south side of the rocks making off from the south side of Sachem Head; buoys mark the approach and some of the dangers. Approaching eastward of Goose Rocks, give the rocks a berth of over 300 yards. The approach from westward is clear between Goose Rocks and the buoy southwestward of Leetes Rocks.

Joshua Point, the west side of Sachem Head, is marked by a rocky islet on its west side and a privately maintained seasonal light shown from a gray cement base. Just northward of the islet a stone jetty with a bulkhead on its north side extends about 100 yards in a northwesterly direction from the shore. Vessels can anchor in the angle near the shore where the depth is about 4½ feet.

Joshua Cove, northwestward of Sachem Head, is little used, but affords good anchorage in its entrance for small vessels in northerly or easterly winds in 6 to 10 feet, soft bottom. The approach from southwestward is clear between Goose Rocks and the buoy southwestward of Leetes Rocks.

Leetes Rocks, midway between Sachem Head and the north end of The Thimbles, are two rocks bare at low water, with an area of broken ground around them. A 9-foot spot is about 200 yards southward of the southerly rock.

Leetes Island Quarry is a prominent feature on the south side of **Hoadley Point**; on the north side of the cove eastward of the point are the ruins of an old dock.

The Thimbles, about 1.6 miles west of Sachem Head, comprise many islands, islets, and rocks that bare. All of the area, extending over 2 miles from Hoadley Point southwestward to **East Reef**, is foul with rocky bottom and many shoals. To lesser extent, the area from East Reef for 2 miles westward and northwestward to Branford Harbor entrance is dotted with islets and rocks. The whole area is suitable only for small pleasure craft, which are very active in summer. Many oyster stakes are encountered and, as these do not mark channels, caution should be used to avoid fouling them. Caution also is advised to avoid fouling the pipelines and cables in the area.

The outermost of The Thimbles proper is **Outer Island**, marked by a house chimney. A boat landing protected by a stone jetty is on the northeast side of this island, and an unmarked rock, bare at lowest tides, is 200 yards eastward. The reefs

southwestward of Outer Island, to and including East Reef and **Browns Reef**, are buoyed.

From eastward a buoyed channel leads through The Thimbles. The channel passes between **Wayland Island** and a buoy marking the foul area southward of **Cat Island**. The channel extends between **Davis Island** and **Dogfish Island**, thence north of **East Crib** and **West Crib** into the more open water westward of The Thimbles; it is good for about 13 feet.

Stony Creek, a village on the railroad, extends southward to **Flying Point** (41°15.5′ N., 72°45.1′ W.). A dredged channel, marked by buoys, leads from Long Island Sound, 250 yards west-northwestward of Flying Point, to a turning basin at Stony Creek; in 1970, controlling depths were 5 feet in the channel and basin. Gasoline, a 2½-ton crane, marine supplies, inside storage, and a small-craft launching ramp are available at marinas eastward of the turning basin; engine repairs can be made. The village dock, for residents only, is about 400 yards northward of Flying Point; a reported depth of about 4 feet can be taken to the dock with local knowledge. The area is subject to shoaling, and caution is advised.

Between the rocks westward of **Rogers Island** and **Blackstone Rocks**, a privately dredged channel, 0.9 mile westward of Flying Point, leads northeastward to a quarry wharf on the west side of a dredged basin. In 1964-1968, the channel and basin had a reported controlling depth of 14 feet. The entrance channel is marked by a **028°** privately maintained range consisting of a front and middle light and a rear daybeacon.

Thimble Island Harbor, in the western part of The Thimbles, affords good shelter for small craft between **Pot Island** and **Money Island** on the east and **High Island** and **West Crib** on the west. Although open southwestward, the sea from that direction loses much of its force before reaching the inner harbor. A rock with 3 feet over it and marked by a buoy is 80 yards off the east side of High Island, just above its south end. Vessels sometimes anchor near midchannel, between this rock and the north end of Pot Island in depths of 13 to 18 feet, soft bottom, but care should be taken to avoid the cables in the area. The harbor is easy of access between Outer Island and Inner Reef.

Pine Orchard, about 3 miles westward of Sachem Head, is a summer resort extending northward and westward of **Brown Point**. A breakwater extending about 300 yards southeastward from Brown Point protects a yacht basin which may be entered either northward or southward of **St. Helena Island**. Depths of about 3 to 5 feet are in the entrance channels, and depths of about 7 feet are reported in the basin. A seasonal private **005°** lighted range marks the entrance outside the breakwater. Gasoline, diesel fuel, ice, and water may be obtained at the yacht club landing.

From Brown Point to Branford Harbor, 2.5 miles westward, bare rocks and shoals extend up to about 2 miles offshore. A seawall extends westward from Brown Point, and the shore is thickly settled. A rock bare at half tide is 600 yards westward of Brown Point and 300 yards from shore.

Rocks bare at low water are eastward of **Haycock Point**, and rocks that bare at half tide are off the southeast side and southwest end of **Green Island**. The foul ground extends about 0.6 mile south-southwestward from Haycock Point, including **Foot Rocks** which are partly above water.

Branford Reef, about 1.8 miles southward of Indian Neck and 5 miles eastward of New Haven entrance, is marked by a light. This reef is surrounded by shoal water for a distance of 150 to 450 yards from the light.

Deep water is between Branford Reef and **Negro Heads**, a reef bare in one place at low water about 0.9 mile northward. Shoreward of Negro Heads are **Spectacle Island**, **Sumac Island**, and **Clam Island**, together with numerous rocks bare and covered.

A boat landing is on the northwest side of Clam Island. Small craft can enter **Maltby Cove** between the bare rocks off the southwest end of Clam Island and **Jeffrey Rock**, favoring the northwest side of Clam Island. Private markers are at the entrance. The northwest side of the cove is foul, the principal danger being a rock bare at low water near the middle, northwestward of Clam Island; the rock is marked by a seasonal private spindle.

Jeffrey Point, the eastern point at the entrance of Branford Harbor, has a bare rock close to its western end.

Branford Harbor is a shallow cove between Jeffrey Point and Johnson Point. Vessels up to 10-foot draft can select anchorage in the harbor southward of the Mermaids in 10 to 14 feet, protected against all but southerly and southwesterly winds. Boats up to 5-foot draft can select a well-sheltered anchorage in the upper part of the harbor above the Mermaids. The harbor is used chiefly for recreational boating and by the small local lobster fishing fleet.

The dangers in the approach and entrance to Branford Harbor either show above water or are marked by buoys. **Cow and Calf**, 1.3 miles southwestward of Jeffrey Point, are two boulders close together bare at low water. Boulders, reported covered 10 feet, are about 0.2 mile northward of Cow and Calf. **Five Foot Rock**, 0.5 mile northeastward of Cow and Calf, has 5 feet over it. **Taunton Rock**, 0.9 mile northeastward of Cow and Calf near the middle of the entrance to Branford Harbor, is large but low and bare. **Blyn Rock**, midway between Johnson Point and Taunton Rock, is covered at extreme high tide. **Bird Rock**, 0.2 mile northward of Blyn Rock, has 5 feet over it.

Little Mermaid, showing a little above high water, and **Big Mermaid**, a high rock marked by a light, are near the middle of Branford Harbor. Two bare rocks are near the head of the harbor. A rock, bare at low water and usually marked by stakes, is about 100 feet north-northeastward of the north end of **Lovers Island**.

Routes.—To enter Branford Harbor from eastward, pass southward of the lighted buoy marking Negro Heads, steer about **306°** heading for Taunton Rock, and enter between Taunton and Jeffrey Rocks; or a **333°** course with Branford Reef Light astern will lead into the harbor between Jeffrey and Taunton Rocks. From westward, pass southward and over 100 yards eastward of the lighted bell buoy marking Cow and Calf, thence westward of the buoys marking Blyn Rock and Bird Rock to the buoyed channel in the harbor.

Local craft pass northwestward of Cow and Calf shoal and midway between Johnson Point and Blyn Rock.

Branford River, narrow and crooked, extends northeasterly from Branford Harbor. In 1969, the controlling depths in the dredged channel were 7 feet from Branford Harbor to Branford Point, thence 5 feet for about 0.8 mile, and thence 5 feet for a midwidth of 50 feet to the upper wharf at Branford, about 1.5 miles above **Branford Point**.

At low water the channel above Branford Point is defined by bare shoals on each side. During the summer numerous stakes used as moorings mark both sides of the channel. A small channel and basin dredged by private interests, 0.5 mile east of Branford Point, has a depth of about 4 feet.

The principal waterborne commerce at Branford is in petroleum products. There are several marinas and boatyards on the river. The largest mobile hoist can handle craft up to 65 feet; gasoline, diesel fuel, water, ice, marine supplies, and complete engine, hull, and radio repairs are available. Seasonal daytime **storm warning signals are displayed.** (See chart.)

Johnson Point is the western entrance point to Branford Harbor; a rock covered 2 feet is about 100 yards off its south side. A small privately dredged basin on the southwest side of the point is well protected in all but southerly winds. In 1971, it was reported that 4 feet could be carried to and in the basin.

Gull Rocks, about 0.3 mile westward of Johnson Point, consist of small islets and sunken rocks that extend about 0.5 mile southwestward from shore on the easterly side of the entrance to a large cove. A rock, bare at half tide, is in the northwestern part of the cove about 350 yards southward of **Short Beach**. The northwest end of the cove has a yacht club landing with a reported depth of 2 feet alongside.

Farm River Gut, a small bight on the west side of the cove, is a good anchorage for small craft. Depths are from 4 to 5 feet with mud bottom, and protection is from all sides except easterly. A marine railway on the north side of the gut can haul out boats up to 40 feet for engine and hull repairs. **Old Clump** is a bare rock about 400 yards south of the bight.

Farm River, about 1.5 miles westward of Branford Harbor, is used by local craft at high water. With local knowledge, a midchannel depth of about 2 feet can be taken to the fixed bridge with a clearance of 4 feet about a mile above the mouth. A 50-foot marine railway is just below the bridge on the west side of the river; berths with electricity, gasoline, diesel fuel, water, and limited marine supplies are available.

East Indies Rocks, about 0.4 mile south of the entrance to Farm River, cover at half tide and are marked by a buoy to the eastward; a rocky shoal with a least depth of 5 feet is 0.2 mile to the eastward. A small ledge, bare at low water, is midway between East Indies Rocks and the south side of Mansfield Point, the western entrance point to Farm River. **Darrow Rocks**, a group of bare rocks, are on the east side of the entrance to the river. The westernmost rocky knoll is marked by a flagstaff. A ledge, bare at low water, with a buoy off its southern end, is 200 yards south of the flagstaff.

Mansfield Point and the shore westward of the entrance to Farm River are thickly settled. Bus communication is available to New Haven.

Charts 218, 116-SC.—New Haven Harbor, an important harbor of refuge, is about 68 miles from New York, 179 miles from Boston via Cape Cod Canal, and 170 miles from Nantucket Shoals Lightship. It comprises all the tidewater northward of the breakwaters constructed across the mouth of the bay, including the navigable portions of the West, Mill, and Quinnipiac Rivers. It is about 2 miles wide. The inner harbor, northward of Sandy Point and Fort Hale, is shallow for the most part, except where the depths have been increased by dredging. The main entrance channel, between Luddington Rock Breakwater and the East Breakwater, leads northward to Tomlinson Bridge at New Haven. Anchorage basins for medium draft vessels are on the west side of the channel north of Sandy Point. Waterborne commerce in the harbor consists of petroleum products, scrap metal, lumber, automobiles, gypsum, steel products, chemicals, rock salt, and general cargo.

New Haven, at the head of the harbor, is an important manufacturing city.

Prominent features.—On the approach from well offshore in clear weather, the prominent landmarks are: on East Rock, the Soldiers and Sailors Monument; in New Haven, the Knights of Columbus Building, a tall rectangular structure with circular pillars at its corners; and on the west side of Mill River, a large gas tank with a red and white checkerboard band around the top and the words "New Haven Gas" in lighted letters. The lights on the ends of the breakwaters and the abandoned tower on Lighthouse Point are also prominent.

Southwest Ledge Light (41°14.1′ N., 72°54.7′ W.), 57 feet above the water, is shown from a white octagonal house on a brown cylindrical pier at the westerly end of East Breakwater. A fog signal is sounded at the light.

Channels.—A Federal project for New Haven Harbor provides for an entrance channel 35 feet deep to a point just below the junction of Mill

River and Quinnipiac River. The channel is well marked. (See Notice to Mariners and latest editions of the charts for controlling depths.)

West River, on the west side of the main channel about 3 miles above Southwest Ledge Light, has a dredged channel marked by buoys to just above the first highway bridge (Kimberly Avenue Bridge), 1.2 miles above the channel entrance. In 1969, the controlling depths were 7 feet for a midwidth of 50 feet from the channel entrance to the Kimberly Avenue Bridge, thence 5½ feet at midchannel to the head of navigation at a point about 200 yards upstream. In 1969, depths of 6 feet and 4 feet were available in the northerly half and southerly half, respectively, of the anchorage area on the south side of the channel 1 mile above the entrance. Principal waterfront facilities are at **City Point**.

Mill River, on the west side of **Fair Haven** about 4 miles above Southwest Ledge Light, is entered from the main channel through a dredged entrance channel that branches into an east and west fork to the Grand Avenue Bridge, 0.6 mile above the mouth. In 1968, the controlling depths were 9 feet at midchannel in the entrance channel, thence 8 feet in the east fork except for shoaling to 3 feet in the northerly 200 feet of the channel, and thence 4½ feet in the west fork except for shoaling to 1 foot 200 feet from the upstream limit of the channel.

Quinnipiac River, on the east side of Fair Haven about 4 miles above Southwest Ledge Light, has a dredged channel to Grand Avenue Bridge, about a mile above the mouth. In January 1967, the controlling depth was 16 feet to Grand Avenue Bridge.

Anchorages.—Inside West Breakwater and the southwest half of Luddington Rock Breakwater, anchorage is available for vessels up to 20-foot draft. Caution should be exercised to avoid the fish stakes in this area.

Vessels may anchor northward of Southwest Ledge Light in depths of 18 to 20 feet, soft bottom in places. Care should be taken to avoid the ledges northward of the East Breakwater. Deep-draft vessels awaiting berthing assignments can anchor about 1 mile southward of the sea buoy; holding ground is excellent.

Morris Cove, on the east side of the main channel just above Lighthouse Point, affords good anchorage and is used by yachts, but is rough in westerly and southerly winds. A Coast Guard station is on the north side of the jutting point, about 1.5 miles northward of Lighthouse Point.

An anchorage basin on the west side of the main channel southward of New Haven Long Wharf is sometimes used, but considerable shoaling is gradually extending into the anchorage from westward. A sunken barge with 5 feet over it is in this anchorage about 550 yards southward of New Haven Long Wharf.

An anchorage area, much used by small craft and scows, is northward of the New Haven Long Wharf (Naval Reserve Pier) in the northwest side of the main channel where depths range from about 9 to 14 feet.

No special regulations prescribe the limits within which vessels must anchor, except that the dredged channels must be kept clear.

Dangers.—Townshend Ledge, 2.7 miles southeastward of Southwest Ledge Light, has a least depth of 18 feet and is marked by a lighted gong buoy.

Stony Islet, 2.2 miles eastward of Southwest Ledge Light, is low, bare, and surrounded by ledges bare at low water to a distance of about 100 yards. A partly bare ledge is about 0.2 mile north-northwestward of Stony Islet. From this ledge and Stony Islet westward to the entrance of New Haven Harbor, an area of foul ground with many rocks bare at low water extends about 0.5 mile offshore. This area should be avoided.

Shoals with 16 to 18 feet over them extend over 0.5 mile southeastward from the breakwaters on both sides of the dredged entrance channel. A spoil area with reported depths of 15 feet is on the eastern side of the entrance channel. An 18-foot spot is on the east side of the main channel, at the first turn westward of Southwest Ledge Light.

The bights on the west shore of New Haven Harbor from Pond Point northward are shoal with bare rocks and foul ground in most of them. The shore is rocky at **Woodmont**, about 2 miles northeastward of Pond Point.

Black Rock, bare at low water and marked by a seasonal buoy, is 0.2 mile off the north end of Morris Cove. Opposite, on the west side, is a breakwater, partly covered, extending from **Sandy Point** and marked by a light. **Shag Bank**, a flat extending about 0.5 mile northward from Sandy Point, has a sand tip about 0.1 mile long.

Bridges.—Tomlinson Bridge, at the head of the main harbor at the confluence of Mill and Quinnipiac Rivers, has a double bascule span with a clearance of 12 feet. Just above this bridge is a fixed highway bridge with a clearance of 60 feet.

Over Mill River, about 0.3 mile above the entrance, is the Chapel Street Bridge with a swing span having clearance of 7 feet. The fixed highway bridge at Grand Avenue has a clearance of 6 feet over the east fork and a clearance of 2 feet over the west fork. Bridges above this point have minimum clearance of 2 feet. Small unmasted boats go as far as the bridge at State Street, 0.5 mile above Grand Avenue.

The Ferry Street Bridge over Quinnipiac River, 0.6 mile above the Tomlinson Bridge, has a bascule span with a clearance of 25 feet. The Grand Avenue Bridge, 0.5 mile farther upstream, has a center-pier swing span with a clearance of 9 feet. Above this are several fixed bridges and trestles.

Kimberly Avenue Bridge over West River has a fixed span with a clearance of 23 feet. (See **117.120**, chapter 2, for drawbridge regulations and opening signals.)

Tides.—The mean range of tide is 6.2 feet. Extreme tides have been recorded as reaching more

than 2.5 feet below the plane of mean low water and more than 8 feet above the same datum.

Currents.—In the entrance between the breakwaters, the tidal current has a velocity on flood of 1.4 knots, and ebb 0.9 knot. The flood sets 320° and the ebb in the opposite direction. In the draw of Tomlinson Bridge the velocity is 0.4 knot. The flood sets 015° and the ebb 215°. Ebb velocities are increased by freshets. (Consult the Tidal Current Tables for predicted times and velocities of currents.)

Ice generally obstructs navigation to some extend for low-powered vessels from December to March and sometimes extends to the mouth of the harbor. During severe winters the accumulation of ice is local. Except in severe weather, powered vessels can always enter and leave the harbor without much difficulty. In New Haven Harbor northerly winds tend to clear the harbor of ice if the formation is light; southerly winds are apt to force in drift ice from the sound.

Weather.—New Haven's climate is typical of coastal areas of southern New England. It is vigorous without being overly severe. New Haven is located at the widest part of Long Island Sound, and the tempering effect of the water is most pronounced in this vicinity. During the summer season, the sea breeze holds temperatures 5° to 15° lower in the afternoon; during the winter season, minimum temperatures in the southern section of the city are usually 5° to 10° higher than those reported from northern sections. The highest summertime temperatures occur with a moderate northerly wind. The lowest winter readings also occur with a northerly wind.

Precipitation is quite evenly distributed throughout the year. The elevation of the land increases northward from the station and results in somewhat higher amounts of precipitation in the northern suburbs as well as a few more thunderstorms each year. During the winter, a variety of precipitation is found in most storms. It is common to have rain along the shore, freezing rain and sleet a short distance inland, and snow in the northern parts of the city. Heavy snow is rather uncommon in the immediate coastal area and usually melts in a few days. Farther inland, the snow becomes progressively heavier and a layer of snow covers the ground most of the winter.

Prevailing wind direction varies with the seasons. From late spring until fall winds are predominantly south to southwest due to the effect of the sea breeze. During the winter, the prevailing winds are northerly. Strong southeast winds cause unusually high tides and some local flooding in low-lying coastal areas two or three times a year.

The National Weather Service maintains an office at the Tweed-New Haven Airport, about 3 miles southeast of the city. (See appendix for **New Haven climatological table.**)

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Routes.—To enter New Haven Harbor from eastward, it is safer for large vessels to pass southward of Branford Reef and Townshend Ledge to the entrance channel. To enter from westward, pass northward of Stratford Shoal Light at a distance of 1.8 miles and head for the entrance channel.

The passage eastward of East Breakwater has boulder patches and is very broken, but can be used by small craft drawing less than 6 feet, taking care to avoid the foul ground along the northeast side of the passage. This passage is buoyed, and local vessels of 10- to 12-foot draft use it at high water. Avoid **Quixes Ledge** which extends about 200 yards southeastward from the eastern end of the breakwater, and pass about 100 yards eastward of the breakwater. The principal danger inside the breakwater is the reef, marked by a buoy, which extends 300 yards southwestward from **Lighthouse Point. Adams Fall**, a rock with 5 feet over it and marked by a buoy, is 0.4 mile southwestward of Lighthouse Point.

Pilotage is compulsory for foreign vessels and U.S. vessels under register. Pilot services are generally arranged for in advance through the ships' agents or directly by shipping companies; pilots are available on a 24-hour basis except during heavy fogs. When vessels are expected, the pilot station monitors VHF-FM channel 16 (156.80 MHz) and uses channels 6 (156.30 MHz), 13 (156.65 MHz), 19A (156.95 MHz), and 24 (157.20 MHz) as working frequencies. Pilots usually board vessels in the vicinity of the sea buoy from tugs when available or from a 34-foot diesel-powered sport fishing vessel with a white hull and superstructure with the word "PILOT" on the sides. Pilots use portable radiotelephones for docking and undocking operations.

Towage.—Tugs up to 1,800 hp. are available at New Haven. Vessels usually proceed to the harbor without assistance. Large vessels normally require tugs for docking and undocking. Arrangements for tug service should be made 24 hours in advance, usually through ships' agents or directly by shipping companies. The tugs monitor VHF-FM channels 13 (156.65 MHz) and 16 (156.80 MHz) and use channel 19A (156.95 MHz) as a working frequency; call sign is KFT-309.

New Haven is a **customs port of entry.** Quarantine officials are stationed in Boston, Mass., **immigration officials** in Hartford, Conn., and **agricultural quarantine** officials in Milford, Conn. (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 regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The U.S. Public Health Service maintains a **contract physician's office** in New Haven. (See appen-

dix for address.) New Haven has many public and private hospitals.

Coast Guard.—The nearest **vessel documentation** office is in Bridgeport, Conn. (See appendix for address.)

The **harbormaster** at New Haven has charge of the berthing and anchoring of vessels; he can be contacted through the local police department.

A city-owned 68-foot fireboat is berthed at the New Haven Long Wharf. It can be contacted through the New Haven Fire Department or the Coast Guard station.

Wharves.—The deep-draft facilities at the Port of New Haven are along the north and east sides of the inner portion of New Haven Harbor. Facilities for smaller vessels and barges are along the sides of the harbor, and in Mill, Quinnipiac, and West Rivers. Depths alongside the facilities in Quinnipiac River range from about 4 to 14 feet; Mill River, 7 to 13 feet; and West River about 12 feet. Only the deep-draft facilities are described. (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 private operator. All 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 particular facility. Cranes up to 50 tons, and warehouses and cold storage facilities adjacent to the waterfront are available.

Wyatt Pier: north end of harbor 0.35 mile northeastward of New Haven Long Wharf; 110-foot face, 270 feet with dolphins, 36 feet alongside; deck height, 11 feet; receipt and shipment of petroleum products, bunkering vessels; owned and operated by Wyatt, Inc.

Wyatt Wharf: 50 yards east of Wyatt Pier; west side 483 feet, 30 feet alongside; south side 173 feet usable with dolphins, 6 to 22 feet alongside; deck height, 11 feet; receipt and shipment of petroleum products, receipt of asphalt; owned and operated by Wyatt, Inc.

Gulf Oil Corp. Wharf: on east side of harbor, 200 yards south of Tomlinson Bridge; 60-foot face, 520 feet with dolphins; 35 feet alongside; deck height, 13 feet; vessels normally moor starboard-side-to; receipt and shipment of petroleum products; owned and operated by Gulf Oil Corp.

T.A.D. Jones Pier: 100 yards southward of Gulf Oil Wharf; north side 480 feet, 400 feet usable, 28 feet alongside; south side, 480 feet, 380 feet usable, 22 feet alongside; deck height, 10 feet; two 2½-ton unloading towers and conveyors; unloading rate, 250 tons per hour each tower; receipt various bulk commodities, shipment of petroleum products, bunkering vessels; owned by Gulf Oil Corp., operated by T.A.D. Jones and Co.

Atlantic-Richfield Co. Pier: 300 yards southwestward of T.A.D. Jones Pier; 110-foot face, 760 feet with dolphins; 35 feet alongside; deck height, 15 feet; vessels normally moor starboardside-to; receipt and shipment of petroleum products; owned and operated by Atlantic-Richfield Co.

New Haven Terminal North Dock: 275 yards southward of Atlantic-Richfield Pier; 568-foot face, 640 feet of berthing space; 34 feet alongside; deck height, 14 feet; two 30-ton traveling gantry cranes, one 50-ton crawler crane; shipment of scrap metal, receipt of steel products, lumber, general cargo; owned and operated by New Haven Terminal, Inc.

New Haven Terminal South Pier: 50 yards southward of North Dock; north and south sides, 650 feet; 34 feet alongside; deck height, 13 feet; cranes up to 50 tons; receipt and shipment of general cargo, receipt of petroleum products, petro-chemicals, chemicals, latex, lumber and steel products, automobiles; owned and operated by New Haven Terminal, Inc.

Humble Oil and Refining Co. Pier: 175 yards southward of South Pier; 80-foot face, 700 feet with dolphins; 35 feet alongside; deck height, 13 feet; vessels normally moor starboardside-to; receipt and shipment of petroleum products; owned and operated by Humble Oil and Refining Co.

Supplies.—Oil bunkering terminals at New Haven are maintained by the major oil companies. Fuel oil and diesel oil in the usual commercial grades are obtainable. Barges are available for bunkering in the anchorages outside the breakwaters or at the piers; 24-hour advance notice is required, and arrangements should be made through ships' agents. Water, provisions, and marine supplies can be procured.

Repairs.—New Haven has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Boston, Mass., and New York. Machine shops in the area can make limited repairs to machinery and boilers, and fabricate shafts and other pieces of equipment.

Small-craft facilities.—There are excellent facilities on the east and west sides of the harbor and on West and Quinnipiac Rivers. Most of these facilities have berths, electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies, and can make hull, engine, and electronic repairs. Marine railways up to 70 feet and lifts up to 40 tons are also available.

Charts 219, 117-SC.—Pond Point, about 5 miles southwestward of the New Haven Harbor entrance, has a rocky shoal with little depth over the greater part of it that extends about 0.3 mile southward. It is marked by a buoy. A prominent white mast is on the point.

Welches Point, 0.8 mile westward of Pond Point, forms the east side of the entrance of The Gulf. A reef extends 0.3 mile southward from the point and is marked by a buoy.

The Gulf, a bight between Welches Point and Charles Island, about 6.5 miles westward of New Haven Harbor entrance, affords anchorage in 6 to 15 feet and is sheltered in all but southerly and southeasterly winds. The entrance is clear. The shoaling is gradual, and soundings are the best guide on the northwest side of the bight; the western side of Welches Point and the reefs around Charles Island extending to the mainland should be approached with caution, as the shoaling is abrupt. The mean range of **tide** is about 6.6 feet.

Milford Harbor, comprising the lower portion of the **Wepawaug River**, is entered at the mouth of the river between two jetties at the head of The Gulf. The westerly jetty extends southward from **Burns Point**, and the easterly jetty is marked by Milford Harbor Light. The harbor is used chiefly for recreational boating, and occasionally for the receipt of shellfish and fish. The National Marine Fisheries Service, U.S. Department of Commerce, maintains a laboratory and research vessel base on the west side of the harbor, about 0.2 mile northward of Burns Point.

A dredged channel leads from The Gulf through the jettied entrance to a point about 400 feet above the town wharf, 0.6 mile above Burns Point. In 1967, the controlling depths were 10 feet to the south end of the anchorage basin on the west side of the channel about 250 yards above Burns Point, thence 8 feet to the head of the channel; depths of 8 to 10 feet were available in the anchorage basin. The channel is marked by buoys to the jettied entrance. An obstruction, a pile, is in the anchorage basin, about 0.2 mile northwestward of Burns Point.

Milford Harbor has several small-craft facilities. Most of these facilities have berths, gasoline, diesel fuel, storage, water, ice, marine supplies and electricity, and can make hull, engine, and electronic repairs. Marine railways up to 60 feet and lifts up to 30 tons are also available.

Storm warning signals are displayed. (See chart.)

Charles Island, on the southwest side at the entrance to The Gulf, is low and partly covered with scrubby trees. A white pole, barely visible over the trees, is on the island. **The Bar**, a rocky area, bare at low water, extends northwesterly from Charles Island to the mainland. An unlighted buoy marks the end of a shoal that extends 250 yards east-northeastward from the island, and a lighted bell buoy marks the end of a rocky area that extends 0.4 mile southward from the island. Northward of Charles Island is a good anchorage in 10 to 16 feet, sheltered from southerly to southwesterly winds.

Between Charles Island and **Stratford Point**, about 3 miles southwestward, several summer resorts are along the shore and the Housatonic River empties into Long Island Sound just above the point. The shoals which extend southward from Stratford Point toward Stratford Shoal Light consist of narrow ridges of hard sand with deeper water between, and have oyster beds marked with stakes. Depths of 12 feet or less extend 1 mile offshore.

Stratford Point Light (41°09.1′ N., 73°06.2′ W.), 52 feet above the water, is shown from a white conical tower, with brown band midway of its height, from the southerly part of the point; a fog signal is sounded at the light station.

Chart 219.—Housatonic River rises in the Berkshire Hills of western Massachusetts and Connecticut, and empties into Long Island Sound about 10 miles southwestward of the New Haven Harbor entrance. The river is joined by the non-navigable **Naugatuck River** in the vicinity of Derby, Conn. Housatonic River is navigable to a point about 1 mile above Shelton, Conn., where it is closed by a power dam. The head of navigation for all practical purposes is at the towns of Derby and Shelton, 11.5 miles above the entrance. Small vessels can anchor in the river abreast of Stratford, where the channel has an available width of about 500 feet. The waterborne commerce on the river is principally in barge shipments of aggregate, fuel oil to the power plant at Devon, and seasonal commercial shellfishing. Navigation above Devon is limited to recreational boating.

On the east side of the entrance to Housatonic River, a breakwater extends out from **Milford Point** across the bar and is marked at its south end by Housatonic River Breakwater Light. The inner section of the breakwater is awash at high water.

The river is entered through a dredged channel that leads from Long Island Sound between the breakwater on the east and Stratford Point on the west to a point about 4.3 miles above the channel entrance, thence through several dredged sections across the river bars to Derby and Shelton 11.5 miles above the entrance. In 1969, the controlling depths in the channel were: 13 feet (17 feet at midchannel) to Buoy 19 at Stratford; thence 9 feet (15 feet at midchannel) to Buoy 29; thence 3 feet to Camp Meeting Bar, 7.1 miles above the channel entrance; thence 2 feet reported across the bar; and thence in 1956-69, 3 feet to Derby and Shelton. The channel is marked to a point about 2.5 miles below Derby and Shelton. In 1971, it was reported that a shoal was extending to the easterly edge of the channel from Milford Point and another shoal was extending into the channel from the northern end of Nells Island.

Stratford is a town on the west side of the river 2.3 miles above the entrance. The principal wharf has a depth of about 9 feet at its end. The **harbormaster** at Stratford controls anchorages and moorings, and has jurisdiction from the entrance of the river to the Shelton town line; a harbor patrol is maintained. Harbor regulations may be obtained from the harbormaster who may be contacted through the Stratford police or at the Town Hall.

Stratford has several small-craft facilities. A 30-ton mobile hoist can handle craft up to 50 feet in length for engine and hull repairs. Gasoline, diesel

fuel, water, ice, marine supplies, and launching ramps are available.

Devon is on the east side about 1 mile above Stratford. Local small craft anchor near the east bank of the river, just north of the highway bridge, in depths up to 10 feet. A 40-foot marine railway at a small-craft facility at Devon can haul out craft for engine and hull repairs; gasoline, water, ice, marine supplies, and storage are available.

Shelton, a town on the west side of the river about 11.5 miles above the entrance is connected to **Derby** by two bridges; the town has several important factories. In 1971, the wharves at Derby and Shelton were in ruins and unsuitable for craft of any size.

Bridges.—About a mile above Stratford is a highway bridge with a bascule span having a clearance of 32 feet. Two bridges cross the river about 0.3 mile farther up: the first, a fixed highway span, has a clearance of 65 feet, and the second, a railroad bridge with a bascule span, has a clearance of 19 feet. An overhead power cable with a clearance of 135 feet crosses at the railroad bridge. Other cables, near **Pecks Mill**, 1.5 miles above, have minimum clearance of 79 feet.

The fixed highway bridge about 3.7 miles above Stratford has a clearance of 85 feet. At Shelton a fixed highway bridge has a clearance of 30 feet; above Shelton are two fixed bridges, with clearances of 17 and 30 feet.

Regulations and opening signals for the drawbridges on Housatonic River are given in **117.125**, chapter 2.

Tides.—The mean range of tide is 5.5 feet at Stratford and 5 feet at Shelton. The time of the tide becomes later and the range diminishes in progressing up the river. At Stratford the tide is about 0.8 hour later than at the entrance whereas at Shelton high water is about 1.8 hours later and low water about 2.8 hours later than at the entrance. The river water is fresh about 6 miles above the entrance.

Currents.—At the entrance near the end of the breakwater the flood has a strong westerly set. Between **Milford Point** and **Crimbo Point**, flood and ebb have a velocity of about 2.5 knots. The flood sets about 300° and the ebb 130°. Just south of the draw of the railroad bridge above Stratford, the velocity of flood is 1.1 knots and of ebb, 1.6 knots. In the openings of the bridge the flood current has some easterly set, but the ebb sets fair with the openings. Between that bridge and Shelton the tidal current has a velocity of about 1 knot. Because of the drainage flow of the river, the ebb is usually greater and the flood less than 1 knot. (Consult the Tidal Current Tables for current predictions and further details.)

Spring **freshets** at Shelton rise 10 feet or more above mean high tide.

Ice closes the river above Stratford during the winter and sometimes extends to the entrance.

Routes.—The channel in Housatonic River is narrow and crooked, with little depth on either side, and across the bars in the channel are dredged cuts 100 feet wide. The tidal currents are strong, especially in the lower part of the river, and strangers are advised to take a pilot. Small craft, without a pilot, should proceed with caution and preferably on a rising tide.

Follow off the buoys on the starboard side at a distance of 75 to 100 feet until Housatonic River Light 5 is about abeam. On this course during a flood current, care must be taken to avoid being set on the shoals on the west side by strong westerly currents. In the vicinity of Milford Point care should be exercised to avoid a shoal that reportedly extends from Milford Point to the eastern edge of the channel. Care should also be exercised off the extreme northern end of Nells Island as a shoal is reported to have encroached into the channel. By steering a midchannel course no difficulty should be encountered.

Pilots and **tugs** can be obtained at New Haven.

Chart 1212.—Stratford Shoal Middle Ground, 5.4 miles south of Stratford Point and covered 4½ to 18 feet, is marked by **Stratford Shoal (Middle Ground) Light** (41°03.6′ N., 73°06.1′ W.), 60 feet above the water and shown from a gray granite octagonal tower projecting from a house on a pier, and by buoys that mark the outer ends of shoal areas extending 1 mile north, 0.9 mile northeast, and 0.5 mile south of the light. A radiobeacon and fog signal are at the light.

North Shore of Long Island.—From Orient Point (41°09.6′ N., 72°14.0′ W.), for about 11 miles to Horton Point, the south shore of Long Island Sound is generally bluff and rocky. The 10-fathom curve is from 0.3 to 0.8 mile from shore, and the shoaling is generally abrupt. The outlying dangers are Orient Shoal and the rocky patch northward of Horton Point.

The prominent features are Browns Hills, a tower at Rocky Point, a tank in the northwest part of Greenport, and Horton Point Light.

Several rocky shoals, including **Orient Shoal** with a least depth of 7 feet, are offshore in the vicinity of **Rocky Point**, about 5 miles westward of Orient Point. The north end of Orient Shoal is marked by a buoy.

Horton Point Light (41°05.1′ N., 72°26.8′ W.), 103 feet above the water, is shown from a black skeleton tower on a small white house on the northwest part of the point. The former lighthouse tower is close by, southwestward of the present light.

A rocky shoal with a least found depth of 28 feet is 1.6 miles northward of Horton Point. The shoal is a ridge having a northeast-southwest direction, with abrupt shoaling on its northwest and southeast sides.

From Horton Point for about 32 miles to Old Field Point, the shore is fringed with shoals that extend off a greatest distance of 1.5 miles and rise abruptly from the deep water of Long Island Sound. Boulders are found near the shore on the

shoals which extend off 0.5 mile in places. A sand shoal, about 0.5 mile in extent with a least depth of 26 feet, is about 1.1 miles northwestward of Duck Pond Point.

The bluffs begin about 1 mile westward of Goldsmith Inlet and reach their greatest elevation just eastward of **Duck Pond Point.** A valley, formed by a break in the bluffs, is just westward of the point; a bathing pavilion is on the beach. Boulders which bare at low water are on the shoals that fringe the shore between Duck Pond Point and Mattituck Inlet.

Chart 363.—Mattituck Inlet, 6.7 miles southwestward of Horton Point Light, is entered between two short jetties. The inlet is marked by a long break in the bluffs. The outer end of the west jetty is marked by a light. A bell buoy about 1 mile north of the jetty light marks the entrance of the inlet. The sides of the channel are sandy and, although shoaling is liable to occur at the entrance, strangers can enter the inlet without great danger. In May 1972, the controlling depths in the dredged channel to the turning basin at Mattituck, about 1.8 miles above the entrance, were 7 feet at midchannel to a point about 200 yards upstream of the inshore end of the west jetty, thence, due to shoaling at this point, 4½ feet at midchannel and 7 feet in the right outside quarter, thence, 4½ feet for a width of 60 feet to the turning basin and 7 feet in the basin. From the remains of Old Mill Bridge, 0.8 mile above the inlet entrance, the channel to the turning basin is marked by seasonal private markers. The overhead power cable about 1 mile above the entrance has a clearance of 78 feet.

The **tidal currents** have an estimated velocity of about 3 knots in the narrow parts of the entrance of Mattituck Inlet. Slack waters occur possibly 1 hour after the time of high and low water. With northerly and westerly winds, the sea is rough in the entrance. The mean range of **tide** is 5.0 feet at the entrance. The inlet is rarely closed by **ice.**

Several marinas and a boatyard are inside the inlet. A 25-ton mobile hoist at the boatyard can haul out craft for engine, hull, and radio repairs. Marine supplies, gasoline, water, and covered and wet storage can be obtained. A transient marina, operated by the Mattituck Park Commission, is at the head of the inlet; depths of about 7 feet are at the end of the pier. A **dockmaster** is at the marina; ice and water are available.

Mattituck is a village on the railroad at the head of the inlet. Provisions can be obtained.

Jacobs Point, about 11 miles southwestward of Horton Point Light, is the site of an open roadstead offshore mooring oil distribution facility at Northville, Long Island, N.Y. The offshore mooring area is about 1 mile northward of Jacobs Point and is marked at its western end by a private lighted bell buoy. There is also an 800-foot-long barge pier just east of the point and southward of the mooring facility. In 1971, depths of 15 feet were reported alongside the pier. The numerous oil storage tanks on Jacobs Point are prominent.

Vessels calling at the offshore mooring facility are moored only during daylight and during the slack water before the ebb tidal current commences and during the first 4 hours of the ebb tidal current. The tidal current periods are substantially the same as at The Race. Strong winds from the north and northwest are experienced during the winter and spring. Tidal currents during maximum ebb and flood often reach 3.5 to 4 knots. Vessels moor in 65 feet of water, heading west, and parallel with the tide current flow. Unmooring is accomplished at most anytime subject to unusual adverse tidal currents and weather.

Vessels arriving at night or at other times not suitable for mooring should anchor about 1 to 1.5 miles northeast of the lighted bell buoy. Holding ground is good, and 75 fathoms of chain is considered safe.

Pilots and **tugs** are arranged for in advance through ships' agents; tug assistance is required to assist in mooring.

A **Mooring Master** and working crew will board the vessel from a 65-foot gray motor launch off the mooring about 1 hour prior to the scheduled mooring. The Mooring Master will pilot the vessel into the moorings, and supervise the mooring and unmooring operation and the connecting and disconnecting of submarine hoses.

Communications with the terminal and the Mooring Master's launch is maintained by VHF-FM radio on Channels 6 (156.30 MHz), 13 (156.65 MHz), 16 (156.80 MHz), 19A (156.95 MHz), and 28 (157.40 MHz); launch call sign is W0-8680. This equipment is on continuously during the vessel's stay in Northville. The Mooring Master's crew maintains a radio watch and constant communications with the terminal for routine and emergency purposes.

Bunkers and fresh-water facilities are not available at Northville. The terminal has no ballast, garbage, or bilge disposal facilities. U.S. antipollution regulations are rigidly enforced. Small quantities of provisions may be obtained at local stores in **Riverhead**, about 4 miles inland. Launch service for crew transportation is not available.

New York City is the **quarantine, customs, immigration,** and **agricultural quarantine** port of entry for Northville. Officials are stationed in New York City. (See appendix for addresses.) Arrangements for such inspections must be made by ships' agents in advance, usually not less than 24 hours Monday through Friday and 48 hours on Saturday and Sunday. Officials will board vessels in the anchorage prior to arrival within the mooring area. When clearance has been granted, the Mooring Master will board the vessel to help the master moor in the berth.

Chart 1212.—Between Mattituck Inlet and Port Jefferson the shore is fringed with rock shoals extending in places 1.5 miles offshore The outer ends of the shoals are marked by buoys.

Horse in Bank, 7.3 miles westward of Mattituck Inlet, is an area of white patches in the brush-covered bluff at **Friars Head**. The feature is at the western end of **Roanoke Point Shoal** and 14 miles westward of Horton Point Light.

The valley of **Wading River**, about 20 miles westward of Horton Point Light, forms a broad break in the high bluffs. A small canal, about 350 yards westward of the entrance to Wading River, leads southward to the site of a nuclear power station which was under construction in 1971. The canal, closed to general navigation, had a reported depth of about 15 feet in 1971.

Tuttles White Bank is a high white bluff 0.6 mile westward of Wading River.

Charts 361, 117-SC.—Mount Sinai Harbor, 22.5 miles westward of Mattituck Inlet is marked by a low break in the beach nearly 1 mile long. The approach to the harbor is marked by buoy. The entrance is protected by two jetties, the outer parts of which are awash at high water. Caution should be exercised when rounding them. A private light is on the outer end of the east jetty. In 1971, a depth of about 8 feet was reported available through the entrance. The northern part of the harbor has general depths of 10 to 20 feet, but the southern part is shoal; the chart is the guide. The channels in the southern part of the harbor are marked during the boating season, but require local knowledge. A yacht club and a town marina are on the south side of **Cedar Beach**, on the north side of the harbor. Gasoline is available at the yacht club, and a pump-out station and transient berths are available at the marina. A **speed limit** of 5 m.p.h. is enforced in the harbor by the Suffolk County Police. A boatyard in the southern part of the harbor has a 20-ton mobile hoist and open storage facilities, and can make engine and hull repairs. The yard is accessible at high tide only; caution is advised.

Mount Misery, 180 feet high, between Mount Sinai Harbor and Port Jefferson, slopes off gradually toward the sound where the bluffs are about 60 feet high and very prominent. Sand banks dug out by sand and gravel companies are very conspicuous.

Port Jefferson Harbor, on the south shore of Long Island Sound eastward of Old Field Point, is entered through a dredged channel that leads between two jetties to a docking area near the southwestern end of the harbor; the jetties are each marked by a light. A fog signal is on the east jetty. Stacks on the west side near the head of the harbor are conspicuous landmarks.

A **121°-301° measured nautical mile** is westward of the entrance to Port Jefferson Harbor on Old Field Beach. The front markers are red wooden posts about 8 feet high; the rear markers are rectangles mounted on legs about 12 feet high, painted red with a 6-inch black vertical stripe in the middle.

The approach to Port Jefferson Harbor is clear, taking care to avoid **Mount Misery Shoal** with depths of 7 to 12 feet, about 0.8 mile north-northeast of the east jetty light.

In May 1970, the controlling depth was 23 feet in the dredged channel through Port Jefferson Harbor to the docking area off an oil pier at the southern end except for reported shoaling to 15 feet in the left outside quarter of the channel opposite Buoy 1 in 1972; depths of 32 feet were available in the docking area in 1970. The channel is marked by buoys and a private **146°** lighted range.

Shoals with little depth are on both sides of the channel from the entrance to Port Jefferson Lighted Bell Buoy 3 inside the entrance. The ground from the east jetty to the lighted bell buoy is broken, with shoals covered 4 to 11 feet. The lighted bell buoy cannot be seen over the breakwater at low tide by small vessels approaching the harbor.

A small basin at the northeast end of Port Jefferson Harbor, dredged by sand and gravel operations to depths of about 18 feet, affords excellent anchorage during northerly weather for any draft able to get inside. The edges of the basin have wrecks and considerable shoaling; caution is advised in selecting anchorage and in moving around in the basin.

The mean range of **tide** is 6.6 feet.

Currents.—In the channel between the jetties the velocity of the tidal currents is 2.6 knots on flood and 1.9 on ebb; flood sets 150° and the ebb 325°.

Ice forms over the entire harbor and interrupts navigation in very cold weather, but does not endanger shipping in the harbor.

Port Jefferson is a town at the southern end of the harbor. The principal industries of the port are the shipping of sand and gravel and the distribution of petroleum products. There are small-craft facilities at the head of the harbor. Berths, electricity, gasoline, some diesel fuel, water, ice, storage, marine supplies, a 35-foot marine railway, and lifts up to 20 tons are available; hull and engine repairs can be made.

Wharves.—Depths of 4 to 16 feet are reported alongside the small commercial wharves and piers at the head of the harbor. A depth of about 32 feet is alongside the oil pier on the west side of the harbor about 400 yards from the head. The power-plant pier about 150 yards to the northwestward has a depth of 29 feet alongside.

Communications.—Port Jefferson is served by railroad and bus. A ferry operates to Bridgeport, Conn., during the summer.

Conscience Bay is entered through a long, narrow channel at the northwest end of Port Jefferson Harbor. The bay and entrance have depths of 1 to 2 feet. Strangers should not attempt to enter as there are many rocks at the entrance.

Setauket Harbor, on the western side of Port Jefferson Harbor, has a narrow crooked channel. In 1971, shoaling was reported in the channel. With local knowledge, a depth of about 4 feet can be

carried in the channel. The entrance from Port Jefferson is marked by buoys.

Setauket is a village on the south shore of Setauket Harbor about 1 mile above the entrance.

9. WESTERN LONG ISLAND SOUND

This chapter describes the western part of Long Island Sound along the north shore from Bridgeport to Throgs Neck, the south shore from Old Field Point to Willets Point, and the East and Harlem Rivers. Also described are the many bays and their tributaries that make into this part of the sound including Bridgeport Harbor, Stamford Harbor, Captain Harbor, Mamaroneck Harbor, Norwalk Harbor, Eastchester Bay, Huntington Bay, Oyster Bay, Hempstead Harbor, Manhasset Bay, Flushing Bay, and New Rochelle Harbor, and the commercial and small-craft facilities found in these waters.

Chart 1213,—Western Long Island Sound is that portion of the deep navigable waterway between the shores of Connecticut and New York and the northern coast of Long Island westward of the line between Bridgeport and Old Field Point.

This region has boulders and broken ground, with little or no natural change in the shoals. The waters are well marked by navigational aids so that strangers should experience no difficulty in navigating them. As all broken ground is liable to be strewn with boulders, vessels should proceed with caution when in the vicinity of broken areas where the charted depths are less than 6 to 8 feet greater than the draft. All of the more important places are entered through dredged channels. During fog, vessels are advised to anchor until the weather clears before attempting to enter. The numerous oyster grounds in this region are usually marked by stakes and flags. These stakes may become broken off and form obstructions dangerous to small craft which, especially at night, should proceed with caution when crossing oyster areas.

Anchorages.—There is anchorage for large vessels in the bight outside of Bridgeport Harbor Light. Cockenoe Harbor is sometimes used by small vessels, but Sheffield Island Harbor is preferred and is sometimes used by tows. Westward of Norwalk Islands, seagoing vessels can anchor toward the north shore and, with good ground tackle, hold on in northerly winds. Captain Harbor affords good shelter, but is rarely used except by local vessels. On the south shore, Huntington Bay and Hempstead Harbor are available for large vessels; Oyster Bay is also used, and Manhasset Bay is available for light-draft vessels. City Island Harbor is a fine resort for coasters.

Tides.—The time of tide is nearly simultaneous throughout Long Island Sound, but the range of tide increases from about 2.5 feet at the east end to about 7.3 feet at the west end. Daily predictions of the times and heights of high and low waters for New London, Bridgeport, and Willets Point are given in the Tide Tables.

The effect of strong winds, in combination with the regular tidal action, may at times cause the water to fall several feet below the plane of reference of the charts.

Currents.—About 0.5 mile northward of Eatons Neck Light the ebb runs about 5 hours longer than the flood. Flood has a velocity of 0.6 knot, and sets 310°. Ebb has a velocity of 1.4 knots, and sets 070°.

The direction and velocity of the currents are affected by strong winds which may increase or diminish the periods of flood or ebb. Directions and velocities from Point Judith to Throgs Neck for each hour of the tidal cycle will be found in Tidal Current Charts, Long Island Sound and Block Island Sound. Currents in East River are described in the latter part of this chapter.

Fog.—In Long Island Sound the north and south shores are equally subject to fog, except that on spring and summer mornings, when there is little or no wind, fog will often hang along the Connecticut shore while it is clear offshore and southward.

In the western end of Long Island Sound, although fogs are liable to occur at any time, they are not encountered so often nor do they generally last so long as farther eastward.

Ice.—In ordinary winters the floating and pack ice in Long Island Sound, while impeding navigation, does not render it absolutely unsafe, but in exceptionally severe winters the reverse is true; then only the powerful steamers can make their way.

Drift ice, which is formed principally along the northern shore of the sound under the influence of the prevailing northerly winds, drifts across to the southern side and accumulates there, massing into large fields, and remains until removed by southerly winds which drive it back to the northerly shore.

In ordinary winters ice generally forms in the western end of the sound as far as Eatons Neck; in exceptionally severe winters ice may extend to Falkner Island and farther eastward.

Effects of winds on ice.—In Long Island Sound northerly winds drive the ice to the southern shore of the sound and southerly winds carry it back to the northern shore. Northeasterly winds force the ice westward and cause formations heavy enough to prevent the passage of vessels of every description until the ice is removed by westerly winds. These winds carry the ice eastward and if of long enough duration, drive it through The Race into Block Island Sound, from where it goes to sea and disappears.

In Bridgeport Harbor winds from north to

northwest clear the harbor of drift ice, and those from southeast through south to southwest force the ice into the harbor from the sound. The outer buoys may be carried out of position by heavy ice during severe winters.

Additional information concerning ice conditions in the waters adjoining Long Island Sound is given under the local descriptions.

Pilotage is compulsory in Long Island Sound for foreign vessels and U.S. vessels under register. Pilots board vessels bound for Long Island Sound ports in the vicinity of Brenton Reef Light (41°25.6′ N., 71°23.4′ W.), Block Island Southeast Lighted Whistle Buoy (41°05.8′ N., 71°30.0′ W.), Block Island North Reef Lighted Bell Buoy 1B1 (41°15.5′ N., 71°34.6′ W.), and about 2 miles south of Point Judith Lighted Whistle Buoy (41°20.0′ N., 71°28.5′ W.). Pilot services are generally arranged for at least 24 hours in advance through ships' agents or directly by shipping companies. Pilots board from launches; 24-hour service is available. In emergencies pilots can be arranged for on 2738 kHz or on 2182 kHz. Pilotage, where required, for the major ports on Long Island Sound is discussed under the name of the port.

Charts 220, 117-SC.—Bridgeport Harbor, on the north side of Long Island Sound north-northwestward of Stratford Shoal Light and about 52 miles from New York, consists of two widely separated units. The main harbor and its branches serve the east and central portions of the city of **Bridgeport**, and Black Rock Harbor and its tributaries serve the western part. Black Rock Harbor and Cedar Creek are described under separate headings. Waterborne commerce at Bridgeport consists mostly of petroleum products, lumber, sand and gravel, building materials, and scrap iron.

Dumping grounds.—Dumping grounds are located in the western portion of Long Island Sound. (See **205.10 (a) and (c) (1) through (6)**, chapter 2, for limits and regulations.)

Prominent features.—The large red and white horizontally banded stack of a powerplant on Tongue Point is the most prominent landmark in this area. Other prominent landmarks include a group of seven stacks on Steel Point; the towers of a high-voltage line; several church spires; a gas tank with checkered band at the top, on the west side of Pequonnock River; the radio towers at Pleasure Beach; and Bridgeport Harbor Light. The rays of an aerolight about 1.3 miles northwestward of Stratford Point can be seen from offshore.

Bridgeport Harbor Light (41°09.4′ N., 73°10.8′ W.), 50 feet above the water, is shown from a black skeleton tower with small white house, on a black base, on the west side of the entrance channel near the end of the west breakwater; a fog signal is sounded at the light.

Channels.—From deep water in Long Island Sound the dredged channel extends north-northeastward between two converging breakwaters into the main harbor, and thence into the three tributaries, Johnsons Creek, Yellow Mill Channel, and Pequonnock River. Federal project depth is 35 feet in the main channel to Steel Point, thence 25 feet to the vicinity of the second bridge on Pequonnock River. (See Notice to Mariners and latest edition of the chart for controlling depths.)

A powerplant is at **Tongue Point**. A privately dredged channel leads from the main channel to the powerplant's offshore oil wharf on the south side of the point. In 1968, depths of 35 feet were reported in channel and alongside the wharf. Another privately dredged channel, used by barges, leads from the main channel to the powerplant's facilities on the east side of the point. In 1969, the controlling depth in the channel was 14 feet.

Johnsons Creek, northward of Pleasure Beach, is entered eastward of Tongue Point through a marked dredged channel leading to an anchorage basin at the head of the creek. In 1966, the controlling depths were 11 feet in the entrance channel to two anchorages (lower 9 feet and upper 6 feet) on the west side of the creek, thence 9 feet to a 6-foot anchorage basin at the head of the creek. The highway bridge, 0.2 mile above the entrance has a swing span with a clearance of 7 feet. (See **117.130**, chapter 2, for drawbridge regulations and opening signals.) Private yacht clubs and two oil-receiving piers are on the creek.

Yellow Mill Channel is entered through a dredged channel that leads for about 0.8 mile north-northeastward from just above the first bend in the main channel to the head of the creek. Flats, largely bare at low water, are on both sides of the channel. In 1965, the controlling midchannel depth was 16 feet through the turnpike bridge, thence 13 feet to the head. A highway bridge about 0.3 mile above the entrance has a bascule span with a clearance of 11 feet. (See **117.131**, chapter 2, for drawbridge regulations.) About 0.1 mile above the bascule bridge is a fixed turnpike bridge with a clearance of 40 feet. Depths at the wharves are 8 to 15 feet.

Pequonnock River,] the most westerly of the tributaries, is easily followed by small craft, but larger vessels may need the assistance of a tug to get around the sharp bends. The river is entered through a dredged channel that leads northward from the main channel at Steel Point to the head of navigation just below the Berkshire Avenue Dam, about 1.1 miles above the entrance. In 1965, the channel had a controlling depth of 9½ feet. Depths at some of the wharves are 10 to 15 feet, but there is little depth at the others.

Bridges.—Type, distance above Steel Point, and clearance of the bridges over Pequonnock River follow: Connecticut Turnpike, fixed, 300 yards, 65 feet; Stratford Avenue, bascule, 500 yards, 7 feet; railroad, bascule, 0.5 mile, 18 feet; Congress Street, bascule, 0.6 mile, 8 feet; highway, bascule 0.7 mile, 4 feet; highway, bascule, 0.9 mile, 13 feet. (See **117.130 and 117.131**, chapter 2, for drawbridge regulations and opening signals.)

Anchorages.—Bridgeport Harbor has two anchorage areas inside the breakwaters. One with depths of 23 to 40 feet is on the east side of the main channel northwestward of Pleasure Beach, and the other with depths of 15 to 25 feet is on the west side of the main channel just northeastward of Tongue Point. The rest of the harbor area consists of broad and shallow sand flats. Vessels seeking shelter from strong northerly winds sometimes anchor off the entrance; the holding ground is good.

An anchorage area is in Johnsons Creek. (See **110.148**, chapter 2, for limits and regulations.)

Dangers.—The entrance is clear, and the only dangers are the previously discussed shoals on the east, south of Stratford Point, and on the west, the Penfield Reef shoals.

Tides.—The mean range of tide is 6.7 feet. (See the Tide Tables for daily predictions of the times and heights of high and low waters.)

Currents.—The velocity of flood or ebb is about 0.7 knot in the entrance between the breakwaters. (See the Tidal Current Tables for predictions.) Inside the harbor the currents are generally weak.

Ice does not interfere seriously with navigation in Bridgeport Harbor, although its tributaries are closed at times. The winds from the north and northwest clear the harbor of drift ice, and those from the southeast through the southwest force the ice into the harbor from the sound. The outer buoys may be carried out of position by heavy ice during severe winters.

Weather.—The terrain of the mainland is of glacial origin and rises in a rolling, mostly wooded, manner to the foothills of the Berkshires, 30 miles to the north, and the Catskills, about 60 to 70 miles to the northwest. There is some foehn effect with north and northwest winds, and the upslope effect with the approach of a coastal low is quite pronounced. The most pronounced topographical effect, however, is that of the land-sea breeze which is most pronounced in the spring, summer, and early autumn. The land-sea breeze effect during this period will inevitably cause a shift in the wind direction, even with a moderately strong isobaric flow.

As a result of the sea breeze, mean monthly temperatures during the summer average 3 to 5 degrees lower than nearby inland stations. Likewise, temperatures during the fall and winter are moderated several degrees owing to the proximity of Long Island Sound.

Precipitation is slightly heavier than nearby inland stations the year around since coastal low pressure systems move quite consistently on a track to the south of Bridgeport. One of the greater hazards along the coastal areas in the vicinity of Bridgeport is the accumulation of water (especially during periods of high tide) with the approach of a slowly moving, deepening, low pressure system from the south. Severe storms occasionally cause inundation of 4 to 5 feet on the airport.

The National Weather Service maintains an office at the Bridgeport Municipal Airport; **barometers** may be compared here. (See appendix for address.) **Storm warning display** locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service. (See appendix for the Bridgeport **climatological table.**)

Pilotage is compulsory for foreign and U.S. vessels under register. Pilots usually board vessels from a small private craft, not radio-equipped, about 2 miles southeast of Bridgeport Harbor Entrance Channel Lighted Gong Buoy 2 (41°07.3′ N., 73°11.3′ W.); 24-hour service is available. The New Haven Pilots Association provides the pilots for Bridgeport Harbor; arrangements for services should be made in advance by ships' agents or directly by shipping companies.

Towage.—Tugs may be obtained from New Haven or New York on advance notice. Deep-draft vessels usually require tugs for mooring in Bridgeport Harbor.

Bridgeport is a **customs port of entry. Immigration** officials are stationed in Hartford, Conn., and **agricultural officials** in Milford, Conn. (See appendix for addresses.) Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with the regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The nearest U.S. Public Health Service **contract physician's office** is in New Haven, Conn. This office also handles vessel quarantine matters for Bridgeport. (See appendix for address.) Bridgeport has several hospitals.

The Coast Guard maintains a **vessel documentation office** in Bridgeport. (See appendix for address.)

Harbormaster.—The control of the port is vested in the harbormaster, who maintains an office at the Bridgeport City Hall and can also be contacted through the Bridgeport Police Department. The Bridgeport police maintain a boat patrol of the harbor during the summer. When underway, the patrol boat handles radio traffic on 2182 kHz and on VHF-FM channel 13 (156.65 MHz).

Wharves.—Bridgeport has three principal privately owned and operated deep-draft facilities; one is on the south side of Tongue Point and the other two are on the east side of the harbor opposite Tongue Point. Facilities for smaller vessels and barges are along the sides of the harbor, and on Johnsons Creek, Yellow Mill Channel, and Pequonnock River. Most of the facilities at Bridgeport are of the marginal-type wharf, particularly those in the constricted tributaries. Only the deep-draft facilities are described. (See the Port Series, a Corps of Engineers publication, for a complete description of the port facilities at Bridgeport.) The alongside depths for the facilities described are reported; for information on the

latest depths contact the private operators. All of these facilities have highway connections, and most have fresh-water connections.

Cargo in the port is usually handled by ship's tackle; special handling equipment, if available, is mentioned in the description of the particular facility.

United Illuminating Co. Wharf; on the south side of Tongue Point; an offshore wharf with 250-foot breasting face; 35 feet alongside; deck height, 20 feet; receipt and shipment of petroleum products; owned and operated by United Illuminating Co.

Buckley Brothers Pier 1: on the east side of the harbor opposite Tongue Point; 270-foot face; 35 to 44 feet alongside; deck height, 13 feet; vessels usually moor portside—to; receipt and shipment of petroleum products; bunkering vessels; owned and operated by Buckley Brothers, Inc., a subsidary of Shell Oil Co.

Cilco Terminal Wharf: 0.3 mile northwestward of Buckley Brothers Pier: 895-foot face; 32 feet alongside; deck height, 13 feet; 7½ acres of open storage; receipt of lumber, steel products, marble slabs and chips, and shipment of scrap metal; owned and operated by Cilco Terminal Co.

The city-owned recreational pier, seldom used for mooring vessels, is on the northwest end of Pleasure Beach; the end of the pier has depths of about 20 feet.

The municipal dock, a marginal-type wharf, is on the west side of Pequonnock River, just below the Connecticut Turnpike Bridge.

Supplies.—Diesel oil, diesel fuel, gasoline, bunker fuel No. 6, lubricants, water, provisions, and marine supplies can be obtained at Bridgeport. Oceangoing vessels and tugs, by special arrangements, can receive bunker fuel No. 6 and diesel oil at the fuel terminal on the east side of the harbor opposite Tongue Point, and also by tank truck at some of the wharves.

Repairs.—Bridgeport has no facilities for making major repairs or for drydocking deep-draft vessels; the nearest facilities are at the ports of Boston, Mass., and New York, N.Y. Bridgeport, however, does have facilities for making above and below the waterline repairs to fishing boats, tugs, and recreational craft, and excellent hull and engine repair facilities for small craft. The largest marine railway in the area can handle vessels up to 150 feet and 400 tons. Oil pollution control equipment is also available.

Communications.—Bridgeport is served by air, rail, and bus. Ferry service to Port Jefferson is available through the summer.

Black Rock Harbor, part of Bridgeport Harbor, although not connected with it other than by Long Island Sound, is entered through a dredged channel about 2 miles westward of the main harbor entrance to Bridgeport. The channel leads northward through Black Rock Harbor, and thence to the head of **Cedar Creek** where it divides into an east and west branch. Black Rock Harbor and Cedar Creek comprise the approach by water to the large factories of the western part of the city of Bridgeport.

In 1968, the controlling depths were 12 feet (15 feet at midchannel) from the entrance to the junction of east and west branches, thence 12 feet in west branch, and 13 feet in east branch except for shoaling to 10 feet at the northeast end of the channel. The channel is marked by buoys and lights for about 1.7 miles above the entrance.

Anchorage in depths of 18 to 22 feet and exposed to southeasterly and northeasterly winds can be found off the entrance, northeast of the bar that makes out from Shoal Point to Black Rock. Small craft drawing less than 6 feet can select anchorage on either side of the dredged channel as far as the yacht club on the east side of Grover Hill.

Depths of 10 to 15 feet are reported alongside some of the wharves in Black Rock Harbor.

To avoid a shoal off the point separating the two branches at the head of Cedar Creek, enter the east branch, pass about 100 feet off the wharf on the southeast side below the entrance, and head up the middle. To enter the west branch, pass 100 feet off the wharves on the southeast side of the branch.

Fayerweather Island, on the eastern side of the entrance of Black Rock Harbor, is marked at its south end by the white tower of an abandoned lighthouse. A breakwater and a seawall connect its northern part with the shore eastward.

Burr Creek, northward of the town of Black Rock, on the west side of the channel, is the site of the Bridgeport Municipal Marina. Depths of about 6 feet are reported at the face of the dock and alongside the boat slips. Gasoline is available at the dock, and water can be had at the slips.

Gasoline, lubricants, water, ice, marine supplies, and complete engine and hull repairs can be obtained in the harbor. The largest marine railway can handle craft up to 45 feet in length.

Penfield Reef, on which there are rocks bare at low water, is about 1.4 miles south of Black Rock Harbor and 1.3 miles eastward of **Shoal Point**, to which it is joined by a bar that bares at low water. **Black Rock**, marked by a daybeacon, is the outermost danger of this reef. A dangerous sunken rock, reported covered 1 foot, is about 40 yards southward of the daybeacon. **The Little Cows**, about 0.2 mile northward of Black Rock, consists of rocks awash.

Penfield Reef Light (41°07.0′ N., 73°13.3′ W.), 51 feet above the water, is shown from a white tower on a granite dwelling on a pier, on the south side of the reef, south of the entrance to Black Rock Harbor. A fog signal is sounded at the light.

A reef, partly bare at low water and with little depth over any part of it, extends over 0.5 mile southward from **Pine Creek Point**, 1.1 miles southwest of Shoal Point. A lighted bell buoy is off the south end of the shoal.

Southport Harbor, about 1 mile westward of Pine Creek Point, comprises the lower portion of

Mill River, and is used primarily for recreational boating. A breakwater, marked at its end by a light, is off the east side of the entrance to the harbor. The harbor is entered through a dredged channel that leads from Long Island Sound to a harbor basin and anchorage, about 1.1 miles above the channel entrance. In 1969, the controlling depth was 8 feet at midchannel to the harbor basin, thence 8 feet in the basin except for shoaling to 5 feet in the southwest corner, and thence 5½ feet in the anchorage just northward of the basin. The channel is marked on its west side by a light, and by buoys up to the breakwater. Caution is advised to avoid oyster stakes in the area southeastward of the harbor entrance. The mean range of **tide** is about 7 feet.

Southport is a village on the west side of the harbor. A yacht club landing and the town dock are on the west side of the harbor; depths of about 6 feet are alongside the town dock, and about 8 feet alongside the yacht club landing. Gasoline, diesel fuel, ice, and some marine supplies can be obtained. A 35-foot marine railway at the town dock can haul out craft for engine and hull repairs. The **harbormaster** can usually be found at the town dock.

Frost Point, 1 mile westward of Southport entrance, is marked by many residences and private piers on its southeast side. A reef partly bare at low water extends about 0.4 mile southward from the point.

Sherwood Point, a mile westward of Frost Point, is marked by a bare boulder on the reef which extends about 250 yards off the point. A rocky patch, on which the least depth found is 11 feet, is about 0.8 mile southward of the point.

Charts 221, 117-SC.—Saugatuck River, 6 miles westward of Penfield Reef Light and northward of Cockenoe Island, has its entrance between **Cedar Point** on the east and **Bluff Point** on the west. The river is shallow, full of ledges and boulders, and is used chiefly for receipt of petroleum products, sand and gravel, and for recreational boating. The mean range of **tide** is 7 feet. Freshets do not appreciably affect the height of the water in the navigable part of the river. During the winter, ice usually covers the entire river to its mouth.

Anchorage exposed to southeasterly winds can be had in the entrance to Saugatuck River in 12 to 22 feet, about 0.4 mile southward of **Cedar Point**.

The channel in Saugatuck River is narrow and crooked; vessels should proceed with caution, preferably on a rising tide. In 1971, it was reported that a depth of about 6 feet except for a 3-foot shoal, about 0.1 mile below the entrance to Duck Creek, could be carried in the river to the end of the buoyed section at **Stony Point** just below Saugatuck; above this point, depths are less than 3 feet to Westport.

Compo Yacht Basin, also known as **Cedar Beach Yacht Basin**, is in the bight about 0.3 mile northwestward of Cedar Point. The privately dredged channel that leads to the basin had a centerline controlling depth of 10 feet in 1969. The channel is marked by a private unlighted entrance range. A yacht club with landing and mooring facilities is in the basin. Gasoline and water are available at the landing. **Storm warning signals are displayed.** (See chart.)

Longshore Town Marina, a private bulkheaded basin, is on the north side of Saugatuck River, about 0.7 mile northwestward of Cedar Point. A private channel, southeastward of **Kitts Island**, leads northward to the basin. The channel is marked on its westerly side by private buoys. In 1971, a reported midchannel depth of about 5 feet was available to the basin. A prominent concrete tower is on the west side of the basin. Gasoline, water, and a launching ramp are available in the basin. **Storm warning signals are displayed.** (See chart.)

A privately dredged basin is on the south side of the river just inside of Bluff Point. In 1965, depths of 16 feet were reported in the basin. Gasoline is available in the basin.

Duck Creek, on the west side of the river about 0.6 mile above Bluff Point, is the site of a private yacht club. The controlling depth in the creek was 4 feet in 1967. The entrance and basin are privately marked. Gasoline, diesel fuel, water, and ice are available.

Bermuda Lagoon, southward of Duck Creek, is a large privately owned and maintained basin for the use of the residents in the immediate area.

Saugatuck, a village in the town of Westport, is 2.5 miles above the entrance. Commercial traffic consists mostly of barges that call at a sand and gravel company at Saugatuck; depths at the wharf are about 5 feet.

At Saugatuck the river is crossed by a railroad bridge having a bascule span with a clearance of 13 feet. Overhead power cables at the bridge have a clearance of 192 feet. The Connecticut Turnpike Bridge, 0.1 mile above, has a fixed span with a clearance of 60 feet. About 0.1 mile farther up is a highway swing bridge with a clearance of 6 feet. (See **117.135**, chapter 2, for drawbridge regulations and opening signals.)

Westport is a town at the head of navigation on the Saugatuck River, about 1.4 miles above Saugatuck.

There are several small-craft facilities on the river in the vicinity of the bridges. Gasoline, water, ice, marine supplies, storage, and a 15-ton lift are available; hull and engine repairs can be made.

Norwalk Islands, privately owned with the exception of Ram and Grassy Islands, which are owned by the city of Norwalk, are 1 to nearly 2 miles off the north shore of Long Island Sound, and extend from Georges Rock to Greens Ledge Light, a distance of 6 miles. **Cockenoe Harbor** and **Sheffield Island Harbor**, the two approaches to Norwalk River, are good anchorages for drafts of 9 to 12 feet, and are easily made. The bottom is very irregular around the islands and rocks in the

group; vessels should proceed with caution when crossing shoal areas and avoid all broken ground. In the vicinity are some oyster stakes and spars, which occasionally are towed under or broken off; caution is recommended, especially at night, for small craft.

Cockenoe Island, at the eastern end of Norwalk Islands, is marked on its south side by two knolls, the remainder of the island being low and level. A bar, dry in places at low water but with general depths of 1 to 2 feet, connects the island with the mainland at **Seymour Point**.

Cockenoe Shoal, is an extensive and dangerous area which extends 1.3 miles eastward and east-southeastward from Cockenoe Island. The entire area is exceedingly broken and should be avoided by strangers, even in small craft. **Cockenoe Reef** extends about 0.5 mile eastward from the northern end of Cockenoe Island; rocks which uncover about 3 feet are near the outer end of the reef. **Georges Rock**, awash at lowest tides, is at the eastern end of the shoal; a buoy is off the northeast side of the rock. A lighted bell buoy marks the southeast end of the shoal.

Channel Rock, covered 1½ feet, is about 0.2 mile southwestward of Cockenoe Island and is marked by a buoy to the southward. **Peck Ledge**, on the western side of Cockenoe Harbor entrance, is marked by Peck Ledge Light 3 and by Peck Ledge Bell Buoy 1.

Cockenoe Harbor, westward of Cockenoe Island, is marked by Peck Ledge Light 3. The best anchorage is in depths of 12 to 25 feet, northward and northwestward of the light.

Routes.—To enter Cockenoe Harbor from the eastward, pass southward of Cockenoe Island Shoal Lighted Bell Buoy 24, steer **254°** until Peck Ledge Light 3 bears northward of **285°**, then steer for the light until up with Buoy 4 that marks Channel Rock, and then pass eastward and northward of the light at a distance of 200 to 300 yards. This course passes close southward of an unmarked sunken wreck with a depth of 17 feet over it in 41°04′21″ N., 73°20′33″ W., mariners are advised to exercise caution.

To enter Cockenoe Harbor from the westward, give the edge of the shoals southward of the Norwalk Islands a good berth until Peck Ledge Light 3 bears westward of **348°**, and then steer **north** and pass 400 yards eastward of the light and midway between Buoy 4 that marks Channel Rock and Peck Ledge Bell Buoy 1.

The islands and rocks on the northwest side of Cockenoe Island include **Calf Pasture Island**, with several houses and a few trees; **Sheep Rocks**, which uncover 2 feet; **East White Rock**, high and white; and **Grassy Hammocks Rocks**, which uncover and are marked by a light.

The larger islands southwestward are in general hilly and partly settled. **Chimon Island** is marked by several houses; **Copps Island** by a conspicuous survey signal; and **Sheffield Island**, the westernmost of the group, by an abandoned lighthouse granite tower. A boat landing is on the north side of Sheffield Island.

Rocks which uncover extend nearly 0.3 mile southwestward of Sheffield Island.

Greens Ledge is a rock and sand ridge that extends 1.1 miles southwestward from Sheffield Island. Depths of 10 to 15 feet extend about 400 yards westward and southwestward from Green Ledge Light. A rocky ledge, on which the least found depth is 21 feet, extends 0.8 mile west-southwestward from the light. Another rocky ledge, with a least depth of 20 feet, is about 0.4 mile south-southeastward from the light.

Greens Ledge Light (41°02.5′ N., 73°26.6′ W.), 62 feet above the water, is shown from a conical tower, the upper half white and lower half brown, on a black cylindrical pier on the north side of the west end of the ledge. A fog signal is sounded at the light.

Cable and Anchor Reef covers an area about 0.4 mile in diameter about 2 miles southeastward of Greens Ledge Light. The least found depth is 22 feet. A lighted gong buoy marks the southern side.

Sheffield Island Harbor, entered between Greens Ledge and the mainland, is the main approach to Norwalk Harbor and Norwalk River. Anchorage in depths of 12 to 20 feet can be found northwestward of Sheffield Island. The shoal flats on the north side of the harbor have rocks and boulders in places.

Norwalk River empties through **Norwalk Harbor** into the north side of Long Island Sound, northward of the Norwalk Islands and about 30 miles east of New York.

Channels.—Norwalk Harbor and River are entered through a dredged channel that extends 3 miles northeasterly from Sheffield Island Harbor between **Manresa Island** on the west and **White Rock** and numerous islet and foul ground on the east, to the first highway bridge at South Norwalk, and thence northerly for another 1.3 miles to the basin at the head of navigation at Norwalk. The tall stack on Manresa Island, marked on top by red lights, is very prominent and can be seen for many miles from sea.

The controlling depths in the dredged channel from Sheffield Island Harbor to the head of navigation at Norwalk were: 12 feet to the first bridge except for shoaling to 10 feet near the channel edge in the vicinity of Buoy 7 in 1966-69; thence, because of shoaling in the west half of the channel at Oyster Shell Point, 10 feet with local knowledge to Ferry Point in March-May 1971; above this point, depths decrease approaching the basin at Norwalk, with 1 foot in the east half and bare spots in the west half of the basin within 30 yards of the head of navigation. South Anchorage Basin, on the east side of the main channel about 2 miles above the entrance, had depths of 8 to 9 feet in 1967-69. The channel is marked by buoys and lights to the South Anchorage Basin.

Bridges.—Three bridges cross Norwalk River between South Norwalk and Norwalk. The first, a

highway bascule bridge, at South Norwalk, has a clearance of 8 feet. The second, a railroad swing bridge just above the highway bridge, has a clearance of 16 feet; an overhead power cable with a clearance of 203 feet crosses the river near the railroad bridge. The third, a turnpike highway fixed bridge, about 0.6 mile above the railroad bridge, has a clearance of 60 feet. (See **117.145**, chapter 2, for drawbridge regulations and opening signals.) In 1971, a vertical lift bridge with a design clearance of 60 feet up and 10 feet down, was under construction just southward of the first bridge.

Tavern Island, with several houses and foul ground on all sides, is just northwestward of the dredged channel entrance to Norwalk Harbor.

Gregory Point, marked by a clubhouse and wharf, is on the east side of Norwalk Harbor 1.9 miles above the channel entrance. The boat basin immediately eastward of Gregory Point, locally known as **Norwalk Cove**, is entered through a privately maintained channel. In 1971, depths of 6 feet were reported in the channel, and 5 to 6 feet in the eastern part of the basin. A 220-yard-long detached timber breakwater is on the north side of channel entrance.

East Norwalk Harbor, at the town of **East Norwalk**, is on the east side of the river about 2 miles above the main channel entrance. The harbor is entered through a dredged channel that leads westward of **Fitch Point** to the head and to North Anchorage Basin on the westerly side of the harbor. In 1966, the channel to the head had a midchannel controlling depth of 5 feet, with depths of 5 feet in the basin except for shoaling along the westerly side and at the northern end of the basin. The channel is marked to near the southern end of the basin.

South Norwalk is an important commercial and manufacturing city on the west side of Norwalk River, about 3 miles above the channel entrance. The depths at the wharves below the bridges range from 5 to 10 feet. Commercial traffic is mainly in building materials, petroleum products, and shell fishing.

Norwalk, 1.3 miles above South Norwalk, is a city on both sides of the river at the head of navigation. The wharves have depths of about 7 feet alongside. The channel from South Norwalk to Norwalk is winding, with extensive flats on both sides, and requires local knowledge to follow it even at high water.

Local regulations provide penalties for exceeding a moderate speed or for dumping refuse in the harbor. These regulations are enforced by the Marine Division of the Norwalk Police Department. Police patrol boats operate the year-round and are equipped to handle radio traffic on 2182 kHz and VHF-FM channel 16 (156.80 MHz). The **harbormaster** at Norwalk can be reached through the police department.

Tides.—The mean range of **tide** is about 7 feet.

Currents.—The tidal currents in Long Island Sound off Norwalk have a velocity of about 1 knot. In Norwalk River, off Gregory Point, the velocity of current is about 0.7 knot. The currents in the harbor follow the direction of the channel, the ebb current being somewhat stronger than the flood. (See the Tidal Current Tables for predictions.)

Ice.—The channel up to South Norwalk is navigable throughout the year. The harbor and river above South Norwalk are covered with ice during a part of the winter. A channel is ordinarily kept open to the highway bridge, but the East Norwalk Channel and the channel in the river are usually closed for about 6 weeks each winter.

Pilotage.—Pilots are not available at Norwalk, but can be obtained from New London or New Haven.

Small-Craft Facilities.—There are excellent small-craft facilities at South Norwalk, East Norwalk, and in Norwalk Cove. The largest marine railway in the area can handle craft up to 65 feet in length. Mobile hoists, gasoline, diesel fuel, water, ice, wet and dry storage, marine supplies, and complete engine and hull repairs are available.

Communications.—Rail and bus lines serve the city and area.

Wilson Cove, on the north side of Sheffield Island Harbor, is entered about 0.6 mile northwestward of the dredged channel entrance to Norwalk Harbor between **Wilson Point** on the north and Bell Island on the southwest. The ruins of a former oil-receiving pier are on the southwestern extremity of Wilson Point. A yacht club is on the east side of the cove, about 150 yards northward of the wharf ruins, and a marina is at the head of the cove. Gasoline, a 20-ton mobile hoist, and engine and hull repair facilities are available at the marina. Good anchorage for small craft in 3 to 6 feet can be had in the cove between Wilson Point and the northern part of Bell Island.

Noroton Point, at the southern end of **Bell Island**, is marked by a flagpole and a prominent house with a cupola. Rocks, bare at low water, are about 300 yards northward of the point. **Pine Point**, just westward of Noroton Point, has a wharf in ruins at its southern end. A shoal with depths of 8 to 12 feet extends about 0.3 mile from the shore westward of Noroton Point. The bottom is broken with boulders in places, and small vessels crossing the shoal should proceed with caution. **Ballast Reef**, about 0.1 mile westward of Pine Point and off the southeast side of the entrance to Fivemile River, is almost bare at low water, and extends 300 yards off **Roton Point**, a buoy marks the outer end of the reef.

Fivemile River, a narrow inlet about 0.6 mile westward of Noroton Point and about 0.9 mile northward of Greens Ledge Light, is entered through a dredged channel that leads northward into the river for about 0.9 mile. The river is shallow except in the dredged channel. In 1968, the midchannel controlling depth was 7 feet to a point about 0.8 mile above the channel entrance, thence

½ foot for another 150 yards to the end of the dredged channel. The channel is marked by buoys at the entrance, and by a buoy on the east side about 0.3 mile above the entrance.

The depths decrease from 6 to 3 feet alongside the small-craft facility wharves on the east side of the river. The river is used chiefly by fishing and pleasure craft. The mean range of **tide** is about 7 feet.

Rowayton is a village at the head of Fivemile River. Several small-craft facilities on the east side of the river have gasoline, diesel fuel, water, ice, berths, electricity, marine supplies, and lifts up to 20 tons; hull, engine and electronic repairs can be made. The largest marine railway in the area can handle craft up to 60 feet.

Scott Cove, about 0.8 mile westward of Fivemile River and about a mile northwest of Greens Ledge Light, is a rocky shelter with a channel good for about 6 feet to the shallow area northward. There are rocks and broken ground in the entrance. The channel into the cove just west of Scott Cove and south of **Great Island** is good for about 9 feet. A rock, covered 5 feet, is reported to lie almost in midentrance to this cove. Local knowledge is required to navigate both coves.

Long Neck Point, about 2 miles southwestward of Fivemile River, has many summer residences and boat landings on both of its sides. Shoals extend about 0.3 mile off the point. An unmarked sunken wreck is about 0.5 mile southeastward of Long Neck Point; depth over the wreck is unknown.

From Long Neck Point to Shippan Point, about 2.6 miles to the southwestward, there are many reefs and boulders, and the bottom is very broken, necessitating caution. This area is the approach to several shallow coves, none of which is commercially important.

Darien River is a small and shallow stream on the west side of Long Neck Point. A private seasonal lighted **341°** range and buoys mark the best water to just below **Peartree Point**. Foul ground with rocks bare at low water extends nearly 200 yards off the west side of Long Neck Point, about 0.3 mile above the south end of the point. A reported depth of about 6 feet can be carried through **The Gut** as far as Peartree Point. Above The Gut, the river is practically dry at low water. A yacht club is just westward of the lighted range, and a boat club is above Peartree Point. Darien River and its entrance is a special **anchorage area** for small vessels. (See **110.1** and **110.56**, chapter 2, for limits and regulations.)

Smith Reef, about 0.9 mile southwestward of Long Neck Point, consists of two rocks which uncover 2 feet. The south end of the reef is marked by a lighted buoy. **Bold Rock**, which uncovers 4 feet, is on the east edge of the rocky ridge extending northward from the reef. Many oyster stakes are on the ridge.

Cove Harbor, northward of Smith Reef and about 1 mile westward of Long Neck Point, has depths of about 5 to 10 feet. Local knowledge is necessary to avoid several rocky areas in the approach to the harbor and to the basin at the northwestern end of the harbor at Cove Mills. A depth of about 3 feet can be carried across the bar at the entrance to the basin; a private seasonal speed limit buoy marks the approach. The Stamford Municipal Marina is in the basin.

Westcott Cove, just westward of Cove Harbor, has a marked dredged channel leading along its westerly side to a basin about 0.7 mile above the channel entrance. In March 1971, the channel had a controlling depth of 7½ feet to Buoy 9, thence 6 feet on the centerline to the basin; depths of about 8 feet were available in the basin. A yacht club is in the northwesterly arm of the basin, and a municipal marina is in the southeasterly arm. Berths, electricity, gasoline, diesel fuel, water, ice, a 60-foot marine railway, and marine supplies are available at a boatyard on the west side of the channel just southward of the basin; hull, engine, and electronic repairs can be made.

Stamford Harbor, on the north side of Long Island Sound about 33 miles east of New York, comprises the bay north of a line from Shippan Point on the east through Stamford Light to the west shore north of Greenwich Point. The harbor is shoal, and the approach is obstructed to a large extent by ledges and rocks. **Shippan Point**, the eastern point at the entrance, is surrounded by rocks which show at low water. Barges and small coastal tankers constitute the main waterborne traffic in the harbor. Petroleum products, sand and gravel, and crushed rock are the principal products handled in the harbor.

Stamford is a manufacturing city on the peninsula at the head of the harbor between East Branch and West Branch.

Prominent features.—A radio tower 160 feet high is about 2 miles north of Stamford. The stack of a red brick powerplant and a gas tank on the east side of West Branch are prominent. **Stamford Harbor West Breakwater Light** (41°00.9′ N., 73°32.3′ W.), 47 feet above the water, is shown from a black skeleton tower on a small white house at the east end of the west breakwater. A fog signal is sounded at the light.

Channels.—Stamford Harbor is entered through a dredged entrance channel that leads northward from Long Island Sound between two detached breakwaters to a point about 1 mile above the entrance to a junction with the dredged channels leading into **East Branch** and **West Branch**. In 1967-69, the controlling depths were 12 feet in the entrance channel to the junction with East and West Branches, thence 14 feet in West Branch to the turning basin at the head, and 11 feet in the basin. In July 1969, the controlling depth in East Branch was 8 feet to within about 100 yards of the head, thence shoaling to bare to the head. The 100-foot-wide channel in East Branch is constricted to 90 feet by a hurricane barrier that crosses the channel

about 300 yards northward of **Ware Island**. The 90-foot gated opening in the barrier will be kept in the open position during fair weather, but will be closed on the approach of a hurricane. A light marks the channel end of each breakwater. The channels are well marked by navigational aids, and, in addition, the entrance channel is marked by a 358° lighted range.

Anchorages.—Anchorage areas, with depths of 13 to 17 feet, are north of the breakwaters and just westward of the line of the range lights, about 0.1 mile eastward of **Highwater Rock**. An unmarked wreck covered 7 feet is in the northwestern end of the anchorage in 41°01′14.5″ N., 73°32′20.0″ W. Small craft can anchor off the yacht club and southward or southeastward of **Rhode Island Rocks** in depths of 5 to 7 feet. All anchorages in the outer harbor are exposed to southerly and southwesterly winds.

Dangers.—**The Cows** comprise a cluster of rocks, almost bare at low water, about 0.8 mile south-southeast of Shippan Point. Between them and the point is an area of foul ground and rocks bare and awash that extends 0.4 mile southward of Shippan Point, and marked by a bell buoy. **Harbor Ledge**, about in the middle of the outer part of the harbor, consists of rocks and a ledge marked by a light.

Tides.—The range of **tide** is 7.2 feet.

Currents in the harbor have little velocity and usually set fair with the channel.

Ice.—The channel in West Branch is usually navigable throughout the year, but in East Branch it is closed by ice for several weeks during severe winters. Ice forms in the harbor during most winters and usually extends to a point just northward of the breakwaters. The channels are kept open as far as practicable by passing traffic.

Prevailing winds are from the south and southwest in the summer and from northeast during the winter season.

No particular directions are required. The range favors the west side of the channel and does not show plainly until eastward of Stamford Harbor West Breakwater Light. In East Branch, caution is advised when making the turn abreast Ware Island to avoid a rock nearly awash at high water, eastward of the channel line.

The **harbormaster** at Stamford can be contacted through the Stamford Police Department. A police boat makes routine patrols of the harbor during the boating season.

Wharves.—The commercial wharves along East Branch and West Branch are of the bulkhead and apron type, all are privately owned, and some are open to the public. Spur tracks from the railroad serve the facilities in East Branch.

Supplies.—Water is available at most of the commercial facilities, and several grades of bunker fuel oil and diesel oil can be obtained at a fuel facility on the west side and near the head of West Branch.

Small-craft facilities.—There are excellent facilities for small craft in both East and West Branches. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, launching ramps, lifts up to 50 tons, and marine railways up to 80 feet are available; hull, engine, and electronic repairs can be made.

Charts 222, 117-SC.—**Captain Harbor**, on the north shore of Long Island Sound westward of Greenwich Point and northward of Great and Little Captain Islands, affords shelter from all winds for vessels drawing 12 feet or less. The depths at the anchorage in the deeper part of the harbor, about 0.5 mile northward of Great and Little Captain Islands, are 15 to 30 feet. Vessels of less than 7-foot draft anchor on the flats. The bottom is soft, but the entire harbor and entrances are characterized by boulders. Strangers should proceed with caution, especially on the flats and other shoal areas. The eastern entrance to Captain Harbor, between Flat Neck Point and Little Captain Island, is the clearer and better one for strangers. The western entrance, northwestward of Great Captain Island, is easy of access, but the broken ground here requires caution.

Greenwich Point, 1.7 miles southwestward of Stamford Harbor West Breakwater Light, is characterized by a low grassy hill. Reefs extend 0.3 mile southeastward from Greenwich Point. **Woolsey Rock** near the easterly end of the reefs is bare at low water. A buoy marks these dangers.

Flat Neck Point, the western end of Greenwich Point, is wooded. A reef with bare and submerged rocks extends nearly 0.3 mile southwestward and westward from Flat Neck Point, and is marked by a buoy. About 0.2 mile northwestward of the point, the boiler of a wreck, privately marked by a red spar buoy, shows above high water.

Greenwich Cove opens into Captain Harbor from eastward, north of Flat Neck Point. It is of no commercial importance and is used only by small craft. **Old Greenwich** is on Greenwich Cove.

Cos Cob Harbor, on the northeast side of Captain Harbor, has a dredged channel through it which extends 1.3 miles northward through the Mianus River to the head of navigation at Mianus. In 1962-67, the midchannel controlling depth was 6 feet. The channel is buoyed to the first bridge; above this point the channel may be followed by steering a midchannel course between the marsh banks. A special small vessel **anchorage area** is in Cos Cob Harbor. (See **110.1** and **110.58**, chapter 2, for limits and regulations.)

There are several dangers off the entrance of Cos Cob Harbor that must be avoided; most are buoyed. These include **Newfoundland Reef**, covered 4 feet, a mile northeastward of Little Captain Island; **Red Rock**, which uncovers 7 feet, 0.5 mile west of Newfoundland Reef; **Hitchcock Rock**, awash at low water, 0.3 mile northwestward of Newfoundland Reef; and **Pecks Rock**, bare at low water, 0.2 mile north of Hitchcock Rock.

The Riverside Yacht Club, on the east side of Cos Cob Harbor and about 0.5 mile below the first

bridge, is prominent. Also prominent are the stacks of a large powerplant on the west side of the harbor, just below the first bridge.

Mianus River is crossed by a railroad bascule bridge with a clearance of 20 feet, and by a highway fixed bridge with a clearance of 45 feet, about 0.4 mile to the northward. The overhead power cables near the railroad bridge have a clearance of 45 feet. (See **117.150, chapter 2, for drawbridge regulations and opening signals.**)

Several marinas and boatyards are along the west side of the river from above the railroad bridge to the head of navigation. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, lifts up to 25 tons, and marine railways up to 80 feet are available; hull and engine repairs can be made.

Mianus, at the head of navigation on the river, is the site of an abandoned sand and gravel wharf.

Indian Harbor is a narrow inlet on the north side of Captain Harbor, about a mile west of Cos Cob Harbor. A channel with a depth of about 7 feet passes about 200 feet westward of Tweed Island, and follows the west bank to the bulkhead on the west side of the cove 300 yards above the entrance. Small craft can anchor in the channel just above this point, favoring the bulkhead. A large prominent white residence with red roof and adjacent white clock tower is on the point separating **Smith Cove** and Indian Harbor.

Depths of 6 feet or less extend 250 yards southward from the point separating Smith Cove and Greenwich Harbor. Bare ledges extend 200 feet southward of the point. The yacht club on the point usually maintains lights on a flagstaff during the summer. The depth is about 3 feet at the landing of the Indian Harbor Yacht Club.

Greenwich Harbor, on the north side of Captain Harbor and northeastward of Field Point, is entered through a dredged channel that leads northward 1.2 miles to the head. The channel is buoyed for about 0.8 mile. In 1968, the controlling depth was 12 feet. Two anchorage basins, one at the head and the other just southward, are off the west side of the channel. Depths of about 5 feet were available in the northerly basin, and about 6 feet in the southerly basin in 1966.

Greenwich is a city on the railroad at the head of the harbor. The wharves are along the point on the east side of Greenwich Harbor. The **harbormaster** at Greenwich can be contacted through the Greenwich Police Department. A police boat patrols the harbor during the summer season.

Several private yacht and boat clubs are in Greenwich Harbor. Gasoline and diesel fuel are available at a small-craft facility on the east side of the harbor. During the summer a ferry operates from the town landing at the head of the harbor to Little Captain Island.

Byram Harbor, a bight used by small craft, is at the northwest end of Captain Harbor, just northward of **Calf Islands**. **Wilson Head**, 2 feet high, on a reef which uncovers, is in the middle of the entrance of the bight, and is marked by a buoy off the eastern end. The entrance to Byram Harbor from eastward lies between Otter Rocks and Bowers Island. **Otter Rocks**, which uncover 3 feet, are marked by a lighted buoy about 150 yards to the southward; a sunken rock is close northward of the buoy. **Bowers Island**, just eastward of Calf Islands, is marked by a clump of trees, and surrounded by a drying reef; a buoy marks the north end of the reef. A rocky ledge makes out from the point 300 yards northwestward of Otter Rocks, and is marked by a buoy. Private small-craft facilities are on the west side of the harbor.

The southeastward approach to Byram Harbor is buoyed. A narrow channel also leads to the harbor from southwestward, passing southward of Huckleberry Islands and between the northwest one of the Calf Islands and the two nearest rocks, which are sometimes marked by private daybeacons. The rocks 90 yards off the southwest end of Huckleberry Islands are bare at low water.

Grassy Rocks, 0.3 mile westward of the southerly tip of Calf Islands, uncover 7 feet. The four large ledges northwestward and westward of Grassy Rocks generally show at low water.

Jones Rocks, partly bare at high water, are at the southeast end of the foul ground which extends over 0.2 mile southeastward from the south end of Calf Islands. The rocks are marked by a light.

Cormorant Reef, northward of Great Captain Island, partly bare at high water, has a rock 4 feet high on the eastern end. A buoy is off the southern end of the reef.

Great Captain Island, 2.6 miles southwestward of Greenwich Point, is 0.4 mile long, fringed with reefs, and marked near its southeast end by a light. A town park and landing are on the island. A buoy marks the reef making off 0.3 mile from the southwestern end. The passage between Great and Little Captain Islands is foul and not recommended.

Great Captain Island Light (40°59.0′ N., 73°37.4′ W.), 65 feet above the water, is shown from a skeleton tower with a black and white checkered diamond daymark on the southeast part of the island. A fog signal is sounded at the light.

A **060°-240° measured nautical mile** is close south-southeastward of Great Captain Island and Little Captain Island. Shore ranges on the two islands mark the course.

Little Captain Island, a summer resort about 0.6 mile northeast of Great Captain Island, has a landing. A reef extends about 250 yards northeasterly to **Wee Captain Island**. An area of boulders and broken ground extends 0.4 mile eastward and northeastward from the island, and is marked by a lighted bell buoy. **Hen and Chickens**, a group of rocks and boulders about 0.4 mile northeastward of Little Captain Island, is marked by a buoy on the north side.

Tides.—The mean range of tide is 7.3 feet.

Currents.—The tidal current in the entrance between Little Captain Island and Flat Neck Point

has a velocity of about 0.8 knot. Between Jones Rock and Cormorant Reef the estimated velocity is 1 knot.

Ice forms in the winter in all the coves and over the greater part of Captain Harbor. It sometimes extends out of the line of Little and Great Captain Islands.

Routes.—From eastward, a course of about **298°** midway between the buoys marking the shoals off Flat Neck Point on the east and Wee Captain Island on the west will bring a vessel to a point 0.2 mile north of Hen and Chickens buoy. From here a heading of **250°**, with the southerly tip of Calf Islands ahead, will lead to anchorage off the entrance of Greenwich Harbor.

From westward, a course of **014°** for Jones Rock Light will lead into the Captain Harbor anchorage. Proceed with caution when crossing the broken rocky area on which the least found depth is 12 feet, extending 0.4 mile westward from the western end of Great Captain Island. Pass 100 yards southeastward of Jones Rock Light, and over 100 yards northward of the buoy northwestward of Cormorant Reef, and steer **070°** in the harbor.

Port Chester Harbor, about 1.2 miles westward of Great Captain Island, is the entrance to Byram River which leads to the city of **Port Chester** and the town of **Byram (East Port Chester)**. The harbor entrance is between the breakwater that extends southward from **Byram Point** on the north and **North Manursing Island** on the south; a light is on the outer end of the breakwater. The lower section of the river forms the boundary between New York and Connecticut.

The harbor is entered from Long Island Sound through a dredged channel that leads northward for 1.2 miles to a turning basin in **Byram River**, and thence for another 0.15 mile to just below a fixed bridge, the head of practical navigation on the river. In 1965-66, the controlling depths were 12 feet to Fox Island, 0.6 mile above the entrance, thence 10 feet to and in the turning basin, and thence bare to the bridge. The channel is marked to a point about 0.3 mile above the entrance.

A fixed highway bridge with a clearance of 60 feet crosses the river about 0.8 mile above the channel entrance.

Routes.—The approach to Port Chester is obstructed by rocks but is not difficult with the aid of the chart. From southward it is safer to pass eastward of **Bluefish Shoal**. **Fourfoot Rocks** may be passed on either side, remembering that the buoy is at the south end of the rocks. Entering the harbor, pass westward of Great Captain Rocks, eastward of **Manursing Island Reef**, and 150 feet southward of Port Chester Light on the end of the breakwater. The channel in Byram River is fairly well defined at low water, but requires local knowledge for the best water; strangers should take it on a rising tide and proceed with caution.

The **mean range of tide** is 7.2 feet.

Principal commerce is in building materials, fuel oil, and petroleum products, carried in vessels drawing 5 to 14 feet. Barges drawing 12 feet discharge oil cargoes at a terminal with depths of 14 feet alongside.

Small-Craft Facilities.—There are several small-craft facilities in Port Chester Harbor, and on the Byram River at Port Chester and Byram. The largest marine railway is at the southern end of the harbor; craft up to 55 feet in length can be hauled out for engine and hull repairs. Gasoline, water, ice, storage, marine supplies, and repairs are available in the area.

The area from Great Captain Island southwestward is fringed with rocks, bare and submerged, and foul ground. **Great Captain Rocks**, part of a reef 0.3 mile southeastward of Port Chester Light, uncover 5 to 6 feet; a buoy marks the southern end of the reef. **Transport Rock**, about 0.3 mile south-southwestward of Manursing Island, is part of several ledges generally bare at high water which extend some 0.3 mile offshore. An opening suitable for small craft leads to Rye Beach; it is buoyed.

Playland, a recreational center at **Rye Beach**, about 2.4 miles southwest of Great Captain Island, has two prominent twin towers at the entrance which are conspicuous from a southeasterly direction. Westward and close to the north breakwater is a ferry landing marked by lights. The landing has depths of about 12 feet. A breakwater extends eastward from the south end of Rye Beach. The area between the ferry landing and the south breakwater is reserved for swimming. A ferry operates to and from New York City during the summer.

Forbes Rocks, about 0.4 mile south of the Rye Beach breakwater, are partly bare at low water, on a reef with depths of 4 to 11 feet that extends 250 yards to the southward and eastward. A buoy marks the east end of the reef. A channel good for a depth of 9 feet and marked by buoys leads southward of **Forlies Rocks** to the ruins of a wharf at **Oakland Beach**. Another channel with a least depth of 8 feet leads southward from Oakland Beach to the sound.

Porgy Shoal, about 0.8 mile south of the Rye Beach breakwater, has a least found depth of 5 feet; it is marked by a lighted buoy.

Scotch Caps are three rocky islets 1.4 miles southwestward from Porgy Shoal and on the northwest side of the extensive reefs which make out 0.9 mile southwestward of **Milton Point**. The southerly end of the reefs is marked by a lighted bell buoy about 0.6 mile southward of Scotch Caps. The entire area of the reef northward and northeastward of the lighted buoy is very broken, and should be avoided even by small craft in the absence of local knowledge. An obstruction covered 12 feet is about 300 yards southwestward of the lighted buoy.

West Rock, just south of the south end of Scotch Caps, is unmarked.

Milton Harbor, between **Peningo Neck** and Hen

Island, is used as a summer anchorage by small pleasure craft. It is protected from all but southwesterly winds. The harbor depths decrease from 8 feet between Scotch Caps and the southwest end of Hen Island to 6 feet abreast Milton Point.

Foul ground is on the northwest side near **Hen Island**; otherwise the principal danger in the harbor is a rock bare at low water and marked by a buoy a little northward of midway between Milton Point and the northeast end of Hen Island. The best entrance is between the buoys 0.4 mile southwestward of Scotch Caps.

A yacht club and landing are near the southwest end of Milton Point. Near the clubhouse is a prominent white flagstaff from which lights are exhibited from sunset to sunrise during the summer.

A dredged channel, marked by buoys, leads through the harbor from about 400 yards northward of Milton Point to the city boat basin and marina below **Mill Pond**. In 1967, the controlling depth to and in the boat basin were 6 feet. In 1971, it was reported that the channel had shoaled to 5 feet, and that a sunken log, covered about 2 feet, was in midchannel about 100 yards northward of Buoy 14. Two boatyards are in the harbor. The largest marine railway can handle craft up to 50 feet in length; gasoline, water, ice, marine supplies, and complete engine and hull repairs are available. The city **harbormaster** is at the boat basin.

Mamaroneck Harbor, an open bight between Hen Island and **Delancey Point**, is exposed to southerly winds but affords shelter against northerly weather. Depths in the outer harbor range from 7 to 12 feet. Important dangers are buoyed; these include **Outer Steamboat Rock**, near the dredged channel entrance, and **Ship Rock**, about 0.5 mile southeastward of Outer Steamboat Rock.

About a mile northwest of Outer Steamboat Rock is the incinerator tower, a red brick building with a large glass tower, which is a prominent landmark.

The harbor is entered through a dredged channel that leads about 0.5 mile west-northwestward to the intersection with the dredged channels leading to the head of East Basin and West Basin. The entrance channel and the channel to East Branch are marked by buoys.

In October-December 1969, the midchannel controlling depths in the dredged channels in Mamaroneck Harbor were: 10 feet in the entrance channel to the intersection with the branch channels to East and West Basins; 6½ feet to the head of the channel in East Basin, thence 7½ feet in the branch channel north of the anchorage area in East Basin, thence 8½ feet in the lower and larger anchorage in East Basin, and 6 feet in the upper and smaller anchorage to the northeastward; and thence 6 feet in the channel to and in the anchorage in West Basin. East Basin is usually filled with moorings of local craft. The mean range of **tide** is 7.3 feet.

The **harbormaster** can usually be found at the float landing on the west side of the channel just north of Harbor Island. A **speed limit** of 5 m.p.h. is enforced within the limits of the inner harbor and channels. A city police boat patrols the harbor during the summer season.

Storm warning signals are displayed. (See chart.)

The town of **Mamaroneck** extends from both sides of the harbor. Petroleum products, carried by barges, is the main commerce in the harbor.

Supplies and repairs.—There are several boatyards and marinas in Mamaroneck Harbor. The largest marine railway can handle craft up to 60 feet in length; gasoline, diesel fuel, water, ice, marine supplies, storage, and complete engine and hull repairs are available.

Foul ground extends southwesterly from eastward of Delancey Point to the Larchmont Harbor breakwater off **Edgewater Point**, on the east side of the harbor entrance; a light is on the end of the breakwater. **Hen and Chickens**, a reef bare at low water in places, lies off the harbor entrance; surrounding depths are 8 to 17 feet on the outer parts of the reef. About 0.3 mile westward of the breakwater light is **Dauntless Rock**, covered 8 feet, and surrounded by depths of 14 to 16 feet. These dangers are buoyed.

Larchmont Harbor is between Edgewater Point and **Umbrella Point**, and about 2.5 miles northward of Execution Rocks Light. The harbor is the headquarters of the Larchmont Yacht Club. Anchorage depths range from about 12 feet in the entrance to 5 feet near **Great Knob**, an islet in the north central part of the harbor. In summer the harbor is full of mooring buoys for small yachts. The rocks on the west side are marked, while unmarked shoals extend 200 yards from the eastern shore. The anchorage for larger vessels is westward of the breakwater.

The seasonal private lights in Larchmont Harbor are maintained by the yacht club.

Storm warning signals are displayed. (See chart.)

Umbrella Rock, marked by a private black daybeacon, is 250 yards eastward of Umbrella Point. A few rocks of a breakwater, which was started on Umbrella Rock, are awash at high water. **North Ledge**, bare at half tide, is near the western shore southeastward of the yacht club; it is marked by privately maintained daybeacons. The beacons on Umbrella Rock and on North Ledge are lighted during the summer. The principal landing, with a reported depth of about 6 feet alongside, is on the southeast side of the yacht club and is lighted until midnight.

Larchmont Harbor may be entered on either side of Hen and Chickens. The easterly entrance, about 100 yards southwestward of the end of the breakwater, is about 300 yards wide and has a depth of about 15 feet.

Horseshoe Harbor is a small cove just westward of Larchmont Harbor. A prominent gray building is at the head. The cove is used as a small-boat

anchorage.

Echo Bay, about a mile southwestward of Umbrella Point and 2 miles northwestward of Execution Rocks Light, is the principal approach to New Rochelle. The bay is entered between **Premium Point** on the northeast and **Davenport Neck** on the southwest.**Hicks Ledge**, about 0.5 mile off the entrance, is covered 6 feet and buoyed.

Middle Ground, an extensive shoal with a reef that uncovers 6 feet, lies about 0.5 mile south-southwestward of Hicks Ledge. **Emerald Rock**, covered 9 feet, is off the west side of the shoal and marked by a buoy. A buoy marks the north end of the shoal.

Bailey Rock, which uncovers 4 feet, is near the end of a reef that extends about 200 yards off the point of Davenport Neck. The rock is marked by a lighted buoy.

The bay is an anchorage for small craft and generally is fully occupied during the summer. Depths range from 4 to 15 feet. Small craft can anchor in the shallow cove on the northeast side of the harbor, entering between **Harrison Island** and the rocky, grassy islet off the northwest side of **Echo Island**. Vessels can anchor in the designated areas on either side of the entrance, in depths of 20 to 24 feet. (See **110.155 (a) (2), (a) (3), and (1)**, chapter 2, for limits and regulations.) Vessels should not anchor near the sewer outlet in the middle of the bay. A small-vessel anchorage area is in Echo Bay. (See **110.1 and 110.60 (b-1)**, chapter 2, for limits and regulations.)

A dredged channel, on the northwest side of Echo Bay, leads to a municipal wharf and turning basin at Beaufort Point. The channel is marked by buoys to the turning basin. In 1967, the controlling depth was 9½ feet at midchannel to the basin, with 9 feet in the basin except for shoaling to 6 feet along the south side of the basin.

The area northward of the turning basin is shoal with extensive mud flats that bare at low water. Southwesterly of the turning basin, the depth varies from 9 to 2 feet at the head of navigation.

New Rochelle is a city on the western shore of Echo Bay. Principal waterborne commerce is in sand, gravel, and petroleum products.

Berthing space is available at the municipal wharf, which forms the northeast side of **Beaufort Point**. The city police patrol boats usually moor alongside the wharf. Several small-craft facilities are in the northern part of Echo Bay. Berths, electricity, gasoline, diesel fuel, water, ice, a 40-foot marine railway, and lifts up to 20 tons are available; hull and engine repairs can be made.

Storm warning signals are displayed. (See chart.)

On the point midway between Beaufort Point and **Duck Point** is a prominent flagstaff which shows a seasonal private green light. This light, on range with the lighted buoy at Bailey Rock, leads between Hicks Ledge and Middle Ground into Echo Bay.

Pine Island, between Davenport Neck and Middle Ground, is rocky, covered with brush, and occupied by several cottages. A small private landing is on the west side of the island. Two bare rocks and a long bare ledge are southwestward of the island.

Charts 223, 117-SC.—Davids Island, southward of Davenport Neck, is the site of **Fort Slocum**, a U.S. Government reservation. The island is marked by a tank on its north end and a square chimney on its southeast end. A ferry landing and service wharf are on the west side of the island; depths of about 10 feet are reported alongside. A fog signal is sounded from the end of the ferry landing. Reefs partly bare at low water, marked by a lighted buoy, extend about 0.2 mile northward of Davids Island.

Davids Island is surrounded on its east and south sides by a foul area of islands and rocks, the passages between which should not be used by strangers, even in small craft. **Huckleberry Island**, at the eastern end of the group, is wooded. **Pea Island**, about 0.3 mile southeastward of Davids Island, is grass covered, and rocks bare at low water are southeastward of it. **Columbia Island** has been improved by a seawall, making it about 150 feet square, with a pier 150 feet long on the west side.

Middle Reef, 0.5 mile southward of Davids Island, has some boulders which show at high water. **East Nonations** and **South Nonations** are rocks that uncover 4 feet between Middle Reef and Hart Island. South Nonations is marked on its south side by a lighted bell buoy.

Aunt Phebe Rock, 300 yards west of Davids Island, is bare at half tide, and marked by a light.

Channels.—The channel leading from the northward to the ferry landing on Davids Island is westward of the light marking Aunt Phebe Rock, and is marked on its west side by a buoy midway between the light and the rock breakwater nearly surrounding Goose Island. Southeastward of the buoy, the channel is a little over 200 feet wide between the buoy and a reef, bare at low water, that makes off from Davids Island. The ferry landing can be approached from the southwestward through a marked channel with a depth of about 13 feet. This channel also leads to New Rochelle Harbor.

New Rochelle Harbor lies between the mainland, and westward of Davenport Neck, and Glen Island; it is off the southerly part of the city of New Rochelle. However, the main access of New Rochelle is through Echo Bay, previously discussed.

New Rochelle Harbor is entered between Glen Island and Davenport Neck. Two well-marked channels lead to the harbor. The southern channel between Davids Island and Glen Island has a depth of about 13 feet; the northern channel between Davids Island and Davenport Neck is deeper. The narrow dredged channel in the harbor had a controlling depth of 8 feet to within 100 yards of the

dam at the head in May 1971.

Anchorage is not recommended in the harbor because of its congestion. **Anchorage areas** are in adjacent waters southerly, extending as far as City Island and Locust Point. (See **110.1, 110.60 (b), (c), (c-1), and (d) through (f), and 110.155 (a) (1), (a) (4), and (1)**, chapter 2, for limits and regulations.)

Several yacht clubs, marinas, and boatyards are in New Rochelle Harbor. Gasoline, water, ice, marine supplies, and complete engine and hull repairs are available. The largest marine railway in the harbor can handle craft up to 40 feet in length.

Execution Rocks, about 1.4 miles eastward of Davids Island, consist of many boulders and shoals of considerable extent, marked by a light and buoys. Broken bottom, covered 5 to 19 feet, extends about 0.7 mile northward from the light.

Execution Rocks Light (40°52.7′ N., 73°44.3′ W.), 62 feet above the water, is shown from a white stone tower with a brown band midway of its height, attached to a granite dwelling. A radiobeacon and fog signal are at the light.

Goose Island, between Davids Island and Glen Island, is almost completely surrounded by a rock breakwater, and has several bare rocks to the westward and southward. A house on pilings is prominent on the island.

Glen Island, 0.4 mile west of Davids Island, is a public park used as a pleasure resort. A light is on the north end of the island. A beach protected by two jetties is on the southeast end of the island. The channel on the northwest side of Glen Island is much used as an anchorage by small craft, particularly those bound to the club on **Travers Island** to the westward. The channel has a depth of about 7 feet.

A bascule bridge connecting Glen Island with **Neptune Island** has a clearance of 13 feet. Just south of the bridge there is a yacht club on the east side of Neptune Island.

Orchard Beach, about a mile southwestward of Davids Island, is a park developed by the State of New York on the filled-in area between Hunter Island, to the north, and Rodman Neck, to the south. The inshore water areas off the crescent beach are foul and should be used only with local knowledge. A bathing pavilion and a flagstaff are prominent. **Chimney Sweeps**, two prominent bare rocks, are about 0.4 mile west of the beach.

Hart Island, about 1.8 miles southwest of Execution Rocks Light, is occupied by a New York City drug rehabilitation center. A stack on the southern part of the island, and large paintings on the sides of the buildings on the island are prominent. A reef extends about 200 yards southeastward from the south end of the island, and is marked by a light. Caution is advised to avoid the 9-foot obstruction and the wreck with 13 feet over it which are 0.3 mile west of the light.

Rat Island is a high bare rock about 0.4 mile west of Hart Island. **The Blauzes**, 13 feet high, are a part of the reef which extends 0.3 mile northwestward from the north end of Hart Island.

The channel between City Island and Rodman Neck is used extensively as an anchorage by small pleasure craft during the summer. Boat clubs and railways for small craft are on the northwest side of City Island. The shores are generally fringed with boulders and should be approached with caution. The north shores of High Island and City Island northeastward of the bridge are very foul, and boats should avoid the shoals with depths less than 12 feet on that side.

City Island is connected with Rodman Neck by a highway swing bridge with a clearance of 12 feet. (See **117.190 (f) (1)**, chapter 2, for drawbridge regulations.) Currents at the bridge are variable and at times exceed 1.5 knots. (See the Tidal Current Tables.)

City Island Harbor, also called **Hart Island Roads**, is between Hart Island and City Island. It is well sheltered from easterly and westerly winds and is an important anchorage for coasting vessels in the western end of Long Island Sound. Besides serving as a harbor of refuge, it is often used by vessels desiring pilots or towboats, or awaiting orders. A spire and cupola in the center of City Island and a steeple in the northerly part of the island are conspicuous objects.

City Island, on the northeast side of Eastchester Bay, is narrow and over 1 mile in length. It is thickly settled and has a commercialized appearance. The west side is residential, and the east side is industrialized with several shipyards and other marine related facilities.

The Hell Gate Pilots maintain a pilot station at the end of a pier on the eastern side of City Island, about 0.4 mile northward of Belden Point. The pilots board vessels off Execution Rocks. (See Pilotage, New York Harbor, chapter 11.)

High Island is 200 yards northeastward of the north end of City Island to which it is connected by a fixed footbridge with a clearance of 11 feet. The ground under the bridge is reported to bare about 1 foot at low water. A 528-foot-high radio tower, marked on top by red lights, is prominent on High Island.

Anchorages.—The usual anchorage for deep-draft vessels is southeastward of City Island, southward of a line joining the south ends of Hart and City Islands. When anchoring, avoid **Deep Reef**, a small rocky patch covered 25 feet. Other general and special **anchorage areas** are in the vicinity. (See **110.1, 110.60, and 110.155**, chapter 2, for limits and regulations.)

A long recreational fishing pier, in disrepair in 1971, and a wide stone pier, the top of which is used as a parking area, are at the south end of City Island at **Belden Point**. The western shore of Hart Island and the wharves on City Island should be given a berth of about 150 yards.

Tides.—The mean range of tide is 7.2 feet.

Currents.—The tidal current has a velocity of about 0.7 knot.

Ice seldom interferes with navigation of powered vessels.

Supplies.—Gasoline, diesel fuel, lubricants, and marine supplies of all kinds are available at City Island. Water is piped to some of the wharves; ice, electrical connections, guest moorings, and dry and wet storage are readily available.

Small-Craft Facilities.—Complete engine and hull repair facilities are available at the many boatyards on the east and northwest side of City Island. The largest marine railway can handle craft up to 180 feet in length. Radio and electronic repairs can also be had. Boatbuilding facilities are available.

Communications.—Buses serve the subway system of New York City. A municipal ferry operates to Hart Island throughout the year.

Eastchester Bay, between City Island and Throgs Neck, has general depths of 7 to 10 feet. The shores of the bay are fringed with boulders, and there are many shoals; caution is essential, especially where the depths are not more than 3 feet greater than the drafts. **Hutchinson River** empties into the north end of the bay.

A dredged channel, entered about 0.5 mile westward of Belden Point, leads northward through Eastchester Bay, thence into and through Hutchinson River to the head of river navigation at the city of Pelham, about 4.3 miles above the channel entrance.

In November-December 1969, the controlling depths in the dredged channel were 6 feet from the channel entrance to the Hutchinson River Parkway Bridge, thence 5½ feet at midchannel to within 200 yards of the New England Thruway Bridge at Eastchester, thence 1½ feet for a midwidth of 50 feet to the Boston Post Road Bridge, thence 4 feet for a midwidth of 50 feet to the junction of East Y and West Y at Pelham, thence depths ranging from 6 feet at the junction to bare at the northern end of the East Y, and depths ranging from 10 feet at the junction to 3 feet at the northern end of the West Y. The channel is buoyed to a point about 3 miles above the channel entrance.

Special small vessel **anchorages** are in Eastchester Bay. (See **110.1** and **110.60 (d), (e), and (f)**, chapter 2, for limits and regulations.)

The dangers in Eastchester Bay are few; **Big Tom**, on the east side near the entrance, is bare at low water, and other rocks around it show at extreme low tides; these are buoyed. **Cuban Ledge**, covered at half tide, is west of the dredged channel about 0.5 mile above the channel entrance and is buoyed. Numerous rocks and shoals are on both sides of the channel near the entrance to Hutchinson River.

Bridges and overhead cables crossing Hutchinson River are listed by type, distance above the channel entrance, and clearance as follows: bascule, 1.9 miles, vertical clearance 13 feet, horizontal clearance limited to 49 feet when leaves are open; rolling lift, 2 miles, 8 feet; overhead power cable at bridge, 130 feet; bascule, 2.4 miles, 30 feet; bascule, 3.4 miles, 31 feet; fixed, 3.6 miles, 50 feet; overhead pipeline, 3.9 miles, 130 feet; bascule, 4 miles, 5 feet, horizontal clearance of 40 feet when open. (See **117.155**, chapter 2, for drawbridge regulations and opening signals.)

Eastchester is a village on the west side of the Hutchinson River about 1.5 miles above Pelham Highway Bridge. Commerce on the river to Eastchester is in building materials, fuel oil, and petroleum products. **Pelham** is on the east side of the river above Eastchester.

Weir Creek is a bight on the west side of the bay near the entrance. Small-craft facilities are on Weir Creek and to the northward on the west side of the bay. The largest marine railway in the area can handle craft up to 50 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, storage, and marine supplies are available.

Locust Point is about 0.8 mile southeastward of Weir Creek. A cove just southwestward of the point provides small-boat shelter. Rocks, bare at low water, are on the north side of the approach. The entrance has a depth of about 5 feet. Inside the cove, depths range from 20 feet at the south end to about 4 feet at the north end. A yacht club and marina are in the cove. A marine railway at the marina at the head of the cove can haul out craft up to 40 feet in length for engine and hull repairs. Gasoline, water, ice, and marine supplies are available at the marina; depths of about 4 feet are at the wharf.

The mean range of tide is about 7 feet. Tidal currents have a velocity of 0.5 knot in the vicinity of Big Tom, and 1.5 knots at Pelham Bridge.

Charts 1213, 117-SC.—Old Field Point, about 5 miles southward of Stratford Shoal (Middle Ground) Light, is a low bluff with a light and an abandoned tower on its summit. Boulders extend a short distance off the point, and the light should be given a berth of about 0.3 mile, even by small craft. A gong buoy is 0.6 mile northward of the point. Depths of 14 to 18 feet are found about 0.4 mile northward of the light.

Crane Neck Point, 2 miles westward of Old Field Point, is a bare conspicuous bluff about 90 feet high and covered on top with brush.

Smithtown Bay, a broad open bight on the south side of the sound, extends 7 miles westward from Crane Neck Point. Rocky shoals extend 1 mile in places from the shore, the water shoaling abruptly from 51 feet in places. A good summer anchorage in 30 to 50 feet sheltered from easterly winds is found about 1 mile southward of Crane Neck Point.

Stony Brook Harbor, locally known as St. James Harbor, is a narrow shallow bay in the southeastern part of Smithtown Bay. The approach to the harbor from the bay is over a bar which extends 0.8 mile off the entrance; the outer end of the bar is marked by a lighted buoy. A light is on the east side of the entrance to the harbor. Two branch channels lead from the entrance into the harbor; one leads southwestward to a steel bulkheaded

wharf and pavilion at the village of **Stony Brook**, 0.5 mile inside the entrance, and the other, **Porpoise Channel**, leads westward to a yacht club at the northwestern end of the harbor at which gasoline is available. In 1971, depths of about 8 feet were reported in the southwesterly channel, and about 4 feet in Porpoise Channel. The channels are not well defined, as the buoys do not always mark the best water; local knowledge is required. The entrance light and channel buoys are privately maintained.

Small-craft facilities are on the east side of the harbor. Berths, electricity, gasoline, water, ice, a 35-foot marine railway, and marine supplies are available; hull and engine repairs can be made.

The railroad station is about 1 mile from the wharf at Stony Brook.

A high bluff is between Stony Brook Harbor and Nissequogue River, another between Nissequogue River and **Sunken Meadow Creek**, and bluffs in places between Sunken Meadow Creek and Northport Bay.

Nissequogue River, a shallow crooked stream about 4 miles westward of the entrance to Stony Brook Harbor, is entered through a privately dredged channel that leads southward from Smithtown Bay for about 1.4 miles into the river. In 1971, the channel had a depth of about 8 feet. Rocks and shoals, bare at low water, are on the bar outside the entrance. A lighted buoy marks the channel approach, and private buoys mark the channel. Strong tidal currents are reported in the channel. Gasoline, water, and ice are available at a pier on the west side of the river, about 0.9 mile above the channel entrance. A State hospital, a group of buildings with green roofs, and two large red brick chimneys are prominent about 0.5 mile southwestward of the river entrance. Farther westward, a brick building and a stack are also prominent. The railroad station is at **Kings Park**.

Charts 224, 117-SC.—Northport Basin, about 10.5 miles westward of Old Field Point Light and 2.7 miles southeastward of Eatons Neck Point, is a small privately maintained basin with general depths of 7 to 11 feet, and formed by gravel dredges working into the high bank; greater depths are available. The entrance to the basin is marked by a private lighted buoy and unlighted buoys; submerged jetties extend northward from the east and west sides of the entrance. A dangerous rock is close northward of the seaward end of the west jetty. The three stacks of a power and light company on the east side of the basin are prominent. The basin is closed to general navigation.

An offshore mooring platform, with off-lying mooring buoys, is about 1.6 miles northward of the entrance to Northport Basin and about 2.4 miles eastward of Eatons Neck Light. Submerged pipelines extend from the shore to the platform. The platform is marked at its eastern end by a light, and at the western end by a light and fog signal. The facility and aids are privately maintained.

Eatons Neck is a prominent wooded headland with elevations of 100 feet or more, and marked at its north end by a light and tower of a Coast Guard station. The lookout tower is a prominent feature.

Eatons Neck Light (40°57.2′ N., 73°23.7′ W.), 144 feet above the water, is shown from a 73-foot white stone tower attached to a dwelling; a fog signal is sounded at the light.

The northwest end of the neck is a spit in the form of a hook which encloses **Eatons Neck Basin**. Eatons Neck Coast Guard Station, is at the head of the basin. The basin is entered through a privately dredged cut between two small riprap jetties about 0.5 mile southwestward of the light; the jetties are covered at half tide. The channel between the jetties is buoyed, and there are buoys farther inside. A depth of about 7 feet was reported through the entrance to the head of the buoyed channel in 1971. Care should be taken in entering the channel, which is very narrow. Depths in the harbor range from 7 to 13 feet.

Shoals with depths of 4 to 18 feet extend about 0.9 mile northward of Eatons Neck, and broken ridges extend northward for another 1.8 miles. The northern end of each area is marked by a buoy.

Huntington Bay, just westward of Eatons Neck, is the approach to Northport Bay and Harbor, Centerport Harbor, Huntington Harbor, and Lloyd Harbor. The bay, protected against all but northerly winds, is an excellent anchorage for large vessels. Depths range from 36 to 25 feet, fairly close to its southern end, and anchorage can be selected according to draft and wind direction.

An obstruction covered by 23 feet is about 0.8 mile southwestward of Eatons Neck Light.

A **358°30′-178°30′ measured nautical mile** is off the west side of Eatons Neck. Shore ranges mark the ends of the courses; the markers are maintained seasonally.

Anchorage with shelter from northwesterly winds can be had for small vessels at the southwesterly end of Huntington Bay, 0.4 mile northeastward of Lloyd Harbor Light, in 18 to 36 feet. The arms of the bay provide secure harbors; Northport Bay is used generally by the larger vessels.

Tides.—The mean range of tide is 7.4 feet.

Currents.—In Huntington Bay the velocity of the tidal current is 0.6 knot off East Fort Point and 1.8 knots in the entrance to Northport Bay. (See the Tidal Current Tables for predictions.)

Duck Island Harbor is a shallow cove on the north side of Northport Bay westward of **Duck Island Bluff**. Depths range from 6 to 9 feet in the entrance. The south side of Duck Island Bluff should be given a berth of about 300 yards to avoid shoal water and inshore rocks which extend southward from it.

Northport Bay, which opens off the southeast end of Huntington Bay, provides good anchorage in 20 to 50 feet in its western part, and in 8 to 11 feet in the eastern half. The entrance to the bay is

marked by a lighted buoy, and the entrance channel, privately dredged to about 12 feet, is buoyed.

An amber light, maintained at the public landing by the town of Northport, is a conspicuous mark at night for vessels making the wharves at Northport.

A privately dredged channel at the eastern end of Northport Bay leads to a dredged basin of a sand and gravel company on the north side of **Bluff Point**. In 1965, the channel had a reported controlling depth of 25 feet. The extensive sand pit on Bluff Point is conspicuous from the northwestward.

Northport Harbor is at the southeastern end of Northport Bay. In 1971, a reported depth of about 8 feet could be taken from Northport Bay to the public landing at Northport, and thence about 5 feet to a boatyard and marina at the southeast end of the harbor. The channel from the town landing to the facilities at the southeast end of the harbor is marked by private buoys from April 15 to November 1, and by spar markers from November 1 to April 15. The boatyard channel is marked by buoys and by a lighted buoy at the entrance; these aids are seasonal and privately maintained. An alternate channel, privately and partially marked, with a depth of about 5 feet, leads from opposite the public landing along the west side of the harbor to the head.

The low, manmade, grass-covered island in the southern part of the harbor, is a bird sanctuary.

Vessels select anchorage according to draft in the harbor; bottom is soft. During severe winters, **ice** may close the harbor for about 2 months. A lighted 5 m.p.h. **speed** limit marker is in the entrance to the harbor.

A special small vessel **anchorage area** is in Northport Harbor. (See **110.1** and **110.60 (a-2)**, chapter 2, for limits and regulations.)

Northport is a village with bus communications on the eastern shore of Northport Harbor. Depths at the principal wharves are about 6 to 8 feet. The greatest depth that can be taken to Northport is about 14 feet at high water.

Several small-craft facilities are on the east side and the head of the harbor, and a yacht club is on the west side. Berths, electricity, gasoline, diesel fuel, water, ice, lifts up to 25 tons, marine railways up to 60 feet, marine supplies, and hull, engine, and electronic repair facilities are available. **Storm warning signals are displayed.** (See chart.)

The U.S. Public Health Service maintains a **contract physician's office** in Northport. (See appendix for address.)

Centerport Harbor is a shoal bight on the south shore of Northport Bay just eastward of the entrance. In 1971, a reported depth of about 7 feet could be taken through the privately dredged channel to the spit extending southwesterly from Little Neck. The harbor serves the small-boat interests of the village of Centerport. A boatyard, reached only at high tide, is on the west side of the harbor just below the bridge. Berths, electricity, gasoline, water, launching ramp, a 20-ton lift, and engine and hull repair facilities are available.

A special small vessel **anchorage area** is in Centerport Harbor. (See **110.1** and **110.60 (a-1)**, chapter 2, for limits and regulations.)

Huntington Harbor, at the southwest end of Huntington Bay, is entered through a marked channel that leads to an anchorage off Old Town Dock, about 2 miles above the channel entrance. A depth of about 8 feet can be carried in the channel. **Lloyd Harbor Light** (40°54.6′ N., 73°25.9′ W.), 42 feet above the water and shown from a concrete tower attached to a dwelling on a rectangular pier, is on the west side of the entrance to the harbor and on the south side of the entrance to Lloyd Harbor. A fog signal is at the light.

The channel is marked by lighted and unlighted aids which mark the best water to within about 0.2 mile of the head, thence by privately maintained seasonal buoys above that point.

The New Town Dock, southward of Old Town Dock, is used by sand and gravel barges, and is under the control of the town **harbormaster.** The harbormaster also controls all the moorings in the harbor and maintains an office at the head of the harbor. Old Town Dock is leased to a private concern.

A boulder reef, on the west side of the entrance, extends out to Lloyd Harbor Light. An obstruction, reported covered 4½ feet, is 0.35 mile eastward of the light.

The tidal currents in the entrance channel have an estimated velocity of 2 knots.

A special small vessel **anchorage area** is in Huntington Harbor. (See **110.1** and **110.60 (a)**, chapter 2, for limits and regulations.)

A **speed** limit of 5 m.p.h. is enforced in the harbor.

Huntington is a village at the head of the harbor. The yacht club landing on the east side of the harbor has a depth of about 10 feet alongside. Gasoline and water can be obtained here. Yachts may anchor off the landing but must keep clear of the channel.

Storm warning signals are displayed. (See chart.) The U.S. Public Health Service maintains a **contract physician's office** at Huntington Station. (See appendix for address.)

Huntington Hospital, well lighted at night, and a lighted radio tower westward of the cupola at the head of the harbor, are prominent.

There are several marinas, boatyards, and private boat clubs in Huntington Harbor. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, launching ramps, marine railways up to 65 feet, and lifts up to 50 tons are available; hull, engine, and electronic repairs can be made. A pumpout station is at the head of the harbor.

Lloyd Harbor extends westward from Huntington Bay nearly to Oyster Bay, from which it is separated by a narrow strip of land. Vessels can anchor just inside the entrance, in depths of 7 to 11 feet. The entrance to the harbor is marked by

buoys and by Lloyd Harbor Light on the south side. The light was described under Huntington Harbor.

Oyster Bay, on the south side of Long Island Sound about 5 miles westward of Eatons Neck Light, lies between Lloyd Neck and Rocky Point and is the approach to Cold Spring Harbor and Oyster Bay Harbor. The harbor is marked by **Cold Spring Harbor Light** 40°54.8′ N., 73°29.6′ W.), 37 feet above the water, and shown from a white skeleton tower on a black cassion with a white square daymark. A fog signal is at the light. The entrance and harbor are characterized by extensive shoals, boulder reefs, and broken ground making off from the shores. Vessels should proceed with caution if obliged to approach or cross shoal areas. The bay south of Cold Spring Harbor Light is a secure harbor, available for vessels of less than 18-foot draft.

Lloyd Neck, between Huntington and Oyster Bays, is high and wooded, and has a high, yellow bluff on its north side 0.8 miles eastward of Lloyd Point. Many patches of boulders having least depths of 2 to 8 feet extend 0.2 to 0.5 mile offshore from **East Fort Point** to Lloyd Point. Small craft skirting this shore should keep well outside the line of buoys.

Lloyd Point, the north end of Lloyd Neck, is a low spit. A rocky shoal extends 0.5 mile north-northeastward from Lloyd Point. A lighted bell buoy about 1 mile northward of Lloyd Point marks the northern limit of the 30-foot curve in this vicinity.

Morris Rock, about 0.5 mile eastward of Lloyd Point, is covered by a least depth of 2 feet. The rock, usually marked by a daybeacon, is temporarily marked by a buoy.

The long jetty, about 0.6 mile southwestward of Lloyd Point, forms the southern entrance point to a pond that has been dredged into the spit by a sand and gravel company. The pond, locally known as **Fairchild Basin**, is State controlled and may be entered by steering a midchannel course through the entrance. It is used considerably by local boats as an anchorage and harbor of refuge. The holding ground is good.

In 1971, reported depths of about 12 feet were in the entrance channel and about 4 to 22 feet in the basin.

Rocky Point, the northern promontory of **Centre Island**, is a small bluff on whose summit is a large prominent house. An extensive foul area with depths of 2 to 17 feet extends about 1 mile northward of Rocky Point. A bell buoy marks the northern end of this foul area. A wreck with a least depth of 17 feet is 350 yards southeastward of the buoy. This area is dangerous and should be avoided.

A shoal area with depths of 4 to 11 feet extends eastward from Rocky Point nearly across Oyster Bay, and is marked near its eastern end by Cold Spring Harbor Light. Small craft with local knowledge cross the shoal at a distance of about 0.4 mile westward of the light, but strangers should not attempt it.

The mean range of **tide** is 7.3 feet.

Currents.—About 0.2 mile north of Cold Spring Harbor Light the velocity is about 0.5 knot; about 0.2 mile north of Cove Point, 1.2 miles southwestward, it is about 0.8 knot. For predictions, the Tidal Current Tables should be consulted.

Ice.—During severe winters ice has been known to extend the full length of the bay during part of January and February.

Plum Point, the easternmost point of Centre Island, is marked at its south end by a small stone tower; boat landings are on the southwest side of the point. A yacht club with a prominent flagstaff is about 0.3 mile west of Plum Point. The yacht club landing has depths of about 9 feet.

Cooper Bluff, at the northeast end of Cove Neck is prominent. A boulder reef extends nearly 0.3 mile northward from **Cove Point** at the northwest end of **Cove Neck**, and is marked by a lighted buoy.

Cold Spring Harbor, the southeasterly end of Oyster Bay, extends about 2.3 miles southward of Cooper Bluff. The tower on top of a dome of a seminary on the hill of **West Neck**, on the east side of the harbor, is prominent. A depth of about 14 feet can be carried to near the head of the harbor by giving the shores a berth of about 0.3 mile.

The village of **Cold Spring Harbor** is on the eastern shore near the head of the harbor. An oil company pier at the village has a depth of about 13 feet alongside. A small-craft facility is on the east side of the cove at the head of Cold Spring Harbor. Gasoline, water, ice, limited marine supplies, and overnight moorings are available; outboard motor repairs can be made.

Special small-vessel **anchorage areas** are in Cold Spring Harbor and Oyster Bay Harbor. (See **110.1 and 110.60 (t) and (u)**, chapter 2, for limits and regulations.)

Oyster Bay Harbor, a long, crooked arm in the western side of Oyster Bay, has a channel with a depth over 30 feet leading into the area westward of **Moses Point**. Good anchorage is available southward of Moses Point. West of this point, the channel is narrow and suitable only for vessels drawing less than 10 feet. Vessels of less than 7-foot draft can anchor in the bight between Cove Neck and the wharf at Oyster Bay, and also in the large bight on the northwest side of Centre Island. A **speed** limit of 5 m.p.h. is enforced in the harbor.

The village of **Oyster Bay**, on the shore south of Oyster Bay Harbor, has rail communication. A privately dredged channel with a depth of about 9 feet leads to the oyster wharf. Reported depths of about 9 feet are on the west side of the wharf, about 8 feet at the face, and about 6 feet on the east side. Parallel to and about 200 feet off the west side of the wharf is a row of sunken barges.

A dredged channel, with a reported depth of about 4 feet, leads from about 200 yards westward of the wharf to the town dock in **Roosevelt Memorial Basin**. Gasoline is available at the dock.

The channel is marked by private buoys. An oil receiving wharf is about 150 yards southeastward of the oyster wharf.

A large boatyard is westward of the entrance to Memorial Basin. Gasoline, diesel fuel, water, ice, marine supplies, storage, and marine railways up to 150 feet are available; hull and engine repairs can be made.

Brickyard Point, about 0.5 mile westward of Moses Point, should be given a berth of at least 0.2 mile off its westerly side to avoid several dangerous rocks to the northwestward of the point. None of these rocks is marked. Extensive privately owned oyster beds, marked by stakes, are in this area.

Mill Neck Creek, at the northwest end of Oyster Bay Harbor, is crossed by a highway bridge having a bascule span with a clearance of 9 feet. The area westward of the bridge has depths of 2 to 16 feet.

Oak Neck Creek, northwest of Mill Neck Creek, is entered at high water as the creek is practically bare at low water.

Charts 222, 117-SC.—Oak Neck Point (41°54.9′ N., 73°34.1′ W.), 4 miles west-southwestward of Lloyd Point, is marked by many large residences. Several stone jetties extend a short distance from the shore just westward of the point. A shoal, strewn with boulders and marked by a buoy, extends 0.3 mile from the shore for part of the distance between Oak Neck Point and Matinecock Point to the westward.

Frost Creek, locally known as Guthries Creek, 2 miles westward of Oak Neck Point, has a channel at the entrance which is well defined when the water is below half tide. The creek is protected by a stone jetty that extends a short distance from the shore about 50 yards eastward of the channel. The channel has a reported depth of about 1 foot near the entrance. The creek is not recommended without local knowledge.

Peacock Point is just west of Frost Creek. A stone jetty to protect a private boat landing extends a short distance from the west side of the point.

Matinecock Point, 1.1 miles westward of Frost Creek, is marked on its western side by a stone pier in ruins. A shoal extends about 600 yards off the point and is marked at its end by a lighted bell buoy which is removed if endangered by ice.

Charts 223, 117-SC.—Hempstead Harbor, 4 miles wide at the entrance between Matinecock Point and Prospect Point, is free from dangers if the shores be given a berth of 0.3 mile. It is much used by vessels seeking shelter in any but strong northerly winds, affording excellent anchorage with good holding ground. Vessels can anchor in any part of the harbor according to draft and direction of wind. A good anchorage for vessels drawing less than 20 feet is just inside a line from Mott Point to the breakwater at Glen Cove Landing. Small vessels can anchor behind the breakwater. On the western shore above and below Bar Beach are large sand and gravel plants. On the eastern shore are several villages.

Waterborne commerce in the harbor is in sand, gravel, petroleum products, and building material. Vessels engaged in this commerce usually draw from 3 to 12 feet.

A special **anchorage area** is in Hempstead Harbor. (See **110.1 and 110.60 (u-1)**, chapter 2, for limits and regulations.)

Weeks Point, on the eastern side near the entrance, is marked by a breakwater which protects a private boat landing. A buoy is 0.2 mile off the point. Nearly 0.5 mile southward of Weeks Point is the entrance to a basin protecting a private wharf which has a reported depth of 8 feet at the end. The basin shoals to the head, and there are rocks bare at low uater near the northern end.

Glen Cove is a city with rail and bus communication on Glen Cove Creek, about 1 mile back from the eastern shore of the bay. The breakwater extends 500 yards west-southwestward from **Glen Cove Landing** and is marked at its end by a light. The anchorage behind the breakwater is known as **Glencove Harbor**, the depths ranging from 18 to 22 feet behind its outer half and 7 to 9 feet near shore.

Glen Cove Creek, 0.6 mile southward of the breakwater, has a dredged channel from **Mosquito Cove** to the head. In 1965 the controlling depths were 8 feet for about 0.6 mile above the mouth and thence 4 feet to the head of navigation. An overhead power cable near the head has a clearance of 65 feet. The entrance is buoyed.

Storm warning signals are displayed. (See chart.)

There are several small-craft facilities in Glen Cove Creek. Berths, electricity, gasoline, diesel fuel, water, ice, storage facilities, marine supplies, lifts, and marine railways up to 60 feet are available; hull and engine repairs can be made. A pumpout station is available at one of the facilities.

A dredged channel, entered between Bar Beach and Glenwood Landing, leads between extensive flats through the southern part of Hempstead Harbor to the Roslyn Old Town Wharf, just northward of the North Hempstead Turnpike Bridge. In 1964-68, the controlling depths were 4 feet to a point opposite South Glenwood Landing, about 0.4 mile above the entrance, thence 4 feet at midchannel to a point opposite Old Town Wharf; the channel is marked by buoys to a point about 0.9 mile above the entrance. In 1971, a reported depth of about 2 feet was available from the Old Town Wharf to the head of navigation at the dam at Willow Avenue. The North Hempstead Turnpike Bridge has a fixed span with a clearance of 51 feet.

Sea Cliff is a village on the steep hill on the south side of Glen Cove Creek. From Sea Cliff southerly to the northerly wharves at Glenwood Landing a shoal extends 300 yards from the east side of the harbor, and is marked by a buoy and light.

Glenwood Landing is a village on the eastern shore abreast Bar Beach. The eight stacks at the

powerplant are prominent. A private light is shown from the outer end of an unloading boom when the boom is in operation. An overhead power cable crossing from the powerplant to Bar Beach has a clearance of 90 feet. Depths of about 8 feet are available at the Glenwood Landing wharves.

A boatyard at South Glenwood Landing has a marine railway that can handle craft up to 35 feet in length for hull and engine repairs.

Roslyn is a village on the railroad at the head of the harbor.

The mean range of **tide** is 7.3 feet.

Currents.—In the channel west of the breakwater the tidal currents are weak and variable. At Bar Beach the tidal currents have a velocity of 1.9 knots through the narrow channel. (See the Tidal Current Tables for predictions.)

Storm warning signals are displayed. (See chart.)

In severe winters **ice** has been known to close navigation for about six weeks during January and February.

The shore between Prospect Point and **Mott Point** (40°51.4′ N., 73°40.6′ W.), to the southeastward, is marked by prominent bluffs. A shoal with boulders extends 0.2 mile from shore between the points and for a short distance south of Mott Point. Buoys mark the limits of the shoal eastward and northeastward of Mott Point. **Picket Rock**, with 2 feet over it, is 350 yards offshore northward of Mott Point.

Prospect Point, marked by prominent houses on the bluff, has a rocky shoal making out nearly 0.4 mile northward from it. The shoal rises abruptly from a depth of 60 feet. The north end of the shoal is marked by a bell buoy which is 0.8 mile eastward of Execution Rocks Light. About 0.2 mile eastward of the buoy are rocky patches with depths of 17 to 18 feet. An obstruction with 23 feet over it is east-northeastward from the buoy.

Sands Point, 0.7 mile west of Prospect Point, is marked by a light. A boulder reef extends about 0.3 mile off the point and is marked by a lighted buoy. The boulders show at low water for a distance of about 300 yards from shore. A stone tower is a prominent object on this point.

Barker Point, about 1 mile south-southwest of Sands Point, is a high bluff on the northeast side of the entrance of Manhasset Bay. **Gangway Rock**, marked by a light, is at the northwesterly end of a broken line of rocks and shoal water which extends 0.6 mile northwestward from Barker Point. **Success Rock**, marked by a daybeacon, is 0.2 mile southeastward from the light.

Manhasset Bay, between Barker Point and Hewlett Point, affords excellent shelter for vessels of about 12 feet or less draft, and is much frequented by yachts in the summer. The depths in the outer part of the bay range from 12 to 17 feet, and 7 to 12 feet in the inner part inside Plum Point. The extreme south end of the bay is shallow with extensive mudflats. Depths of about 6 to 2 feet can be taken through a natural channel almost to the head of the bay.

Waterborne commerce is in sand, gravel, building material, and petroleum products, carried in vessels drawing 6 to 12 feet.

Anchorage areas are in Manhasset Bay. (See **110.1, 110.60 (g) through (j), and 110.155 (a) (6) and (1)**, chapter 2, for limits and regulations.) The bottom is soft and affords good holding ground.

A seaplane **restricted area** is off Manorhaven. (See **207.35**, chapter 2, for limits and regulations.)

The mean range of **tide** is 7.3 feet.

Storm warning signals are displayed. (See chart.)

Plum Point, marked by a clubhouse with a prominent cupola, is a low spit extending southward from the eastern shore about 0.6 mile southward of Barker Point. A lighted buoy is about 150 yards southward of Plum Point. The bight eastward of Plum Point is shoal.

Port Washington is a village with rail communication on the south side of a shoal bight about 1.2 miles southeastward of Plum Point. A channel with depths of about 8 feet, marked at its entrance by buoys, leads along the east side of the bight, thence northward past the town wharf to the north end of the bight northeast of **Tom Point**. Depths at the wharves are reported to range from 4 to 9 feet.

Depths of about 8 feet can be carried in the buoyed approach from the entrance lighted buoy of the inner harbor, southward of Plum Point, to the town wharf at Port Washington.

There are extensive small-craft facilities at Port Washington and to the eastward and westward of Tom Point at **Manorhaven**. The largest marine railway in the area can handle craft up to 60 feet in length; mobile hoists, cranes, gasoline, diesel fuel, water, ice, wet and dry storage, marine supplies, and complete engine and hull repairs are available. There are several private boat and yacht clubs on the west shore of Manhasset Bay.

Hewlett Point (40°50.3′ N., 73°45.2′ W.) is on the west side of the entrance to Manhasset Bay. A boulder reef, mostly bare at low water, and marked by a lighted buoy at its northern end, extends about 0.2 mile northward from the point.

Anchorage areas are between Hewlett Point and Elm Point, about 1.3 miles southeastward of Stepping Stones Light. (See **110.1, 110.60 (j-1), and 110.155 (a-6 and (1)**,, chapter 2, for limits and regulations.)

Stepping Stones Light (40°49.5′ N., 73°46.5′ W.), 46 feet above the water, is shown from a red brick structure on a granite pier, 1.3 miles southwest of Hewlett Point; a fog signal is sounded from the light station. The **Stepping Stones**, a dangerous boulder reef which dries in places- extend 0.8 mile southeastward from the light to the Long Island shore.

Kings Point, marked by a light, is 1.6 miles south-southwestward of Hewlett Point, and is the site of the **U.S. Merchant Marine Academy**. The 172-foot unguyed steel flagpole at the academy is said to be the country's tallest; the top of the pole

is 216 feet above the water. A boat basin, partially enclosed by an L-shaped pier, is at the point. Depths of 13 feet were reported in the basin in 1969.

Little Neck Bay is entered between Kings Point and Willets Point, 1.2 miles to the south-southwestward. Depths are 10 to 12 feet in the entrance, decreasing gradually to the head, about 2 miles inland, where the bay divides into two branches which almost dry; there are boulders in places close to the shores.

The shores of Little Neck Bay are thickly settled, and there are many private boat landings. A much used anchorage, in depths of 4 to 7 feet, is in the cove midway along the east side of the bay.

Small-craft facilities are on the west side and at the southeast end of the bay. Gasoline, water, ice, marine supplies, and engine and hull repairs are available; the largest mobile hoist in the area can handle craft up to 8 tons.

Anchorage areas are in Little Neck Bay. (See **110.1, and 110.60 (k), and 110.155 (a-7) and (1)**, chapter 2, for limits and regulations.)

Charts 223, 226, 745.—East River is a 14-mile-long tidal strait that connects Long Island Sound with New York Upper Bay and separates the western end of Long Island from the New York mainland. The Sound entrance is between Throgs Neck and Willets Point; the Upper Bay entrance is between the Battery and Governors Island. Hell Gate, about halfway between Throgs Neck and the Battery, is noted for its strong tidal currents. Harlem River extends northward from Hell Gate to the Hudson River. Both sides of the East River, from the Battery to Port Morris, a distance of 9 miles, present an almost continuous line of wharves except where shoals or currents prevent access.

Channels.—A Federal project provides for main-channel depths of 35 feet from Throgs Neck to the inactive New York Naval Shipyard, about 2 miles from the western entrance, and thence 40 feet to deep water in New York Upper Bay.

Caution.—Mariners transiting East River in the vicinity of Rikers Island and/or South Brother Island Channel are advised of the following:

East River Main Channel Lighted Buoy 3 (black, Fl. G. 2.5 sec.) has been established northeast of Rikers Island in 40°47′47″ N., 73°51′59″ W. to assure that no vessel penetration of air space exists over that portion of the East River which coincides with the glide path of the northeast-southwest runway of La Guardia Airport. Vessels with mast heights in excess of 125 feet shall pass 100 yards to the north of this buoy so as to avoid interference with the glide path.

Vessels transiting South Brother Island Channel and using the turning basin at its southern terminus shall ballast prior to entry, and are cautioned that mast heights in excess of 125 feet may penetrate the glide path to the northwest-southeast runway to La Guardia Airport. If mast heights cannot be lowered below 125 feet, La Guardia Air Traffic Control Tower shall be notified by telephone (212-779-0242) prior to terminal departure or channel entry.

Several **anchorage areas** are in East River. (See **110.1, 110.60, and 110.155**, chapter 2, for limits and regulations.)

Tides.—The mean range of tide in East River is 7.1 feet at Willets Point, 5.1 feet in Hell Gate, and 4.5 feet at the Battery. (See the Tide Tables for daily predictions.)

Currents.—In East River the flood current sets eastward and the ebb sets westward. **Note well** that this is the direct opposite of conditions in Long Island Sound where the flood is generally westward and the ebb eastward.

The velocity of current is about 1 knot at Throgs Neck, 2 knots at Port Morris, 4 knots in Hell Gate, 3 knots at Brooklyn Bridge, and 1.5 knots north of Governors Island. In Hell Gate (off Mill Rock) the velocity is 3.4 knots for the eastward current and 4.6 knots for the westward current.

The direction and velocity of the currents are affected by strong winds which may increase or diminish the periods of flood or ebb. The currents generally set with the channel, but heavy swirls are found in Hell Gate.

(See the Tidal Current Tables for the daily predictions of slack water and times and velocities of strengths of currents in Hell Gate and at other places on the East River, and the Tidal Current Chart New York Harbor, for directions and velocities of the currents in East River for each hour of the tidal cycle.)

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Pilotage.—(See Pilotage, New York Harbor, chapter 11, for details.)

Towage.—Vessels intending to employ a tug should arrange to do so before proceeding westward of Rikers Island.

Charts 223, 117—SC.—Throgs Neck, on the northwest side of the entrance to East River, is marked by a light, a stack, and a tall tank. **Throgs Neck Light** (40°48.3′ N., 73°47.5′ W.), 64 feet above the water, is shown from a red skeleton tower, small white house, on the outer end of the neck; a fog signal is sounded from the light station. The shoal ground which extends 0.1 mile southward and eastward from the light is marked by a lighted bell buoy.

Fort Schuyler, on the outer end of Throgs Neck, is used as a base for the **State University of New York Maritime College**. The 550-foot-long wharf, on the southwest side of the fort, is used to moor the school's training ship. Depths of about 25 feet are reported alongside the face. The 255-foot-long T-pier, to the northwestward, is used by the U.S. Navy; depths of about 20 feet are reported alongside.

Storm warning signals are displayed. (See chart.)

Throgs Neck Bridge, a highway suspension bridge with a channel clearance of 138 feet, and 152 feet at the center, crosses East River from Throgs Neck to the Long Island Shore.

Willets Point, 0.7 mile southeastward across the entrance to East River from Throgs Neck, is marked by **Fort Totten**, the granite walls of which are prominent. **Little Bay**, westward of Willets Point, has general depths of 6 to 10 feet and is used by local small craft. There are many private boat landings along the shores. Depths of about 9 feet can be taken in the buoyed channel to the piers on the Little Bay side of Willets Point.

An **anchorage area** is in Little Bay. (See **110.155 (b-2) and (1)**, chapter 2, for limits and regulations.)

Whitestone Point, 2 miles westward of Willets Point, is a small bluff marked by a light; a fog signal is sounded at the light. The town of **Whitestone** is between Little Bay and Whitestone Point. Several small-craft facilities are at Whitestone. Craft up to 14 tons can be hauled out for engine and hull repairs; gasoline, water, ice, marine supplies, and storage are available. Depths alongside the principal wharves and small-craft facilities range from 4 to 20 feet.

The **Bronx-Whitestone Bridge** is a suspension structure that crosses East River from Old Ferry Point on the Bronx side to a Long Island landing 0.4 mile southwestward of Whitestone Point; the channel clearance is 135 feet.

Powell Cove, between the Long Island end of the Bronx-Whitestone Bridge and Tallman Island, 0.6 mile to the westward, has general depths of 2 to 5 feet; a light marks the east side of the entrance. **Tallman Island**, now joined to the Long Island shore, is marked by the prominent tanks of a sewage-disposal plant.

Old Ferry Point is on the north side of East River 2 miles westward of Throgs Neck. The bight between Throgs Neck and Old Ferry Point affords anchorage, with good holding ground, in depths of 15 to 35 feet; the water shoals abruptly from 18 feet, 0.3 mile from shore, to depths of 4 to 5 feet. A marina with a 55-foot marine railway is on the north side of this bight. Gasoline, water, ice, marine supplies, wet and dry storage, and engine and hull repairs are available.

Westchester Creek, on the north side of East River, is entered through a dredged channel that leads northward through a shallow bight between Old Ferry Point and Clason Point (chart 226), 0.7 mile to the westward, to the head of navigation at **Westchester**, about 2.3 miles above the channel entrance. In August 1969-September 1970, the controlling depths were 10 feet to a point 100 yards southward of Randall Avenue, about 0.9 mile above the entrance, thence 7 feet to Westchester. The channel is buoyed to a point about 1 mile above the entrance. Waterborne traffic on the creek consists chiefly of petroleum products, sand and gravel, and crushed rock.

The highway bascule bridge over Westchester Creek at **Unionport**, 1.5 miles above the channel entrance, has a clearance of 14 feet. (See **117.156**, chapter 2, for drawbridge regulations and opening signals.) In 1971, two fixed highway bridges with design clearances of 50 feet were under construction across Westchester Creek; one close northward and the other close southward of the bascule bridge.

There are small-craft facilities on the west side of the creek above Castle Hill Point and at Unionport. Berths, electricity, gasoline, water, ice, marine supplies, storage facilities, marine railways up to 50 feet, and lifts up to 30 tons are available; hull and repairs can be made.

Chart 226.—Clason Point (226). (40°48.3′ N., 73°50.9′ W.) is on the north side of East River about 3 miles west of Throgs Neck. **Pugsley Creek**, which empties into Westchester Creek and East River along the east side of Clason Point, is very shallow and should not be entered without local knowledge. Small boats anchor on the flats west of Clason Point. A boatyard and marina are on the south side of the point. A marine railway at the boatyard can haul out craft up to 50 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

College Point is on the Long Island side of East River opposite Clason Point. **College Point Reef**, covered 6 feet and marked by a light, is 0.2 mile north-northeastward of the point.

The town of **College Point** is south of the point and on the east side of the entrance to Flushing Bay. The wharves on the west side of the town have depths alongside ranging from 2 to 10 feet. The shallow bight north of the town has depths of 2 to 5 feet and is used as a small-boat anchorage. The largest of several boatyards at College Point makes barge and tugboat repairs and can haul out vessels up to 140 feet in length. Several small-craft facilities are also at College Point. Marine railways up to 40 feet, mobile hoists, water, ice, marine supplies, storage, and hull and engine repairs are available. The mean range of **tide** at College Point is 6.5 feet.

The entrance to **Flushing Bay** is between the town of College Point and La Guardia Airport, 0.6 mile to the southwest. A dredged channel, marked by bouys and light, extends 1.8 miles south-southeastward from East River to a turning basin at the head of the bay, westward of the entrance to Flushing Creek, and to the extensive small-craft facilities southward and westward of the turning basin. In September 1969, the controlling depths were 13 feet to the turning basin, thence 12 feet in the basin, thence 13 feet at midchannel in Flusing Creek to just below the first highway bridge, thence least depths of 7 feet to the head of navigation just below the I.R.T. (Roosevelt Ave.) Railroad Bridge. Flushing Bay is mostly shallow, with depths of less than 6 feet outside the channel.

Depths of 8 to 14 feet are between the east side of the channel and the town of College Point.

Small craft anchor south of College Point in depths of 4 to 8 feet.

Special small vessal **anchorage areas** are in Flushing Bay. (See **110.1**, and **110.60 (1) through (1-2) and (m) through (m-2)**, chapter 2, for limits and regulations.)

A **restricted area** is in a portion of the southern part of the channel through Flushing Bay. (See **207.36**, chapter 2, for limits and regulations.)

A 0.6-mile-long dike, covered at high water and marked at either end by a light, runs close along the west side of the channel to within 0.3 mile of the head of the bay.

The L-shaped pier at the head of Flushing Bay partially encloses a small-boat basin; depths of about 8 feet were reported in 1965. The Worlds Fair Marina to the westward has a reported depth of about 6 feet inside. Gasoline, diesel fuel, water, ice, storage, marine supplies, and limited repairs are available at both facilities, and a 30-ton hoist is available at the marina.

Ice generally obstructs navigation in Flushing Bay and Flushing Creek during a part of January and February.

The twin fixed highway bridges over Flushing Creek, 0.2 mile above the mouth, have a clearance of 34 feet. The Northern Boulevard Bridge, 0.4 mile above the mouth, has a bascule span with a clearance of 25 feet.

Flushing is on the east side of Flushing Creek. Waterborne traffic consists chiefly of sand, gravel, crushed rock, and petroleum products. Drafts of inbound and outbound vessels seldom exceed 12 feet. Vessels must go directly to the marginal wharves because the creek has no room for anchorage. Gasoline, fresh water, ice, and some other supplies can be obtained at Flushing.

The east entrance to **Rikers Island Channel**, between Rikers Island and the mainland, is obstructed by a lighted runway approach to **La Guardia Airport**. The approach to Bowery Bay is from westward of Rikers Island.

Bronx River, on the north side of East River, is entered through a dredged channel that leads north-northwestward through a shallow bight between Clason Point and Hunts Point, 1.1 miles to the westward, to the head of river navigation at East 172d Street, about 2.3 miles above the channel entrance. The river is being filled in above East 172d Street. In 1970-July 1972, the controlling midchannel depths were 10 feet to the Westchester Avenue Bridge, about 2 miles above the channel entrance, and thence 1 foot to East 172d Street. The channel is marked by buoys to a point about 0.6 mile above the entrance.

Waterborne traffic on the Bronx River consists chiefly of sand, gravel, and crushed rock.

The mean range of **tide** is 6.9 feet at Hunts Point and at Westchester Avenue Bridge.

Bronx River is crossed by four bridges to 172d Street. Bruckner Boulevard Bridge, 1.7 miles above the entrance, has a bascule span with a clearance of 27 feet. Westchester Avenue Bridge, 2 miles above the entrance, has a bascule span with a clearance of 14 feet, but the draw is no longer opened. (See **117.190 (a) and (f) (2)**, chapter 2, for drawbridge regulations.) The elevated railway structure over Westchester Avenue Bridge has a fixed span with a clearance of 61 feet. The railroad bridge, 2.1 miles above the entrance, has a rolling-lift span with a clearance of 8 feet, but the draw is no longer opened. (See **117.190 (a) and (f) (3)**, chapter 2, for drawbridge regulations.)

Hunts Point is on the north side of East River about 4 miles west of Throgs Neck. A marginal wharf extends 0.3 mile northeastward from the point; depths of 17 to 24 feet are reported alongside. Small craft anchor in depths of 9 to 17 feet on the flats east of the wharf.

Rikers Island, in the middle of East River between Hunts Point and La Guardia Airport, is partly occupied by buildings of the Department of Correction of New York. The island is about a mile long, southeast to northwest, and 0.6 mile wide. The larger part of the island, southeast of the buildings, is used as a trash dump. An inactive ferry slip is at the northwest end of the island.

East River main channel, project depth 35 feet, leads northward of Rikers Island. A much-used **anchorage area**, with depths of 21 to 30 feet, is between the south side of the channel and the flats off the north side of the island. (See **110.155 (b) (6) and (1)**, chapter 2, for limits and regulations.)

Caution.—East River Main Channel Lighted Buoy 3 (black FL. G. 2.5 sec.) has been established northeast of Rikers Island in 40°47′47″ N., 73°51′59″ W. to assure that no vessel penetration of air space exists over that portion of the East River which coincides with the glide path of the northeast-southwest runway of La Guardia Airport. Vessels with mast heights in excess of 125 feet shall pass 100 yards to the north of this buoy so as to avoid interference with the glide path.

North Brother Island, 0.3 mile northwest of Rikers Island, is occupied by the ruins of former municipal buildings. East River main channel leads northward and westward of the island; a light marks the main channel side of the island.

The buoyed channel between North Brother Island and **South Brother Island**, 0.1 mile to the southward, has a controlling depth of about 25 feet. The channel is marked by a light and fog signal on the south end of North Brother Island, and by a light off the north side of South Brother Island.

A ledge, partly bare at low water, extends 0.2 mile southward from South Brother Island; the outer part of the ledge is marked by a light.

Port Morris, 0.2 mile westward across East River main channel from North Brother Island, has rail terminals to and from which car floats are taken through East River.

South Brother Island Channel, buoyed and marked by a private **182°** lighted range, leads from deep water east of North Brother Island and along the west side of Rikers Island to a turning basin on

the west side of Bowery Bay. In September 1971, the controlling depth was 29 feet from the entrance to and in the turning basin, except for a 28-foot spot in 40°48′03.6″ N., 73°53′45.2″ W., and a 27-foot spot in 40°47′53.9″ N., 73°53′38.9″ W.

Caution.—Vessels transiting South Brother Island Channel and using the turning basin at its southern terminus shall ballast prior to entry, and are cautioned that mast heights in excess of 125 feet may pentrate the glide path to the northwest-southeast runway to La Guardia Airport. If mast heights cannot be lowered below 125 feet, La Guardia Air Traffic Control Tower shall be notified by telephone (212-779-0242) prior to terminal departure or channel entry.

Bowery Bay, across Rikers Island Channel from Rikers Island, has depths of about 10 feet. A **special anchorage area** is in the west part of the bay. (See **110.1, 110.60 (n) and 110.155 (b) (5) and (1)**, chapter 2, for limits and regulations.) A fixed highway bridge crosses Rikers Island Channel and Bowery Bay and connects Rikers Island with the Borough of Queens, New York; clearance over the channel is 52 feet for a width of 125 feet.

Bowery Bay may be approached from the East River main channel from the northward through South Brother Island Channel and from the northwestward through a 100-yard-wide channel which leads between the ledges that make off from Lawrence Point on the southwest and South Brother Island on the northeast. The controlling depth in the 100-yard-wide channel is about 19 feet. Caution is advised in the northwestern approach as the channel is narrow, the bottom is rocky and uneven, and tidal currents are strong.

Lawrence Point, on the southeast side of East River 0.7 mile westward of Rikers Island, is occupied by an extensive gas and electric plant. A light marks the outer part of the ledge, partly bare at low water, which extends 0.3 mile northeastward from the point.

Randalls Island and Wards Island are on the northwestern side of East River between Port Morris and Hell Gate, separating that river from Harlem River, which is described later. The islands provide recreational facilities for the residents of the city of New York.

Bronx Kill, which separates Randalls Island from Port Morris, is a narrow unnavigable passage that extends westward for 0.8 mile from East River to Harlem River. In 1969, it was reported that Bronx Kill had been filled in.

Sunken Meadow is the reclaimed area now joined to the northeast end of Wards Island and southeast end of Randalls Island. A light marks the main-channel side of the filled area.

Little Hell Gate, which formerly separated Wards Island from Randalls Island and formed a passage from East River to Harlem River, has been mostly filled in and together with Sunken Meadow joins Wards Island with Randalls Island.

Hell Gate Bridge, which crosses East River from Wards Island to Long Island 7.1 miles from the Battery, has a fixed railroad span with a clearance of 134 feet.

Negro Point is the southernmost point of Wards Island. **Triborough Bridge**, which crosses East River from Negro Point to Long Island 6.8 miles from the Battery, has a highway suspension span with a clearance of 138 feet.

Holmes Rock and **Hog Back** are two bare rocks, which lie on the eastern and northern parts, respectively, of a reef in the bight on the south side of Wards Island westward of Negro Point. The western extremity of this reef is marked by a light.

Hallets Point, on the Long Island side of East River about 0.3 mile southwestward of Negro Point, is marked by a light. There are main-channel depths close to the point.

Hell Gate is the part of East River between Wards Island and Welfare Island, 0.7 mile to the southwest. The crooked channel, the strong tidal currents, and the heavy traffic in Hell Gate require extra caution on the part of the navigator to avoid accident or collision. Vessels navigating Hell Gate on a rising tide sometimes find it necessary to pass starboard-to-starboard because of the strong currents between Negro Point and Hallets Point. This situation may arise when one of the vessels does not maneuver readily or is handling a tow. Northeastward of Negro Point and southwestward of Hallets Point, the customary port passings are made.

Mill Rock, on the northwestern side of the main channel through Hell Gate, is 0.2 mile southwest of Wards Island and the same distance northwest of Hallets Point. The islet is marked by lights on its north and south ends.

Charts 226, 274.—Harlem River, which joins East River in Hell Gate between Wards Island and Manhattan Island, extends northward about 7 miles and connects with Hudson River through Spuyten Duyvil Creek. The dredged channel through Harlem River is narrow and tortuous and is navigable only for powered vessels. In 1964-68, the controlling depth was 14 feet to the Hudson River.

Traffic is heavy in Harlem River. Vessels with heights too great to pass under the closed drawbridges should make the passage against the current.

Bridges.—There are more than a dozen draw and fixed bridges over Harlem River. The minimum clearance under closed drawspans is 24 feet except at the railroad bridge over the entrance from Hudson River where it is only 5 feet. Clearance under raised vertical-lift spans exceed 100 feet. (See **117.160**, chapter 2, for drawbridge regulations and opening signals.) Minimum clearances under fixed bridges exceed 100 feet at the center of the spans.

Tides.—The mean range of tide in Harlem River is 5.1 feet in Hell Gate and 3.6 feet at the entrance from Hudson River.

Currents.—The tidal currents in Harlem River run southward from Hudson River to East River

while the east-going current is running in Hell Gate; and the reverse. The south-going current in Harlem River is considered the flood. The times of slack water are subject to variations depending upon freshet conditions in Hudson River. The velocity of the current is 2 knots or more in the narrower parts of the channel. (See the Tidal Current Tables and the Tidal Current Charts for predictions and detailed information.)

Chart 226.—Welfare Island (Blackwells Island), 1.6 miles long and 0.1 mile wide, lies in the middle of East River southwest of Hell Gate. A gray stone tower is on the north end of the island and a fountain, illuminated at night, is on the south end of the island.

East River main channel, with project depth of 35 feet, is on the west side of Welfare Island. The channel east of the island is narrower and has a controlling depth of about 23 feet.

The highway bridge which crosses the eastern channel from Welfare Island to Long Island 5.6 miles from the Battery has a vertical-lift span with clearances of 40 feet down and 99 feet up.

In 1970, a tunnel was under construction between Manhattan Island and Long Island about 0.4 mile southwestward of the highway bridge. Mariners should use caution in navigating in the area since various floating construction equipment might exist at the site.

Queensboro Bridge, which crosses from Manhattan Island to Welfare Island and thence to Long Island 5.0 miles from the Battery, has fixed spans with clearances of 131 feet over the main channel and 133 feet over the eastern channel.

Chart 745.—Welfare Island Reef (Blackwells Island Reef), with bare islets, rocks awash, and submerged rocks, extends 0.3 mile southwestward from the island. **Belmont Island**, near the southwest end of the reef, is marked by a light.

Chart 275.—Newtown Creek is entered on the eastern side of East River 3.6 miles from the Battery. The creek extends 3.3 miles eastward and southward and has several short tributaries or basins. Traffic is fairly heavy and consists chiefly of petroleum products, sand, gravel, and crushed rock; drafts of vessels navigating the creek seldom exceed 15 feet.

Tributary basins are **Dutch Kills**, on the north side of Newtown Creek 0.8 mile from East River; **Whale Creek**, on the south side opposite Dutch Kills; **Maspeth Creek**, on the east side 2.2 miles from East River; **East Branch**, on the east side 2.5 miles from the river; and **English Kills**, which extends westward and southward from the East Branch entrance and forms the last 0.8 mile of Newtown Creek.

In 1966, the controlling depths in the improved channels were 13 feet (18 feet in midchannel) in Newtown Creek to the south side of Maspeth Creek, thence in 1966-September 1970, 7 feet in midchannel (14 feet in the right inside quarter) to English Kills and East Branch; thence in September 1970, 6 feet (7 feet in midchannel) in East Branch. In July 1971, the controlling depths in English Kills were 11 feet (15 feet in midchannel) to Metropolitan Avenue Bridge; thence in September 1971, 5½ feet to within 200 yards of Montrose Avenue Bridge, thence 1½ feet to the bridge.

In September-October 1970, a depth of about 10 feet could be carried in midchannel in Dutch Kills to the turning basin at the head; lesser depths were found in the rest of the channel. Depths of about 13 feet were available in the center of the basin, and 4 feet in the eastern end and 6 feet in the western end. In September 1970, Maspeth Creek had shoaled to bare in places; depths of about 13 feet were available between the mouth of the creek and the easterly edge of the improved channel in Newtown Creek.

The mean range of **tide** in Newtown Creek is 4.1 feet. The tidal current is weak and variable.

Pulaski Bridge, which crosses Newtown Creek 0.5 mile above the mouth, has a bascule span with a clearance of 39 feet at the fenders and 46 feet at the center.

Dutch Kills, which is about 0.5 mile long, is crossed by several bridges. Minimum clearance under closed drawspans is 2 feet; clearance under the fixed bridge is 90 feet.

Greenpoint Avenue Bridge, 1.1 miles above the mouth of Newtown Creek, has a bascule span with a clearance of 26 feet. Kosciusko Memorial Bridge, 1.8 miles from the mouth, has a fixed span with a clearance of 125 feet. Metropolitan Avenue Bridge, which crosses English Kills 3 miles from the mouth of Newtown Creek, has a bascule span with a clearance of 10 feet at the center. Montrose Avenue Bridge, at the head of English Kills, has a swing span with a clearance of 4 feet.

Grand Avenue Bridge, which crosses East Branch, has a swing span with a clearance of 8 feet. (See **117.165 (b) and (c)**, chapter 2, for drawbridge regulations and opening signals.)

Chart 745.—From abreast the entrance to Newtown Creek the 35-foot-project main channel of East River crosses from the west side of the river to the east side. Depths of 24 feet extend as much as 0.2 mile from the piers on the west side. **Poorhouse Flats Lighted Range** (40°43.4′ N., 73°57.8′ W.), bearing **161°**, is on the Brooklyn side of the river and marks the best water in the crossover.

Williamsburg Bridge, which crosses East River 2.0 miles northeast of the Battery, has a suspension span with a clearance of 133 feet.

The site of the inactive **New York Naval Shipyard** is in **Wallabout Bay**, on the Brooklyn side of East River 1.7 miles northeast of the Battery.

Manhattan Bridge, which crosses East River 1.0 mile northeast of the Battery, has a suspension span with a clearance of 134 feet.

Brooklyn Bridge, which crosses East River 0.7

mile northeast of the Battery, has a suspension span with a clearance of 127 feet.

East River Deepwater Lighted Range (40°42.0′ N., 74°00.0′ W.), bearing **078°**, is on the Brooklyn side of the river and marks the best water in the 40-foot-project main channel which leads from deep water in New York Upper Bay to the inactive New York Naval Shipyard. The range line passes about midway between the Battery and Governors Island, 0.5 mile to the southward.

10. SOUTH COAST OF LONG ISLAND

This chapter describes the south coast of Long Island from Shinnecock Inlet to and including East Rockaway Inlet; several other inlets making into the beach along this part of the coast; and the canals, bays, and tributaries inside the beach. Also described are the towns of Patchogue and Oceanside with their oil terminals; Bay Shore, a large fishing center; and the many smaller communities which support a large small-craft activity.

Caution.—Eelgrass is found in most of the waters described in this chapter. Eelgrass nets are often placed at the entrances to canals and are sometimes difficult to see.

Storm warning display locations are listed on NOS charts and shown on the Marine Weather Services Charts published by the National Weather Service.

Chart 1108.—The south coast of Long Island has a general trend of 247° for 68 miles from Montauk Point of Fire Island Inlet, and thence trends 263° for 36 miles to the western end of Coney Island in the Lower Bay of New York Harbor. It is a clear shore, and may be safely approached as close as 1 mile with not less than 30 feet anywhere between Montauk Point and Rockaway Inlet, except off Fire Island Inlet and the inlet's westward side where the shore should be given a berth of at least 1.5 miles. When viewed from seaward it presents only a few prominent features. It is composed of a series of sand dunes backed by low dark woods.

Shinnecock, Moriches, Great South, and Hempstead Bays are inside the beach along the south coast of Long Island and form an **inside route** for boats of about 3-foot draft. The three main inlets from the sea to these bays are Fire Island Inlet, Jones Inlet, and East Rockaway Inlet. These inlets are subject to frequent and extensive changes, and, although buoyed, should not be used without local knowledge.

Two small inlets, Shinnecock Inlet and Moriches Inlet, which broke through in 1938 and 1931, respectively, are also used by small boats for entrance to these bays, but their use is not advisable without local knowledge.

Chart 120-SC.—Shinnecock Canal, 31.5 miles southwestward of Montauk Point, is about 1 mile long and connects Great Peconic Bay with Shinnecock Bay. It is a partly dredged cut and is protected at the north entrance by two jetties, each marked by a light. The fixed bridges and overhead power cables across the canal have a least clearance of 20 feet. In 1971, a fixed highway bridge with a design clearance of 22 feet was under construction close southward of the fixed highway bridge at the south end of the canal; upon completion it will replace the existing bridge. The lock about midway in the canal is 250 feet long, 41 feet wide, with a depth of 12 feet over the sills. Tide gates are parallel to and westward of the lock. The lock gates and tide gates are constructed so that tidal action opens them to allow the current to set south through the canal and closes them to prevent water from Shinnecock Bay to flow back into Great Peconic Bay. The lock gates are tended 24 hours and are opened mechanically when the tidal current is flowing northward to allow the passage of boats. The signal for opening the lock is three blasts of the boat whistle or horn. At the railroad bridge, the current has an average velocity of 1.5 knots, but it has been reported that greater velocities may be experienced; see Tidal Current Tables for predictions. It is further reported that swirls occur between the northernmost bridge and the northern end of the lock.

The Shinnecock Canal and the dredged cuts through Shinnecock Bay, Quantuck Bay, Moriches Bay, Narrow Bay, and Bellport Bay to Great South Bay are owned and maintained by Suffolk County of New York and provide an inland waterway along the south side of Long Island. The cuts were dredged to a depth of 6 feet and a width of 100 feet. This waterway, from the south end of Shinnecock Canal to a point in Great South Bay opposite Patchogue, a distance of about 29.2 miles, is subject to frequent shoaling; mariners are advised to obtain local knowledge.

On the east side of Shinnecock Canal just south of the jetties is a boat basin in which the depth ranges from 7 to 10 feet. Near the railroad bridge boats tieup at the bulkhead. There are several small-craft facilities on both sides of the canal. Gasoline, diesel fuel, water, ice, storage, marine supplies, berths, and mobile hoists up to 40 tons are available; hull and engine repairs can be made.

Hampton Bays, a station on the Long Island Railroad just west of Shinnecock Canal, is the nearest post office. **Canoe Place**, the settlement at the canal, has gasoline and some supplies. Small craft and fishing vessels tie up along the bulkheads lining the west bank of the canal and berth in the basins along its eastern edge.

Shinnecock Inlet, 31 miles westward from Montauk Point along the south coast of Long Island, is the easternmost entrance from the Atlantic to **Shinnecock Bay** and the inland water route along the south shore of Long Island. The inlet should not be attempted without local knowledge because of the frequent changes in channel depths.

Shinnecock Light (40°50.5′ N., 72°28.8′ W.), 67 feet above the water, is shown from a red skeleton tower on the west side of the inlet. A fog signal and marker radiobeacon are at the light. Private

lights are on the jetties at the entrance to the inlet, and uncharted buoys mark the channel.

The east jetty extends about 120 yards beyond the light marking it. There are small-craft facilities just westward of Shinnecock Light. Berths, gasoline, diesel fuel, water, ice, and some marine supplies are available; hull and engine repairs can be made.

A fish haven, marked by an orange and white spar buoy, is about 2.4 miles south of Shinnecock Inlet entrance.

Ponquogue Point, low and sandy, is 1.2 miles northwestward of Shinnecock Light. The channel from inside Shinnecock Inlet to the waterway south of the point has a depth of about 8 feet. The highway bridge crossing Shinnecock Bay at Ponquogue Point has a 49-foot bascule span with a clearance of 13 feet at the center and 10 feet elsewhere. A Coast Guard station is on Ponquogue Point. **Storm warning signals are displayed. (See chart.)**

Entrances to the small coves on the northeast side and the east end of Shinnecock Bay have depths of about 3 feet.

There are numerous small-craft facilities along the shore and in the creeks making into the north shore of Shinnecock Bay from Ponquogue Point to West Point, the eastern entrance point to Tiana Bay. Berthing, electricity, gasoline, diesel fuel, water, ice, marine supplies, launching ramps, and facilities for hull, engine, and electrical repairs are available. The largest marine railway in the area can handle craft up to 65 feet in length.

Pine Neck, 2.3 miles westward of Ponquogue Point and on the west side of Tiana Bay, is low, flat, and sandy. A shoal extends southward from **Pine Neck Point** and is marked on the south end by a lighted buoy. About 0.5 mile east of Pine Neck, a private unmarked dredged channel leads to a basin at **Tiana Beach**, a small summer resort on the south side of Shinnecock Bay; in 1966, depths were 7 feet in the channel and 5 feet in the basin.

Weesuck Creek, on the north side near the western end of Shinnecock Bay, is entered through a privately dredged channel that leads to the head of the cove at **East Quogue**. In 1967, the channel had a controlling depth of 7 feet. There are two boatyards on the west side near the head of the creek. Gasoline, diesel fuel, water, ice, marine supplies, and storage facilities are available. The largest marine railway can handle craft up to 65 feet in length; hull and engine repairs can be made.

Quogue Canal, depth 5 feet, connects Shinnecock Bay with Quantuck Bay. The canal is crossed by a highway bascule bridge with a clearance of 15 feet, and by an overhead power cable with a clearance of 80 feet.

Quantuck Bay joins Quogue Canal with Quantuck Canal. **Quantuck Creek**, at the head of the bay, is crossed by a fixed bridge, which is the head of navigation except for small pulling boats.

Quantuck Canal, depth 5 feet, connects Quantuck Bay and Moriches Bay. The canal is crossed by two highway bascule bridges with a least clearance of 10 feet. The overhead power cable at **Potunk Point** has a clearance of 77 feet.

About 300 yards northeastward of the bridge at Potunk Point, a privately dredged channel leads to a yacht basin at **Westhampton Beach**. The channel is along the west bank in the bight, and is marked by private seasonal lights and buoys. A dredged cut leads up to Main Street in Westhampton Beach. A reported depth of about 4 feet can be carried to the yacht basin just before reaching the Stevens Lane Bridge, which has a fixed span with a clearance of about 7 feet. Gasoline, water, ice, and marine supplies are available on the east bank of the bight. A marine railway here can haul out craft up to 36 feet in length for engine and hull repairs.

Moriches Bay extends for about 8 miles from Quantuck Canal to Narrow Bay and provides an inside passage for small boats. The general depths in the bay range from 5 to 7 feet, but the southern part is shoal.

Speonk Point, near the eastern end of Moriches Bay on the north shore, is marked by a long, narrow boat landing in ruins, and a prominent flagstaff.

Seatuck Cove, on the north side of Moriches Bay, about 1 mile westward of Speonk Point, is entered through a privately dredged channel that leads northward for about 1.1 miles and then forks into three branch channels: **East Branch**, the easterly branch; **Seatuck Creek**, the northerly branch; and **Little Seatuck Creek**, the westerly branch. In June 1966, the controlling depth in the entrance channel and in the three branches was 7 feet. Private seasonal lighted buoys mark the entrance channel to the fork, and in East Branch to a small-craft facility on the west bank just inside the entrance.

A landing at **Eastport** is on the point just above the fork between East Branch and Seatuck Creek. Gasoline, water, and ice are available at the small-craft facility on East Branch. A 7-ton lift here can haul out craft for engine and hull repairs. Depths of 3 feet are reported alongside. A water tank close northwestward at the head of Seatuck Creek is prominent.

Hart Cove, westward of Seatuck Cove, is entered through a privately dredged and marked channel that leads to the head of the cove. In 1967, the channel had a controlling depth of 7 feet. Small-craft facilities are near the head on the west side of the cove. Gasoline, water, ice, storage, marine supplies, a launching ramp, and a 15-ton mobile hoist are available; hull and engine repairs can be made.

Tuthill Cove, locally known as **West Cove**, on the north side of Moriches Bay, 1.5 miles westward of Seatuck Cove, is entered through a privately dredged and partially marked channel that leads to the head of the cove; in 1965, the channel had a controlling depth of 6 feet. Several privately dredged channels lead from the main

channel to small-craft facilities on the east side of the cove. **East Moriches** is on the north side of the cove. The small-craft facilities on the east side of the cove and those just westward of Tuthill Point have berths, electricity, gasoline, diesel fuel, water, ice, some marine supplies, storage, and launching ramps; hull and engine repairs can be made.

Tuthill Point is on the west side of the entrance to Tuthill Cove. A Coast Guard station is on the east side of the cove. **Storm warning signals are displayed.** (See chart.) A tower 150 feet high, showing red lights, is about 0.2 mile northeasterly of the station.

Moriches Inlet, 44 miles westward of Montauk Point, is a shallow entrance from seaward to the deeper water in Moriches Bay. The entrance is protected by jetties, each with a light on its seaward end. The inlet is considered unsafe to navigate at any time because of the rapidly changing shoaling conditions and existing dangers.

A fish haven, marked by an orange and white spar buoy, is about 2.4 miles south-southwestward of Moriches Inlet west breakwater light.

Orchard Neck Creek, 1.7 miles west of Tuthill Point, is extensively used by local small craft as a mooring basin. A reported depth of about 3 feet is available to the head of navigation. A private seasonal light marks the end of the jetty on the west side of the entrance. A small-craft facility is on the west side of the creek near its head. Gasoline, water, ice, marine supplies, and a 30-foot marine railway are available; hull and engine repairs can be made.

Areskonk Creek, immediately westward of Orchard Neck Creek, is used as a harbor by yachtsmen. A privately dredged and marked channel leads to the head of the creek. In 1969, the channel had a controlling depth of 6 feet. Gasoline, berths, water, ice, some marine supplies, and a launching ramp are available at a small-craft facility just inside the entrance.

Senix Creek, 0.6 mile westward of Orchard Neck Creek, has a narrow entrance. With local knowledge, a reported depth of about 4 feet can be carried in the channel to about 0.5 mile above the entrance. Private lights mark the end of the breakwater and the east side of the entrance. Small-craft facilities near the head of the creek have berths, electricity, gasoline, a launching ramp, and some marine supplies; hull and engine repairs can be made. A marine railway can haul out vessels up to 32 feet in length.

Mud (West Senix) Creek, to the westward of Senix Creek, has a reported depth of about 6 feet. A turning stake inside the mouth of Senix Creek marks the entrance to Mud Creek. The creek is used mostly by local residents. A marina on the east side of the creek near the head has berthage, electricity, gasoline, water, and a small-craft launching ramp; engine repairs can be made.

Forge River, at the northwest end of Moriches Bay, about 0.5 mile westward of the common entrance to Senix and Mud Creeks, is entered through a privately dredged channel that leads to the town dock and turning basin at **Mastic**, about 1.5 miles above the entrance, thence for about 0.2 mile to the head of navigation. In 1965, the controlling depths were 8 feet to the turning basin, thence 5 feet in the basin, and thence 7 feet to the head of navigation. The channel is marked to the turning basin. The town dock is available only to the local residents, howerer, overnight transient berths are available. A **contract physician's office** of the U.S. Public Health Service is at Mastic; see Appendix for address.

Old Neck Creek empties into the easterly side of Forge River about 0.5 mile above the entrance. A privately dredged channel leads from the river to the head of the creek. In 1965, the channel had a controlling depth of 8 feet. A marina, just inside the easterly entrance to the creek, has berths, gasoline, water, ice, some marine supplies, and a small-craft launching ramp; hull, engine, and electrical repairs can be made.

Narrow Bay extends for about 3 miles from Moriches Bay to Bellport Bay, and provides a continuation of the inside passage for small boats. The bridge across the bay eastward of **Smith Point** has a bascule span with a clearance of 18 feet. Caution is recommended when in the vicinity of the bridge because of the piling near the channel.

Bellport Bay extends for about 3 miles from Narrow Bay to Great South Bay and provides a continuation of the inside passage for small boats. The bay is shoal in its southern part but has depths of 5 to 7 feet in the northern part.

Carmans River, on the northeast side of Bellport Bay, has a depth of about 2 feet through the entrance. Sometimes bush stakes are placed on each of the shoals making off from the points at the entrance. Enter in midriver between these stakes, favor the west side for a distance of 0.5 mile, and then follow midriver. The river, marked at the entrance by a lighted buoy, is entered between **Long Point** on the west and Sandy Point on the east. Some of the land areas on both sides of the river just above the entrance are part of the **Werthein National Wildlife Refuge**. A small-craft facility is on the west side of the river about 0.6 mile above the entrance. Berths, electricity, gasoline, water, some marine supplies, a 35-foot marine railway, and a launching ramp are available; hull repairs can be made.

Beaverdam Creek, on the north side of Bellport Bay about 1.5 miles westward of Carmans River, is entered through a privately dredged and marked approach channel. In 1965, the channel had a controlling depth of 7 feet. A small-craft facility is at the head of the creek. Berths, storage, gasoline, and a 35-foot marine railway are available; hull and engine repairs can be made.

The wharf of a yacht club is on the northwest side of Bellport Bay at the town of **Bellport**, about 0.5 mile westward of the entrance to Beaverdam Creek. In 1971, depths of 4 feet were reported

alongside the wharf. Gasoline, water, and a small-craft launching ramp are available.

Great South Bay, on the south shore of Long Island, extends from Bellport Bay on the east to South Oyster Bay on the west. It is about 20 miles long and about 4 miles across its widest part. It can be entered through Fire Island Inlet, from Great Peconic Bay via the inside route, and from westward through Hempstead Bay. The southeast and southwest portions of the bay are shoal. The central portion has, for the most part, depths ranging from 7 to 12 feet. The channels through the bay are well buoyed and lighted.

Ice is a problem in the Great South Bay during the season which usually starts in early January and ends about mid-March. The Coast Guard endeavors to maintain sufficient channels open to ensure shipments of fuel oil.

Abets Creek and **Mud Creek**, on the northeast side of Great South Bay, have depths of about 5 feet and 8 feet, respectively. The entrance to each creek is marked by a private seasonal lighted buoy. Small-craft facilities in the creeks can provide gasoline, diesel fuel, water, ice, storage, and hull and engine repairs. A 4-ton marine railway is available in Abets Creek, and mobile lifts up to 30 tons are available in Mud Creek.

Swan River, about 0.4 mile westward of Mud Creek, is entered through a privately dredged channel that leads to the head of navigation about 1 mile above the mouth. In 1962, the channel had a controlling depth of 6 feet. A private seasonal lighted buoy marks the entrance, and poles mark the channel above the entrance.

Patchogue River, on the north side of Great South Bay, 3.7 miles west of Bellport and 0.9 mile westward of Swan River, is entered through a dredged channel that leads from Great South Bay, thence through **Patchogue Bay**, and thence to the head of river navigation about 1 mile above the mouth. In April 1970, the controlling depth was 6½ feet to the head of navigation. The channel is marked by unlighted buoys from the bay to the jettied entrance. The west side of the entrance is protected by a breakwater with a light on the outer end, and the east side by a bulkhead and short jetty extending southward from it; a private light is near the end of the jetty.

Patchogue, on Patchogue River, is the principal town on Great South Bay and an important distributing point for most of the major oil companies. Barges and coastal tankers constitute the main traffic on the river. Two oil terminals are on the west side of the river, and one is on the east side; in 1971, depths of about 8 feet were reported alongside the oil piers. Elsewhere, the depths at the wharves and piers range from 3 to 9 feet.

Storm warning signals are displayed on the west side of Patchogue River, just inside the entrance.

Passenger ferry service, summer only, is maintained between Patchogue and **Davis Park** on Fire Island.

Small-craft facilities.—Several marinas and boatyards are on both sides of the river at Patchogue. Berths, electricity, gasoline, diesel fuel, diesel oil by truck, water, ice, storage, launching ramps, and marine supplies are available. The largest marine railway in the area can handle craft up to 110 feet, and the largest lift can handle up to 36 tons; hull, engine, and electrical repairs can be made.

Corey Creek, 0.6 mile westward of Patchogue River, is entered between two jetties each marked by a private seasonal light. In 1966, depths of 4 feet were available in the creek. A marina, on the east side of the creek just inside the entrance, has berths, electricity. gasoline, marine supplies, and a 12-ton mobile hoist; hull and engine repairs can be made.

Brown Creek, 3 miles westward of Patchogue, is entered between two short jetties extending out to a depth of about 4 feet. The west jetty is marked at the south end by a light, and the east jetty by a daybeacon. In March-May 1971, the controlling depths in the dredged channel were 6 feet from Great South Bay to Old Town Dock, on the east side of the entrance, thence 4 feet for 0.3 mile to a point opposite a boatyard, thence 3 feet to a point about 0.3 mile south of the Sayville Highway Bridge, and thence 2 feet with local knowledge to the head of navigation at the bridge.

There are several small-craft facilities on the creek. Berths, electricity, gasoline, water, marine supplies, mobile hoists, a small-craft launching ramp, and hull and engine repairs are available. A marine railway can haul out vessels up to 60 feet in length and 7 feet in draft.

Passenger ferry service, summer only, is available from Sayville to Fire Island.

Green Harbor is about 1 mile west of Brown Creek at **Sayville**. The largest marine railway in the harbor can haul out craft up to 50 feet in length; gasoline, water, ice, marine supplies, storage, and complete engine and hull repairs are available. A depth of about 5 feet is reported in the harbor.

Westward of the entrance to Green Harbor are several wharves that are extensively used by the local oyster industry. Gasoline, water, and ice can be obtained there.

Connetquot River, locally known as **Great River**, 3 miles westward of Brown Creek, has a depth of 2 feet for 2 miles above the entrance to the head of navigation at the railroad; favor the east bank of the river when entering. A prominent mansion with a tower, now part of a private school, is on the north shore of the entrance.

There are several small-craft facilities on the lower east side of the river. Gasoline, water, ice, storage, marine supplies, and a 24-ton mobile hoist are available; engine and hull repairs can be made. **Great River** is a village on the west side of the river.

Watch Hill, across Great South Bay from Patchogue, is part of the **Fire Island National Seashore**. A privately dredged and marked channel with a reported depth of 4 feet in October 1971

leads from Great South Bay to a seasonally operated marina. Berthage, electricity, water, ice, and some supplies are available. A passenger ferry operates between Watch Hill and Patchogue.

Cherry Grove, a summer resort across Great South Bay from Connetquot River, has a boat landing extending out to a depth of 4½ feet. Seasonal ferry service is maintained with Sayville.

Point o' Woods, **Ocean Beach**, **Fair Harbor**, and **Saltaire** are summer resorts on Great South Bay westward of Cherry Grove. Gasoline is available at Ocean Beach, and provisions are available at most of these resorts. Year-round ferry service is maintained between Ocean Beach and Bay Shore, a town northwestward on the north shore of Great South Bay, while there is seasonal service between the rest of these settlements and Bay Shore.

On the north shore of Great South Bay, in the vicinity of **Nicoll Point**, is **Hecksher State Park**. A boat basin with guest moorings and a small-craft launching ramp are at the park in a cove about 1.6 miles west of Nicoll Point.

Sailors Haven, across Great South Bay from Nicoll Point, is part of the Fire Island National Seashore. A privately dredged and marked channel with a depth of about 4 feet leads from Great South Bay to a seasonally operated marina at which berthing, water, ice, and some supplies are available. A passenger ferry operates between Sailors Haven and Sayville.

Great Cove, on the north side of Great South Bay about 4 miles westward of Nicoll Point, had depths of 4 to 8 feet. A line of private orange and white spar buoys across the mouth of Great Cove marks a shellfish closure area.

Orowoc Creek, which enters the northeast part of the cove, leads to the boat basin and wharves at the town of **Islip**. The channel in the cove is sometimes marked by stakes, and had a reported depth of about 6 feet in 1971. A private seasonal light marks the westerly edge of the 3-foot shoal on the east side of the channel near the entrance to the creek. Small-craft facilities on the creek can provide gasoline, water, ice, storage, marine supplies, and complete engine and hull repairs. A 55-foot marine railway and a 25-ton mobile hoist are available. Several fish packing plants are on the creek.

A **contract physician's office** of the U.S. Public Health Service is at **West Islip**. (See appendix for address.)

Penataquit Creek and **Watchogue Creek**, locally known as **West Creek**, about 0.5 mile westward of Orowoc Creek, empty into the northwest end of Great Cove through a common entrance. **Bay Shore** is a large fishing center on the northwest shore of Great Cove at the head of the creeks. The common entrance is protected on its westerly side by a bulkheaded sandspit, which forms a well-protected boat basin. The entrance channel leads between the northeast end of the sandspit and a private seasonal light marking the northerly side of the channel; the channel had a reported depth of 6 feet in 1971.

The Bay Shore town landing near the entrance of Penataquit Creek had a reported depth of about 4 feet at its end in 1971; the southern end has a red light on a pole. From the town landing ferries connect with Ocean Beach on a year-round schedule and during the summer with Point o' Woods, Saltaire, and other beach points. **Storm warning signals are displayed.** (See chart.)

There are several small-craft facilities in Penataquit and Watchogue Creeks. Berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and launching ramps are available. The largest marine railway in the area can handle craft up to 100 feet in length, and lifts up to 20 tons are also available; hull, engine, and electrical repairs can be made.

There are several creeks and a dredged boat basin between Watchogue Creek and Conklin Point to the southwestward. These waterways are for the most part privately maintained and for the exclusive use of the local property owners.

Fire Island Inlet, about 28 miles westward along the south coast of Long Island from Moriches Inlet, is the only direct entrance from the Atlantic to Great South Bay. The inlet is subject to frequent changes and has been moving westward for many years. Mariners are warned to beware of extreme tidal turbulence especially during times of tidal change and should seek local knowledge of the latest conditions before entering. Navigation of the inlet is is difficult even with relatively calm seas, and for small craft it can be extremely dangerous. During heavy weather, the entrance usually is obstructed by breakers.

Fire Island Light (40°37.9′ N., 73°13.1′ W.), 167 feet above the water, is shown from a black and white horizontally banded tower, 167 feet high, about 3.5 miles eastward of **Democrat Point**. A radiobeacon is adjacent to the light. A Coast Guard station is about 2 miles westward of the light. **Storm warning signals are displayed** at the Coast Guard station. (See chart.)

The **Robert Moses Causeway Bridge** over Fire Island Inlet, 2.1 miles inside the entrance, has a clearance of 65 feet at the 464-foot center span.

A boat basin at the **Robert Moses (Fire Island) State Park** has its entrance just westward of the southern end of the bridge. Berths and water are available in the basin.

The **currents** in Fire Island Inlet, after crossing the bar, have a velocity of about 2.4 knots at full strength and are influenced greatly by the force and direction of the wind. (Consult the Tidal Current Tables for predictions.) In the bay, currents have little velocity except in the narrow channels between the shoals and within a radius of 3 miles from Fire Island Light where their estimated velocity is 1 to 1.5 knots.

Fire Island Inlet remains open throughout the year, but **ice** does become a problem in the inland channels through Great South Bay from early

January through about mid-March. The Coast Guard endeavors to maintain sufficient channels open in Great South Bay to ensure shipments of fuel oil.

The area between Fire Island Inlet and Jones Inlet is characterized by low, sandy beaches and numerous islands fringed by vast stretches of marshy ground. Many shallow areas, irregular in outline, are a serious menace to the navigation of light-draft vessels. An extensive network of bays, creeks, coves, channels, and inlets covers the entire area.

The channel connecting Great South Bay with Jones Inlet, East Bay, and South Oyster Bay is narrow, treacherous, and has numerous short bends. Caution should be exercised when navigating in these areas in small boats.

Several channels lead from Fire Island Inlet to places in Great South Bay and connecting inside waterways. **East Channel** follows the buoyed channel along the north side of **Great South Beach** and joins with the inside passage south of **Nicoll Bay**. It has a depth of about 8 feet. **Range Channel**, just westward of East Channel, has a depth of about 6 feet. **West Channel**, just westward of **Fire Islands**, has a depth of about 7 feet. **Dickerson Channel**, northeastward of Captree Island, was reported to have shoaled to 3 feet in 1967. These channels are marked with buoys that are shifted in position with changing conditions.

From Fire Island Inlet the **State Boat Channel** leads westward through Great South Bay and South Oyster Bay to Zacks Bay at Jones Beach State Park, thence westward in Hempstead Bay through winding channels, well marked by lights and white-capped piles to Reynolds Channel at Point Lookout, just west of Jones Inlet. This channel is maintained and marked by the **Long Island State Park Commission**.

Copies of the rules and regulations for the guidance of vessels using the State Boat Channel may be obtained from the Long Island State Park Commission at Babylon, New York. These regulations limit the **speed** of vessels to 12 m.p.h. in the channel and 5 m.p.h. in the areas designated as basin or anchorage.

A marina on the south side of the channel at the eastern end of **Captree Island** has berthage, gasoline, diesel fuel, water, and ice.

The Robert Moses Causeway Bridge over the State Boat Channel, connecting Oak Beach with Captree Island, has twin bascule spans with a clearance of 29 feet at the center. The twin fixed spans of this bridge and causeway over the inside passage in Great South Bay between Captree Island and **Conklin Point** have a clearance of 60 feet for a middle width of 460 feet.

Oak Island Channel, privately marked and with a depth of 9 feet in 1967, extends northwestward from the State Boat Channel from a point opposite the northeastern end of **Oak Island** to Great South Bay and **Babylon Cove**. From a point about 1.7 miles above the State Boat Channel, Oak Island Channel connects with a privately dredged and marked channel, locally known as **East-West Channel**, that leads westward and parallels the northern shore of Great South Bay for about 6 miles to South Oyster Bay. In 1967, East-West Channel, had a controlling depth of 11 feet. Several channels, some leading northward into the waterways on the north side of Great South Bay and some leading southward to the State Boat Channel, connect with East-West Channel. These connecting channels are discussed later in this chapter.

A line of private orange and white spar buoys across the mouth of Babylon Cove marks a shellfish closure area.

Babylon is a town on the north shore of Great South Bay. A water tank and a church spire are prominent. The public landing, about 0.3 mile northward of Sampawams Point and at the mouth of Sampawams Creek, has a depth of 5 feet at the end. Approaching around **Sampawams Point**, give the point a berth of 0.3 mile when southeastward of it and head northwestward to the wharf.

Sampawams Creek, just northward of the wharf, has been dredged to reclaim adjacent lands and is bulkheaded on the west side. The entrance is marked by private seasonal buoys and a private light. It is used as an anchorage by small craft and has a depth of about 5 feet through the entrance and greater depths inside. Boats also anchor between the public landing and Sampawams Point. This anchorage becomes choppy during easterly or southeasterly winds.

There are several small-craft facilities on the creek. Berthage, gasoline, water, storage, marine supplies, a small-craft launching ramp, and hull and engine repairs are available. The largest marine railway in the area can handle craft up to 50 tons.

Carlls River, westward of Sampawams Point, in 1968, had a depth of 7 feet in the privately dredged entrance channel leading northward from East-West Channel. A marina on the river has berthage, gasoline, water, ice, marine supplies, and a 15-ton mobile hoist; hull and engine repairs can be made.

West Babylon Creek, locally known as **Mud Creek**, about 1 mile westward of Sampawams Point, has been dredged by private interests to reclaim land near it for a boat basin. In 1968, the privately dredged and marked entrance channel leading northward from East-West Channel had a controlling depth of 7 feet. Small-craft facilities on the creek have berths, gasoline, water, ice, marine supplies, and a 15-ton mobile hoist; hull and engine repairs can be made. Several creeks to the westward have been improved in a similar manner.

Oak Beach is primarily a summer resort and fishing village on the north side of Fire Island Inlet. The channel to the village pier, passing eastward of Oak Island, has a depth of about 9 feet.

Seganus Thatch, westward of Captree Island, has a boatyard with a marine railway that can haul out boats up to 50 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete en-

gine and hull repairs are available. Depths of 8 feet were reported alongside in 1970.

Cedar Island Beach and **Gilgo Beach**, westward of Oak Beach, are maintained and operated by the County and Township authorities and are not part of the Long Island State Park System.

Neguntatogue Creek, on the north side of Great South Bay at the town of **Lindenhurst**, has several small-craft facilities that can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies; hull and engine repairs can be made. Maximum haul-out capacities are: railway, 55 feet; lift, 40 tons. In 1966, the controlling depth was 5 feet in the privately dredged channel from the Neguntatogue Creek entrance across Great South Bay to a junction with the State Boat Channel just eastward of Cedar Island; the channel is marked by privately maintained buoys. Several large landings near the head of the creek, from which local boats leave for fishing parties, are available for public use.

Strongs Creek, westward of Neguntatogue Creek, in 1968, had a controlling depth of 7 feet in the privately dredged entrance channel leading northward from East-West Channel. Small-craft facilities in the creek have gasoline, storage, and a 12-ton mobile hoist; hull and engine repairs can be made.

Great Neck Creek, westward of **Strongs Point**, has a depth of about 7 feet in the privately dredged entrance channel leading northward from East-West Channel; greater depths are inside. Small-craft facilities in the creek can provide berths, electricity, gasoline, water, and marine supplies; hull and engine repairs can be made. The largest mobile hoist can handle craft up to 15 tons.

Amityville Creek, on the north side of the western extremity of Great South Bay, had a reported depth of about 4 feet in 1971. Several boatyards on the creek have marine railways, the largest of which can handle craft up to 50 feet in length; gasoline, water, ice, diesel fuel, storage, marine supplies, and complete engine and hull repairs are available.

Amityville is a small town on the north shore of Great South Bay at its western extremity. A channel, locally known as **Amityville Channel**, with a reported depth of about 4 feet in 1971, privately maintained and marked by lights and markers, extends southward from Amityville Creek and joins the State Boat Channel near Gilgo Beach. The village wharf bares at low water at its face.

Narraskatuck Creek, 0.5 miles westward of Amityville Creek had a reported depth of about 3 feet in 1971. The small-craft facilities on the creek have berths, electricity, water, ice, storage, and marine supplies. Mobile hoists can handle craft up to 20 tons; hull, engine, and electrical repairs can be made.

Carman Creek, about 0.8 mile westward of Amityville Creek, is used by boats drawing about 3 feet.

South Oyster Bay, lying between Great South Bay and Hempstead Bay, is shoal over its greater part. A channel marked with poles, good for a draft of 4 feet at high water, extends through the bay. Through traffic uses the State Boat Channel and connecting lanes on the south side of the Bay.

Gilgo Heading, a channel and basin between the State Boat Channel and Gilgo Beach, has a depth of about 7 feet.

An 081°-261° measured nautical mile is along the State Boat Channel about a mile westward of **West Gilgo Beach**. The course is marked by ranges on the south side of the channel.

Chart 120-SC.—Hempstead Bay is on the south side of Long Island inside the beach extending from the west end of Great South Bay to Far Rockaway. The bay has many sloughs that are subject to change in the vicinity of the inlets and where dredging is done to reclaim land. Navigational aids marking the main channels of the bay are maintained by the town of Hempstead. Many shoal spots, some to a foot or less, have been reported at several areas of the rivers and channels.

Chart 120-SC.—Jones Beach State Park, on the south coast of Long Island, comprises about 2,500 acres, and is under the jurisdiction of the Long Island State Park Commission. A prominent red brick water tower, 202 feet high, with a pyramid top, 3.5 miles eastward of Jones Inlet, is the center of Central Mall. The tower, floodlighted at night, is visible 25 miles. **Zachs Bay**, a dredged basin above State Park, has depths of 4 to 29 feet. The eastern part of Zachs Bay is used as an anchorage, and the western part is reserved for swimming.

Great Island Channel, privately marked and with a depth of about 4 feet, leads northward from the State Boat Channel and eastward of **Green Island** to the village of **Seaford** at the head of **Seaford Creek**. There are many small-craft facilities at Seaford and in the vicinity. Berthage, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and small-craft launching ramps are available. The largest marine railway can handle craft up to 45 feet in length, and the largest mobile hoist is 35 tons; hull, engine and electrical repairs can be made.

The Jones Beach Causeway Bridge has the following clearances: 14 feet for the 29-foot fixed span across the State Boat Channel from Jones Beach State Park to Green Island; 16 feet for the bascule span between Green Island and Great Island; and 11 feet for the 26-foot fixed span across Island Creek.

Caution.—The current is reported to be swift during periods of maximum flood and ebb at the bridge crossing the State Boat Channel from Green Island to Jones Beach State Park, and has a tendency to set boats into the bridge abutments. Mariners are advised to avoid this part of the channel during these periods, and to use the secondary route around Green Island.

A privately marked channel, locally known as

Racehorse Channel, with a depth of about 6 feet, leads northward from the State Boat Channel and westward of Green Island to the western entrance of **Island Creek**. Three privately marked spur channels from near the northern end of Racehorse Channel lead westward into **East Bay**.

A fish haven, marked by private lighted buoys, is near the middle of East Bay.

On the north side of East Bay, there are several small-craft facilities at the head of **Bellmore Creek** and on the west side of **Nicks Point**. Berths, electricity, gasoline, water, ice, storage, marine supplies, and hull and engine repair facilities are available. The largest marine railway in the area can handle craft up to 50 feet in length.

A channel with a depth of about 5 feet leads between **Snipe Island** and **Egg Island** into **Haunts Creek** on the western side of **Deep Creek Meadow** and joins **Sloop Channel** northwestward of Jones Beach State Park.

The channel joining Sloop Channel on the south and passing east of **East Crow Island**, thence through **Broad Creek Channel** to East Bay, and thence to **Merrick Creek**, has a depth of about 2 feet. The channel joining Sloop Channel on the south through **Swift Creek** and **Neds Creek** to East Bay bares at low water about 0.7 mile north-northeastward of the bridge between West Crow Island and Pettit Marsh. The channel between **False Channel Meadow** and Pettit Marsh has a depth of about 5 feet and leads to Freeport Creek, discussed later in this chapter.

The Meadowbrook State Parkway Bridge has the following clearances: 22 feet for the bascule span across Sloop Channel between Jones Beach State Park and **Jones Island**; 14 feet for the 29-foot fixed span between **West Crow Island** and **Pettit Marsh**; and 12 feet for the 28-foot fixed span between Pettit Marsh and **Fighting Island**.

The Loop Parkway Bridge has the following clearances: 21 feet for the 29-foot fixed span over Swift Creek between West Crow Island and **Meadow Island**; 21 feet for the bascule span between Meadow Island and **Alder Island**; and 20 feet for the 29-foot fixed span over Reynolds Channel between Alder Island and Point Lookout.

Jones Inlet, about 12 miles westward along the south coast of Long Island from Fire Island Inlet, is the principal entrance from the Atlantic to the inside passages and towns in Hempstead Bay. The inlet, which is used mostly by pleasure craft and fishermen, should not be attempted without local knowledge because the channel and depths are constantly changing.

A light and fog signal are on the outer end and a marker radiobeacon is at the inner end of the jetty on the east side of the entrance to Jones Inlet. A Coast Guard station is inside the inlet on the north side of **Short Beach. Storm warning signals are displayed** at the station. (See chart.)

In May 1970, the midchannel controlling depth was 8½ feet in the dredged channel from Point Lookout (40°35.6′ N., 73°34.6′ W.) to a point about 400 yards southward of the Loop Parkway Bridge over Long Creek, thence 8½ feet in the right outside quarter to the bridge. The buoys and soundings in Jones Inlet are not charted because of continual changes; caution and local knowledge is advised.

The **tidal current** in the inlet has a velocity of about 3 knots. (See Tidal Current Tables for predictions.) The mean range of **tide** is about 4 feet.

A wreck, reported covered 4 feet and unmarked, is about 320 yards westward of the jetty light.

Point Lookout is a village on the east end of the barrier beach on the west side of Jones Inlet. Small-craft facilities are on either side of the bridge; gasoline, diesel fuel, marine supplies, and minor repairs are available. **Storm warning signals are displayed.** (See chart.)

Long Creek, marked by privately maintained buoys and poles, leads northward from Jones Inlet between Alder Island and Meadow Island, and between **Smith Meadow** and **Pine Marsh** to Freeport. The channel below the Loop Parkway Bridge has been improved by dredging as previously mentioned. The channel above the bridge at the intersection with **Sea Dog Creek** is subject to frequent change; local information should be obtained before using these waters. The channel above the intersection with Sea Dog Creek has a depth of about 8 feet. A channel between Pine Marsh and Pettit Marsh, with a depth of 13 feet, joins with **The Narrows** and Long Creek about 1 mile northward of the **Bay of Fundy**.

Freeport Creek, leading northward from The Narrows and the channel between Pettit Marsh and False Channel Meadow, had a reported depth of about 8 feet in 1971. Several boatyards and marinas are along the creek where gasoline, water, and marine supplies may be obtained; complete engine and hull repairs can be made to small boats.

Hudson Channel, extending northward to the piers at Freeport, had a reported depth of about 7 feet in September 1971. **Woodcleft Canal**, westward of Hudson Channel, had a depth of about 13 feet.

Freeport is a city on the north shore of **Baldwin Bay** with rail and bus communications to New York City and other points on Long Island. Many small-craft facilities are at Freeport. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage, and complete hull, engine, and electrical repairs are available. The largest marine railway can haul out craft up to 70 feet in length, and the largest mobile hoist is 25 tons. **Storm warning signals are displayed.** (See chart.)

An anchorage area is in **Randall Bay** at the northeast end of **Baldwin Bay**. (See **110.156**, chapter 2, for limits and regulations.)

A channel with a reported depth of about 4 feet in 1971, passes through **Scow Creek** to **Baldwin Harbor**. A channel connecting Baldwin Harbor with Randall Bay, had a reported depth of about 4 feet in 1971.

Milburn Creek, a dredged channel extending northward to **Baldwin** from Baldwin Bay, had reported depths of 3 to 5 feet in 1971. The entrance to the channel is marked by private seasonal barrel buoys. A dredged channel with a reported depth of about 5 feet in 1971 in the northern part of **Middle Bay** leads to **Parsonage Cove**.

Reynolds Channel extends westward from Jones Inlet to East Rockaway Inlet and is the main thorofare of the route between the inlets. It is crossed by several bridges. Strong currents exist in the western portion of Reynolds Channel, and caution must be exercised when approaching the drawbridges, particularly with a fair current; the signal to open the bridge should be given sufficiently in advance so the bridge can be cleared of traffic and the draw opened before the vessel arrives there. The currents of the two inlets meet at the entrance of the channel leading west from Cinder Creek.

A secondary channel extending northwestward through **Cinder Creek** and westward of **Parsonage Island** to Middle Bay had a reported depth of about 3 feet in 1971.

Chart 120-SC.—Long Beach is a seaside resort on the outer beach about 4 miles west of Point Lookout. The waterfront on the bayside is bulkheaded.

The highway bridges crossing Reynolds Channel between Long Beach and **Island Park** have bascule spans with clearances of 20 feet. (See **117.180,** chapter 2, for drawbridge regulations and opening signals.) The railroad bridge about 0.2 mile westward of the highway bridges has a swing span with a clearance of 3 feet.

A dock of the Long Beach Hospital is on the south side of Reynolds Channel about 0.3 mile eastward of the highway bridge; medical aid to boatmen is available here.

Just westward of the railroad bridge, a 10-foot dredged channel passes through Island Park. In 1970, shoaling to 4 feet was reported in the channel about 0.4 mile above the southern entrance. The fixed footbridge and highway bridge crossing the channel have a least clearance of 7 feet. Several wharves are available at Island Park.

Hog Island Channel, the main route to the towns of **Oceanside** and **East Rockaway**, joins Reynolds Channel southwestward of Island Park and leads westward of Island Park, then eastward of West, East, and North Meadows. **East Rockaway Channel**, privately marked and an alternate and shallower route to the towns, junctions with Hog Island Channel about 0.8 mile and 2.4 miles above Reynolds Channel. Oceanside and East Rockaway are along the east and west sides, respectively, of the northern part of East Rockaway Channel.

In 1971, the reported controlling depth in Hog Island Channel was 12 feet to the oil dock at a power plant about 1.75 miles above the junction with Reynolds Channel, thence about 8 feet to the northern junction with East Rockaway Channel. In September 1971, East Rockaway Channel had a reported controlling depth of 6 feet to its head.

Mariners of vessels transiting Hog Island Channel in the vicinity of the public beach at the village of Island Park are requested to proceed at a **speed** that will create minimum wave wash and wake, and avoid damage to the beach facilities.

There are numerous marginal-type petroleum wharves along the eastern side of Hog Island Channel between 1.75 and 2.25 miles above the junction with Reynolds Channel. In 1971, depths of 8 to 13 feet were reported alongside the wharves; oil barges and coastal tankers berth at or near high tide and ground out at low tide when alongside.

Small-craft facilities.—There are extensive small-craft facilities along the south and southeast sides of Island Park, and also on East Rockaway Channel at Oceanside and East Rockaway. Most of these facilities have berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage, launching ramps, and facilities for hull and engine repairs. Marine railways up to 60 tons and lifts up to 40 tons are available at Island Park, and railways up to 50 tons and lifts up to 20 tons are available at Oceanside and East Rockaway.

Storm warning signals are displayed at East Rockaway. (See chart.)

Broad Channel, which joins Reynolds Channel eastward of **Hicks Beach** and leads to **Hewlett Bay** and Macy Channel, had a reported depth of about 3 feet in September 1971.

Woodsburgh Channel, which joins Broad Channel about 0.5 mile northward of Hicks Beach and leads northwestward to **Woodsburgh**, has a depth of about 6 feet. The two fixed bridges over **Woodmere Channel** northwestward of **Brosewere Bay** have a least clearance of 11 feet.

Atlantic Beach is an oceanfront and bayside community on the east side of East Rockaway Inlet. A brown structure with a cylindrical tower atop, is prominent and visible from a considerable distance offshore. Facilities for mooring are eastward and westward of the highway bridge. Gasoline, diesel fuel, fresh water, provisions, and other supplies are available.

Bannister Creek, just east of the Atlantic Beach Bridge, has depths of 7 to 12 feet. A small boatyard on the creek can haul out craft up to 4 tons in weight for hull and engine repairs; water and some marine supplies are available.

The highway bridge crossing Reynolds Channel just inside East Rockaway Inlet has a bascule span with a clearance of 25 feet. (See **117.180,** chapter 2, for drawbridge regulations and opening signals.)

East Rockaway Inlet, about 8 miles westward along the south coast of Long Island from Jones Inlet, is the westernmost entrance from the Atlantic to Hempstead Bay and the inland water route along the south shore of Long Island. The inlet is subject to frequent changes but is reported to be usually safer to navigate than Jones or Fire Island Inlets. The aids marking the inlet are periodically

moved to mark the best water; local knowledge is advised.

A light with a gong buoy to the southward is on the outer end of the jetty on the east side of the entrance to East Rockaway Inlet. A Coast Guard station is inside the inlet at Atlantic Beach. **Storm warning signals are displayed.** (See chart.)

Two large identical apartment buildings are prominent about 0.8 mile north-northeastward of the jetty light.

The **tidal current** in the inlet has a velocity of about 2.3 knots. (See the Tidal Current Tables for predictions.) Caution should be exercised when passing through the inlet and bridge at times of maximum current. The mean range of **tide** is 4.1 feet in East Rockaway Inlet and from 2 to 4 feet in Hempstead Bay.

11. NEW YORK HARBOR

This chapter describes New York Harbor and its approaches and the areas adjacent to it bounded by and including Jamaica Bay to the eastward and Sandy Hook Bay to southward. Included in the text in addition to the facilities at New York City and Staten Island are the New Jersey ports of Perth Amboy, Port Elizabeth, Port Newark, Bayonne, and others which are accessible through tributaries that empty into New York Harbor such as Arthur Kill, Kill Van Kull, Passaic River, and Hackensack River. The Hudson River above New York City is discussed in chapter 12, and the East River, the approach to New York Harbor from Long Island Sound, is discussed in chapter 9.

Chart 1215.—The approach to **New York Harbor** from seaward is generally along the south coast of Long Island or the east coast of New Jersey, although the harbor is easily approached from any direction between east and south. When approaching, the south shore of Long Island will be seen to northward, and the low sandy beaches of the New Jersey shore will be observed to westward. The Long Island shore is readily identified by sand hillocks and thickly settled beach communities, whereas the New Jersey shore is characterized by long sandy stretches and many summer resort settlements.

Dumping grounds are located in the approaches to New York Harbor. (See **205.10** (**a**) and (**b**), chapter 2, for limits and regulations.)

Prominent features.—The four most prominent landmarks, which can be seen for a long distance at sea, are Fire Island Light and a tower at Jones Beach on the Long Island shore, and Sandy Hook Light and the towers of the abandoned Navesink Lighthouse at the north end of the New Jersey coast. When nearing the Lower Bay of New York Harbor, Ambrose Light will be seen; it marks the entrance to Ambrose Channel which is the principal deep-water passage through the Lower Bay.

The south coast of Long Island from Fire Island Inlet to Rockaway Inlet has a general 263° trend for 30 miles. It is a clean shore, and may be approached as close as 1 mile, with not less than 5 fathoms except off the inlets where the shore should be given a berth of at least 1.5 miles. This coast is characterized by sandy beaches and summer resorts at the eastern end, and amusement parks and densely settled communities at the western end.

The shoreline is broken by three prominent and navigable inlets which lead to the inland waterway along the south shore of Long Island. Fire Island Inlet is at the eastern extremity, and its entrance is marked by lights and buoys. Jones Inlet is about 12 miles to the west of Fire Island Inlet. The entrance is prominently indicated by a lookout tower and flag tower on the eastern side and by navigational aids. Jones Beach State Park is on the east side of the inlet; a lighted tower in the park is a conspicuous landmark.

East Rockaway Inlet, about 8 miles westward of Jones Inlet, is the extreme western entrance to the inland waterway. The inlet entrance is marked by a breakwater with a light on its seaward end. The shoreline between the two inlets is closely built up with large communities. Elevated tanks, towers, and other tall structures are prominent in this area.

A fish haven, marked by private buoys off its southeast and southwest ends, is about 2 miles offshore midway between East Rockaway Inlet and Rockaway Point.

Rockaway Point, 17 miles westward of Jones Inlet, is the southwestern extremity of Long Island and the eastern entrance to New York Lower Bay. **Rockaway Inlet Light** (40°33.1′ N., 73°56.4′ W.), 25 feet above the water, is shown from the top of an orange house on the point; a marker radiobeacon, suitable for calibration purposes, is at the light. A breakwater, marked at its seaward end by a light and fog signal, extends southward from the point. Rockaway Inlet forms a large deep entrance to Jamaica Bay.

Ambrose Light (40°27.5′ N., 73°49.9′ W.), 136 feet above the water and off the entrance to New York Harbor, is shown from a red tower on a square white deckhouse on four steel pilings with the name AMBROSE in white letters on all four sides; a fog signal and radiobeacon are at the light. **Storm warning signals are displayed during daytime.**

Sandy Hook, the southern entrance point to New York Harbor, is low and sandy. A Coast Guard station and two tall observation towers are near the northern extremity of Sandy Hook. These observation towers, and a large black tank to the southeast, are the most prominent objects on the northern end of Sandy Hook. Southward of the tank are several houses and **Sandy Hook Light** (40°27.7′ N., 74°00.1′ W.), 88 feet above the water and shown from a white stone tower, 85 feet high. This light, established in 1764, is the oldest in continuous use in the United States. A loran station is about 0.6 miles northward of the light.

The most prominent landmark southward of the entrance to New York Harbor is the high wooded ridge forming the **Highlands of Navesink**. The brownstone towers of the abandoned Navesink Lighthouse located on the easternmost spur of the highlands are 73 feet above the ground and about 246 feet above the water. The northerly tower is

octagonal, and the southerly tower is square. A privately maintained light is shown from the northerly tower.

Boundary lines of inland waters.—The lines established for New York Harbor are described in **82.20**, chapter 2.

Soundings will be found most useful to warn vessels of too close an approach to the shore in approaching New York Harbor. Many vessels have been wrecked on the coast of New Jersey and Long Island through failure to take frequent soundings when the position was uncertain. Depth is a better indication of position off this part of the coast than the character of the bottom, as the same characteristics may be found in widely different positions. A frequent use of soundings and close study of the charts will always give sufficient warning of danger. If a vessel is not certain of her position, the depth should not be shoaled to less than 15 fathoms on the south coast of Long Island eastward of Fire Island Light, or 11 fathoms between Fire Island Light and Barnegat Lighted Horn Buoy B, or 9 fathoms southward of Barnegat Lighted Horn Buoy B.

From the position of the two shores relative to each other and to the entrance to New York Harbor it follows that a course of 215° will deepen the water if the vessel is on the Long Island side of the approach and will shoal if she is off the New Jersey coast. A course of 035° will deepen the water if the vessel is off the New Jersey side of the approach and will shoal if she is off the Long Island coast.

Eastward of Fire Island Light the water shoals quite rapidly toward the Long Island shore, but inside a line drawn from Nantucket Traffic Lane Lighted Whistle Buoy NB to Barnegat Lighted Horn Buoy B, there is no marked difference in the soundings as either shore is approached except in Mud Gorge.

Modern surveys show the existence of a canyon, evidently cut by the Hudson River in prehistoric days, across the continental shelf, extending about 120 miles southeastward from off Sandy Hook. The inshore section is called the **Mud Gorge** and the offshore section the **Hudson Canyon**. In some sections of this cut the depths are considerably greater than those adjacent to it and the walls are very steep. The use of soundings, especially by vessels equipped with echo sounding apparatus, permits a very accurate determination of a ship's position by the comparison of the soundings with the depth curves on the charts. The bottom of the Mud Gorge is usually of mud; on both sides of it sand predominates.

Cholera Bank, about 10 miles southeastward of Ambrose Light, is about 2 miles long in an east-west direction and has a least depth of 10 fathoms. The bank is very little raised above the general level of the bottom, however, because the bottom is rocky in character; a careful use of the lead will give useful indications in thick or foggy weather. During the summer numerous vessels may be seen on this bank.

Caution.—Telegraphic companies report serious interruptions of international telegraphic communications resulting from repeated breaking of their cables by vessels anchoring southeastward and eastward of Ambrose Light. The companies state that they will be glad to compensate any vessel, which, having fouled the cable, cuts away its anchor and chain in order to save the cable from interruption. Vessels making New York in thick weather and finding it necessary to anchor before entering Ambrose Channel should anchor in the area southward of Sandy Hook Channel Approach Lighted Horn Buoy 2A and westward of the meridian passing through Ambrose Light.

Tides.—(See the Tide Tables for daily tide predictions for Sandy Hook.)

Currents.—The important currents affecting navigation in the approach to New York Harbor are those due to winds. The largest velocity likely to occur under storm conditions is about 1.5 knots. A sudden reversal in the direction of the wind produces a corresponding change in the current, either diminishing or augmenting the velocity. Sustained winds do not maintain the currents at the maximum velocities. The velocity is about 0.2 knots at Ambrose Light. The largest velocity likely to occur is 2 knots.

Between Nantucket and Cape May away from the immediate vicinity of the shore, the tidal currents are generally rotary. They shift direction, usually clockwise, at an average rate of about 30° an hour, and have velocities generally less than 0.3 knot except in the vicinities of the entrances to the larger inland waterways where the velocities increase as the entrances are approached. For a considerable distance from the inlets, strengths of flood and ebb set respectively toward and away from those entrances, and minimums of velocity, corresponding to the slacks of reversing currents, set at right angles to the direction of flood and ebb strengths.

Offshore and away from the influence of the tidal flow into and out of the larger bays, the tidal current maintains an approximately uniform velocity. Shifting its direction continuously to the right, it sets all directions of the compass during each tidal cycle of 12.4 hours. (See the Tidal Current Tables for the predicted times and velocities of the tidal currents at a number of locations in the coastal waters.)

Between Nantucket Island and Sandy Hook there is a general drift of the sea south-southwestward. The average velocity of this movement is about 0.1 knot.

Approaching New York Harbor from the vicinity of Nantucket Shoals Lightship, a slight allowance should be made for a southwesterly set of the current. With an easterly wind it is customary to allow, in order to make the course good, a set of the current with it of at least 0.5 knot.

The effect of the wind on the current should always be considered. The largest velocities likely to

occur during storms are 2.5 knots about 3 miles northward of Nantucket Shoals Lightship and 1.5 knots three miles north of Nantucket Traffic Lane Lighted Whistle Buoy NB and off Five Fathom Bank.

Between Gay Head and Montauk Point the tidal currents set northward on the flood and southward on the ebb. The estimated velocity at strength where the depth is about 25 fathoms is 0.5 knot; closer inshore and near the entrance this velocity increases.

Three miles north of Nantucket Traffic Lane Lighted Whistle Buoy NB the tidal currents have a mean velocity at strength of about 0.2 knot in a westward direction on the flood and an eastward direction on the ebb.

Information about the coast south of Sandy Hook is contained in United States Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry.

Chart 369.—New York Harbor is the principal entrance by water to New York City and the surrounding ports. The harbor is divided by The Narrows into Lower Bay and Upper Bay. The **Battery**, the southern tip of Manhattan, is at the junction of East River and Hudson River. The main channel from the sea to the deep-water terminals in Hudson River has a project depth of 45 feet.

A **Traffic Separation Scheme** has been established off the entrance to New York Harbor. (See charts 1108 and 1215.)

The Scheme is composed basically of **directed traffic areas** each with one way inbound and outbound **traffic lanes** separated by defined **separation zones, a precautionary area,** and a **pilot boat cruising area.** The Scheme is recommended for use by vessels approaching or departing New York Harbor, but is not necessarily intended for tugs, tows, or other small vessels that 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.

(See chapter 3 for a discussion of North Atlantic Lane Routes.)

The **precautionary area** off the entrance to New York Harbor is inscribed by part of a circle with a radius of seven miles centered on Ambrose Light (40°27.5′ N., 73°49.9′ W.) and extending from off the entrance to East Rockaway Inlet to the shore southward of Sandy Hook with the traffic lanes fanning out from its periphery. A Danger Area is in the southeast quadrant of the precautionary area. Extreme caution must be exercised in navigating within the area inasmuch as both incoming and outgoing vessels use the area in making the transition between New York Harbor and the traffic lanes.

The **pilot boat cruising area** is westward of Ambrose Light. (See Pilotage later in this chapter.)

Eastern Directed Traffic Area:

Nantucket to Ambrose Traffic Lane, Inbound.—The eastward approach to New York Harbor is northward of Nantucket Shoals Lightship (40°30.0′ N., 69°28.0′ W.) through the Nantucket-Ambrose Traffic Lane that tapers from 5 miles to 1 mile wide in its 193-mile length. By entering the traffic lane 4 miles north of Nantucket Shoals Lightship, a course of **268½°** follows the centerline of the traffic lane to a point about 4 miles abeam of Nantucket Traffic Lane Lighted Whistle Buoy NB (40°25.7′ N., 73°11.5′ W.), thence a centerline course of **265°** to the junction with the precautionary area, and thence on a **westerly** course for about 8 miles to the pilot boat cruising area. The least known depth in the traffic lane is 59 feet.

Note: Nantucket Shoals Outer Lighted Gong Buoy 12 (40°44.3′ N., 69°19.2′ W.) about 15.9 miles north-northeastward of Nantucket Shoals Lightship is established to facilitate the passage of westbound traffic north of the lightship.

Ambrose to Nantucket Traffic Lane, Outbound.—The eastward exit by outbound vessels is south of Nantucket Traffic Lane Lighted Whistle Buoy NC (40°26.5′ N., 73°40.8′ W.) through Ambrose-Nantucket Traffic Lane that expands from 1 mile to 5 miles wide. By entering the traffic lane 1 mile south of Lighted Whistle Buoy NC, a course of **100°** follows the centerline of the outbound traffic lane to a point 4 miles abeam of Nantucket Traffic Lane Lighted Whistle Buoy NB (40°25.7′ N., 73°11.5′ W.), thence a centerline course of **088½°** to the end of the traffic lane. When seaward of Nantucket Shoals Lightship, steer usual courses to destination. Least known depth in the traffic lane is 61 feet.

Note: The Ambrose to Nantucket Traffic Lane passes 12.8 miles north of the departure point for passenger vessels and other vessels adhering to the North Atlantic Track Line Agreement; this lane is not intended to alter the practice of those vessels.

Separation Zone.—The eastern separation zone between the inbound and outbound traffic lanes tapers from 3 miles to 1 mile wide centered on a line through Nantucket Shoals Lightship and three lighted whistle buoys 131, 170.5, and 193 miles, respectively, westward of the lightship.

Southeastern Directed Traffic Area:

Hudson Canyon to Ambrose Traffic Lane, Inbound.—The southeastward approach traffic lane to New York Harbor is entered near the 100-fathom curve at a point in about 39°24.8′ N., 72°13.0′ W., and tapers from 5 miles to 1 mile wide in its 91-mile length. A **312½°**-course from the entrance follows the centerline of the traffic lane to a point about 4 miles abeam of Hudson Canyon Traffic Lane Lighted Whistle Buoy HA (40°07.6′ N., 73°21.4′ W.), thence a centerline course of **305°**

to the junction with the precautionary area, and thence on a **northwesterly** course for about 8 miles to the pilot boat cruising area. Least known depth in the traffic lane is 69 feet.

Ambrose to Hudson Canyon Traffic Lane, Outbound.— The southeastward exit point for outbound vessels through the Ambrose-Hudson Canyon Traffic Lane, which expands from 1 mile to 5 miles wide, is about 7 miles 141° from Ambrose Light. A course of **140°** follows the centerline of the traffic lane from the exit point to a point about 4 miles abeam of Hudson Canyon Traffic Lane Lighted Whistle Buoy HA (40°07.6′ N., 73°21.4′ W.), thence a centerline course of **132½°** to the end of the traffic lane at the 100-fathom curve. The least known depth in the traffic lane is 77 feet.

Separation Zone.—The southeastern separation zone between the inbound and outbound traffic lanes is centered on a line extending 132½° from Ambrose Light, and tapering from 3 miles wide at the 100-fathom curve to 1 mile wide at the junction with the precautionary area.

Southern Directed Traffic Area:

Barnegat to Ambrose Traffic Lane, Inbound.—The southern approach to New York Harbor is eastward of Barnegat Lighted Horn Buoy B (39°45.8′ N., 73°46.0′ W.) in Barnegat-Ambrose Traffic Lane that tapers from 5 miles to 1 mile wide in its 36-mile length. By entering the traffic lane 4 miles eastward of Barnegat Lighted Horn Buoy B, a course of **353°** follows the centerline of the traffic lane to the junction with the precautionary area, and thence on a **northwesterly** course for about 8 miles to the pilot boat cruising area. The least known depth in the traffic lane is 72 feet.

Ambrose to Barnegat Traffic Lane, Outbound.—The southern exit by outbound vessels is westward of Barnegat Traffic Lane Lighted Whistle Buoy BA (40°20.7′ N., 73°47.7′ W.) through the Ambrose-Barnegat Traffic Lane that expands from 1 mile to 5 miles wide. By entering the traffic lane 1 mile west of the Lighted Whistle Buoy BA, a course of **183°** follows the centerline of the outbound traffic lane. When seaward of Barnegat Lighted Horn Buoy B steer usual courses to destination. The least reported depth in the traffic lane is 45 feet.

Separation Zone.—The southern separation zone between the inbound and outbound traffic lanes tapers from 3 miles to 1 mile wide centered on a line through Barnegat Lighted Horn Buoy B and Barnegat Traffic Lane Lighted Whistle Buoy BA, 35 miles northward of Barnegat Lighted Horn Buoy B.

Channels.—Ambrose Channel, the principal entrance, extends from the sea to deep water in Lower Bay. Thence, **Anchorage Channel**, an extension of Ambrose Channel leads through Upper Bay to the Battery. **Hudson River Channel** continues northward from the Battery for about 5 miles to West 59th Street, Manhattan. Project depth for these channels is 45 feet. Special regulations have been prescribed for the use of Ambrose Channel. (See **207.40**, chapter 2.)

In addition to the usual aids, Ambrose Channel in its outer portion is also marked by **West Bank Light**, shown from a brown conical tower on a black cylindrical pier, in range with **Staten Island Light**, which is shown from a light-colored octagonal brick tower on a gray limestone base on the high ground of Staten Island at Richmond.

Lower Bay is that part of New York Harbor extending from Sandy Hook westward to Raritan River and northward to The Narrows.

Local magnetic disturbance.—Differences of as much as 5° from the normal variation have been reported in Lower Bay in the vicinity of 40°29.6′ N., 74°04.2′ W.

Sandy Hook Channel, project depth 35 feet, provides a secondary route from the sea to deep water in Lower Bay; it connects with **Raritan Bay Channel** to the westward, **Chapel Hill Channel** to the north, and **Terminal Channel** to the south. Chapel Hill Channel has a project depth of 30 feet. The channels are well marked with navigational aids.

(See Notice to Mariners and the latest editions of charts for controlling depths.)

Swash Channel, a natural buoyed passage between Ambrose Channel and Sandy Hook Channel, has a controlling depth of 18 feet, but care is necessary to avoid spots with a least depth of 13 feet near the sides of the channel and a spot cleared to a depth of 14 feet in about the middle of the channel. A lighted range, the rear marker of which is Staten Island Light, leads on a bearing of **305°** to the junction with Chapel Hill Channel.

False Hook Channel, along and close to the eastern shore of Sandy Hook, joins Sandy Hook Channel eastward of the north end of Sandy Hook. The channel has depths of 9 to over 20 feet, and a buoy is at the southern entrance. Strangers should not use the channel.

Fourteen Foot Channel enters Lower Bay just north of Ambrose Channel. The channel has a depth of about 13 feet and is unmarked.

Anchorages.—Anchorage areas have been prescribed for the Port of New York by Federal Regulations. (See **110.1**, **110.60**, and **110.155**, chapter 2, for limits and regulations.)

Vessels are especially cautioned against anchoring in the vicinity of the pipeline and cable areas as shown on the charts. The pipeline area across The Narrows supplies the water for Staten Island. Extensive cable areas are in the vicinity of Governors Island, the Battery, and Ellis Island. (See also chart 541.)

Dangers.—There are five shoal areas in the entrance to New York Harbor which are subject to change in depths and should be avoided by strangers. **False Hook**, off the northeastern side of Sandy Hook, has depths of 4 to 18 feet. **Flynns Knoll**, between Swash, Sandy Hook, and Chapel Hill Channels, has depths of 9 to 18 feet. **Romer Shoal**, between Ambrose and Swash Channels, has depths of 4 to 15 feet and is marked by Romer

Shoal Light; a fog signal is sounded from the light station. **East Bank**, northward and eastward of Ambrose Channel, has depths of 6 to 15 feet. **West Bank**, westward of Ambrose Channel between West Bank Light and Fort Wadsworth, has depths of 1 to 17 feet. Buoys mark the eastern extremity of West Bank.

Mariners are cautioned to maintain a sharp lookout for floating debris in the harbor and channels.

Tides.—The mean range of tide in New York Harbor is 4.6 feet at Sandy Hook and 4.5 feet at the Battery. Daily predictions for both places are given in the Tide Tables.

Currents.—The flood current entering Lower Bay from the sea attains a velocity of about 2 knots in Ambrose Channel entrance, near the outer extremities of Sandy Hook, Coney Island, and The Narrows. It sets generally parallel to the lower straight section of Ambrose Channel and tends to continue to that direction where the channel bends toward The Narrows, setting more or less diagonally across the upper straight section of Ambrose Channel. At the beginning of the flood, the current sets in at the bottom and near the shores while it is still ebbing at the surface in Ambrose Channel.

The ebb in Lower Bay is generally stronger than the flood by 10 percent or more. At its strength it sets from The Narrows approximately parallel to the upper straight end of the lower straight section.

In the channel northward of Governors Island, cross currents may be encountered. During the first 2 hours of flood in this channel (eastward), the current in Hudson River is still ebbing (southward). In the first 1.5 hours of ebb (westward) in the channel north of Governors Island, the current in Hudson River is still flooding (northward). (See Tidal Current Charts, New York Harbor.) At such times large vessels must take special care in navigating the channel. It is reported that the most dangerous time is about 2 hours after high water at the Battery. At this time the current is setting north in the Hudson River and westward from the East River. The effect on a large vessel coming from southward and turning into the East River is to throw her stern to port and her bow to starboard, thus causing a sheer to starboard toward the shoals off the north end of Governors Island. When coming from northward in the Hudson River the same effect tends to prevent the vessel from turning and to cause her to overrun her course. These cross currents are known locally as **The Spider**.

At the seaward end of Ambrose Channel the velocity of the flood current is 1.7 knots and of the ebb current 2.3 knots.

When the ebb is strong the currents in both Ambrose and Swash Channels tend to set toward Romer Shoal. Caution should be maintained to prevent being set onto Romer Shoal when using either channel. On the flood and especially with a westerly wind, caution should be exercised to prevent being set onto Romer Shoal when using Swash Channel.

In The Narrows the velocity of the flood current is about 1.7 knots and of the ebb current 2 knots. (See Tidal Current Tables for the daily predictions of slack water and strength of current.)

In Hudson River off the Battery the velocity of the flood current is 1.5 knots and the velocity of the ebb current is 2.3 knots. Off Forty Second Street, velocities for flood and ebb strengths are 1.7 and 2.3 knots, respectively. (See the Tidal Current Charts, New York Harbor, for the direction and velocity of the current for every hour of the tidal cycle throughout New York Harbor.)

Ice.—Navigation of the channels in the Port of New York and New Jersey is not restricted by ice. The main channels do not freeze over, and any ice in the smaller waterways is well broken up by tugs and general traffic. Fresh-water ice is brought down the Hudson River in large floes during periods of thaws or winter freshets. Occasionally there are large accumulations of ice at Spuyten Duyvil where Harlem River joins the Hudson, and at such times it is difficult for low-powered vessels or tows to make much headway. Under conditions of strong winds the slips on the exposed side of the channel become packed with drift ice, causing difficulty when maneuvering in the slip or when berthing. During extremely severe winters navigation is interfered with seriously for only short periods of time.

Weather.—New York City, an area exceeding 300 square miles, is located on the Atlantic coastal plain at the mouth of the Hudson River. The terrain is flat and diversified by numerous waterways; all but one of the city's five boroughs are situated on islands. Elevations range from less than 50 feet over most of Manhattan, Brooklyn, and Queens to almost 300 feet in the northern part of Manhattan and the Bronx, and over 400 feet in Richmond (Staten Island).

Despite its nearness to the ocean and the numerous bays and rivers nearby, New York City has a climate which more closely resembles the continental type of climate than it does the maritime type. Its modified continental climate follows from the fact that weather conditions affecting the city usually approach from a westerly direction and not from the ocean on the east. Some important exceptions to this must be noted, since the oceanic influence is by no means entirely absent. During the summer, local "sea breezes", winds blowing onshore from the cool water surface, often moderate the afternoon heat; and most often in winter, coastal storms, accompanied by easterly winds, produce, on occasion, considerable amounts of precipitation.

From November through April the prevailing winds are from the northwest; for the remainder of the year the prevailing winds are southwesterly. Gales with velocities of 40 miles per hour or more are predominately from the northwest.

New York's mean annual temperature is slightly

higher than that of most places in the United States of the same latitude, with the exception of localities near the Pacific coast. Precipitation is both moderate and distributed evenly throughout the year. Most of the rainfall from June through September comes from thunderstorms, and, therefore, is usually of brief duration, but relatively intense. From October to April, however, precipitation is generally associated with widespread storm areas, so that day-long rain or snow is common. Over the entire year, the city receives 59 percent of the sunshine hours possible at its latitude. This value compares favorably with that for any region east of the Mississippi, except the Southeast. Relative humidity averages about 66 percent for the year, showing that the city has a relatively damp climate.

The National Weather Service maintains an office at 30 Rockefeller Center, New York, N.Y.; **barometers** may be compared there.

(See appendix for **New York City climatological and 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.

Pilotage is compulsory for foreign vessels and U.S. vessels under register entering or departing from the Port of New York and New Jersey.

Vessels entering the Port of New York and New Jersey through Lower Bay are served by the Sandy Hook Pilots. A pilot boat will be found within the charted pilot boat cruising area westward of Ambrose Light. The pilot boats have black hulls and white superstructures, display the name PILOT NO. 1, PILOT NO. 2, or PILOT NO. 3 in yellow on each side of the hull below the pilot house, and fly a blue flag during the daytime, and show a white light over a red light at night. A pilot boat is usually on station; boarding is made from a smaller motorboat. The pilot boats are equipped to handle radio traffic on 2182 kHz, 2638 kHz, and VHF channel 13 (156.65 MHz), and monitor on a continuous basis 2738 kHz, and VHF channels 16 (156.80 MHz), and 18A (156.90 MHz). Arrangements for pilots are made in advance through the ships' agents. A 24-hour ETA (or participation with AMVER) is requested. Vessel arrival is reported to the Maritime Exchange in New York by the pilots.

Vessels entering the Port of New York and New Jersey through Long Island Sound and Hell Gate are boarded by the Hell Gate Pilots from a pilot boat off Execution Rocks. The 48-foot pilot boat, based at a pier on the east side of City Island about 0.4 mile northward of Belden Point, has a black hull and white superstructure, displays the name PILOT in international orange on each side of the deckhouse, and shows a white light over a red light at night; no signal is displayed during the daytime. The pilot boat is equipped to handle radio traffic on 2182 kHz, 2638 kHz, and VHF channels 13 (156.65 MHz) and 16 (156.80 MHz). Arrangements for pilot services should be made in advance by ships' agents through the Sandy Hook Pilots (telephone: 212-448-3900). A 24-hour and a 3-hour ETA is requested; 24-hour service is available when ordered.

Masters of vessels entering the Port of New York and New Jersey are requested at the time of boarding to proceed at the slowest possible speed, make a lee for the pilot boat, and have a pilot ladder over the side about 3 to 4 feet above the water. Pilotage on the Hudson River northward of Yonkers, N.Y., is provided by the Hudson River Pilots who board vessels in midriver off Yonkers, N.Y. (See chapter 12.)

Towage.—The Port of New York and New Jersey has several towing companies with radio-equipped tugs with over 4,000 hp. Arrangements for tugs are usually made in advance by ships' agents. Fireboats are stationed throughout the harbor.

New York is a **customs port of entry** and the headquarters of the **Regional Commissioner. Quarantine, immigration, and agricultural quarantine** officials are stationed in New York City. (See appendix for addresses.) Vessels subject to such inspections generally make arrangements through ships' agents; officials usually board vessels at their berths.

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.) The quarantine headquarters and boarding station are about 0.55 mile above Fort Wadsworth at Rosebank, Staten Island. The quarantine anchorage is off the station. Vessels not granted pratique are usually inspected at the anchorage, whereas those granted pratique are inspected at their berths.

A **U.S. Public Health Service Hospital** is on Staten Island, and a **contract physician's office** is in New York City. (See appendix for addresses.)

Coast Guard.—The **Captain of the Port** maintains an office at the Coast Guard base on Governors Island. A **Marine Inspection Office** and a **vessel documentation** office are in New York City. (See appendix for addresses.)

Harbor regulations.—The administration of the Port of New York and New Jersey and the enforcement of its laws are vested in no single body, but are divided among various departments of the Federal, State, and Municipal Governments.

Speed.—The Coast Guard desires to warn masters and pilots of all types of vessels that possible action may result against their licenses, and criminal procedures may be exercised, when the wash of a vessel proceeding at excessive speed in confined waters endanger life, limb, or property. Damage to vessels moored at docks and terminals has been reported. The parting of a mooring line may cause a serious oil fire or damage to pipelines or barges which are being loaded or discharged at chemical and petroleum company terminals. Damage caused by excessive speed may also lead

to a possible suit by the injured party against owners, masters, or pilots for monetary recovery.

The **New York City Department of Ports and Terminals** administers the piers along the New York waterfront within the city limits. The office is at the Battery Maritime Building.

The **Port Authority of New York and New Jersey**, an executive body appointed by the governors of New York and New Jersey, is essentially a port development unit. It serves as a bureau of port information and an aid to the mariner. The Port Authority administers piers in Brooklyn, Hoboken, Port Newark, and Port Elizabeth. The office of the Authority is at 111 18th Avenue, New York City.

Wharves.—The Port of New York and New Jersey has over 1,100 waterfront facilities. Most of these facilities are privately owned and operated, and the rest are owned or operated by either the railroads serving the port, the Port Authority of New York and New Jersey, the City of New York, the States of New York and New Jersey, the Federal Government, or other municipalities.

The major steamship passenger terminals are along the east side of the Hudson River (North River) above the Battery. Containership terminals are throughout the port but principally at Elizabeth, Newark, and Weehawken, N.J. Other containership facilities are under construction at Howland Hook at the northwestern end of Staten Island. Break-bulk general cargo terminals are throughout the port but principally along the east side of Upper New York Bay, on the northeast side of Staten Island above The Narrows, and along the East River. Grain handling facilities are at Jersey City and Brooklyn, Petroleum and other liquid cargo facilities are along Arthur Kill, and on the Passaic and Hackensack Rivers. The major railraods serving the Port of New York maintain many waterfront facilities on the New Jersey side of the Hudson River and on the west side of Upper New York Bay.

General cargo in the port is usually handled to and from vessels by ship's tackle. Heavy lifts up to 150 tons, floating cranes up to 500 tons, and derricks are available in port. Most of the waterfront facilities throughout the port have highway and railroad connections.

The wharves and piers of New York City along the waterfronts of the Hudson and East Rivers are numbered beginning at the Battery and follow in sequence eastward along the East River and northward along the Hudson River. (See the Port Series, a Corps of Engineers publication, for a complete and detailed description of the waterfront facilities throughout the Port of New York and New Jersey.)

Foreign Trade Zone No. 1 is located in Building 77 (third floor), Brooklyn Navy Yard, New York, N.Y.

Supplies.—Provisions and supplies of all kinds are available in the Port of New York and New Jersey. All grades of heavy marine bunker fuel, lubricants, and diesel fuel can be obtained. Large vessels are usually bunkered at their berths by tank barges or self-propelled tankers. Water is available at most of the piers and wharves.

Repairs.—The Port of New York and New Jersey has extensive facilities for making all types of repairs to vessels of all sizes. The shipyards at Brooklyn, Hoboken, Staten Island, Queens, and Perth Amboy can drydock some of the largest ocean-going vessels, and can make major repairs to hull, electronic equipment, machinery, and propulsion plants. Also within the port area are a number of firms without waterfront facilties that are engaged in various types of marine repair work. These firms maintain shops and portable equipment for making above-waterline repairs and for installation of equipment, gear, and machinery on all types of craft at berth. Several salvage companies also perform all types of salvage work.

The largest floating drydock, on the west side of the Hudson River at Hoboken, N.J., has a lifting capacity of 25,000 tons, an overall length of 700 feet, a maximum clear inside width of 100 feet, and a depth of 29 feet over the keel blocks; cranes up to 45 tons are available. The largest graving dock, at Erie Basin in Upper Bay at Brooklyn, N.Y., can handle vessels up to 716 feet and has a 87-foot clear gate width, 113-foot inside top width, a 93-foot inside bottom width, and 24½ feet over the keel blocks; cranes up to 90 tons are available. The largest marine railway, on the east side of East Mill Basin in Jamaica Bay, can handle vessels up to 300 tons or 130 feet long; an 8-ton hoist is available.

Communications.—The Port of New York and New Jersey is served by eight trunk line and six short line railroads, numerous trucking firms engaged in long and short-haul freight service, and several bus companies. Over 100 steamship companies connect the port with the principal United States and foreign ports.

Three major airports, John F. Kennedy (New York) International, La Guardia, and Newark, provide frequent scheduled service between New York and domestic and overseas points.

Chart 542.—Rockaway Inlet, the entrance to Jamaica Bay, is between **Rockaway Point** on the southeast side and **Manhattan Beach** and **Barren Island** on the north side. The inlet is obstructed by a shifting sand bar. The entrance channel westward of the jetty has depths greater than 20 feet and is marked by lighted and unlighted buoys. A light and fog signal are near the outer end of the jetty. Rockaway Inlet Light with a marker radiobeacon is 0.7 mile northward of the jetty light. A shoal area with reported depths of 4 feet or less is westward of the entrance channel. A submerged obstruction is about 1.3 miles northwestward of the jetty light.

Marine Parkway Bridge, crossing Rockaway Inlet between Rockaway Point and Barren Island, has a vertical lift span with a clearance of 55 feet down and 152 feet up. A Coast Guard station is

just west of the bridge on Rockaway Point. **Storm warning signals are displayed.** (See chart.)

The mean range of tide at Rockaway Inlet is about 5 feet. In the entrance channel near Rockaway Point the tidal current has a velocity of about 2.2 knots. The ebb attains a greater velocity than the flood and probably exceeds 3 knots at times. South of Barren Island the velocity is about 2 knots; east of Barren Island it is about 1.5 knots. (See Tidal Current Tables for predictions and Tidal Current Charts, New York Harbor, for hourly directions and velocities.)

Jamaica Bay is on the south shore of Long Island about 15 miles southeastward of The Battery, New York City. The bay is characterized by numerous meadows, hassocks, and marshes. The north and east shores are bordered by marshlands which extend inland for a short distance. Several small tidal creeks enter the bay from the north. Channels and basins have been dredged to depths of 12 to 20 feet for use of craft operating in the bay. Rockaway Beach forms the south shore. The bay is about 7 miles long and 3.5 miles wide, and covers an area of about 22.5 square miles. The greater portion of the bay is in the Boroughs of Brooklyn and Queens, New York City, and a small section of the eastern extremity, consisting of parts of Motts Basin and Head of Bay, is in Nassau County.

The commercial vessel traffic in Jamaica Bay consists of motor tankers, barges, and tugs. The bay is used extensively by pleasure craft.

Jamacia Bay has excellent transportation facilities. Highways connect with all of Long Island and New York City, and the Rockaway Beach Branch of the Long Island Railroad crosses the central part of the bay and extends eastward and westward along the Rockaway peninsula with stations at Far Rockaway and Inwood serving the Motts Basin area.

Ice is a problem in Jamaica Bay, mainly in the tributaries and basins, from early January to about mid-March.

Sheepshead Bay, on the northern side of the eastern extremity of Coney Island and northward of **Manhattan Beach**, is well protected and is used by numerous pleasure and party fishing craft during the summer. The entrance channel is marked by buoys and has a depth of about 14 feet; depths inside the bay are about 10 feet to the bridge near the head of navigation except for some shoaling to 2 feet along the edges. A private light marks the outer limit of an outfall sewer that extends southward from the bay.

Special anchorage areas have been prescribed for Sheepshead Bay. (See **110.1** and **110.60**, chapter 2, for limits and regulations.)

Small-craft facilities in the bay can provide berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and hull and engine repairs; the largest marine railway can handle craft up to 30 feet.

Gerristen Inlet, northward of Rockaway Inlet, is the common approach to **Plumb Beach Channel**, Gerristen Creek, and Mill Creek. A fixed highway bridge with a clearance of 35 feet crosses the inlet. The channel through the inlet is marked by buoys. In 1971, it was reported that a depth of 12 feet could be carried in midchannel through the inlet to the head of Plumb Beach Channel by avoiding a 5-foot spot close eastward of Gerristen Inlet Buoy 7. Mariners are advised to follow the buoys through the inlet closely, as a reported shoal area with a least depth of 2½ feet is about 0.1 mile southeastward of Gerristen Inlet Buoy 7, and a reported obstruction is 0.3 mile eastward of the buoy.

From the highway bridge over Gerristen Inlet, Plumb Beach Channel leads westerly and **Gerristen Creek** and **Mill Creek** lead northwesterly. There are dangerous pilings and remains of old barges along the south side of Plumb Beach Channel, and several submerged wrecks in Gerristen and Mill Creek. The fixed highway bridge over Mill Creek is in ruins; mariners are advised to exercise caution in this area as some parts of the bridge structure have fallen into the water and are an obstruction to navigation.

There are several small-craft facilities on Plumb Beach Channel at **Gerristen**. Berths, electricity, diesel fuel, gasoline, water, ice, marine supplies, and storage facilities are available; hull and engine repairs can be made. Marine railways up to 50 feet and lifts up to 30 tons are also available.

Dead Horse Bay makes into the southwest side of Barren Island eastward of the highway bridge across Gerristen Inlet. A marina, on the north side of the bay, has berths and moorings.

Island Channel, with depths of 16 feet or more except for a 6-foot spot in 40°38′22.5″ N., 73°51′40.0″ W., leads northerly from just eastward of Barren Island to Canarsie, thence northeasterly to Howard Beach. The channel is marked by a lighted range, and lighted and unlighted buoys. A seaplane **restricted area** is in Island Channel and adjacent waters eastward of Barren Island. (See **207.37**, chapter 2, for limits and regulations.)

Big Fishkill Channel and **Pumpkin Patch Channel** lead in a northeasterly direction from Island Channel just west of **Ruffle Bar** and rejoin Island Channel 0.3 mile west of the Cross Bay Boulevard Bridge at Howard Beach. In 1971, it was reported that Pumpkin Patch Channel had shoaled to 2 feet at a point about 1 mile southward of its junction with Island Channel. Local knowledge is advised before entering.

Floyd Bennett Field, on Barren Island, is the site of a Coast Guard air station. A 1,800-foot-long marginal wharf with a depth of about 24 feet alongside is at the southeastern extremity of the island.

Mill Basin is northward of Barren Island on the west side of Jamaica Bay. In 1971, a reported midchannel depth of about 16 feet could be taken to the north end of the basin. Several small-craft facilities in the basin can provide gasoline, water, ice, marine supplies, storage, and engine and hull

repairs. The largest marine railway can handle craft up to 50 tons.

A bascule highway bridge with a clearance of 34 feet crosses Mill Basin between Barren Island and Brooklyn. (See **117.175**, chapter 2, for drawbridge regulations and opening signals.)

East Mill Basin is about 0.4 mile northeastward of Mill Basin. In 1971, a midchannel depth of about 14 feet could be taken to the head of the basin. Small-craft facilities in the basin can provide berths, electricity, gasoline, water, ice, marine supplies, storage, and engine and hull repairs. The largest marine railway in the basin can handle craft up to 130 feet or 300 tons.

Bergen Beach is a summer resort about 2 miles north of Barren Island. **Paerdegat Basin**, just north of Bergen Beach, has a midchannel depth of about 11 feet. A fixed highway bridge across the basin near the mouth has a clearance of 29 feet. A marina at the head of the basin can haul out craft up to 18 tons. Gasoline, marine supplies, water, and engine and hull repairs are available. Several yacht clubs are also in the basin.

Canarsie, a town and summer resort on the northwestern shore of Jamaica Bay, is a part of New York City. The reinforced concrete pier at Canarsie has a length of about 380 feet along its face and about 580 feet on its southwest and northeast sides, with depths of 12 to 20 feet alongside. Two flagpoles in about the center of the pier are prominent. The dredged areas on the west and east sides of the pier provide anchorage for boats. A maximum current of about 0.6 knot under normal conditions sets along the southeast side of the pier. Public facilities at the pier include mooring berths for pleasure and fishing craft.

Fresh Creek, 0.6 mile northeastward of the pier at Canarsie, has a midchannel depth of about 8 feet. A highway bridge across the creek near the entrance has a 43-foot fixed span with a clearance of 21 feet. **Hendrix Creek**, 0.4 mile northeastward of Fresh Creek, is the site of a sewage treatment plant. **Old Mill Creek**, 1.1 miles northeastward of Fresh Creek, bares at low water just above the entrance. Fresh, Hendrix, and Old Mill Creeks were little used in 1971.

Howard Beach, about 2.5 miles eastward of Canarsie, on the north side of Jamaica Bay, has several basins for boats. Cross Bay Boulevard Bridge with a bascule span and a clearance of 20 feet crosses Island Channel just south of Howard Beach. (See**117.175**, chapter 2, for drawbridge regulations and opening signals.)

Shellbank Basin, extending northward about a mile from Island Channel and just west of Howard Beach, has a controlling depth of about 8 feet. The basin has numerous small piers and float landings along both sides, and facilities for complete small-craft engine and hull repairs. The largest marine railway in the basin can handle craft up to 42 feet; gasoline, diesel fuel, water, ice, and marine supplies are available. The bascule span of a former highway bridge across the basin has been permanently removed leaving a channel width of 40 feet.

Hawtree Creek, about 0.2 mile eastward of Shellbank Basin, has a depth of about 11 feet. A fixed pedestrian bridge, about 0.3 mile above the mouth, has a clearance of 17 feet.

A railroad bridge across Island Channel, 0.5 mile east of the Cross Bay Boulevard bridge, has a swing span with a clearance of 26 feet. (See **117.175**, chapter 2, for drawbridge regulations and opening signals.)

Rockaway Beach is a popular summer resort on the barrier beach forming the southern extremity of Jamaica Bay. Train and bus transportation is available to New York City. Excursion boats operate between New York and Rockaway Beach during the summer only. Berths, electricity, diesel fuel, gasoline, water, ice, storage, a 50-foot marine railway, and a 100-ton lift are available at Rockaway Beach in **Vernam Basin**, about 0.7 mile northeastward of Cross Bay Boulevard Bridge. Hull and engine repair facilities are also available.

Beach Channel, on the north side of Rockaway Beach, had a least depth of 13 feet from Rockaway Inlet to the Cross Bay Boulevard Bridge, thence 11 feet to the wharves near the railroad bridge 0.5 mile to the eastward in 1970. A shoal, bare at low water, is about 100 yards southeastward of Channel Light 7.

A 056°-236° measured nautical mile is along the south shore of Jamaica Bay parallel with the steel bulkhead of Beach Channel Drive southward of **Nova Scotia Bar**. The structures are maintained by the Brooklyn Power Squadron; the front markers are yellow squares with black borders, and the rear markers are black and yellow chevrons.

Cross Bay Boulevard Bridge, crossing Beach Channel at Rockaway Beach, has a fixed span with a clearance of 50 feet; the bascule bridge close westward is being removed. The railroad bridge over Beach Channel, 0.5 mile eastward, has a swing span with a clearance of 26 feet. **Broad Channel** is blocked off by the railroad trestle of this bridge.

Winhole Channel, a natural and buoyed channel, extends 1 mile northward to Grassy Bay from the junction of Beach Channel with Grass Hassock Channel. Winhole Channel has a least depth of about 16 feet, except for reported shoaling to 3 feet extending into the west side of the channel near the southern entrance in about 40°36′12″ N., 73°48′21″ W. A lighted buoy marks the junction of Beach, Grass Hassock, and Winhole Channels.

Grass Hassock Channel joins Beach Channel off **Brant Point** and continues in a northeasterly direction to Head of Bay. The controlling depth in the channel is about 15 feet.

Sommerville Basin, about 1.2 miles eastward of the railroad bridge at Rockaway Beach, is approached through depths of about 8 feet with depths of 27 to 40 feet inside. Several charted sunken wrecks are in the basin. A boatyard at the

head of the basin has berths, electricity, gasoline, water, ice, marine supplies, storage facilities, and a launching ramp; engine and hull repairs can be made.

Motts Basin, a tidal inlet in the eastern part of Jamaica Bay, entered through **Negro Bar Channel**, partially separates the communities of **Inwood** and **Far Rockaway**, Two branch channels lead from inside the entrance to the northeasterly and southeasterly ends of the basin. In 1961, a controlling depth of about 15 feet was available in the entrance and branch channels; the channels are marked by buoys. A depth of 3 feet is at the junction of Negro Bar Channel with Grass Hassock Channel, just southward of Grass Hassock Channel Light 23. **Ice** may obstruct vessel movement in the basin during severe winters.

Overhead power cables across Motts Basin have the following clearances: one over the northerly arm, 70 feet; two over the southerly arm, least clearance 92 feet; and one over the cut on the south side of the southerly arm, 60 feet. A retractable boom is on the south shore of the basin about 90 yards northwest of the overhead cable tower. A light is shown from the boom when it is extended into the water.

Depths alongside the wharves in Motts Basin range from 1 to 14 feet. Waterborne commerce in the basin is chiefly in petroleum products.

Head of Bay joins Grass Hassock Channel near **Northwest Point** and extends in a northeasterly direction on the south side of **John F. Kennedy (New York) International Airport.** Depths of about 15 feet are in the entrance channel and channel in the bay; aids mark the channels. A draft of about 9½ feet can be taken to the oil piers on **Uncle Daniels Point** at high water.

Thurston Basin, at the eastern extremity of Head of Bay, has depths of about 15 feet.

Grassy Bay, along the southwestern side of John F. Kennedy (New York) International Airport in the northeastern part of Jamaica Bay, is blocked at the southeastern end by an airport runway. The runway continues into the marshlands on the southerly side of the bay.

Bergen Basin, at the northern extremity of Grassy Bay, has depths of about 15 feet with lesser depths in the eastern arm of the basin. The entrance is marked by buoys. Conspicuous are a yellow brick circular tower about 40 feet high on the southwestern side of the entrance and the numerous oil storage tanks at the head of the basin on the eastern shore. Coastal tankers and sand-and-gravel barge tows account for most of the commerce in the basin.

Chart 540.—Coney Island, on the northern side of the entrance to New York Harbor, is a large summer amusement resort. Numerous stacks, towers, and amusement rides, including a red steel parachute tower 303 feet high, are prominent on the island. **Coney Island Light** (40°34.6′ N., 74°00.7′ W.), 75 feet above the water, is shown from a white square skeleton tower on **Norton Point**, the westernmost extremity of the island. A fog signal is sounded at the light station. **Storm warning signals are displayed** during daytime. (See charts.)

Coney Island Channel, a buoyed passage along the south side of Coney Island, has a controlling depth of about 13 feet to Rockaway Inlet. It is used principally by vessels going to Jamaica Bay and Coney Island.

Gravesend Bay, northward of Coney Island, affords good anchorage in depths of 11 to 50 feet. General and explosives **anchorage areas** have been prescribed in the bay. (See **110.1** and **110.115** (e) and (m) (1), chapter 2, for limits and regulations.) The southeasterly part of the bay is shoal with depths of 1 to 6 feet.

Coney Island Creek is at the southeastern end of Gravesend Bay and on the north side of Coney Island. Commercial traffic on the creek consists mainly of occasional barge shipments of sand and gravel. The area northward of the entrance to the creek is being filled, and there is piling along the northern side of the creek at the filling site. A reported obstruction is in the creek in about 40°35′47″ N., 73°59′32″ W. Depths of about 11 feet are available in the channel along the north shore of Coney Island from Gravesend Bay to about 200 yards below the first bridge, thence 11 to 2 feet to the gas pipeline bridge about 0.5 mile above the first bridge. One bascule bridge and three fixed bridges cross the creek; least clearance is 2 feet. (See **117.190 (a) through (e)** and **(f) (5)** and **(6)**, chapter 2, for drawbridge regulations.)

A buoyed channel with a least depth of 15 feet leads from deep water northward of Coney Island to off the docks in the eastern part of Gravesend Bay. Small-craft facilities here and one on the southern side of Coney Island Creek can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, and hull and engine repairs. Lifts up to 30 tons are available.

Swinburne Island and **Hoffman Island** are artificial islands on West Bank across the Ambrose Channel from Coney Island. A dredged channel from just south of Fort Wadsworth on Staten Island extends southward to these islands. The midchannel depth is about 11 feet to Hoffman Island, thence about 5 feet to Swinburne Island.

Chart 541.—The Narrows, connecting Lower Bay and Upper Bay of New York Harbor, has a clear width of over 0.6 mile at its narrowest point between Fort Wadsworth and Fort Hamilton. The **Verrazano Narrows Bridge**, a fixed suspension span, crosses the narrows at these two points linking Staten Island with Brooklyn. The bridge has a vertical clearance of 217 feet for a midchannel width of 2,000 feet. **Note:** A traveling maintenance platform, when in operation, reduces the vertical clearances by 15 feet. A fog signal is sounded from the eastern end of the bridge.

The Quarantine Station, numerous deep-draft piers, a Coast Guard Reserve facility, and ferry

terminals are on the east side of Staten Island between Fort Wadsworth and St. George.

Upper Bay is that portion of New York Harbor between The Narrows and the Battery. **Anchorage Channel**, marked by lighted buoys, is the main passage through the middle of the bay. **Gowanus Flats** is a shoal area with depths of 8 to 20 feet east of Anchorage Channel. **Jersey Flats**, the area on the New Jersey side west of Anchorage Channel, is much shoaler with depths up to 6 feet. Channels have been dredged through these shoal areas to provide access to the piers on both sides of the bay.

Channels.—Bay Ridge Channel, Red Hook Channel, and **Buttermilk Channel** follow the Brooklyn piers from The Narrows to East River. Controlling depths in these channels are 32 to 40 feet. An obstruction covered 28 feet is at the junction of Red Hook and Buttermilk Channels in 40°40′44.3″ N., 74°01′16.0″ W. Caution should be exercised when docking and undocking vessels along the southeasterly side of Bay Ridge Channel because the current may flow in a direction opposite to the normal channel flow, especially between the piers.

Gowanus Bay, at the junction of Bay Ridge and Red Hook Channels, is a bight in the Brooklyn shore at the mouth of Gowanus Creek. A dredged channel in the creek leads from Gowanus Bay to the Hamilton Avenue Bridge, about 1.1 miles above the mouth. In 1969, controlling depths were 30 feet to Percival Street, about 0.2 mile below the head of the project, thence 22 feet for about another 0.1 mile, thence 18 feet to just below the head of the project. The Gowanus Bay area has several shipyards. The largest floating drydock is on the north side of Gowanus Creek; it has a lifting capacity of 7,500 tons, length of 455 feet, a depth of 21 feet over the keel blocks, and clear inside width of 71 feet.

Gowanus Canal, the improved waterway above Hamilton Avenue, has depths of about 8 to 12 feet. The bridges across the canal have the following minimum clearances: drawbridges, 3 feet; fixed bridges, 90 feet. The fixed bridge across that part of the canal which extends southward along Fifth Street has a clearance of 20 feet.

Erie Basin, just north of Gowanus Bay, is entered from the Red Hook Channel. The basin has drydock and repair facilities for vessels. A graving dock here is capable of hauling out vessels up to 716 feet in length and 25 feet in draft; cranes up to 90 tons are available.

Governors Island is at the middle of the mouth of East River where the river joins Upper Bay. Formerly a U.S. Army installation, it is now the largest **Coast Guard** base. **Fort Columbus** is on the northeast part of the island and **Castle William** is at its northwest end. The main channel is westward of the island. Several lights and fog signals are on the island, and a hexagonal shaped structure is prominent on the northeast side. A privately dredged channel leads northwestward from the main channel and southward of Ellis Island to private facilities on the New Jersey side. In 1965, the controlling depth in the channel was 26 feet.

East River and the route to Long Island Sound are described in chapter 9.

Robbins Reef Light (40°39.4′ N., 74°04.0′ W.), 56 feet above the water, is shown from a conical tower, with the lower half brown and the upper half white, on the southeastern part of Jersey Flats. A fog signal is sounded at the light.

Liberty (Bedloe's) Island, on the eastern part of Jersey Flats across the main channel from Governors Island, is marked by the **Statue of Liberty**, a colossal structure more than 305 feet high; the figure faces southeastward. In 1960, the channel leading to the pier on the west side of the island had a reported depth of 15 feet. A fog signal is on the end of the pier.

The channel leading from the main channel about 0.7 miles southward of Liberty Island, thence along the New Jersey pierhead line to Kill Van Kull, has a controlling depth of about 18 feet. This channel, through connecting branch channels, leads to the **Caven Point** Army Terminal Pier, Lehigh Valley Railroad Pier, and the Penn Central Railroad Terminal piers at **Greenville**. The Bayonne Terminal Pier, to the southward of the Penn Central Railroad piers, can also be reached through a dredged channel just southward of Robbins Reef Light. The channels are well marked with navigational aids; a lighted range, privately maintained, marks the channel leading to Lehigh Valley Railroad Pier. Note that the buoyage system changes southward of Bayonne Terminal Pier.

Charts 369, 544.—Sandy Hook Bay is the southern part of Lower Bay, westward of Sandy Hook and eastward of Point Comfort. The bay is an excellent anchorage, the depths of water ranging from 30 feet just inside Sandy Hook to 15 feet near its southern part; the shoaling is gradual and the bottom is good holding ground. The best anchorage during easterly and southeasterly winds is in the eastern part of the bay. Vessels of more than 24-foot draft will not find good anchorage out of the channel until above Fort Wadsworth. Extensive shoals make off northward and eastward from Point Comfort, but as the depths of water decrease gradually, soundings will give sufficient warning of too close an approach to the shore. Heavy fish traps extend out to a depth of 20 feet in places on the shoals on the southwest side of Sandy Hook Bay between Atlantic Highlands and Point Comfort.

A **110°04′-290°04′ measured nautical mile** is in the southern side of Sandy Hook Bay.

Sandy Hook, the southern point at the entrance to New York Harbor and the northern point of the New Jersey coast, is low and sandy. The hook, including Plum Island at the mouth of the Shrewsbury River, is a Government reservation, and landing is not permitted. The two lights, a Coast Guard station, the gray standpipe, and several towers on the

north end of Sandy Hook are prominent. **Storm warning signals are displayed** at the Coast Guard Station. (See chart.)

Chart 824-SC.—Shrewsbury River and **Navesink River** empty through a common entrance into the southern extremity of Sandy Hook Bay eastward of the Highlands of Navesink.

In July 1970-June 1971, the controlling depths were: 8 feet in midchannel in the common entrance to the Shrewsbury and Navesink Rivers; thence in Shrewsbury River, 5 feet or 7 feet in midchannel to the Branchport Avenue Bridge at Long Branch; thence in Navesink River, 6 feet to a point about 0.4 mile eastward of the bridge at Oceanic, thence 3½ feet or 6 feet in the right outside quarter to the bridge, thence in 1967, 5 feet to a turning basin and anchorage at Red Bank. The channels are well marked with navigational aids.

Caution.—All cables within the area in about 40°24.2′ N., 73°59.0′ W., in Shrewsbury River have been abandoned. Mariners are cautioned that the cables remain in place.

Tides.—The mean range of tide is as follows: Entrance 4.7 feet; Highlands, 3.8 feet; Red Bank, 3 feet; Sea Bright, 1.7 feet; Branchport, 1.7 feet. Strong southerly and westerly winds lower the water surface, and northerly and easterly winds raise it.

Currents.—At Highlands bridge, the currents have a velocity of 2.6 knots. At Sea Bright bridge the velocity is 1.7 knots.

Ice.—Navigation in Shrewsbury and Navesink Rivers is generally suspended because of ice from December to March, inclusive.

Supplies.—Gasoline, lubricants, marine supplies, and provisions can be obtained at most of the towns along the shores of the Shrewsbury and Navesink Rivers.

Communications.—Railroad or bus connects with New York to points on the New Jersey coast.

Highlands is a summer resort on the west side of Shrewsbury River 1.5 miles inside the entrance. There are good small-craft facilities here. Gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs are available; mobile hoists up to 30 tons are available. A railroad connects Highlands with New York.

The railroad bridge across Shrewsbury River at Highlands is in ruins. The swing span over the west draw has been removed. The highway bridge 100 yards above the railroad bridge has a bascule span with a clearance of 40 feet at the center. The fender system from the center pier of the railroad bridge to the east side of the highway bascule opening is continuous. The east side of the river northward of the bridge and the west side 0.3 mile southward of the bridges are used as anchorages for small craft.

Caution should be exercised at the junction of the Shrewsbury and Navesink Rivers, about 0.6 mile southward of the highway bridge at Highlands, to avoid the submerged stone jetty. Craft entering Navesink River should pass westward of the junction lighted buoy. The ends of the jetty are marked by two daybeacons, about 180 yards apart, to indicate the submerged ruins.

A highway bridge over Shrewsbury River between **Rumson** and **Sea Bright** has a bascule span with a clearance of 15 feet at the abutment. (See **117.25 (a) through (g)** and **(h) (3)**, chapter 2, for drawbridge regulations and opening signals.)

Small-craft facilities at Sea Bright can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, marine supplies and hull and engine repairs; mobile lifts up to 12½ tons are available.

Pleasure Bay, at the southeast end of Shrewsbury River, is crossed by a fixed highway bridge with a clearance of 25 feet. **Branchport** is a small town on the east side of Pleasure Bay at the head of navigation.

Small-Craft facilities in Pleasure Bay can provide berths, electricity, gasoline, water, ice, storage, launching ramps, marine supplies, and hull and engine repairs. A 50-foot marine railway and lifts up to 25 tons are available.

The privately dredged and marked channels in **Little Silver Creek, Town Creek, Oceanport Creek, Parker Creek**, and **Blackberry Creek** had controlling depths of about 5 feet in 1965-67.

A fixed highway bridge with a clearance of 24 feet crosses the westerly part of Shrewsbury River, just eastward of its junction with Parker and Oceanport Creeks.

The tributaries that empty into the southeasterly and southwesterly sides of Shrewsbury River are crossed by bridges with the following clearances: **Manhassett Creek**, fixed highway, 6 feet; **Troutmans Creek**, fixed highway, 6 feet; Oceanport Creek, railroad with swing span, 4 feet; and Parker Creek, fixed railroad, 4 feet. (See **117.215 (a) through (g)**, and **(h) (3)**,and **117.225 (a) through (e)**, and **(f) (6)**, and **(f) (7)** for drawbridge regulations and opening signals.)

The channel in Navesink River is crooked but well marked by buoys. The highway bridge across the river between Oceanic and **Locust Point** has a bascule span with a clearance of 22 feet.

Oceanic is a town on the south side about 1.7 miles above the entrance to Navesink River. Small-craft facilities just west of the bridge at Oceanic can provide berths, electricity, gasoline, water, ice, and storage. Radio repairs can be made, and a 7-ton mobile hoist is available.

Fair Haven is on the south side of Navesink River about 1 mile above the bridge at Oceanic. A boatyard and two yacht clubs are at Fair Haven. The boatyard can provide berths, electricity, gasoline, water, ice, storage, marine supplies, and hull, engine, and radio repairs; lifts up to 15 tons are available. A depth of about 5 feet can be taken to the boatyard.

Red Bank, a town near the head of navigation on the Navesink River, has several small-craft facili-

ties. Berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, hull and engine repairs, a 60-foot marine railway, lifts up to 15 tons, and a launching ramp are available.

The dredged channel that extends for 1.5 miles above the landings at Red Bank had a centerline depth of 6 feet to the second highway bridge, and thence 3 feet for the rest of the dredged section in 1967. The channel is privately marked by buoys and stakes. The fixed bridges crossing this channel have a least channel width of 36 feet and a clearance of 9 feet.

Chart 369, 544.—Atlantic Highlands is a town on the south side of Sandy Hook Bay about 2 miles west of Sandy Hook. A breakwater, marked by a light at its eastern end, forms an anchorage basin with a depth of about 6 feet. The entrance to the basin is marked by private lighted range. Small-craft facilities at the southwest end of the basin can provide berths, electricity, gasoline, diesel fuel, water, ice, storage, marine supplies, launching ramps, and hull and engine repair; mobile lifts up to 30 tons are available. Numerous piles and ruins of former wharves are westward of the basin.

Terminal Channel, entered from Sandy Hook Channel about 1 mile west-southwestward of Sandy Hook, leads south-southwestward to a turning basin and to two deepwater ammunition handling piers of the U.S. Naval Ammunition Depot at **Leonardo**, N.J., a town on the south side of Sandy Hook Bay. Federal project depth is 35 feet in the channel and turning basin. (See Notice to Mariners and latest editions of the charts for controlling depths.) The channel is marked by a private **207°30′** lighted range and by lighted and unlighted buoys. A dredged and marked side channel leads southward from the southeastern end of the turning basin to an ammunition barge-loading pier; depths of about 14 feet can be carried to and alongside the pier. The deepwater piers and barge pier are connected to the shore by a trestle that extends 1.6 miles across the flats from Leonardo. The waters adjacent to the piers and trestle are **prohibited** to navigation. (See **110.155 (f) (1)**, chapter 2, for rules and regulations.)

Security zones have been established in the vicinity of the U.S. Naval Ammunition Depot and Terminal Channel within the areas described below:

(a) Naval Ammunition Depot Piers: The waters within the following boundary is a security zone: A line beginning on the shore at 40°25′57″ N. latitude, 74°04′32″ W. longitude; thence to 40°27′52.5″ N. latitude, 74°03′14.5″ W. longitude; thence to 40°27′28.3″ N. latitude, 74°02′12.4″ W. longitude; thence to 40°26′29.2″ N. latitude, 74°02′53″ W. longitude; thence to 40°26′31.1″ N. latitude, 74°02′57.2″ W. longitude; thence to 40°25′27.3″ N. latitude, 74°03′41″ W. longitude; thence along the shoreline to the beginning point.

(b) Terminal Channel: The waters within the following boundary is a security zone: A line beginning at 40°27′41.2″ N. latitude, 74°02′46″ W. longitude; thence to 40°28′27″ N. latitude, 74°02′17.2″ W. longitude; thence to 40°28′21.1″ N. latitude; 74°02′00″ W. longitude; thence to 40°28′07.8″ N. latitude, 74°02′22″ W. longitude; thence to 40°27′39.8″ N. latitude, 74°02′41.4″ W. longitude; thence to the beginning.

(c) The following rules apply to the security zone established in paragraph (b) of this section.

(1) No vessel may anchor, stop, remain, or drift without power at anytime in the security zone.

(2) No vessel may enter, cross, or otherwise navigate in the security zone when a public vessel or any other vessel, that cannot safely navigate outside the Terminal Channel, is approaching or leaving the Naval Ammunition Depot Piers at Leonardo, N.J.

(3) Vessels may enter or cross the security zone, except as provided in subparagraph (2) of this paragraph of this section.

(4) No person may swim in the security zone.

A dredged channel, about 0.4 mile eastward of the trestle at Leonardo, leads southward from Sandy Hook Bay to a small boat basin. In May 1971, the controlling depth was 8 feet to Light 9, thence 2½ feet to the basin, and thence 3 feet in the basin in 1967. The channel is marked by private buoys and seasonal lights.

Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and engine repairs are available in the basin. A boatyard with a 30-foot marine railway is about 0.5 mile eastward of the boat basin; complete hull and engine repairs can be made. Leonardo has rail freight service to New York and other points.

Compton Creek, 4 miles westward of Sandy Hook, is used extensively as a harbor of refuge by small fishing craft. The creek is entered through a dredged channel that leads from Sandy Hook Bay, thence through **Shoal Harbor**, and thence to the Main Street Bridge, about 0.4 miles above the mouth. In September 1971, the channel had a controlling depth of 10 feet (12 feet at midchannel) to the first bend in the creek, thence 8 feet to the Main Street Bridge. The entrance channel is marked by a private **199°** lighted range and by buoys. About 0.1 mile above the Main Street Bridge, the channel shoals to less than 2 feet. The creek is navigable by small boats for 1 mile to a railroad bridge. The Main Street Bridge has a swing span with a clearance of 4 feet; several fixed bridges upstream of this bridge have a minimum clearance of 2 feet.

A boatyard is on the south side of Compton Creek, just above the Main Street Bridge. Marine supplies, hull and engine repair facilities, and a 90-foot marine railway are available.

Port Monmouth, a village at the head of Compton Creek, is a shipping point for fresh fish, shellfish, and inedible animal products. Several private landings and a town landing are available. Several small-craft facilities front Port Monmouth on the

bay side. Berths, electricity, gasoline, marine supplies, storage, a launching ramp, a 35-ton mobile hoist, and hull and engine repairs are available.

Staten Island forms the northwest side of Lower Bay. The high wooded ridge of the islands has elevations of 100 to over 300 feet. **South Beach** and **Midland Beach** are summer resorts and amusement areas on the southeast side of the island.

Staten Island Flats are extensive shoals making off from the southeast side of Staten Island. Parts of these flats are **Old Orchard Shoals** and West Bank which border on the main channel up the bay. A channel, used by local vessels of less than 8-foot draft, leads westward of West Bank. From the bell buoy 0.6 mile southward of Fort Wadsworth, steer southwestward through the dredged channel to the gong buoy about 0.5 mile northward of Hoffman Island, then steer a course to stay on the range between this gong buoy and Old Orchard Shoal Light.

New York and New Jersey Channels extend from deep water in the main channel, northwest of Sandy Hook, through Lower Bay and Raritan Bay to Perth Amboy, and thence through Arthur Kill, lower Newark Bay, and Kill Van Kull, known collectively as Staten Island Sound, to deep water in Upper Bay. The length of this route is about 27 miles and is approximately along the boundary line between the States of New York and New Jersey.

The channels are well marked by navigational aids; the project depth for the channels are given under their respective geographic names.

Charts 286, 369.—Raritan Bay is that part of Lower Bay lying westward of Point Comfort and southward of Staten Island. The bay is full of shoals with depths of 7 to 18 feet.

Channels.—A Federal project provides for a 35-foot channel extending through Lower Bay, the northern part of Raritan Bay, to the junction with Arthur Kill. (See Notice to Mariners and latest editions of the charts for controlling depths.)

Anchorages.—(See **110.1** and **110.155 (j)**, chapter 2, for limits and regulations of anchorage areas in Raritan Bay.)

Tides.—The mean range of tide in Raritan Bay is about 5 feet.

Ice.—In ordinary winters ice does not seriously interfere with navigation in Raritan River or Arthur Kill, but in severe winters the ice sometimes prevents the movements of vessels for periods of 2 weeks at a time. In easterly winds the drift ice in Lower Bay collects in Raritan Bay and obstructs navigation, but usually only for a short time, as the prevailing westerly winds drive the ice out of the bay.

Pilotage for ports in the States of New York and New Jersey is compulsory for foreign vessels and U.S. vessels under register. Pilots for vessels bound for Perth Amboy, South Amboy, or up the Raritan River and Arthur Kill are provided by the Sandy Hook Pilots. (See Pilotage, New York Harbor, discussed earlier in this chapter.)

Towage.—Tugs are used by the larger vessels and are available in New York. (See Towage, New York Harbor, discussed earlier in this chapter.)

Customs, quarantine, immigration, and agricultural quarantine inspections are discussed earlier in this chapter under New York Harbor.

Supplies.—Water can be had at most of the wharves in Perth Amboy and South Amboy. Provisions and marine supplies can be had at Perth Amboy, Tottenville, New Brunswick, and South Amboy.

Chart 286.—Great Kills Harbor, a shallow bight on the south side of Staten Island northwestward of Old Orchard Shoal Light, is used as an anchorage by small craft. The harbor is entered through a dredged channel that leads from deep water in Lower New York Bay along the southwesterly side of **Crooks Point**, thence along the westerly side of the harbor to the head. In November 1971, the channel had a midchannel controlling depth of 9½ feet. The channel is marked by a 334°30′ lighted entrance range, and by buoys to the head. **Great Kills Light** is shown from a red skeleton tower on a concrete base east of the channel entrance.

A **special anchorage area** for small vessels is in Great Kills Harbor. (See **110.1** and **110.60 (r-1)**, chapter 2, for limits and regulations.)

Great Kills, on the west side of Great Kills Harbor, has several small-craft facilities with berths, electricity, gasoline, diesel fuel, water, ice, storage, launching ramps, and marine supplies. Lifts up to 15 tons, a 70-foot marine railway, and hull and engine repairs are available.

Seguine Point, 3 miles southwestward of Great Kills Harbor, is marked by a prominent structure with a conspicuous chimney and cupola to northward. The wharf here has a depth of about 8 feet at its face. A boatyard with a marine railway can handle craft up to 40 feet in length for engine and hull repairs. Gasoline, water, ice, storage, a launching ramp, and marine supplies are available. Seasonal daytime **storm warning signals are displayed.** (See chart.)

Lemon Creek, 0.2 mile westward of Seguine Point, is a narrow shallow stream used only by local boats which enter at high water. The midchannel controlling depth over the bar is about 2 feet with deeper water inside. The retractile drawbridge across the creek has a clearance of 3 feet. (See **117.215 (a) through (g)**, and **(j) (1)**, chapter 2, for drawbridge regulations and opening signals.)

A small marina on the creek can haul out craft up to 4 tons for minor engine and hull repairs; berths, electricity, gasoline, water, ice, and outside storage are available.

A prominent tower of a former lighthouse with a statue on top is on the south side of Staten Island, 0.8 mile westward of Seguine Point. Prominent buildings are near the point at **Red Bank**, 0.3 mile

southwestward of the tower.

Keansburg, on **Point Comfort** on the south side of Raritan Bay, is a summer resort. The wharves on the west side of Point Comfort are in ruins and no longer used.

There are small-craft facilities at Keansburg along the westerly side of Point Comfort and just inside the entrance to **Waackaack Creek**, about 0.6 mile southwestward of the point. Berths, electricity, gasoline, a 12-ton mobile hoist, launching ramps, and marine supplies are available; hull and engine repairs can be made.

Keyport Harbor, 3 miles westward of Point Comfort, is a shallow harbor on the south side of Raritan Bay between **Conaskonk Point** and **Matawan Point**. A buoyed approach channel leads southward from the bay to a dredged marked channel that leads through the harbor to the mouth of Matawan Creek. In April 1971, the dredged channel had a controlling depth of 4 feet.

Matawan Creek, entered at the head of Keyport Harbor, is very shoal with depths of about 2 feet; greater depths can be carried with local knowledge. The creek is used mostly by local craft.

Keyport is a town on the east side of the entrance to Matawan Creek. There are several small-craft facilities on Matawan Creek and on the southeast side of Keyport Harbor at Keyport. Berths, electricity, gasoline, water, ice, storage facilities, marine supplies, and launching ramps are available. The largest marine railway on the creek can handle craft up to 60 feet in length for hull and engine repairs. Vessels proceed to the small-craft facilities at Keyport at high water. The mean range of **tide** is about 5 feet.

Keyport has rail freight service and bus service to New York and other points.

A privately dredged channel, about 25 feet wide in places, leads about 0.3 mile southwesterly from the mouth of Matawan Creek to a small-boat basin at the entrance to **Luppatatong Creek**. The channel is used only at high water.

Cheesequake Creek and **Stump Creek**, sharing a common entrance and leading southwesterly and southeasterly, respectively, are on the south side of Raritan Bay 6 miles westward of Point Comfort. The entrance is between two stone jetties awash at high water. The outer ends are marked by a daybeacon on the east jetty and a light on the west jetty. A private light marks a sewer outfall about 100 yards northward of the jetty light. The controlling depth in the entrance channel to the railroad bridge at Morgan is about 5 feet. The mean range of **tide** is about 5 feet.

Local boats from Lower Bay usually head for Boundary Light, 1.6 miles east-northeastward of the jetties, and then shape a course to enter between the jetties at the entrance to Cheesequake and Stump Creeks. Caution should be exercised to avoid the sunken wrecks, 0.2 mile eastward of the east jetty.

The highway bridge, 0.2 mile inside the jetties, has a bascule span with a clearance of 25 feet. The overhead power cable just north of the bridge has a clearance of 105 feet. The railroad bridge, 0.3 mile inside the jetties, has a bascule span with a clearance of 3 feet. (See **117.215, (a) through (g) and (j) (4)**, chapter 2, for drawbridge regulations and opening signals.) The fixed highway bridge over Cheesequake Creek, 1.1 miles inside the jetties, has a clearance of 16 feet.

Laurence Harbor is a summer resort on the east side of Stump Creek, and **Morgan** is a settlement on the west side of Cheesequake Creek. There are several small-craft facilities with marine railways and lifts in this area. The largest marine railway can handle craft up to 50 feet; berths, electricity, gasoline, water, ice, storage, launching ramps, marine supplies, and complete engine and hull repairs are available.

Chart 375.—Raritan River empties into the western end of Raritan Bay between Perth Amboy and South Amboy. The channel from South Amboy to New Brunswick is 11 miles long and very crooked, but is well marked with navigational aids. Waterborne commerce on the river is in coal, ore, and petroleum products.

Channels.—Vessels enter Raritan River from the east by way of Great Beds Reach, the junction of New York and New Jersey Channels, and from the north by way of Arthur Kill via Raritan River Cutoff Channel. Controlling depths were 25 feet in midchannel in Great Beds Reach in 1967, and 20 feet in midchannel in Raritan River Cutoff Channel, in 1964. The controlling midchannel depths in the dredged channels in Raritan River are as follows: In 1964-January 1971, 24 feet from the junction with New York and New Jersey Channels to the junction with Titanium Reach, 0.6 mile above the Garden State Parkway Bridge, thence in 1962, 7 feet to the Washington Canal, and thence about 9 feet to New Brunswick; in December 1970-July 1971, 25 feet in Titanium Reach to the National Lead Company dock (Titanium Pigment Company), thence in 1967, 10 feet in midchannel to the Middlesex County Sewage Dock, thence in 1963, 10 feet to the Crossman Dock, the head of the dredged channel. In 1961, the controlling midchannel depth in **Washington Canal** was 12 feet; in **South River**, 10 feet to the first highway bridge, thence 8 feet for about a mile, thence ½-foot to a point 800 yards north of the highway bridge at **Old Bridge**.

A sunken drydock, marked by a light, is on the east side of the river, 1.5 miles above the Garden State Parkway fixed bridge. The wreck extends 60 feet into the channel and is visible at all stages of the tide.

Bridges.—Several drawbridges and fixed bridges cross Raritan River and South River. The distances above the mouth of the Raritan River and clearances follow: railroad bridge with center-pier swing span, 0.4 mile, 8 feet, overhead power cable at the bridge has a clearance of 140 feet; Victory

Highway Bridge with center-pier swing span, 1.4 miles, 28 feet, the northern span only should be used; Thomas Edison Memorial Bridge with high-level fixed span, 1.9 miles, 135 feet; Garden State Parkway with fixed span, 2 miles, 135 feet; overhead power cable near Crab Island, 5.2 miles, 128 feet; New Jersey Turnpike with fixed span, 8.7 miles, 45 feet; overhead power cables, 8.9 miles, 90 feet; and U.S. Highway No. 1 Bridge with fixed span, 9.6 miles, 91 feet. The highway bridge over South River at the town of South River has a bascule span with a clearance of 6 feet. The railroad bridge, 0.4 mile upstream, has a swing span with a clearance of 4 feet. (See **117.210,** chapter 2, for drawbridge regulations and opening signals.)

Tides and currents.—The mean range of tide is about 5 feet at South Amboy, 5.8 feet at New Brunswick, and 5.5 feet at the highway bridge on South River at the town of South River. (For predictions, consult the Tide Tables.) The tidal current has a velocity of about 1.5 knots at the Victory Highway Bridge at Perth Amboy.

South Amboy is a city on the south side of the entrance to Raritan River. Waterborne commerce at the port is in fuel oils, coal, and petroleum products. Depths alongside the wharves and piers range from about 7 to 22 feet. Water, provision, and marine supplies can be obtained here.

Sayreville, 6 miles above South Amboy on the south bank of the Raritan River, is a village important for its brick manufacturing industry. Most of the private wharves are used by sand and gravel barges.

South River is a town on the west side of South River 7.5 miles above South Amboy. Several small boatyards are on the river, northward of the bascule bridge and southward of Washington Canal. Gasoline, water, ice, limited marine supplies, and engine and hull repairs are available.

The **Delaware and Raritan Canal**, closed to navigation since 1933, had its entrance to the Raritan River at New Brunswick.

Charts 285, 286.—Arthur Kill is the narrow body of water separating Staten Island from New Jersey. The cities of Perth Amboy, Tottenville, Elizabeth, many large factories, and oil refineries and storage facilities are on its shores.

Channels.—Federal project depth in Arthur Kill is 35 feet. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages.—Anchorage areas have been prescribed for Arthur Kill. (See **110.155,** chapter 2, for limits and regulations.)

Tides and currents.—The mean range of tide in Arthur Kill is about 5 feet. Throughout Arthur Kill the flood sets from Raritan Bay to Newark Bay and the ebb in reverse direction. Velocities of current vary with the location from about 1 to 1.5 knots.

Chart 286.—Perth Amboy is on the point at the junction of Raritan River and Arthur Kill at the western end of Raritan Bay. The principal wharves are along the west bank of Arthur Kill. The greatest draft entering is about 30 feet. The wharves have depths of 14 to 30 feet alongside. Good anchorage is found abreast some wharves in 30 feet.

Customs.—Perth Amboy is a customs port of entry.

The Coast Guard maintains a **vessel documentation office** at Perth Amboy. (See appendix for address.)

Repairs.—Several ship and boat repair yards are in Perth Amboy. Drydocks are available; the largest floating drydock can handle vessels of 2,300 tons in weight, 240 feet in length, 60 feet in width, and 17 feet in draft. Small-craft engine and hull repairs can be made.

Supplies.—Diesel oil, diesel fuel, gasoline, water, lubricants, and marine supplies are available at Perth Amboy.

Perth Amboy Boat Basin, southward of the main wharves and about 0.4 mile northward of **Ferry Point**, the southeastern point of Perth Amboy, has a reported depth of about 5½ feet inside. The basin is primarily for the use of town residents. Berths, electricity, gasoline, diesel fuel, water, ice, and storage are available. A **harbormaster** is at the basin.

Outerbridge Crossing Bridge, 1.7 miles above Ward Point, has a fixed span with a clearance of 143 feet across Arthur Kill between Perth Amboy and **Tottenville**.

Woodbridge Creek enters Arthur Kill from westward about 2.8 miles above **Ward Point**. In 1949-52, the midchannel controlling depth in the dredged channel in the creek was about 5 feet to near the Shell Oil Company dock, 0.2 mile above the mouth, thence about 3 feet to the railroad bridge, and thence about 1 foot at the Town Dock, 1.6 miles above the mouth. Commerce on the creek is in petroleum products. A highway bridge, 0.5 mile above the mouth, has a bascule span with a clearance of 7 feet. A railroad bridge, 100 yards upstream, has a bascule span with a clearance of 5 feet. (See **117.225, (a) through (e), and (f) (5),** chapter 2, for drawbridge regulations.) The overhead power cables near the bridges have a minimum clearance of 40 feet.

Port Socony, on the east side of Arthur Kill 2.9 miles above Ward Point, is a bulk oil storage terminal. A privately maintained dredged channel leads from the main channel in Arthur Kill to the oil company dock. In 1965, a reported depth of about 35 feet was available to and alongside the dock.

Smith Creek enters Arthur Kill from northward about 3.3 miles above Ward Point. The entrance channel is privately marked by stakes and a range. In 1969, a depth of 6 feet was available to just above the first bend in the channel. The creek is used principally by small craft.

Several small-craft facilities with marine railways are along Smith Creek. The largest marine

railway can handle craft up to 48 feet in length; berths, gasoline, diesel fuel, water, ice, marine supplies, storage, launching ramps, and engine and hull repairs are available.

Port Reading, 4.5 miles above Ward Point on the north side of Arthur Kill, has several oil storage facilities. Depths of about 35 feet are reported alongside. The large freight terminal northeastward of the oil facilities is used for the shipment of coal by barges. Depths alongside the coal pier are reported as 18 to 25 feet on the south side and 10 feet to bare on the north side.

Fresh Kills enters Arthur Kills from eastward about 6 miles above Ward Point. There are two entrances 0.4 mile apart. **Great Fresh Kills**, the southerly entrance opposite the steel works at **Chrome**, is approached on a northeasterly course favoring the south shore to avoid a shoal which extends southward from the shore on the north side. **Little Fresh Kills**, the northerly entrance, is good for a depth of about 3 feet by favoring the southerly shore to avoid a shoal which extends southwesterly from the north shore. The controlling depth is about 10 feet through the south entrance to the junction with Richmond Creek and Main Creek. A highway bridge crossing the kill, about 1.1 miles above the entrance at Great Fresh Kills, has a fixed span with a clearance of 28 feet.

Richmond Creek, the easterly branch of Fresh Kills, has a reported midchannel depth of about 5 feet to the drawbridge, thence shoaling above the bridge to about 2 feet at Richmond. The highway bridge across the creek has a bascule span with a clearance of 9 feet, but the draw is no longer opened. (See **117.190 (a) and (f) (8)**, chapter 2, for drawbridge regulations.)

Main Creek, the northerly branch of Fresh Kills, is shoal, but barges drawing about 5 feet are towed at high water to the head of the creek at **Travis**, a distance of about 1.5 miles.

Chart 285.—Rahway River enters Arthur Kill from westward, about 7.2 miles above Ward Point, and extends westward for about 4.5 miles to the town of **Rahway**. It is used only by small craft. In 1946-51, a midchannel depth of about 5 feet could be taken to Lamberts Wharf about 2.1 miles above the mouth and about 0.5 mile above the New Jersey Turnpike bridge.

Name or location, type of span, distance above mouth, and clearances of the bridges over Rahway River are as follows: East Rahway, bascule, 1.7 miles, 6 feet; Linden and Carteret, fixed, 1.8 miles, 36 feet; Lawrence Street, swing, 3.8 miles, 6 feet; State Route 25, fixed, 3.9 miles, 23 feet; Milton Avenue, fixed 42-foot span, 4.2 miles, 4 feet; Monroe Avenue, fixed 30-foot span, 4.4 miles, 7 feet. (See **117.210**, chapter 2, for drawbridge regulations and opening signals.)

An overhead power cable with a clearance of 165 feet crosses Arthur Kill about 1.7 miles north of the Rahway River entrance.

The **Goethals Bridge**, 10 miles above Ward Point, has a fixed span with a clearance of 137 feet over Arthur Kill just southward of Elizabethport. The railroad bridge, 200 yards above Goethals Bridge, has a vertical lift span with a clearance of 31 feet down and 135 feet up.

Elizabethport, about 11 miles above Ward Point, is the eastern part of the city of **Elizabeth**. It is at the northern end of Arthur Kill at its junction with Newark Bay.

Most of the wharves along the Elizabeth waterfront are of the bulkhead-marginal type. Depths alongside range from 8 to 30 feet. Waterborne commerce at these wharves is in petroleum, sand and gravel, chemicals and petro-chemicals, and vegetable and animal oils.

Elizabeth River enters Arthur Kill from westward at Elizabethport. In 1959, the midchannel depth in the river was about 4 feet to South First Street Bridge, 0.5 mile above the mouth, thence 1 foot to the railroad bridge, 0.6 mile above the mouth. The overhead power cable just above the entrance has a clearance of 59 feet. South Front Street Bridge, just above the mouth of the river, has a bascule span with a clearance of 3 feet; South First Street Bridge, 0.5 mile above the mouth has a bascule span with a clearance of 5 feet; and Elizabethport railroad bridge, 0.8 mile above the mouth, has a bascule span with a clearance of 14 feet. (See **117.225 (a) and (f) (3)**, chapter 2, for drawbridge regulations.) The bridges above the railroad bridge have a least clearance of 3 feet.

Kill Van Kull separates the southern shore of the city of Bayonne from Staten Island and connects the Upper Bay of New York Harbor with Newark Bay and Arthur Kill. There are extensive through traffic in the kill and large factories on its shores.

Channels.—A Federal project provides for a main channel leading northward, and a channel leading southward of Shooters Island in Kill Van Kull to Arthur Kill. Project depth in the north channel is 35 feet, and 30 feet in the south channel. (See Notice to Mariners and latest editions of charts for controlling depths.)

Bayonne Bridge, a fixed span with a clearance of 140 feet, crosses Kill Van Kull from just east of **Bergen Point**, the southwestern end of the city of Bayonne, and connects with Staten Island.

Tides and currents.—The mean range of tide in Kill Van Kull is about 4.5 feet. The flood current sets westward and the ebb eastward. In the bight on the south side of the channel between West New Brighton and Port Richmond there is more or less of an eddy when the current is at strength.

Constable Hook and **Port Johnson**, on the north shore of Kill Van Kull, are parts of the city of **Bayonne**. They are commercially important for the shipment of petroleum and other products. A dredged channel 23 feet deep, marked by buoys, leads from the easterly end of Kill Van Kull to the wharf on the north side of Constable Hook.

Several private yacht and boat clubs, and a public marina are on the southwestern shore of Bayonne above Bergen Point. A 90-ton crane at the marina can haul out craft for engine and hull repairs; berths, electricity, gasoline, water, ice, and marine supplies are available.

New Brighton, **Port Richmond**, and **Mariners Harbor** are on the south shore of Kill Van Kull. The largest of several shipyards and floating drydocks on the south shore can handle vessels up to 10,500 tons, 500 feet long, 87 feet wide and 22 feet in draft. All kinds of repairs can be made.

A marina in Mariners Harbor can haul out craft up to 40 tons in weight; gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs are available.

Charts 285, 287.—Newark Bay has a length of about 4 miles from Kill Van Kull to the junction of the two channels leading to Passaic and Hackensack Rivers. The greater part of the bay is very shoal, but a dredged channel leads through the bay to the rivers. The channel is well marked by lights and buoys. Strangers in small vessels should have no difficulty when using the chart as a guide. Deep-draft vessels should employ a pilot.

Channels.—Federal project depth in the main channel leading to the branch channels to Elizabeth-Port Authority Marine Terminal and Port Newark Terminal is 35 feet, and thence 32 feet to the junction of Passaic and Hackensack Rivers. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages.—Anchorage areas have been prescribed for Newark Bay. (See **110.1, 110.60, and 110.155**, chapter 2, for limits and regulations.)

The mean range of **tide** in Newark Bay is about 5 feet.

Ice sometimes closes navigation during a part of January and February.

The railroad bridge across Newark Bay, 0.7 mile above the south entrance, has a vertical-lift span with a clearance of 35 feet down and 135 feet up over both the east and west draws. (See **117.200**, chapter 2, for drawbridge regulations and opening signals.)

A dredged channel marked by a private lighted range and buoys leads from the main channel about 300 yards north of the railroad bridge to a 300-foot pier of the Allied Chemical and Dye Corporation. A turning basin is at the inner end of the channel, and a causeway connects the pier to the shore. The controlling depth along the range was 12 feet in 1959.

The **Elizabeth-Port Authority Marine Terminal**, operated by the Port Authority of New York and New Jersey, is on Newark Bay in Elizabeth, N.J., on the south side of Elizabeth Channel south of Port Newark. The facility is about 8 miles from the Narrows via Kill Van Kull. It is adjacent to the New Jersey Turnpike and Newark Airport in the heart of the New Jersey industrial area, about 25 minutes by highway from Manhattan.

In 1971, the terminal had 13 berths along the 7,700-foot bulkhead on the south side of Elizabeth Channel and two berths along Elizabeth Pierhead Channel on Newark Bay. Deck heights are 12 feet. An additional 10 berths are under construction.

Depths of 27 to 34 feet are reported alongside the berths on the south side of Elizabeth Channel, and 30 to 36 feet alongside the berths along the Elizabeth Pierhead Channel.

A large container-handling complex with extensive lift-on/lift-off and roll-on/roll-off systems is at the terminal. Included in this complex are cranes up to 40 tons capable of handling containers up to 40 feet long, mobile straddle carriers with 32-ton capacities, cargo-handling buildings with more than 1-million square feet of storage space, and a large area for open storage.

The terminal is served by four major railroads. All railroads serving New York provide lighterage service to and from shipside and wharves at the terminal. A carfloat bridge provides direct access for the railroads to all areas of the terminal. Excellent cargo handling and storage facilities are available.

Channels.—Federal project in Elizabeth Channel and Elizabeth Pierhead Channel, leading to the terminal from the main channel in Newark Bay, is 35 feet. (See Notice to Mariners and latest editions of charts for controlling depths.)

Port Newark Terminal, operated by the Port Authority of New York and New Jersey, is on the western side of Newark Bay 2.7 miles above the south entrance, northward of Elizabeth-Port Authority Marine Terminal. It is in the heart of the New Jersey industrial area, adjacent to the New Jersey Turnpike and Newark Airport. There are 34 deep-draft berths (two additional berths were planned in 1971); depths alongside, 30-35 feet; deck heights, 11 feet; many transit and storage areas and excellent cargo handling facilities, used for the receipt and shipment of general cargo, metals, vegetable oils, petroleum, automobiles and machinery, and for the receipt of bananas, rubber products, lumber and pulpwood, and chemicals. The terminal is served by four major railroads, each providing lighterage service to and from shipside and the wharves.

Channels.—Federal project depth in Port Newark Channel and Port Newark Pierhead Channel, leading to the terminal from the main channel in Newark Bay, is 35 feet. (See Notice to Mariners and latest editions of charts for controlling depths.)

The Turnpike bridge, 0.7 mile above the entrance to Port Newark Terminal, has a fixed span with a clearance of 135 feet. The railroad bridge, 0.2 mile above the Turnpike bridge, has a vertical-lift span with a clearance of 35 feet down and 135 feet up. (See **117.200**, chapter 2, for drawbridge regulations and opening signals.)

Chart 287.—Passaic River, which flows into the northwest end of Newark Bay, is used by vessels to **Passaic**, a manufacturing city at the head of

navigation 13 miles above the mouth. Above the Wall Street bridge at Passaic the river is obstructed by boulders partly showing above the water for 1.5 miles to the **Dundee Dam**. The city of **Newark** extends along the river for a distance of nearly 5 miles above the mouth. The towns of **Belleville, Arlington, Rutherford, Nutley, Garfield**, and several villages are located on the river between Newark and Passaic.

Channels.—In 1965, the midchannel controlling depth in the Passaic River was 30 feet to just downstream of the Lincoln Highway Bridge. Above this point, in 1953-64, a depth of about 15 feet could be taken to the Nairn Linoleum Works, 5.8 miles above the mouth, and thence about 6 feet to a point 100 yards west of the Eighth Street Bridge at Passaic. The channel is well marked with aids.

Bridges.—More than 20 draw and fixed bridges cross the Passaic River between the mouth and Passaic. The minimum clearance of the bridges with fixed spans is 99 feet at the New Jersey Turnpike Bridge, 2.4 miles above the mouth. The minimum clearance of the bridges with drawspans is 7 feet. (See **117.200 and 117.225 (a) through (e) and (f) (2), (f) (2-a), and (f) (2-b)**, chapter 2, for regulations and opening signals for drawbridges crossing Passaic River.) The Second Street and Eighth Street bascule span highway bridges at Passaic remain in the closed position with a clearance of 5 feet. The fixed highway bridge between Passaic and Garfield has a clearance of 5 feet. The minimum clearance of the cables over Passaic River is 135 feet.

Tides.—The mean range of tide in Passaic River from the mouth to Passaic is about 5 feet.

Freshets overcome the flood current down as far as Newark, and sometimes to the mouth of the river. Ordinary freshets usually of a few hours duration cause a rise of about 2 feet and a current velocity of about 3 knots at Newark. Destructive freshets occasionally occur at intervals of years, generally in the spring and fall.

Small-Craft Facilities.—There are several boatyards along the Passaic River between the entrance and Passaic. The largest marine railway is at Rutherford, where vessels up to 60 feet in length can be hauled out for complete engine and hull repairs. Berths, electricity, gasoline, water, ice, storage, and marine supplies are available along the river.

Hackensack River flows into the northeast end of Newark Bay and is navigable for about 17.8 miles to the dams at **New Milford**.

Channels.—In 1968, the midchannel controlling depths in the Hackensack River were 29 feet to the Lincoln Highway Bridge, thence in 1966, 26 feet to the turning basin 3.5 miles above the mouth, and 25 feet in the basin. Above this point in 1948-February 1971, depths of 11 feet were available for varying widths with local knowledge to the N.Y.S. & W.R.R. bridge at Hackensack, 14.2 miles above the mouth. The channel is well marked with aids.

Bridges.—More than 15 draw and fixed bridges cross the Hackensack River between the mouth and Hackensack. The minimum clearance of the bridges with fixed spans is 49 feet at the New Jersey Turnpike Authority highway bridge about 10 miles above the mouth. The minimum clearance of the bridges with drawspans is 2 feet at Hackensack, 14.2 miles above the mouth. (See **117.200 and 117.225 (a) through (e) and (f) (1-b)**, chapter 2, for drawbridge regulations and opening signals.) The fixed bridges above Hackensack have a minimum clearance of 2 feet. The minimum clearance of the cables over Hackensack River to Hackensack is 89 feet; thence 26 feet to the dams at New Milford.

Tides.—The mean range of tide is about 5 feet at the mouth of Hackensack River, 5.3 feet at Little Ferry, and 5.3 feet at Hackensack. (See the Tide Tables for predictions.) The river has little freshet flow, and the tidal currents are rarely affected by it.

Small-Craft Facilities.—There are several boatyards and marinas on the Hackensack River. The largest marine railway at **Carlstadt**, opposite **Secaucus**, can handle craft up to 30 feet in length for complete engine and hull repairs. Other repair facilities for small craft are available along the river, as well as berthage, electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies.

Berry Creek Canal flows into the Hackensack River from westward 6.8 miles above the mouth. A midchannel depth of about 11 feet is available to the bridge about 1 mile above the entrance. Two fixed highway bridges with a least clearance of 35 feet cross the creek just above the entrance. The bridge about 1 mile above the entrance has a clearance of 40 feet, and the overhead power cable close northward of the bridge has a clearance of 45 feet. The overhead power cable 0.8 mile upstream from the bridge has a clearance of 54 feet.

Overpeck Creek flows into the Hackensack River from eastward 11.1 miles above the mouth. The bridges at the entrance have bascule and swing spans with a minimum clearance of 3 feet. (See **117.220 and 117.225 (a) through (e) and (f) (1)**, chapter 2, for drawbridge regulations and opening signals.) A dam, about 0.8 mile above the mouth, forms the head of navigation on the creek.

12. HUDSON RIVER

The chapter describes the Hudson River from above New York City to Troy N.Y., and includes the principal cities of Yonkers, Newburg, Poughkeepsie, Kingston, and Albany.

Mileages shown in this chapter for the Hudson River as Mile 0.9 E, Mile 12 W, etc., are the nautical miles above the Battery; the letters N, S, E, and W denote by compass points the side of the river where each feature is located. Mile 0.0 is a point at the mouth of the Hudson River in 40°42.1′ N., 74°01.5′ W.

Charts 745, 746, 748, 282, 283, 284.—Hudson River, sometimes called **North River** in New York City, has its source in the Adirondack Mountains, about 275 miles along its course from a junction with East River at the Battery, New York, and flows in a general southerly direction into New York Upper Bay. Troy Lock and Dam, 134 miles above the Battery, permits vessels to pass from tidewater to the upper river and the New York State Barge Canal System. The river water is usually fresh as far south as Poughkeepsie, halfway from Troy Lock and Dam to the Battery.

New York City extends along the eastern bank of Hudson River for a distance of about 14 miles above the Battery. For about 5 miles northward from the Battery, the New York waterfront is an almost continuous line of wharves and piers, some of which can accommodate the largest transatlantic liners.

On the opposite side of Hudson River from New York City are Jersey City, Hoboken, Weehawken, Guttenberg, Hudson Heights, Edgewater, and Fort Lee; this entire stretch of about 9 miles is lined with piers.

Dumping grounds.—Dumping grounds are located in the Hudson River. (See **205.10 (a) and (d) (1) through (7)**, for limits and regulations.)

Channels.—The lower Hudson River has depths of 45 feet or more in midchannel from deep water in Upper New York Bay off Ellis Island to the upper limit of New York City's major wharves at 59th Street, about 5.3 miles above the entrance. Above this point, the Federal project depth is 32 feet to Albany, except for that section of the channel along the New Jersey Weehawken-Edgewater waterfront between 85th Street and 156th Street, Manhattan, where the project depth is 30 feet. (See Notice to Mariners and latest editions of charts for controlling depths.)

Bridges.—The bridges over Hudson River from New York Harbor to Albany have either fixed or suspension spans; the minimum clearance is 132 feet. The least clearance of the overhead cables is 145 feet.

Anchorages.—Defined anchorage grounds begin 5 miles above the Battery and extend upriver for about 10 miles. (See **202.155**, chapter 2, for limits and regulations.)

Vessels proceeding from New York to Albany frequently anchor over night in the vicinity of Kingston, 79 miles above the Battery and 47 miles below Albany, to await daylight hours for passing through the constricted part of the river.

A buoyed anchorage, 400 feet wide and 2,400 feet long, with depths of 32 feet is on the east side of the channel just above Stuyvesant, 111 miles above the Battery and 15 miles below Albany.

Dangers.—Numerous fishtraps are planted each spring, usually from about mid-March to mid-May, during the seasonal run of shad to the spawning grounds in the upper Hudson. The charts show the fishtrap areas in the 30-mile stretch beginning about 5 miles above the Battery and extending upriver to Stony Point; Corps of Engineers permits are required for the placing of shad nets and poles in the charted areas. Outer limits of the nets usually are marked by flags during the day and by lights during the night. Caution is advised when navigating a fishtrap area because broken-off poles from previous traps may remain under the surface.

Navigation of the river is easy as far north as Kingston, but above Kingston it is more difficult because of the numerous steep-to shoals and middle grounds. In general tows are apt to follow the shoreline which is most favorable as regards wind and current; with a strong northwest wind, tows will follow the west shore regardless of the direction in which they are traveling.

Tides.—The tides in Hudson River are affected by freshets, winds, and droughts. Because of these variables the predictions given in the Tide Tables for points above George Washington Bridge are based upon averages for the 6 month period, May to October, when the fresh-water discharge is at a minimum.

The mean range of tide is 4.5 feet at the Battery, 3.7 feet at Yonkers, 2.8 feet at Newburgh, 3.1 feet at Poughkeepsie, 3.7 feet at Kingston, 4.6 feet at Albany, and 4.7 feet at Troy. (Daily predictions for the Battery and Albany are given in the Tide Tables.)

Currents.—The currents in Hudson River are influenced by the same variables that affect the tides. The times of slack water and the velocities and durations of flood and ebb are subject to extensive changes; the times of strengths are less likely to be affected. The currents usually set fair with the channels except in the vicinities of bends and wharves.

Velocities of currents are 1.5 knots flood and 2.3 knots ebb northwest of the Battery, 1.6 and 2.2

knots at George Washington Bridge, 0.9 and 1.1 knots at Newburgh, 1.1 and 1.2 knots at Poughkeepsie, 1.3 and 1.6 knots at Kingston, and 0.3 knot flood and 0.8 knot ebb at Albany. Near Troy Lock and Dam, the current does not flood and the ebb has a velocity of 0.7 knot. These values are for the summer when the fresh-water discharge is at a minimum.

Daily current predictions for the Narrows, New York Harbor, are given in the Tidal Current Tables. Predictions for places along Hudson River may be obtained by applying the differences and ratios listed for these places in the tables. The directions and velocities of the currents throughout New York Harbor for every hour of the tidal cycle are shown on the Tidal Current Charts, New York Harbor.

Ice.—In extremely severe winters Hudson River may be temporarily closed to navigation because of ice. Depending upon the extent of ice conditions and the availability of suitable icebreakers, the Coast Guard endeavors to maintain an open channel to Albany to meet any reasonable demands of commerce. The ice season usually starts in early January and ends in mid-March. Normally shipping is affected most seriously in the Hudson River between Tappan Zee and Albany. In addition to the problem of getting through the ice, aids to navigation are covered or dragged off station by moving ice. Buoys are removed from the Hudson River during the ice season then reset in late March when the ice clears. However, the river is well marked by lights along the shore.

Freshets.—During March, April, and May, freshets have reached heights above normal high water of as much as 18 feet at Albany and 25 feet at Troy Lock and Dam. At the time of the larger freshets the tide may be completely masked, the water continuing to rise and fall for a period of several days without any tidal oscillation. At the time of smaller freshets the range of tide is greatly diminished and the times of high and low waters are somewhat delayed.

During the smaller freshets, the flood current disappears and the ebb current has a velocity of about 1.5 knots. The larger freshets produce an ebb current that varies from 1.5 to nearly 5 knots depending on the size of the freshet and the stage of the tide.

Pilotage is compulsory on the Hudson River for foreign vessels and U.S. vessels under register. Pilotage north of Yonkers is provided by the Hudson River Pilots Association. Arrangements for pilot services are generally made in advance through ships' agents or directly by shipping companies: 24-hour service is provided. Pilots board vessels from launches in midriver (40°56'21" N., 73°54'41" W.) off the pilot station at Yonkers, N.Y.; pilots debark at the same location. Bridge-to-bridge communication (156.65 mc.) is maintained by the pilots on the Hudson River. Vessels between Yonkers and Ambrose Channel entrance are serviced by Sandy Hook Pilots, and vessels proceeding from or to Execution Rocks by Hell Gate Pilots.

Towage.—Tugs are available in New York Harbor and at Albany. (See chapter 11, and Albany later in this chapter.)

Quarantine, customs, and immigration.—Matters pertaining to these services for places along Hudson River are handled at the Port of New York or at Albany. (See chapter 11, New York Harbor, and Albany later in this chapter.)

Chart 745.—Hudson River averages about 0.6 mile in width along this 5-mile stretch above the Battery. The chart covers most of the principal wharves on the New York City side and those of **Jersey City, Hoboken**, and **Weehawken** on the west, or New Jersey, side.

Chart 746.—On the New Jersey side of the river are the piers of **Guttenberg**, Mile 5.5W; **Hudson Heights**, Mile 6.5W; **Edgewater**, Mile 7.5W; and **Fort Lee**, Mile 9.5W. Small-craft facilities at Edgewater can provide berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, storage, and hull and engine repair. The largest mobile hoist can handle craft up to 55 feet.

The New York side of the river is mostly parkway for the length of the chart. A marina, at Mile 5.5E, can provide berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, and minor engine repairs.

Sailors and Soldiers Monument, Mile 6.2E, is a prominent landmark at 89th Street and Riverside Drive, Manhattan.

General Grants Tomb, Mile 7.7E, is prominent at 123rd Street and Riverside Drive, Manhattan.

George Washington Bridge, Mile 10, crosses Hudson River from Fort Lee, N.J., to **Fort Washington Point**, New York City. The suspension span is nearly 0.6 mile long from shore to shore, and the tops of the towers are about 600 feet above the water. The clearance at midriver is more than 200 feet.

Chart 747.—From Fort Lee, N.J., the rocky cliffs of **Palisades Interstate Park** extend up the west side of the river for about 12 miles to Piermont, N.Y. The Palisades are 300 to 500 feet high and in places are thickly wooded with scrub.

Tubby Hook, Mile 11E, has several small-boat landings.

Spuyten Duyvil Creek, entered at Mile 12E, is marked by the railroad swing bridge over the mouth. The creek is the Hudson River entrance to Harlem River, which is described in chapter 9. Currents are swift and erratic around the mouth of the creek.

Englewood Boat Basin, on the New Jersey side opposite Spuyten Duyvil Creek, has depths of 3 to 7 feet and can accommodate craft up to 55 feet in length; berths, gasoline, diesel fuel, water, and ice are available.

Yonkers, Mile 16E, adjoins the north side of

New York City. Waterborne commerce is in petroleum products, sugar and syrup products, cement, sand, and other building materials.

A sugar refining plant (40°55′45″ N., 73°54′21″ W.) has a 400-foot marginal wharf with depths of 30 to 28 feet alongside and a deck height of 10 feet. The plant has 45,000 square feet of covered storage, and is served by a conveyor system with two 20-ton hoppers for the receipt of raw sugar. Vessels berth outboard of two floating cranes moored at the face of the wharf.

Several other private facilities at Yonkers, used mainly by barges, have reported depths of 8 to 30 feet alongside.

Small-craft facilities, about 0.6 mile north of the sugar refining plant, can provide berths, gasoline, water, ice, storage, and cranes up to 3 tons. The U.S. Volunteer Life Saving Corporation maintains small craft at Yonkers for search and rescue work. They can be contacted through the Coast Guard in New York.

Chart 748.—Alpine is a prominent landing at Mile 16W. A boat basin here, operated by the Palisades Interstate Park Commission, affords shelter for numerous small craft; berths, gasoline, and a launching ramp are available.

A **special anchorage area** for small vessels adjoins a yacht club on the Yonkers side of the Hudson River, 17 miles above the Battery; another **special anchorage area** is about 0.5 mile to the northward. (See **110.1 and 110.60 (o) and (o-1)**, chapter 2, for limits and regulations.)

Hastings-on-Hudson, Mile 19E, has several prominent stacks and tanks along its waterfront which are floodlighted at night. The 45-foot T-head pier of the Tappan Tanker Terminal, near the southern end of the waterfront, has depths of 35 feet alongside, deck height of 7 feet, and can provide 200 feet of berthing space with dolphins.

A private boat club is immediately southward of the tanker terminal, and a marina is about 0.5 mile northward of the T-head pier. Berths, electricity, gasoline, water, ice, marine supplies, a 10-ton mobile hoist, winter storage facilities, and hull and engine repairs are available at the marina. A yacht club, northward of the marina, is adjoined by a **special anchorage area** for small vessels. (See **110.1 and 110.60 (p)**, chapter 2, for limits and regulations.)

The **boundary line** between the States of New Jersey and New York extends northwestward from a point on the west side of Hudson River at Mile 19. The river is 0.8 mile wide at this point.

Dobbs Ferry, a town at Mile 20.5E, has an oil storage receiving facility near the southern end of the waterfront in about 41°00.7′ N., 73°52.9′ W. The facility is used by barges, and has depths of about 10 feet at the loading dolphins. A small-craft facility is on the north side of town; berths, electricity, water, ice, storage facilities, a launching ramp, a 5-ton mobile crane, and hull and engine repairs are available.

Irvington, Mile 22E, has a large lumber terminal at the southern end of the waterfront, and a small private wharf at the northern end. The lumber terminal marginal wharf has a 1,150-foot face, 30 to 25 feet alongside, and a deck height of 20 feet.

At **Piermont**, Mile 22E, an earthen embankment extends 0.8 mile channelward from the shore to **Piermont Pier**. The outer end of the pier is marked by a light. The Erie Railroad has a terminus at the inner end of the embankment; a tank, and several stacks and buildings are prominent. A T-head pier, used by Columbia University to moor its geological research vessels, extends from the outer end of Piermont Pier; depths of about 16 feet are reported alongside the face. The ruins of a former ferry slip and other piers are on the south side of Piermont Pier.

A foul area, marked at its northeastern end by a lighted buoy, extends about 300 yards northward from the outer end of Piermont Pier. A visible wreck is just southward of the buoy; caution is advised.

Several small-craft facilities are just northward of Piermont Pier. Berths, electricity, gasoline, water, ice, storage, marine supplies, mobile hoists up to 10 tons, and hull and engine repairs are available. A scuba diving team of the Piermont Volunteer Fire Department is available for underwater search and rescue work. They can be contacted through the Piermont Police Department; telephone (914-359-0240).

Chart 282.—Tappan Zee is the 2-mile-wide part of Hudson River between Piermont and Croton Point, 8 miles to the northward.

New York State Thruway Bridge, Mile 23.5, crosses Tappan Zee from Nyack to Tarrytown. The fixed span over the main channel has a clearance of 140 feet; a fog signal is sounded from the middle of the span. The 500-foot east and west spans, on either side of the main span, have clearances of 123 feet. Three auxiliary openings for small boats have clearances of 11 feet.

Tarrytown, Mile 24E, has about 1 mile of developed waterfront, part of which has been improved by dredging.

An abandoned lighthouse and the large buildings of an automobile assembly plant are prominent at Tarrytown.

In 1965-67, the controlling depths in the improved channels in Tarrytown Harbor were 9½ feet for a midwidth of 200 feet in the waterfront channel, and 12 feet and 10 feet, respectively, in the access channels leading southwest and northwest of the waterfront channel to deep water in Hudson River. The easterly edge of the waterfront channel along the wharf has shoaled to 6 feet. An obstruction, consisting of rocks, is at the channel edge, in 41°04.8′ N., 73°52.2′ W.

Both access channels are buoyed. A lighted 048° range marks the southwest channel.

The Tarrytown Harbor usually is open to navigation throughout the year, but in severe winters ice

floes from the upper river may temporarily block the channels.

Several waterfront terminals, with depths of 10 feet alongside, are available at Tarrytown, and there are rail connections nearby. The wharves are used mostly for the receipt of petroleum products, sand, gravel, and crushed rock.

A marina is southward of the principal wharves; berths, gasoline, diesel fuel, water, ice, marine supplies, a 12-ton mobile hoist, and minor hull and engine repairs are available. A private boat club is just southward of the marina.

Nyack, on the west side of Tappan Zee at Mile 25W, has depths of about 8 feet alongside the principal wharves. Small-craft facilities at Nyack include a boatyard with a marine railway that can handle craft up to 60 feet in length for complete engine and hull repairs; the railway, just south of Lower Nyack landing, can only be used at high tide. Berths, electricity, gasoline, diesel fuel, water, ice, storage, and marine supplies are available.

A **special anchorage area** for small craft is at Nyack. (See **110.1 and 110.60 (o-2)**, chapter 2, for limits and regulations.)

Upper Nyack, about 0.6 mile north of Nyack, has a boatyard with several marine railways that can handle vessels up to 100 feet in length; a 25-ton fixed crane is also available. The boatyard wharf has depths of about 8 feet at the face. Berths, electricity, gasoline, water, diesel fuel, ice, marine supplies, and complete engine and hull repairs are available.

Hook Mountain, 730 feet high, is on the west side of Tappan Zee at Mile 27W. The summit is only 0.3 mile inland and is very prominent from the river.

Ossining is on the east side of Tappan Zee at Mile 29E. Depths of 5 to 8 feet are on the flats off the oil storage receiving facility piers at Ossining. **Sing Sing Prison**, the State penitentiary, is on the low flat shore on the south side of Ossining. Two water towers near the prison are prominent. A marina at the north end of town can handle craft up to 15 tons; diesel fuel, gasoline, water, ice, marine supplies, and complete engine and hull repairs are available. Guest berths are usually available. There are also two boat clubs and a yacht club at Ossining.

From Hook Mountain, Mile 27W, northward to Haverstraw, Mile 33W, the west bank of the Hudson River rises precipitously to heights of more than 800 feet.

Croton Point, Mile 30E, is a long peninsula that extends 1.5 miles channelward from the main shore. The Penn Central Railroad has repair shops at **Harmon**, near the inner end of Croton Point; a high stack is prominent. Seasonal **storm warning signals are displayed** at Croton Point State Park. (See chart.)

Haverstraw Bay is the wide stretch of Hudson River between Croton Point and Stony Point, 5 miles to the northward; the greatest width is about 2.5 miles. The extensive flats in the eastern half of the bay have depths of 6 to 9 feet.

Croton-on-Hudson is on the east side of Haverstraw Bay at Mile 31.5E. The marginal wharf of a sand and gravel company here has a reported depth of 5 feet alongside, and is used by barges. A yacht club is just southward of the wharf.

High Tor, 820 feet high, is on the west side of Haverstraw Bay at Mile 32W.

Haverstraw, on the west side of Haverstraw Bay at Mile 33W., has several abandoned brickyards along its waterfront. Prominent on Bowline Point (41°12.2′ N., 73°57.6′ W.) are the cement stacks and large red rectangular buildings of a powerplant. In 1971, a pier for the powerplant was under construction in the vicinity of Bowline Point.

Two marginal wharves, used by barges and operated by sand, stone, and gravel companies, are about 0.7 mile southward of Bowline Point. In 1971, depths of 9 feet were reported alongside the wharves. A small private boat club is in the cove immediately northward of the more northerly wharf.

Grassy Point is on the west side of Haverstraw Bay at Mile 34W. An industrial pier, marked on its outer end by a light, is on the south side of the point; depths of about 18 feet are reported alongside. Small-craft facilities and a boat basin with a reported depth of about 5 feet are on the north side of Grassy Point. Berths, electricity, gasoline, water, ice, storage, marine supplies, lifts up to 40 tons, and engine and hull repairs are available.

Stony Point, Mile 35W, is marked at the outer end by a light; a fog signal is at the light.

Verplanck Point, Mile 35.5E, is marked on its northwestern side by prominent gray eroded banks of tailings from a trap-rock plant. Small-craft facilities on the point can provide gasoline, water, ice, and marine supplies.

Indian Point, on the east side of Hudson River, 1.7 miles northward of Verplanck Point, is the site of a nuclear powerplant. A tall red and white banded stack, lighted on top, is conspicuous on the point.

Tomkins Cove, a town at Mile 36W, has a large stone quarry, a rock crusher, and a trap-rock plant. Barges tie up at the 1,200-foot long wooden wharf to load crushed rock; a depth of about 16 feet is reported alongside. A powerplant pier, just northward of the wharf, consists of four cement steel-filled cells, the center two of which are connected to each other and the shore by a steel catwalk. Depths of 25 to 30 feet were reported alongside in 1971.

An overhead power cable with a clearance of 160 feet crosses the Hudson River north of Tompkins Cove.

Peekskill is at the head of a shallow bight at Mile 38E. A dredged U-shaped channel extends northeastward from deep water in Hudson River to the wharf area and thence northwestward back to deep water. The channel is buoyed, and a light

marks the north side of the southern entrance. In 1957, the controlling depths were 6½ feet in the south channel, 8 feet in the north channel, and 5 feet in the channel west of the wharves.

A yacht club at Peekskill has gasoline, water, and ice.

On the south side of Peekskill, a privately maintained channel leads from deep water in Hudson River to an oil storage facility on **Charles Point**. A privately maintained range marks the channel, but is lighted only when a ship or tow is expected. The channel has a controlling depth of about 26 feet.

An oil receiving pier at **Rao Hook**, on the north side of Peekskill, has a reported depth of about 18 feet alongside.

Peeks Kill is a very shallow creek on the north side of Peekskill. The railroad bridge over the entrance has a bascule span with a clearance of 3 feet. (See **117.190 (a) and (f) (9)**, chapter 2, for drawbridge regulations.) The highway bridge 0.2 mile above the railroad bridge has a fixed span with a clearance of 19 feet.

Dunderberg, 1,110 feet high, is a densely wooded mountain at Mile 38W. The mountain slopes eastward to **Jones Point**, which is low and flat.

The river becomes much narrower at Jones Point and has an average width of 0.3 mile for the next 8 miles between the bases of the highlands on both sides. When approaching the sharp turns in this reach, caution should be exercised and a warning signal should be given.

Iona Island, formerly a naval depot at Mile 40W, is controlled by the Palisades Interstate Park Commission. A light, shown from a skeleton tower on the north side of the island, is conspicuous.

A rock, with a depth of 10 feet over it and marked by a buoy, is 0.2 mile north-northwestward of the northernmost point of Iona Island. When descending the river, particularly with a strong fair current, a careful watch should be maintained to avoid being set on this rock.

Bear Mountain, Mile 40.3W, is 1,305 feet high and has its summit about 1 mile inland. There are wharves at **Day Line Park**, on the riverbank at the foot of the mountain.

Anthonys Nose, 900 feet high, is a steep, thickly wooded hill at Mile 40.5E. **Anthonys Nose Aero Light** (41°19.1′ N., 73°58.5′ W.), 950 feet above the water, is shown from a tower atop the hill.

Bear Mountain Bridge, Mile 40.6 crosses the Hudson River from Bear Mountain to Anthonys Nose. The suspension span has a clearance of 155 feet.

Con Hook, a small island at Mile 43W, is marked on its channel side by a light. A rock, with a depth of 7 feet over it and marked by a lighted buoy, is about 0.3 mile southward of Con Hook. When descending the river, particularly with a fair current, there is a tendency to set toward the rock; caution is advised.

Highland Falls, Mile 44W, is the site of the Ladycliff School for Women. A tower at the school is prominent.

A yacht club at **Garrison**, Mile 45E, has depths of about 20 feet alongside its fuel dock. Craft up to 60 feet in length can be accommodated at the slips; gasoline, water, electricity, and some marine supplies are available.

West Point, Mile 45W, is the site of the **U.S. Military Academy**. The academy is easily recognized from the prominence of the buildings and the road leading up the hillside from the railroad station and wharfs on the riverbank.

A **special small-craft anchorage area** is at West Point. (See **110.1 and 110.60 (p-1)**, chapter 2, for limits and regulations.)

The northeastern extremity of West Point descends to **Gees Point**, a rocky feature which is marked by a light with fog signals. About 0.2 mile south of Gees Point, another light marks the outer edge of a rocky shallow area along the west bank.

Worlds End, a sharp bend in Hudson River at Mile 46, has depths of more than 200 feet. Extreme caution should be exercised when passing through Worlds End; the view is obstructed and vessels should reduce speed and sound a warning signal.

Constitution Island is on the upper side of Worlds End at Mile 46.5E. **Magazine Point**, on the channel side of the island, is marked by a light.

Crows Nest Mountain, Mile 47W, is 1,403 feet high and prominent. A boat club is at **Cold Spring**, Mile 47.3E.

Little Stony Point, Mile 48E, is the site of a rock quarry with a prominent hopper structure.

Storm King Mountain, 1,355 feet high, is prominent at Mile 49W.

Breakneck Point, on the opposite side of Hudson River from Storm King Mountain, is marked by one highway tunnel and two railroad tunnels; the lights are prominent at night. Behind Breakneck Point is **Breakneck Mountain**, 1,196 feet high.

Cornwall On The Hudson is at Mile 50W. The wharf at Cornwall is in ruins. A boat club and a yacht club, about 0.6 mile southeastward of the wharf in ruins, can provide gasoline and water; guest moorings and a launching ramp are available.

Pollepel Island, Mile 50E, is a private estate with buildings that resemble a medieval castle. A light is shown from a skeleton tower 0.1 mile off the west side of the island.

Newburgh, Mile 53W, is a major petroleum distribution center. Most of the piers of the major oil companies are at **New Windsor**, the southern end of the 2-mile waterfront at Newburgh. Depths at the piers are reported to range from about 14 feet at the northern end to 30 feet at the southern end of the waterfront.

The yacht club landing near the north end of the Newburgh waterfront has depths of about 5 feet alongside. The marine railways here can haul out craft up to 40 feet in length for minor engine and hull repairs; berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available.

Beacon, on the east bank of the Hudson River opposite Newburgh, has some manufacturing

facilities. A fixed highway bridge, with a clearance of 150 feet for a middle 760-foot width and 181 feet at the center, crosses the river between Beacon and Newburgh. A fog signal is at the bridge.

Danskammer Point, Mile 58W, is marked by a conspicuous powerplant with two large buildings and two stacks. There are numerous brickyards on both sides of the river between Newburgh and Danskammer Point, but most of them have been abandoned.

Chart 283.—Wappinger Creek is entered at Mile 58.5E through a dredged channel that leads to just below **Wappingers Falls**, 1.6 miles above the entrance. In 1971, the channel had a reported controlling depth of 3 feet. The entrance to the creek from the Hudson River is marked by buoys. Caution should be exercised in the upper part of the creek because of the numerous snags and reports of extensive shoaling; local knowledge is advised. The mean range of **tide** is about 3 feet.

The railroad bridge across the mouth of Wappinger Creek has a bascule span with a clearance of 1 foot. (See **117.190 (a) through (c) and (f) (10)**, chapter 2, for drawbridge regulations.) The nearby overhead cables have a clearance of 43 feet over the creek. The fixed highway bridge about 300 yards above the railroad bridge has a clearance of 12 feet. An overhead power cable with a clearance of 31 feet crosses the creek about 1.5 miles above the mouth.

Diamond Reef, with a depth of 5 feet over it and marked by a buoy, lies in about the middle of Hudson River 0.2 mile above the entrance to Wappinger Creek. Between Diamond Reef and Poughkeepsie the west side of the river should be favored to avoid several 18-foot spots which are buoyed.

A marina at **New Hamburg**, just north of the entrance to Wappinger Creek, has berths, electricity, gasoline, water, ice, a 12-ton lift, and marine supplies; hull and engine repairs can be made.

Poughkeepsie, Mile 66E, is an important industrial center specializing in manufactured goods, oil, and lumber.

Mid Hudson Bridge, a suspension span with a clearance of 137 feet, and a fixed railroad bridge with a clearance of 167 feet, 0.5 mile northward, cross the river at Poughkeepsie; both bridges are well lighted at night. Submerged piling, covered 2 feet, are reported to exist in the westerly side of the Hudson River between the second and third abutments of the railroad bridge.

The marginal wharf of a lumber company is at the northern end of the 1-mile waterfront of Poughkeepsie. About 600 feet of berthing space is available at the wharf; depths of about 35 feet are reported alongside. Several bulk oil receiving wharves with reported depths of 8 to 14 feet alongside are southward of the Mid Hudson Highway Bridge. A town park and a small-craft launching ramp are about 0.2 mile north of the highway bridge.

A marina, near Mile 68E, has berths, electricity, gasoline, water, ice, a launching ramp, a 6-ton crane, and marine supplies; minor engine repairs can be made.

Hyde Park, Mile 71E, is the birthplace of Franklin Delano Roosevelt, the 32d President of the United States. The residence and library are about 0.4 mile inland.

A **special anchorage area** is at Mile 72.7E. (See **110.1 and 110.60 (p-2)**, chapter 2, for limits and regulations.) The Poughkeepsie Yacht Club, just southward of the anchorage area, has berths, electricity, gasoline, water, a 15-ton mobile hoist, and ice.

Esopus Island, Mile 73, is marked by a light on the south end and a buoy marking a ledge, partly bare at low water, extending about 300 yards from the north end. The better channel is westward of the island. A prominent large graystone building is on the west side of the river above **Esopus**, about a mile north of Esopus Island.

Indian Kill flows into the Hudson River at Mile 73.8E. At the entrance to Indian Kill is a small-boat basin with a depth of about 8 feet; private lights mark the north and south entrance points to the boat basin. Gasoline, water, ice, and a 20-foot concrete launching ramp are available in the basin. Supplies can be obtained nearby.

Esopus Meadow Light 11, Mile 75.8, 52 feet above the water, is shown from a white tower and dwelling on a granite pier on the west side of the main channel in the Hudson River; a fog signal is at the light. Shoals with depths less than 3 feet extend as much as 0.4 mile from either shore from about 1 mile below the light to Rondout Creek at Kingston. The shoal area on the east side of the river is marked by buoys.

Rondout Creek is entered from the Hudson River at Mile 79W through a dredged channel that leads between two long dikes to Eddyville, about 3 miles above the channel entrance. A light marks the seaward end of each dike, and a fog signal is on the north dike. In 1966-67, the controlling depths were 14 feet from the entrance to the highway bridge, about 1.1 miles above the entrance, thence 12 feet to Eddyville. The channel is marked by buoys. The head of practical navigation is at the lock of the abandoned **Delaware and Hudson Canal**, 3.3 miles above the entrance. The lower 2-mile portion of Rondout Creek serves as a harbor for Kingston.

Kingston is partly on the lowlands adjacent to the north bank of Rondout Creek and partly on the elevated plateau to the north and westward of it. Waterborne traffic consists chiefly of sand, gravel, crushed rock, and petroleum products.

Bridges.—Rondout Creek is crossed by a highway suspension bridge with a clearance of 86 feet, about 1.1 miles above the entrance, and by a fixed highway bridge with a clearance of 144 feet, about 2 miles above the entrance. An overhead power cable with a clearance of 75 feet crosses the

creek about 0.45 mile above the railroad bridge.

Tides.—The mean range of tide at the entrance to Rondout Creek is about 3.7 feet.

Wharves.—Several privately owned wooden piers with depths up to 16 feet alongside are along the north shore waterfront at Kingston. No charge is made for occasional use of the piers.

Small-Craft Facilities.—There are several small-craft facilities on Rondout Creek. The largest marine railway, on the south side of the creek about 1.5 miles above the mouth, can handle craft up to 100 tons for engine and hull repairs. Berths, electricity, gasoline, diesel fuel, water, ice, marine supplies, launching ramps, and wet and dry storage are available.

Charts 283, 284.—In the Hudson River above Kingston many shoals with depths less than 3 feet are in midriver or extend from the shore on either side. The bottom is rocky at many of the bar crossings. Most of the channels through the critical areas are marked with lights and buoys, but strangers in all except small boats are advised to take a pilot. Pilots are engaged at New York.

Chart 283.—**Kingston Point**,Mile 80W, is an oil terminal. Tugs and barges drawing 10 to 15 feet transport petroleum products both up and down the river from this terminal.

Kingston-Rhinecliff Bridge crosses the Hudson River at Mile 82.7. The fixed channel spans have a clearance of 132 feet.

Esopus Creek is entered at Mile 88.5W. The entrance is between two dikes marked by lights and a fog signal on the north dike. **Saugerties** is on the north bank of the creek about a mile above the entrance. In 1966-67, the controlling depth was 10 feet to the steamboat wharf about 0.7 mile above the entrance. The mean range of tide is about 4 feet. Above the steamboat wharf several shoals bare at low water and there are many large boulders. Small craft, with local knowledge, use this area as an anchorage, but is should be avoided by strangers. A dam crosses the creek about 1.3 miles above the entrance. Small-craft facilities below the steamboat wharf can provide berths, electricity, gasoline, diesel fuel, water, ice, outside storage, some marine supplies, and limited engine and hull repairs; launching ramps are also available.

The Maelstrom is a dangerous whirlpool on the east side of the main channel about 2 miles north of Esopus Creek.

Several large cement manufacturing plants that have prominent buildings and elevators are near **Cementon**, Mile 92,5W. Another cement factory is at **Dewitt Point**, 2 miles above Cementon. A wharf just below the point has a depth of 8 feet at the end. The landing for **North Germantown** is across the river opposite this wharf.

Catskill Creek, marked at the entrance by buoys, is entered at Mile 97.5W. **Catskill** is about 1 mile above the mouth. A controlling depth of 6½ feet is available to about 100 yards above the highway bridge, 0.9 mile above the mouth. The bridge, which remains in a closed position, has a bascule span with a clearance of 14 feet. An overhead power cable about 200 yards above the bridge has a clearance of 60 feet. The north edge of the channel leads close to the end of the wharf at the entrance, then passes 75 feet off the first small pier, lying 200 yards inside the end of the wharf, and then passes close to the next small pier on the north side. The best water is then in midcreek when approaching the first sharp bend to avoid a rock with 4 feet over it about 50 feet off the western end of the wharf. The channel then favors the south bank until about 350 yards from the highway bridge, then follows the north bank to the highway bridge.

A long wharf extends along the north side of Catskill Creek from the entrance to Catskill. Several small-craft facilities are on the creek. Berths, electricity, gasoline, diesel fuel, storage facilities, launching ramps, water, ice, marine supplies, a 55-foot marine railway, and lifts up to 20 tons are available; hull, engine, and electronic repairs can be made.

Rip Van Winkle Bridge crosses the Hudson River at Mile 98.7. The fixed span over the channel has a clearance of 146 feet. High-voltage power cables with a clearance of 145 feet cross the river about 2.4 miles above the bridge. Red lights are atop the suspension towers on both sides of the river.

Hudson, Mile 102E, is on a slope that rises from the east bank of the Hudson River. Waterborne commerce is in cement, scrap iron, and petroleum products. The cement facility marginal wharf and the bulk petroleum T-head pier have reported depths of about 14 feet alongside. Gasoline for small craft is available at a boat club at Hudson.

Athens is on the west side of the Hudson River opposite Hudson. An asphalt receiving facility and a bulk petroleum storage facility are at Athens. Barges call at these facilities which have reported depths of about 14 to 16 feet alongside. A small-craft facility at the north end of town has berths, electricity, gasoline, water, ice, limited marine supplies, and can make minor engine repairs.

Chart 284.—**Coxsackie** is at Mile 108W. Berths, gasoline, diesel fuel, and water are available at a yacht club, and a boat club, at the north end of town. A State-owned 20-foot steel-mat launching ramp is also available at Coxsackie.

A 32-foot buoyed **anchorage** basin is on the east bank of the river north of **Stuyvesant** about 3.1 miles above Coxsackie.

Coeymans, Mile 115W, has a boatyard that can provide berths, electricity, gasoline, diesel fuel, water, ice, a 12-ton lift, and marine supplies; hull and engine repairs can be made.

A **special anchorage area** is at Coeymans. (See **110.1 and 110.60 (v)**, chapter 2, for limits and regulations.)

A fixed railroad bridge with a clearance of 139

feet crosses the Hudson River at Mile 117.8. An overhead power cable just southward of the bridge has a clearance of 185 feet. The fixed highway bridge about 150 yards above the railroad bridge has a clearance of 135 feet.

Castleton-on-Hudson, Mile 119E, has several small-craft facilities that can provide berths, gasoline, water, storage, and hull and engine repairs.

A marine at **Cedar Hill**, Mile 120W, has moorings and gasoline. A **special anchorage area** is just below Cedar Hill. (See **110.1 and 110.60 (w)**, chapter 2, for limits and regulations.)

Albany, Mile 126W, is the capital of New York State, and the principal port on the river above New York City. The port of Albany is the terminus for deep-draft vessels on the Hudson River, and serves as a transshipping point for the immediate vicinity, large areas of New England, and most of the areas accessible by waterways.

Waterborne commerce at the port is mostly in petroleum products, but grain, molasses, scrap iron, aggregates, lumber, wood byproducts, bananas, steel, chemicals, and general cargo are also handled.

The Albany Port District includes the lower harbor between points about 0.2 mile below and 1.9 miles above the entrance to Island Creek (42°36′26″ N., 73°45′50″ W.), and the upper harbor extending northward of this point to the northern limits of Albany on the west side and **Rensselaer** on the east side.

Channels.—The Federal project depth is 32 feet from New York Harbor to Albany. Above the Port of Albany, the project depth is 14 feet to the Troy Lock and Dam. (See Notice to Mariners and latest editions of the charts for controlling depths.)

Anchorages.—The restricted width of the river at Albany is not sufficient to permit vessels to swing at anchor without interfering with passing craft. However, in an emergency, vessels sometimes anchor in midstream to wait for berthing space.

Bridges.—A fixed highway bridge with a clearance of 60 feet crosses Hudson River at Albany at Mile 126.4. A railroad bridge 0.7 mile above the highway bridge has a swing span with a clearance of 25 feet. (See **117.185 (a) through (g) and (h) (3)**, chapter 2, for drawbridge regulations and opening signals.) An overhead power cable at the railroad bridge has a clearance of 135 feet.

Tides.—The mean range of tide at Albany is 4.6 feet. (For daily predictions see Tide Tables.) **Tidal currents** for Hudson River are described at the beginning of this chapter.

Weather.—The climate at Albany is primarily continental in character, but is subjected to some modification from the maritime climate which prevails in the extreme southeastern portion of New York State. The moderating effect on temperatures is more pronounced during the warmer months than in the cold winter season when outbursts of cold air sweep down from Canada with greater vigor than at other times of the year. In the warmer portion of the year temperatures rise rapidly during the daytime to moderate levels. As a rule, temperatures fall rapidly after sunset so that the nights are relatively cool. Very occasionally, the area experiences extended periods of oppressive heat up to a week or more in duration. The highest temperature of record is 104°, but since 1874, 100° temperatures have been recorded on only 15 days.

Winters are usually cold and occasionally fairly severe. Maximum temperatures during the colder winter months often are below freezing, and nighttime low temperatures frequently drop to 10° or lower. Subzero temperatures occur rather infrequently, about a dozen times a year. Snowfall in the area is quite variable and over some of the higher nearby areas ranges up to 75 inches or more for a season. Snow flurries are quite frequent during the cold months. Precipitation is sufficient to serve the economy of the region in most years, and only occasionally do periods of drought become a threat. A considerable portion of the rainfall in the warmer months is from showers associated with thunderstorms, but hail is not usually of any consequence.

On the whole, wind velocities are moderate. The north-south Hudson River Valley has had a marked effect on the lighter winds and the warm months usually average out as a south wind. Destructive winds occur infrequently.

The area enjoys one of the highest percentages of sunshine that can be found in the State. This is true of the Hudson Valley area from Albany southward to the coast with slightly more sunshine progressively southward. Seldom does the area experience extended periods of cloudy days or extended periods of smog. Occasionally during the warm months, there are short periods when high humidity associated with temperatures above 85° is rather uncomfortable.

Tornadoes are rather rare in the Albany area; six have been reported since 1826.

(See appendix for **Albany climatological tables.**)

Pilotage information for the Hudson River is given at the beginning of this chapter.

Towage.—Tugs up to 2,100 hp., based at Cohoes and New York City, are available at Albany. Arrangements for tugs are usually made in advance by ships' agents.

Albany is a **customs port of entry. Immigration and agricultural quarantine** officials are stationed in Albany. (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. Vessels may be granted pratique by radio. (See Public Health Service, chapter 1.)

The U.S. Public Health Service maintains a **contract physician's office** in Albany. (See appendix for address.) Albany has several hospitals.

Coast Guard.—The Coast Guard maintains a Captain of the Port office in Albany. (See appendix for address.) A Marine Inspection Office and a vessel documentation office are also at this office.

Harbor regulations.—Local rules and regulations for the port are handled by the Albany Port District Commission.

Wharves.—There are about 30 waterfront facilities at Albany and Rensselaer; most are located on the west side of the Hudson River at Albany. All have highway connections and, with the exception of the petroleum berths, railroad connections. Cargo is generally handled by ships' tackle. Crawler and truck cranes up to 100 tons can be rented. The alongside depths given for each facility are reported; for information on the latest depths, contact the operator. Only the major facilities are described. (See the Port Series, a Corps of Engineers publication, for a complete description of the port facilities.)

West side of Hudson River below Island Creek (42°36′26″ N., 73°45′50″ W.):

Sears Oil Co. Tanker Wharf: about 1.2 miles southward of Island Creek; offshore wharf, 191 feet with dolphins; 25 feet alongside; deck height, 10 feet; receipt of petroleum products; owned and operated by Sears Oil Co., Inc.

Texaco North Wharf: about 0.85 mile southward of Island Creek; offshore wharf, 230 feet with dolphins; 30 feet alongside; deck height, 14 feet; fresh-water connections; receipt of petroleum products; owned and operated by Texaco Inc.

West side of Hudson River above Island Creek:

Agway Petroleum Wharf: about 0.1 mile northward of Island Creek; offshore wharf, 260 feet with dolphins; 32 feet alongside, deck height, 11 feet; receipt of petroleum products; owned and operated by Agway Petroleum Inc.

Cirillo Bros. Petroleum Plant Wharf: about 0.5 mile northward of Island Creek; bulkhead wharf, 280 feet with dolphins; 26 feet alongside; deck height, 10 feet; receipt of asphalt; owned by Albany Port District Commission and operated by Cirillo Bros.

Albany Port District Commission Berths 1 through 10: provide 4,070 feet of continuous berthing; depths of 32 feet alongside; deck heights, 16½ feet; water and electrical shore power connections; owned and operated by Albany Port District Commission.

Berth 10: about 0.65 mile northward of Island Creek; 300-foot marginal wharf; special crane and hopper-conveyor system for receipt of sand, gravel, stone, and scrap iron.

Berths 7, 8, and 9: immediately northward of Berth 10; 1,270-foot marginal wharf; 13½-million-bushel grain elevator; special grain-handling equipment; pneumatic unloading system, rate 20,000 bushels per hour; conveyor-belt loading system, rate 40,000 bushels per hour; pipelines to molasses storage tanks.

Berths 5 and 6: immediately northward of Berth 7; 750-foot marginal wharf; 80,000 square feet covered storage; 35 acres open storage; pipelines to molasses storage tanks; receipt and shipment of general cargo and molasses.

Berths 3 and 4: immediately northward of Berth 5; 850-foot marginal wharf; 149,000 square feet covered storage; receipt and shipment of general cargo and fruit.

Berth 2: immediately northward of Berth 3; 300-foot marginal wharf; receipt and shipment of general cargo.

Berth 1: immediately northward of Berth 2; 600-foot marginal wharf; not in operation in 1971.

Mobile Oil Co. Tanker Wharf: about 200 yards northward of Berth 1; offshore wharf, 200 feet with dolphins; 36 feet alongside; deck height, 16 feet; freshwater connections; receipt of petroleum products; owned and operated by Mobil Oil Co.

East Side of Hudson River:

American Oil Co. Wharf: about 0.75 mile southward of Island Creek; offshore wharf, 180 feet with dolphins; 32 feet alongside; deck height, 12 feet; receipt of petroleum products; owned and operated by American Oil Co.

Hess Oil and Chemical Corp. Wharf: about 0.3 mile northward of Island Creek; offshore wharf, 240 feet with dolphins; 30 feet alongside; receipt of petroleum products; owned by Hess Oil and Chemical Corp. and operated by Hess Oil and Chemical Corp. and Sun Oil Co.

Atlantic-Richfield Co. Wharf: about 0.65 mile northward of Island Creek; offshore wharf, 295 feet with dolphins; 33 feet alongside; deck height, 11 feet; fresh-water connections; receipt of petroleum products; owned by Atlantic-Richfield Co.; various operators.

Bray Terminals: about 0.8 mile northward of Island Creek; offshore wharf, 250 feet with dolphins; 25 feet alongside; deck height, 12 feet; water and electrical shore power connections; receipt of petroleum products; owned by Bray Terminals; various operators.

Port of Albany Lumber Terminal Wharf: about 1.25 miles above Island Creek; marginal wharf, south portion not used, north portion, 605 feet; 32 feet alongside; deck height, 16½ feet; forklifts, straddle trucks, and other mechanical equipment; receipt of lumber; owned and operated by Albany Port District Commission.

Supplies.—Bunkering services for deep-draft vessels are not available at Albany; this service is obtained in New York. Diesel fuel, through metered pumps, is available for small vessels; water, marine supplies, and provisions are available.

Repairs.—There are no drydocks or marine railway facilities for ocean-going vessels at the port of Albany. All types of repairs, not requiring hauling out, are available for steel and wooden hulls,

machinery, boiler work, and machine shop work.

A marine repair facility at **Cohoes**, 8 miles above Albany and 1.5 miles above the Troy Lock and Dam, is equipped to make all types of above-and-below the waterline repairs to tugs, barges, and other small vessels. The floating drydock at this facility has a lifting capacity of 600 tons, an overall length of 110 feet, and a maximum clear inside width of 33 feet.

Small-craft facilities.—A yacht club is on the east side of the Hudson River at Rensselear at Mile 126.4, about 0.2 mile south of the fixed highway bridge; berths, electricity, gasoline, diesel fuel, and water are available. Additional facilities at Watervliet, north of Albany, are discussed later in this chapter.

Communications.—Albany is served by air, rail, and highway communications. The Delaware and Hudson Railroad serves the facilities on the west side of the river while the Penn Central Railroad serves the facilities on the east side. The Albany Port District Railroad, a terminal switching line, serves the waterfront facilities and property owned by the Albany District Commission and connects with the main line railroads.

A fixed highway bridge with a clearance of 60 feet crosses the Hudson River just above Albany at Mile 127.8.

A **031°-211° measured course**, 5,280 feet long, begins about 0.7 mile above the bridge; the markers are on the east bank of the river.

A fixed highway bridge crossing the Hudson River at **South Troy**, Mile 130.5, has a clearance of 61 feet. The overhead power cables between Albany and Troy have a least clearance of 87 feet. Red lights are shown from the suspension towers on both sides of the river.

Troy, Mile 132E, is a manufacturing center. **Watervliet**, on the west side of the river opposite Troy, is the site of the United States Arsenal with a 755-foot stone bulkhead. The harbor extends from the southern limits of the city of Troy to the Troy Lock and Dam. Vessels usually berth on arrival because the narrow width of the river and character of the bottom are not suitable for anchorage.

The highway bridge connecting Watervliet and Troy, at Mile 132.2, has a fixed span with a clearance of 55 feet. The railroad bridge 0.5 mile upstream has a lift span with a clearance of 24 feet down and 129 feet up. (See **117.185 (a) through (g) and (h) (5)**, chapter 2, for drawbridge regulations and opening signals.)

Well-equipped wharves at Troy have berthing space of about 2,400 feet and depths of 9 to 14 feet alongside. A mile-long concrete bulkhead extends along the waterfront. The only public docking facility is at the State barge canal terminal. The oil storage terminals on the island under the railroad bridge have depths up to 14 feet alongside. Facilities for repairs to hulls, machinery, and boiler equipment are available for vessels not requiring hauling out.

Small-craft supplies are available at Watervliet at the boating center, about a mile below the highway bridge, and at the yacht basin just below the highway bridge. These include gasoline, diesel fuel, water, and ice; berths with electricity are also available. Each place has a marine railway that can handle boats up to 50 feet for hull and engine repairs.

The Troy Lock and Dam is about 8 miles above Albany. The lock dimensions are: length 492.5 feet; width 44.4 feet; depth over upper miter sill 16.3 feet at normal pool level; and depth over lower miter sill 13 feet at lowest low water. The lift at the lowest stages is 17.3 feet. The mean range of **tide** is about 4.7 feet below the lock. (See **207.50 and 207.60**, chapter 2, for navigation regulations for the lock and operating regulations for the dam.)

Storm warning signals are displayed. (See chart.)

The Hudson River above the Troy Lock and Dam joins with the New York State Barge Canal System to form a connecting waterway westward to Lake Erie and Lake Ontario, and northward to Lake Champlain.

The **New York State Barge Canal System**, comprising Erie Canal, Oswego Canal, Cayuga, and Seneca Canals, and Champlain Canal is under the jurisdiction of the State of New York. Navigation on the State canals is free except for mooring, dockage, wharfage, storage, or use of canal equipment or facilities for which a permit is required. Detailed data regarding movement through the New York State Barge Canal System may be obtained from the Office of the Director, Waterways Maintenance Subdivision, New York State Department of Transportation, State Campus, Building 5, 1220 Washington Avenue, Albany, N.Y. 12226; telephone (518-457-4420).

Controlling dimensions of channels, locks, and bridges.—The channels are 12 feet deep at normal pool level, and the minimum widths are 104 feet in earth, 120 feet in rock, and from 110 to 200 feet in river and lake sections. The inside dimensions of locks are about 310 feet in length and 45 feet in width; the maximum usable dimensions are 300 feet in length and 43½ feet in width. The depth over miter sills of locks and guard gates is 12 feet at normal pool level. The overhead clearance of bridges and cables is 15 feet. The navigation season is normally from the first part of April to the later part of November.

Erie Canal, a 294-mile waterway, extends from the pool of the Troy dam in the Hudson River at Waterford westerly through the Mohawk River and landcuts to Oneida Lake, thence through Oneida, Seneca, and Clyde Rivers, landcuts, an artificial channel, and Tonawanda Creek to Niagara River at Tonawanda. The Niagara River connects the Erie Canal with Lake Erie at Buffalo.

Oswego Canal, a 21-mile waterway, extends northward from the Erie Canal, 141 miles westward of the Troy dam, to Oswego where it joins Lake Ontario. For the most part the canal follows the Oswego River from its confluence with the

Oneida and Seneca Rivers.

Cayuga and Seneca Canals are, in general, improved waterways of the Seneca River and Cayuga and Seneca Lakes. The Cayuga Canal extends southward from the Erie Canal, 177 miles westward of the Troy dam near the confluence of the Seneca and Clyde Rivers, to Cayuga Lake, thence through the lake to Ithaca. The Seneca Canal extends westward from the junction with Cayuga Canal at the north end of Cayuga Lake up the Seneca River to and through Seneca Lake to Watkins Glen. These lakes are two of the so-called Finger Lakes of central New York and are each about 30 miles in length.

Champlain Canal, a 52-mile waterway, follows the Hudson River northward from Waterford for about 32 miles to Fort Edward, thence through a landcut and Wood Creek to Whitehall at the entrance to Lake Champlain.

Lake Champlain, about 90 miles long from Whitehall to the Canadian border and up to 10 miles at its widest part, has considerable water commerce between the ports along its shores. The controlling depth is about 12 feet at low lake level through the main channel to the Canadian border and to the principal ports. The least overhead clearance is 92 feet, a fixed bridge at Crown Point, about 32 miles above Whitehall.

An international waterway for commerce is available between the United States and Canada by the use of Champlain Canal, Lake Champlain, and the **Richelieu River** and **Chambly Canal**, which extend from the northerly end of Lake Champlain for about 70 miles in Canadian waters to the St. Lawrence River, 40 miles below Montreal. The size of vessels that can navigate this route is controlled by the least dimensions of the Chambly Canal locks which are: usable length, 111 feet, 5 inches; width, 22½ feet; depth on sills, 6½ feet. Bridges over the waterway are provided with draws; the least overhead clearance of cables is 120 feet. The navigation season is from about the middle of April to the middle of November.

Charts and pilot information for the New York State Barge Canal System and Lake Champlain is published by the Lake Survey Center, NOS, National Oceanic and Atmospheric Administration, Detroit, Mich. Charts and pilot information for the Richelieu River, Chambly Canal, and other Canadian waters are published by the Canadian Hydrographic Service, Survey and Mapping Branch, Department of the Environment, 615 Booth Street, Ottawa, Canada.

APPENDIX

NATIONAL OCEAN SURVEY.—Coasts Pilots, Nautical Charts, Tide Tables, Tidal Current Tables, and Tidal Current Charts are sold by the National Ocean Survey and by authorized sales agents located in many United States 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 of the United States should be made either by an International Money Order or by a check payable on a United States bank. Chart catalogs, which include a listing of authorized sales agents, are free upon request. Counter sales are available at 6501 Lafayette Ave., Riverdale, Md.

Field offices:

Norfolk: Director, Atlantic Marine Center, NOS, National Oceanic and Atmospheric Administration, 439 West York St., Norfolk, Va. 23510.

Detroit: Director, Lake Survey Center, NOS, National Oceanic and Atmospheric Administration, 630 Federal Bldg. and U. S. Courthouse, Detroit, Mich. 48226.

Kansas City: National Geodetic Survey Operations Center, NOS, National Oceanic and Atmospheric Administration, Federal Bldg., 601 East 12th St., Kansas City, Mo. 64106.

Seattle: Director, Pacific Marine Center, NOS, National Oceanic and Atmospheric Administration, 1801 Fairview Ave., East, Seattle, Wash. 98102.

COAST PILOTS:

U. S. Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod, 1972.

U. S. Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook, 1973.

U. S. Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry, 1972.

U. S. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West, 1972.

U. S. Coast Pilot 5, Atlantic Coast—Gulf of Mexico, Puerto Rico, and Virgin Islands, 1967.

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, Fourth (1967) Edition.

New editions of Coast Pilots 1, 2, 3, and 4 will be 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, and 4, 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 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.

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 agents.

Mississippi River (Cairo Ill., to Gulf of Mexico): Published and for sale by Mississippi River Commission, Vicksburg, Miss.

Mississippi River (Cairo, Ill., to Minneapolis, Minn.) and Illinois Waterway (Mississippi River to Lake Michigan): Published and for sale by 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 National Ocean Survey, Lake Survey Center, 630 Federal Bldg. and U. S. Courthouse, Detroit, Mich. 48226.

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: Published and for sale by National Ocean Survey, Lake Survey Center, 630 Federal Bldg. and U.S. Courthouse, Detroit, Mich. 48226.

Foreign countries (Sailing Directions): 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: Published by National Ocean Survey; 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 and his sales agents.

Foreign countries: Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by that office and its sales agents.

Radio.—Radio Navigational Aids, Atlantic and Mediterranean Area (H.O. Pub. No. 117A); Radio Navigational Aids, Pacific and Indian Oceans Area (H.O. Pub. No. 117B): Radio Weather Aids (H.O. Pub. No. 118): Weather Station Index (H.O. Pub. No. 119). Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by that office and its sales agents.

Miscellaneous.—The Nautical Almanac, The Air Almanac, and American Ephemeris and Nautical Almanac: Published by Defense Mapping Agency Hydrographic Center (DMAHC); for sale by Superintendent of Documents and his sales agents.

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.

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.

Official U.S. Coast Guard Recreational Boating Guide (CG—340): Published by U.S. Coast Guard; for sale by the Superintendent of Documents. Price 45 cents.

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, U.S. ARMY.—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 of New England except western Vermont and small portions of Massachusetts and Connecticut along their western boundaries, and includes small portions of southeastern New York, all embraced in the drainage basins tributary to Long Island Sound and the Atlantic Ocean east of the New York-Connecticut State line. It also includes Fishers Island, N.Y.

New York District Office: 26 Federal Plaza, New York, N.Y. 10007.

The New York District includes western Vermont, small portions of western Massachusetts, Connecticut, northcentral Pennsylvania, eastern and south-central New York, including Long Island, and northeastern New Jersey, embraced in the drainage basins tributary to Lake Champlain and the St. Lawrence River system east thereof and to the Atlantic Ocean from New York-Connecticut State line to, but not including, Manasquan Inlet, N.J., and the Susquehanna River basin from about 4 miles south of the Pennsylvania-New York State line to its source.

It exercises jurisdiction, however, over all matters pertaining to the improvement of the Great Lakes-to-Hudson River waterway. Under the direction of the Secretary of the Army, the district engineer, as Supervisor of New York Harbor, also exercises jurisdiction under the laws enacted for the preservation of the tidal waters of New York Harbor, its adjacent or tributary waters, and the waters of Long Island Sound.

COAST GUARD.—District offices and areas covered by this Coast Pilot.

Commander, First Coast Guard District, J. F. Kennedy Federal Building, Government Center, Boston, Mass. 02203. The coastal waters and tributaries of Massachusetts and Rhode Island to Watch Hill, R. I.

Commander, Third Coast Guard District, Governors Island, New York, N. Y. 10004. From Watch Hill, R. I., the coastal waters and tributaries of Rhode Island, Connecticut, New York and New Jersey.

Captains of the Port:

Albany Captain of the Port, 313 Federal Bldg., Albany, N. Y. 12207.

Boston Captain of the Port, U. S. Coast Guard Base, 427 Commercial St., Boston, Mass. 02109.

New London Captain of the Port, Coast Guard Mooring, Fort Trumbull, New London, Conn. 06320.

New York Captain of the Port, Governors Island, New York, N. Y. 10004.

Providence Captain of the Port, 409 Federal Bldg., Providence, R. I. 02903.

Marine Inspection Offices:

Albany, N. Y. Federal Bldg., Room 313, 12207.

Boston, Mass.: U. S. Coast Guard Base, 427 Commercial St. 02109.

New London, Conn.: U. S. Customhouse, 150 Bank St. 06320.

New York, N. Y.: Battery Park Bldg. 10004.

Providence, R. I.: U. S. Customhouse, Room 104, 02903.

Documentation Offices:

Albany, N. Y.: U. S. Post Office and Federal Bldg., Room 213, 12207.

Bridgeport, Conn.: U. S. Post Office Room 205, 120 Middle St. 06603.

New Bedford, Mass.: U. S. Customhouse, Room 6, 02740.

New York, N. Y.: Battery Park Bldg. 10004.

Providence, R. I.: U. S. Customhouse, Room 101, 02903.

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.

Massachusetts:

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.

Chatham (41°40.3' N., 69°57.0' W.). Southeastern Cape Cod, near Chatham Light.

Woods Hole (41°31.2' N., 70°40.0' W.). On west side of Little Harbor, about 450 yards northward of Juniper Point.

Brant Point (41°17.4' N., 70°05.5' W.). On west side of entrance to Nantucket Harbor, near Brant Point Light.

Gay Head (41°21.0' N., 70°45.9' W.). West end of Martha's Vineyard, near Menemsha Light.

Rhode Island:

Castle Hill (41°27.7' N., 71°21.5' W.). On west shore of Newport Neck, near Castle Hill Light.

Bristol (41°40.0' N., 71°16.7' W.). On Bristol waterfront.

Point Judith (41°21.7' N., 71°28.9' W.). On Point Judith, near Point Judith Light, 0.5 mile east of Point Judith Harbor of Refuge.

Block Island (41°11.7' N., 71°35.3' W.). On Block Island, west side of entrance to Great Salt Pond.

Connecticut:

New London (41°20.7' N., 72°05.7' W.). At Fort Trumbull, on west side of main channel northward of Greens Harbor.

New Haven (41°16.4' N., 72°54.3' W.). On the north side of the jutting point, about 1.5 miles northward of Lighthouse Point.

New York:

Fishers Island (41°15.4' N., 72°01.9' W.). In Silver Eel Pond, on west end of island.

Eatons Neck (40°57.3' N., 73°23.9' W.). Near Eatons Neck Light, north shore of Long Island, east side of entrance to Huntington Bay.

Montauk Point (41°04.3' N., 71°56.1' W.). In Montauk Harbor, Long Island.

Shinnecock (40°51.0' N., 72°30.3' W.). East side of Ponquogue Point, 1.3 miles northwest of Shinnecock Inlet.

Moriches (40°47.2' N., 72°45.0' W.). On Moriches Bay, about 1 mile north of Moriches Inlet.

Fire Island (40°37.5' N., 73°15.6' W.). Near west end of island, 1.9 miles west of Fire Island Light.

Short Beach (40°35.4' N., 73°33.4' W.). Near Jones Inlet, opposite Meadow Island.

Atlantic Beach (40°35.5' N., 73°44.5' W.). On north side of Atlantic Beach, 0.25 mile west of bascule bridge.

Rockaway (40°34.1' N., 73°53.1' W.). On Rockaway Beach, 2.5 miles east of Rockaway Point.

Coast Guard Air Station, Floyd Bennett Field (40°35.3' N., 73°53.5' W.).

Staten Island (St. George Base) (40°38.5' N., 74°04.4' W.). At the northeast end of Staten Island.

New York (40°41.5' N., 74°01.0' W.). On Governors Island.

New Jersey:

Sandy Hook (40°28.2' N., 74°00.8' W.). On the Bay side, 0.5 mile south of the northern extremity of Sandy Hook.

Broadcasts by Coast Guard radio stations.—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 EST.

NMY, New York, N.Y., 486 kHz, 1200 and 2000 EST.

Radiotelephone:

NMF, Boston, Mass., 2670 kHz, 0540, 1140, 1740, and 2340 EST.

NMK, Cape May, N.J., 2670 kHz, 0600 and 1800 EST.

NMY, New York, N.Y., 2670 kHz, 0720 and 1920 EST.

CUSTOMS.—Ports of entry and customs stations covered by this volume are as follows:

Boston Region:

Boston District: Fall River, New Bedford. Customs station: Provincetown (Supervised by Plymouth port of entry).

Bridgeport District: Bridgeport, Hartford, New Haven, New London.

Providence District: Newport, Providence.

New York Region:

New York District: Albany, New York City, Perth Amboy, N. J.

NATIONAL WEATHER SERVICE. —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:

Block Island, R. I.: National Weather Service office, (telephone: 401-466-5531).

Boston, Mass.: National Weather Service office, Atlantic Weather Patrol, U. S. Coast Guard Base, 427 Commercial St., (telephone: 617-227-8139). Logan International Airport, East Boston, (telephone: 617-567-4670).

Bridgeport, Conn.: Bridgeport Municipal Airport, (telephone: 203-378-2344).

New York, N. Y.: National Weather Service office, 30 Rockefeller Plaza, (telephone: 212-971-5561).

Providence, R. I.: T. F. Green State Airport, Warwick, R. I., (telephone: 401-737-5100).

Radio Weather Broadcasts.—Taped or direct broadcasts of forecasts and storm warnings are made by commercial and Coast Guard radio stations in the area covered by this Coast Pilot. These broadcasts usually are made several times a day; the transmission schedules are shown on the Marine Weather Services Charts for the following areas:

Eastport, Maine to Montauk Point, N. Y.

Montauk Pont, N. Y. to Manasquan, N. J.

The charts are for sale, 1 5 cents each, by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

The weather broadcasts schedules of Coast Guard radio stations are also listed in the descriptions of Coast Guard marine services found elsewhere in this appendix.

VHF-FM Continuous Weather Broadcasts.—National Weather Service VHF-FM radio stations provide mariners with continuous FM broadcasts of weather warnings, forecasts, radar reports, and surface weather observations. These stations usually transmit on 162.55 or 162.40 MHz. Reception range is up to 40 miles from the antenna site, depending on the terrain, type of receiver, and antenna used. The following VHF-FM radio stations with location of antenna are in or near the area covered by this Coast Pilot:

KHB-35, Boston, Mass. (42°22′ N., 71°03′ W.), 162.40 MHz.

KEC-73, Hyannis, Mass. (41°41′ N., 70°20′ W.), 162.55 MHz.

KHB-47, New London, Conn. (41°26′ N., 72°08′ W.), 162.40 MHz.

KWO-35, New York, N. Y. (40°46′ N., 73°59′ W.), 162.55 MHz.

PUBLIC HEALTH SERVICE.—Quarantine stations where supervision of quarantine and medical examination of aliens are performed:

Boston: U.S. Quarantine Station. Logan International Airport, East Boston, Mass. 02128.

New York: U.S. Quarantine Station. Rosebank, Staten Island, N. Y. 10305.

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.

Hospitals: Staten Island: Bay and Vanderbilt Sts., Stapleton, N.Y. 10304.

Outpatient Clinics: New York, N. Y.: 245 West Houston St. 10014.

Contract Physician's Offices:

Block Island, R. I.: Box 426.

Bristol, R. I.: 1180 Hope St.

Chatham, Mass.: Crowell Rd.

East Hampton, L. I., N. Y.: 94 Pantigo Rd.

Edgartown, Mass.: North Summer St.

Fishers Island, N. Y.: Box 397

Huntington Station, L.I., N.Y.: 180 E. Polaski Rd.

Mastic, L.I., N.Y.: Professional Bldg. Montauk Hwy. and Lambert Ave.

Menands (Albany), N. Y.: 14 Riverhill Apts.

Nantucket, Mass.: Vesper Lane.
New Bedford, Mass.: 23 Ocean St.
New Haven, Conn.: 1172 Chapel St.
New London, Conn.: 425 Montauk Ave.
Newport, R. I.: Acquidneck Medical Group, Memorial Blvd.
New York, N. Y.: 35 E. 85th St.
Northport, L. I., N. Y.: 325 Main St.
Providence, R. I.: 1981 Broad St.
Provincetown, Mass.: 322 Commercial St.
Wakefield, R. I.: 25 Mechanic St.
West Islip, L. I., N. Y.: 761 Montauk Hwy.

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.

WSL, Amagansett, Long Island, N.Y.
NMF, Boston, Mass.
WCC, Chatham, Mass.
NMY, New York, N.Y.
WSC, Tuckerton, N.J.

DEPARTMENT OF AGRICULTURE.—Maritime Ports covered by this Coast Pilot where Agricultural Quarantine inspectors are located and inspections conducted:

Connecticut:
Milford: 215 Broad St. 06460.
New York:
New York: Room 844, Federal Bldg., 641 Washington St. 10014.
Rhode Island:
Warwick: 325 West Shore Road, Suite No. 8, 02889.

IMMIGRATION AND NATURALIZATION:
Connecticut:
Hartford: U. S. Post Office Bldg., 135 High St. 06101.
Massachusetts:
Boston: John F. Kennedy Federal Bldg., Government Center, 02203.
New Jersey:
Newark: Federal Bldg., 970 Broad St. 07102.
New York:
Albany: Room 442, U. S. Post Office Bldg., 12201.
New York: 20 West Broadway, 10007.
Rhode Island:
Providence: Federal Bldg., U. S. Courthouse, Exchange Place, 02903.

FEDERAL COMMUNICATIONS COMMISSION:
District field offices:
Boston, Massachusetts: Room 1600, U. S. Customhouse, 02209.
New York, N. Y., Federal Bldg., 641 Washington St. 10014.

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.

Beach Channel, along south shore of Jamaica Bay. (542).
Block Island, on west side of Block Island (269).
Captain Harbor, on south side of Great Captain Island (222).
Eatons Neck (seasonal), off west side of Eatons Neck (224).
Hudson River, above Albany (284).
Port Jefferson, off Port Jefferson Harbor (361).
Sandy Hook Bay, in south part of bay (544).
West Gilgo Beach, along State Boat Channel (120-SC).

The pages in the text describing the courses can be obtained by referring to the index for the geographic places. The chart number is shown in parentheses.

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 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.

NANTUCKET, MASS. (Memorial Airport) 41°15'N., 70°04'W. Elevation (ground): 43 feet NWS-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)	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	126	8	20	98

PROVIDENCE, RHODE ISLAND (T. F. Green Airport) 41°44'N., 71°26'W. Elevation (ground): 51 feet NWS-1970

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)	7	7	(b)	17	17	7	7	17	10	17	17	17	17	17	17	17	17	17	17
Jan.	37.3	21.0	29.2	65	-5	3.81	3.34	10.0	68	55	10.2	NW	40S	57	6.2	11	6	14	11	3	*	2
Feb.	38.3	21.1	29.7	56	-5	3.10	2.72	10.5	70	55	10.4	NNW	40SW	56	6.5	8	7	13	10	2	*	2
Mar.	45.3	28.6	37.0	73	1	4.14	4.53	10.8	70	54	10.8	WNW	52S	57	6.6	9	8	14	11	3	1	2
Apr.	56.6	37.7	47.2	84	19	3.75	2.82	0.7	68	47	11.0	SW	44SSW	56	6.5	8	9	13	11	*	2	2
May	67.7	47.2	57.5	94	32	3.35	3.76	0.0	69	48	9.9	S	36SSW	59	6.5	8	10	13	11	0	3	2
June	76.1	56.3	66.2	94	41	2.76	1.99	0.0	74	55	9.0	SW	35SSW	59	6.2	8	10	12	11	0	4	2
July	81.4	62.7	72.1	97	49	2.91	2.80	0.0	76	56	8.4	SW	30NNW	58	6.4	7	12	12	9	0	5	2
Aug.	80.0	60.9	70.5	93	40	3.96	5.47	0.0	77	54	8.4	SSW	78ESE	58	6.1	9	11	11	10	0	4	2
Sept.	73.1	53.3	63.2	93	35	3.52	4.89	0.0	79	54	8.6	SW	50S	59	5.6	11	7	12	8	0	2	2
Oct.	63.4	42.9	53.2	85	21	3.10	6.63	0.1	79	51	8.7	NW	36SE	59	5.3	12	7	12	8	*	1	3
Nov.	52.2	33.8	43.0	71	16	4.11	3.04	0.5	77	59	9.3	SW	45S	49	6.3	9	6	15	11	*	1	2
Dec.	40.4	23.5	32.0	69	-2	3.62	3.85	8.9	75	60	9.7	WNW	42SE	54	6.0	9	8	14	12	3	*	2
Year	59.3	40.8	50.1	97	-5	42.13	6.63	41.5	74	54	9.6	SW	78ESE	57	6.2	109	101	155	123	11	23	25

BLOCK ISLAND, RHODE ISLAND (State Airport) 41°10'N., 71°35'W. Elevation (ground): 110 feet NWS-1970

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)	20	20	(b)	20	20	14	14					18	18	18	18	20	20	14	14
Jan.	37.9	26.3	32.1	57	-2	3.84	4.06	5.3	73	65					6.5	8	9	14	11	2	*	4
Feb.	36.7	25.1	30.9	55	-2	3.29	2.52	6.6	73	65					6.0	8	8	12	9	2	*	4
Mar.	42.2	31.2	36.7	60	8	4.07	3.63	6.9	75	65					5.8	9	9	13	10	2	*	5
Apr.	50.8	38.4	44.6	73	21	3.61	2.50	0.3	79	65					6.3	8	9	13	10	*	2	9
May	60.1	47.6	53.9	82	34	3.01	2.35	0.0	80	67					6.2	7	11	13	10	0	2	11
June	69.6	56.2	62.9	90	41	2.56	2.25	0.0	84	69					6.2	9	10	11	8	0	2	11
July	75.9	63.2	69.6	91	51	2.69	2.66	0.0	87	72					6.8	7	11	13	7	0	4	12
Aug.	75.6	63.6	69.6	88	51	3.86	4.86	0.0	86	71					6.6	7	11	13	9	0	4	11
Sept.	70.2	57.8	64.0	87	43	3.20	8.52	0.0	84	70					5.9	10	9	11	7	0	1	5
Oct.	61.1	49.2	55.2	77	30	3.02	6.63	T	80	66					5.4	11	8	12	8	0	1	4
Nov.	51.7	38.6	45.2	70	20	3.71	3.96	0.2	76	65					6.6	7	9	14	10	*	*	3
Dec.	42.1	29.6	35.9	64	-4	3.59	4.39	3.5	72	65					6.1	7	10	14	11	1	*	3
Year	56.2	43.9	50.1	91	-4	40.45	8.52	22.8	79	67					6.2	98	114	153	110	7	16	82

HARTFORD, CONNECTICUT (Bradley International Airport) 41°56'N., 72°41'W. Elevation (ground): 169 feet NWS-1970

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)	11	11	(b)	16	16	11	11	16	9	16	16	16	16	16	16	16	16	16	16
Jan.	34.7	17.3	26.0	65	-26	3.58	2.44	11.1	72	58	8.5	NW	43NW	57	6.2	8	8	15	10	3	*	2
Feb.	36.0	18.2	27.1	59	-21	2.94	2.16	13.6	74	57	8.8	NW	46SW	56	6.6	6	8	14	11	3	*	3
Mar.	45.3	26.7	36.0	77	-6	3.80	2.31	13.9	74	54	9.1	NW	43NE	57	6.6	7	8	16	11	3	1	2
Apr.	59.6	37.3	48.5	94	9	3.73	3.00	1.6	71	45	9.4	S	41NE	56	6.7	6	9	15	11	1	1	2
May	72.0	47.7	59.9	96	30	3.41	2.71	T	73	45	8.4	S	36NW	59	6.6	6	10	15	11	0	3	2
June	80.5	56.9	68.7	100	37	3.70	3.72	0.0	78	52	7.4	S	39W	59	6.6	6	10	14	11	0	5	3
July	85.0	61.8	73.4	102	44	3.61	3.48	0.0	80	51	6.9	S	31NW	61	6.6	6	12	13	10	0	5	2
Aug.	82.7	59.7	71.2	97	36	4.01	12.12	0.0	84	53	6.8	S	38NW	63	6.3	6	12	13	10	0	4	3
Sept.	74.7	51.8	63.3	96	30	3.65	5.28	0.0	86	54	6.9	S	37NE	61	6.0	9	9	12	9	0	2	3
Oct.	64.8	41.2	53.0	91	21	3.18	4.45	T	84	51	7.3	N	35W	59	5.9	9	9	13	8	0	1	4
Nov.	50.9	31.6	41.3	74	14	3.84	2.39	1.6	80	57	7.7	S	44W	45	7.0	6	8	16	12	*	1	2
Dec.	37.6	20.2	28.9	65	-9	3.47	2.12	14.4	79	62	8.0	N	43NW	50	6.6	7	8	16	12	4	*	3
Year	60.3	39.2	49.8	102	-26	42.92	12.12	56.2	78	53	7.9	S	46SW	58	6.5	82	111	172	126	14	23	31

BRIDGEPORT, CONNECTICUT (Bridgeport Municipal Airport) 41°10'N., 73°08'W. Elevation (ground): 7 feet NWS-1970

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)	5	5	(b)	22	22	5	5	14	7	10		22	22	22	22	22	22	22	22
Jan.	37.4	22.9	30.2	63	-3	3.69	2.42	7.0	70	59	11.1	NW	58NNW		6.2	9	7	15	11	2	*	3
Feb.	38.2	22.7	30.5	53	-2	2.96	2.31	8.5	72	59	11.6	NW	56NNW		6.2	8	7	13	10	2	*	3
Mar.	45.2	29.7	37.5	66	4	4.25	2.74	5.6	73	59	11.6	NW	44WSW		6.3	8	9	14	11	1	1	3
Apr.	56.7	39.3	48.0	76	21	3.80	2.54	0.5	73	57	11.0	N	48NW		6.4	7	9	14	11	*	2	3
May	67.9	49.5	58.7	92	31	3.71	3.23	T	74	60	10.2	E	43E		6.4	7	11	13	11	0	3	4
June	77.1	58.8	68.0	94	41	3.40	2.02	0.0	79	64	9.0	SW	33WSW		5.9	9	9	12	9	0	4	3
July	82.6	64.8	73.7	100	55	3.77	3.57	0.0	76	60	8.4	SW	31SSW		6.0	7	12	12	9	0	5	2
Aug.	81.1	63.4	72.3	93	48	4.45	3.97	0.0	78	60	8.5	SW	36W		5.7	9	11	11	10	0	4	1
Sept.	74.6	56.4	65.5	93	41	3.95	4.67	0.0	80	60	9.6	NE	41NNE		5.4	10	9	11	9	0	2	1
Oct.	64.7	46.0	55.4	84	26	3.38	2.39	T	74	58	10.3	NE	44WSW		5.2	11	9	11	6	0	1	1
Nov.	52.7	36.3	44.5	76	21	4.02	4.07	0.5	78	64	10.9	NW	50SE		6.2	8	8	14	10	*	*	2
Dec.	40.8	25.6	33.2	62	6	3.51	3.69	5.9	72	61	11.1	NW	46WSW		6.1	9	8	14	11	2	*	2
Year	59.9	43.0	51.5	100	-3	44.89	4.67	28.0	75	60	10.3	SW	58NNW		6.0	102	109	154	118	7	22	28

NEW HAVEN, CONNECTICUT (Tweed-New Haven Airport) 41°16'N., 72°53'W. Elevation (ground): 6 feet NWS-1968

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)	25	25	(b)	25	25	25	25	21		25	25	25	25	25	25	25	25	21	21
Jan.	37.1	22.0	29.6	65	-8	3.96	2.85	9.3	76	63	7.2		39S	55	6.3	9	7	15	12	3	*	3
Feb.	38.0	21.1	29.6	60	-5	3.19	2.76	10.3	76	61	7.4		36W	60	6.3	8	6	14	11	3	*	2
Mar.	44.9	28.9	36.9	74	1	4.62	3.11	6.9	75	61	7.6		36E	60	6.2	8	9	14	12	2	1	3
Apr.	55.9	37.9	46.9	83	17	3.89	2.81	0.7	75	61	7.3		41NW	57	6.4	7	9	14	12	*	2	3
May	66.8	47.5	57.2	86	32	3.71	3.09	T	77	63	6.4		30SW	60	6.5	6	11	14	12	0	4	4
June	75.2	57.1	66.2	96	40	3.53	2.69	0.0	80	65	5.7		28SW	65	6.0	8	10	12	10	0	5	3
July	80.5	63.2	71.9	100	47	3.43	4.29	0.0	81	66	5.5		30SW	68	5.9	7	13	11	10	0	6	2
Aug.	79.4	61.8	70.6	100	45	4.24	3.90	0.0	83	67	5.6		43W	66	5.8	8	12	11	10	0	4	2
Sept.	73.3	54.5	63.9	91	33	3.93	5.55	0.0	84	65	6.1		36N	65	5.5	10	9	11	8	0	3	2
Oct.	63.7	44.2	54.0	84	24	3.45	3.81	0.1	82	63	6.4		38E	65	5.2	12	8	11	7	*	1	2
Nov.	51.9	34.9	43.4	75	14	4.05	4.68	1.1	81	64	7.0		50E	53	6.3	8	8	14	11	*	1	2
Dec.	40.4	24.4	32.4	63	-3	4.02	4.25	8.7	77	63	7.2		39SW	55	6.2	9	7	15	12	3	*	1
Year	58.9	41.5	50.2	100	-8	46.02	5.55	37.1	79	64	6.6		50E	61	6.1	100	109	156	127	11	27	29

NEW YORK, NEW YORK (John F. Kennedy International Airport) 40°39'N., 73°47'W. Elevation (ground): 13 feet NWS-1970

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)	10	10	(b)	23	12	9	9	12		7		12	12	12	12	12	12	12	12
Jan.	38.0	25.6	31.8	64	0	3.23	1.60	7.1	70	59	11.5		45WSW		6.0	9	8	14	10	2	*	2
Feb.	38.5	24.7	31.6	62	-2	2.93	2.87	9.3	69	58	12.1		40WSW		6.3	7	8	13	10	2	*	3
Mar.	45.9	31.4	38.7	72	7	4.15	2.27	5.2	71	57	11.8		36WNW		6.0	8	10	13	12	2	1	3
Apr.	57.5	40.4	49.0	82	26	3.48	1.79	0.1	71	56	11.1		38WSW		6.2	7	10	13	11	*	2	3
May	69.5	50.9	60.2	99	34	3.67	2.88	T	70	55	10.2		30WSW		6.0	7	13	11	11	0	3	3
June	79.3	60.9	70.1	99	45	3.35	1.81	0.0	73	59	9.5		28WNW		6.0	7	11	12	9	0	4	4
July	84.7	67.1	75.9	104	55	4.04	3.21	0.0	74	57	9.2		32NNW		6.2	6	12	13	9	0	5	3
Aug.	82.9	66.0	74.5	97	46	4.97	6.59	0.0	76	57	9.0		40WNW		5.9	7	13	11	9	0	5	2
Sept.	76.2	59.3	67.8	94	40	4.16	5.83	0.0	78	56	9.3		35WNW		5.2	11	9	10	8	0	2	1
Oct.	65.9	49.3	57.6	84	25	3.21	3.21	T	77	53	8.7		34WSW		5.1	12	9	10	7	0	1	3
Nov.	53.2	39.1	46.2	73	20	3.51	2.93	0.2	75	58	10.7		38NE		6.4	8	8	14	11	*	1	2
Dec.	41.3	28.4	34.9	68	5	3.23	2.05	6.0	73	61	11.1		40ENE		6.1	8	9	14	11	2	*	3
Year	61.1	45.3	53.2	104	-2	43.93	6.59	27.9	73	57	10.4		45WSW		6.0	97	120	148	118	8	24	32

ALBANY, NEW YORK (Albany County Airport) 42°45'N., 73°48'W. Elevation (ground): 275 feet NWS-1970

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)	5	5	(b)	24	24	5	5	32	15	32	32	32	32	32	32	24	24	32	32
Jan.	31.0	14.4	22.7	57	-26	2.47	1.68	15.4	79	64	8.4	WNW	50W	46	7.0	6	8	17	13	4	*	1
Feb.	32.5	14.8	23.7	54	-16	2.20	1.42	15.1	73	58	9.0	WNW	62NW	51	6.9	5	8	15	11	4	*	1
Mar.	41.9	24.0	33.0	77	-10	2.72	1.53	12.0	72	53	9.1	WNW	48W	53	6.9	6	8	17	12	3	1	1
Apr.	56.7	35.7	46.2	88	10	2.77	2.20	2.3	69	46	9.0	WNW	43W	53	6.9	6	8	16	12	1	1	1
May	69.5	46.3	57.9	92	26	3.47	2.17	0.1	74	51	7.9	S	43W	56	6.9	5	10	16	13	*	4	2
June	78.7	55.8	67.3	98	36	3.25	3.48	0.0	77	56	7.0	S	39W	60	6.5	5	12	13	11	0	6	1
July	83.7	60.5	72.1	98	43	3.49	2.70	0.0	77	54	6.3	S	37NW	64	6.3	6	13	12	11	0	7	1
Aug.	81.4	58.5	70.0	93	37	3.07	4.08	0.0	81	53	6.0	S	33S	61	6.0	8	11	12	10	0	5	3
Sept.	72.9	50.3	61.6	91	30	3.58	3.66	0.0	84	56	6.3	S	42S	58	5.9	8	10	12	9	0	3	4
Oct.	61.8	39.8	50.8	84	16	2.77	2.46	0.1	82	54	6.9	S	39NW	54	6.1	8	10	13	8	*	1	4
Nov.	47.5	30.6	39.1	71	9	2.70	2.01	3.0	81	63	7.7	S	61E	37	7.4	4	8	18	12	1	*	2
Dec.	34.5	18.5	26.5	65	-22	2.59	4.02	16.4	81	68	7.9	S	47W	39	7.2	5	8	18	12	4	*	2
Year	57.7	37.4	47.6	98	-26	35.08	4.08	64.4	78	56	7.6	S	62NW	54	6.7	72	114	179	134	17	28	23

METEOROLOGICAL TABLE FOR COASTAL AREA OFF NEW YORK
Boundaries: From 40°N., and 72°W., north and westward to coast

Weather Elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	No. of observations
Wind ≧ 34 knots (1)	3.4	3.7	2.6	1.3	0.6	*	0.2	0.2	0.6	1.8	2.3	3.3	1.6	16253
Wind ≧ 41 knots (1)	1.0	1.1	0.7	0.4	0.2	*	*	0.1	0.3	0.5	0.7	0.5	0.4	16253
Wave height ≧ 12 feet (1)	5.6	3.7	1.8	0.8	1.8	*	*	*	3.5	1.2	2.9	1.4	1.7	1601
Wave height ≧ 20 feet (1)	*	*	*	0.4	*	*	*	*	*	*	0.7	*	0.1	1601
Visibility < 2 naut. mi. (1)	5.9	3.8	4.8	8.9	12.3	8.1	7.8	4.4	3.2	2.7	4.0	3.0	6.0	7099
Visibility < 0.5 naut. mi. (1)	1.5	1.0	2.3	5.7	9.2	5.1	4.0	1.8	1.8	1.8	1.3	1.4	3.3	7099
Precipitation (1)	12.2	10.8	12.7	12.2	7.2	4.7	8.1	6.2	9.4	9.7	10.2	10.4	9.4	9190
Temperature ≧ 85°F (1)	*	*	*	*	*	*	1.3	0.5	*	*	*	*	0.2	7716
Temperature ≦ 32°F (1)	22.7	31.9	10.4	*	*	*	*	*	*	*	1.0	14.8	5.7	7716
Sky overcast or obscured (1)	36.1	36.0	35.4	36.8	34.2	25.5	30.9	28.8	27.9	26.1	34.7	33.9	32.2	7015
Thunder and lightning (1)	*	*	*	0.1	0.6	1.4	1.1	1.5	0.8	0.2	0.4	*	0.5	9190
Mean wind speed (knots)	15.1	15.3	13.7	12.5	10.2	9.8	9.3	9.2	10.9	12.1	14.5	15.4	12.2	16253
Prevailing wind direction	NW	NW	NW	W	SW	S	S	S	S	NW	W	WNW	W	16253
Mean temperature (°F)	37.9	35.9	41.1	47.4	55.5	65.0	72.0	72.2	67.1	58.8	50.7	41.2	54.5	16011
Mean sea-surface temperature (°F)	43.0	40.0	40.6	44.4	52.1	62.2	69.5	71.1	67.9	60.9	54.2	47.8	55.1	14690
Mean relative humidity (%)	77	74	76	78	82	84	80	79	75	74	73	76	77	7540
Mean cloud cover (eighths)	4.8	4.5	4.4	4.7	4.6	4.2	4.5	4.3	4.0	3.9	4.7	4.7	4.4	7015
Mean sea-level pressure (2)	1018	1018	1016	1014	1016	1015	1015	1016	1017	1018	1019	1020	1016	9274
Extreme max. sea-level pressure (2)	1042	1042	1041	1035	1032	1035	1031	1032	1037	1040	1041	1041	1042	9274
Extreme min. sea-level pressure (2)	978	971	983	985	995	992	994	977	992	995	989	983	971	9274

METEOROLOGICAL TABLE FOR COASTAL AREA OFF GULF OF MAINE
Boundaries: From 42°N., and 66°W., north and westward to coast

Weather Elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	No. of observations
Wind ≧ 34 knots (1)	7.4	7.7	4.3	1.5	0.6	0.2	0.1	0.4	0.9	2.3	4.3	7.3	3.0	29579
Wind ≧ 41 knots (1)	1.8	2.7	0.7	0.4	*	*	*	0.1	0.2	0.7	1.6	2.3	0.8	29579
Wave height ≧ 12 feet (1)	8.0	9.1	2.4	1.0	0.1	0.2	*	0.1	0.5	3.1	4.2	8.2	2.9	7610
Wave height ≧ 20 feet (1)	0.7	0.4	*	0.5	*	*	*	*	*	*	*	1.1	0.2	7610
Visibility < 2 naut. mi. (1)	8.3	8.5	12.1	8.6	12.1	16.8	22.7	17.4	10.0	6.1	5.2	7.1	10.8	21849
Visibility < 0.5 naut. mi. (1)	3.2	3.1	1.9	4.2	8.1	10.4	15.5	11.9	6.0	4.0	2.0	3.6	6.3	21849
Precipitation (1)	21.7	23.7	15.3	11.7	9.8	8.0	4.7	6.9	7.2	7.0	13.2	22.1	12.3	26487
Temperature ≧ 85°F (1)	*	*	*	*	*	*	*	*	*	*	*	*	*	23161
Temperature ≦ 32°F (1)	40.9	45.8	22.3	2.9	*	*	*	*	*	0.1	1.7	26.7	10.7	23161
Sky overcast or obscured (1)	49.6	44.3	35.0	34.5	34.1	31.1	31.1	30.8	28.9	28.8	40.8	47.0	36.2	21780
Thunder and lightning (1)	*	0.1	*	0.1	0.1	0.4	0.5	0.5	0.3	0.1	*	*	0.2	26487
Mean wind speed (knots)	18.8	18.3	16.9	13.5	12.0	11.4	9.9	10.9	12.0	14.1	16.8	18.3	14.2	29579
Prevailing wind direction	NW	NW	WNW	W	SW	SSW	SW	SW	SW	SW	NW	W	SW	29579
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	47.7	29546
Mean sea-surface temperature (°F)	40.4	37.9	37.6	39.5	44.0	50.1	56.7	58.6	57.1	53.4	48.6	44.1	47.8	26452
Mean relative humidity (%)	79	79	78	80	85	86	88	88	84	81	78	80	82	20134
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	4.9	21780
Mean sea-level pressure (2)	1014	1013	1013	1015	1015	1014	1015	1015	1018	1017	1016	1016	1015	27274
Extreme max. sea-level pressure (2)	1052	1042	1040	1042	1038	1033	1030	1037	1041	1039	1041	1045	1052	27274
Extreme min. sea-level pressure (2)	976	970	977	980	990	994	994	992	988	973	980	971	970	27274

METEOROLOGICAL TABLE FOR COASTAL AREA OFF NANTUCKET
Boundaries: Between 40°N., and 42°N., and 69°W., and 72°W.

Weather Elements	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	No. of observations
Wind ≧ 34 knots (1)	4.9	5.9	4.5	1.9	0.6	0.2	0.1	0.3	1.3	2.5	3.5	5.0	2.4	43058
Wind ≧ 41 knots (1)	1.2	1.2	1.3	0.6	0.2	0.1	*	0.1	0.5	0.5	0.8	1.8	0.7	43058
Wave height ≧ 12 feet (1)	13.4	7.4	4.5	2.2	1.6	0.4	0.2	0.4	3.7	1.1	7.8	6.0	3.8	6149
Wave height ≧ 20 feet (1)	1.9	1.0	0.6	*	*	*	*	*	0.4	0.3	0.7	0.4	0.4	6149
Visibility < 2 naut. mi. (1)	4.6	4.7	5.2	10.4	15.4	17.7	16.1	9.9	6.3	3.5	3.3	4.0	8.5	27287
Visibility < 0.5 naut. mi. (1)	1.4	1.9	3.0	6.6	11.6	12.8	11.0	6.1	4.0	2.1	1.6	1.5	5.4	27287
Precipitation (1)	12.0	12.7	10.2	9.8	6.7	4.8	5.5	6.4	7.2	7.0	9.3	12.7	8.5	32071
Temperature ≧ 85°F (1)	*	*	*	*	*	0.1	0.4	0.2	0.1	*	*	*	0.1	28281
Temperature ≦ 32°F (1)	22.9	25.4	8.0	0.3	*	*	*	*	*	*	0.1	11.3	5.0	28281
Sky overcast or obscured (1)	44.3	39.7	36.2	41.1	37.3	31.7	35.1	29.0	29.9	26.9	37.4	42.9	35.8	26977
Thunder and lightning (1)	0.1	*	0.1	0.2	0.3	0.6	1.2	1.0	0.4	0.4	0.4	0.1	0.4	32071
Mean wind speed (knots)	16.9	17.0	15.7	13.3	10.8	10.1	9.4	10.3	11.6	13.7	15.5	17.1	13.2	43058
Prevailing wind direction	WNW	NW	W	W	SW	SW	SW	SW	SW	W	W	NW	W	43058
Mean temperature (°F)	38.5	37.3	40.3	45.7	52.2	61.1	68.2	69.5	65.1	58.3	51.0	42.6	53.2	42824
Mean sea-surface temperature (°F)	44.5	41.6	41.1	43.5	48.9	57.9	65.5	68.7	65.4	59.9	54.4	49.0	53.9	39367
Mean relative humidity (%)	80	79	79	82	83	85	86	84	82	78	79	77	81	25252
Mean cloud cover (eighths)	5.5	5.2	4.6	4.8	4.7	4.4	4.7	4.4	4.3	4.2	5.1	5.6	4.8	26977
Mean sea-level pressure (2)	1015	1015	1014	1015	1015	1015	1016	1016	1018	1017	1016	1017	1016	32762
Extreme max. sea-level pressure (2)	1042	1042	1040	1040	1035	1036	1035	1037	1037	1040	1041	1043	1043	32762
Extreme min. sea-level pressure (2)	976	976	967	977	977	995	996	968	973	978	974	983	967	32762

(1) Percentage frequency.
(2) Millibars.
*0.0-0.5%
These data are based upon observations made by ships in passage. Such ships tend to avoid bad weather when possible, thus biasing the data toward good weather samples.

MEAN SURFACE WATER TEMPERATURES (T) AND DENSITIES (D)

Stations	Years	Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec		Mean	
		(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}	(T) °C	(D) σ_{15}
Cape Cod Canal (E. ent.), Mass. (41°46'N., 70°30'W.)	16	1.1	23.5	0.4	23.5	1.8	23.4	5.3	23.3	9.4	23.1	12.8	23.2	14.7	23.4	16.2	23.4	15.9	23.4	13.3	23.5	9.4	23.4	4.7	23.5	8.8	23.4
Cape Cod Canal (W. ent.), Mass. (41°44'N., 70°37'W.)	15	0.8	23.2	0.4	23.2	2.2	23.1	6.1	22.9	10.4	22.9	15.0	23.0	17.6	23.2	18.7	23.3	17.4	23.3	13.9	23.3	9.6	23.2	4.3	23.2	9.7	23.2
Woods Hole, Mass. (41°31'N., 70°40'W.)	27	1.2	23.2	0.5	23.2	2.4	23.1	6.8	23.2	11.8	23.3	17.0	23.5	20.9	23.6	21.6	23.5	19.7	23.6	15.6	23.6	10.5	23.5	4.9	23.3	11.1	23.4
Newport, R. I. (41°30'N., 71°20'W.)	16	2.3	22.7	1.6	22.5	3.1	22.5	6.3	22.3	10.9	22.8	16.3	23.1	19.8	23.5	20.6	23.4	18.6	23.5	15.3	23.4	11.3	23.1	5.8	22.9	11.0	23.0
New London, Conn. (41°22'N., 70°06'W.)	24	2.8	13.6	2.4	12.4	4.3	10.1	9.3	9.2	14.3	10.4	19.2	13.9	22.1	17.4	22.5	18.7	20.3	19.2	16.2	18.7	10.9	16.2	5.5	14.1	12.5	14.5
Bridgeport, Conn. (41°10'N., 73°11'W.)	7	3.9	19.5	3.6	18.4	5.8	18.1	10.1	17.7	15.7	17.6	21.7	18.0	24.8	19.1	26.3	19.8	24.4	19.9	19.6	20.1	13.9	20.0	8.0	19.7	14.8	19.0
Plum Island (L. I. Sound), N. Y. (41°10'N., 72°12'W.)	10	2.9	21.6	1.3	21.6	2.4	21.4	5.6	20.9	9.7	20.8	14.6	21.3	18.8	21.8	20.3	22.2	19.3	24.7	15.8	22.4	11.5	22.0	6.4	21.8	10.7	21.9
Montauk (Fort Pond Bay), N. Y. (41°03'N., 71°58'W.)	23	2.2	22.5	1.5	22.4	3.1	22.3	6.6	21.7	10.8	21.8	16.1	22.2	20.1	22.6	21.1	22.8	19.6	23.1	15.9	23.1	11.0	22.9	5.7	22.6	11.1	22.5
Willets Point (E. River), N. Y. (40°48'N., 73°47'W.)	39	1.9	18.8	1.0	18.5	2.8	18.3	7.0	17.7	12.2	17.7	17.1	18.1	20.3	18.6	22.1	19.1	21.2	19.2	16.8	19.0	11.1	19.0	5.1	18.8	11.6	18.6
New York (The Battery), N. Y. (40°42'N., 74°01'W.)	44	2.8	15.5	2.0	15.4	3.7	13.6	7.6	12.1	12.9	13.7	18.3	15.7	21.9	17.0	22.9	17.5	21.4	17.5	16.8	17.3	11.4	16.2	6.0	15.3	12.3	15.6
Bear Mountain (Hudson R.), N. Y. (41°19'N., 73°59'W.)	5	0.7	-0.6	0.4	-0.8	1.8	-0.7	7.6	-0.8	14.1	-0.9	20.6	-0.8	24.2	-0.4	25.2	-0.2	23.8	0.2	17.8	0.0	10.8	-0.5	3.8	-0.5	12.6	-0.5
New York (Fort Hamilton), N. Y. (40°37'N., 74°02'W.)	12	2.1	16.6	1.2	17.3	2.4	14.8	6.5	12.5	11.8	15.2	17.0	17.0	20.8	18.1	21.8	19.0	19.8	18.7	15.3	17.9	9.8	16.8	4.9	16.5	11.1	16.7
Sandy Hook, N. J. (40°28'N., 74°01'W.)	33	1.4	17.0	1.4	16.9	4.1	15.9	9.1	14.9	14.6	16.2	20.2	17.7	23.4	19.0	23.5	19.1	20.8	19.2	15.1	19.1	9.4	18.4	3.8	17.5	12.2	17.6

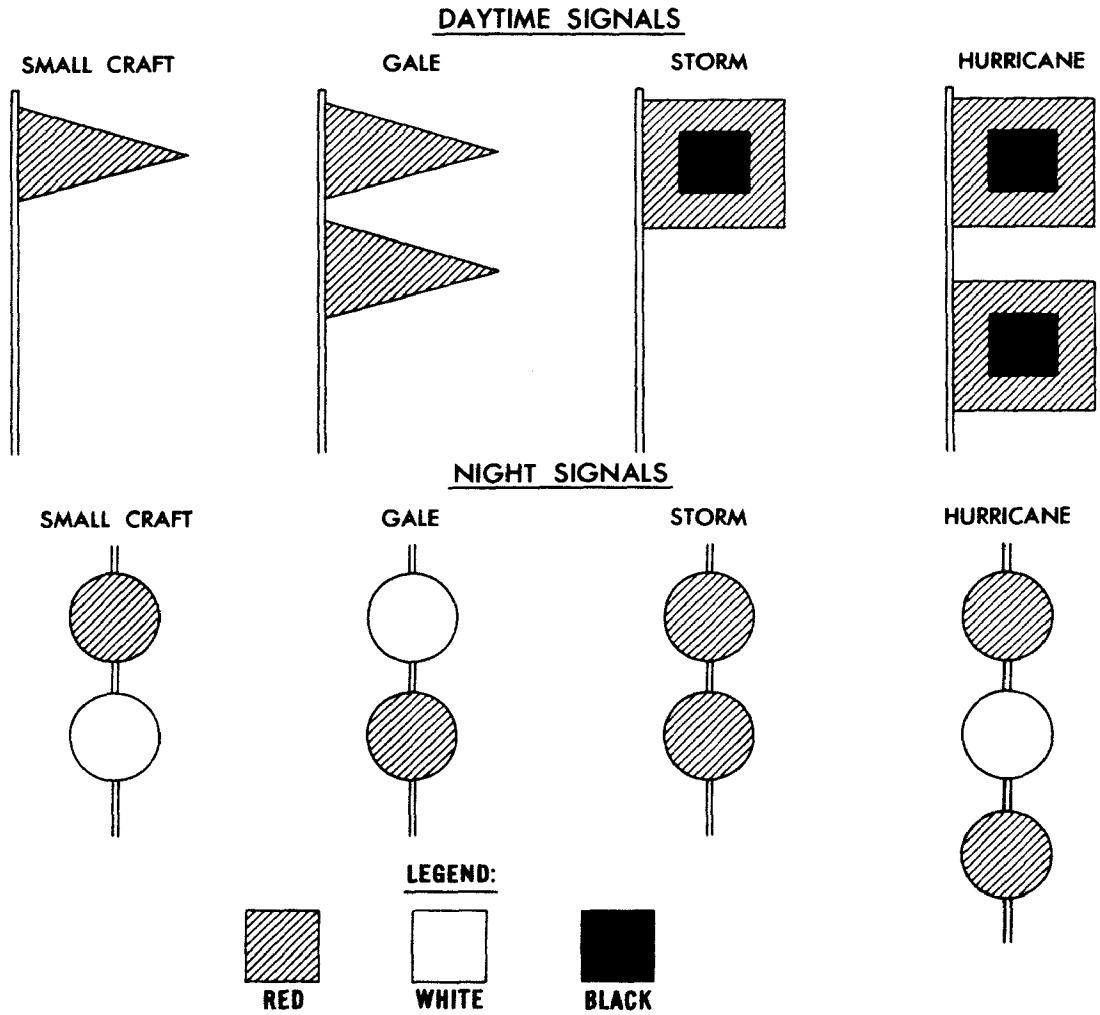
F (Fahrenheit) = 1.8C (Celsius) + 32

Density as used in this table is the specific gravity of the sea water or the ratio between the weight of a sea-water sample and the weight of an equal volume of distilled water at 15°C (59°F). These figures representing density at 15°C (ρ_{15}) are expressed in terms of sigma-t (σ_t) where t = 15°C and σ_{15} = (ρ_{15} − 1) 1000. Thus, for ρ_{15} = 1.0238, σ_{15} = 23.8. Obtain the pamphlet, "Surface Water Temperature and Density, Atlantic Coast, North and South America, 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.

BEAUFORT SCALE OF WIND FORCE

Beaufort Number	Miles per Hour	Knots	Wind Effects Observed at Sea	Terms used in NWS Forecasts and Warnings
0	Less than 1	Less than 1	Sea like a mirror	
1	1- 3	1- 3	Ripples with the appearance of scales formed, but without foam crests	Light
2	4- 7	4- 6	Small wavelets, short but pronounced; crests appear glassy, do not break	
3	8-12	7-10	Large wavelets with crests beginning to break; foam appears glassy. Perhaps scattered white horses (white foam crests).	Gentle
4	13-18	11-16	Small waves, becoming longer; fairly frequent white horses	Moderate
5	19-24	17-21	Moderate waves of a pronounced long form; many white horses, possibly some spray.	Fresh
6	25-31	22-27	Large waves begin to form; white foam crests more extensive everywhere; probably some spray.	Strong
7	32-38	28-33	Sea heaps up; some white foam from breaking waves blows in streaks along the direction of the wind.	
8	39-46	34-40	Moderately high waves. Edges of crests begin to break into spindrift. Well-marked streaks of foam blow along direction of wind.	Gale
9	47-54	41-47	High waves. Dense streaks of foam along direction of wind. Spray may affect visibility.	
10	55-63	48-55	Very high waves with long overhanging crests; great patches of foam blown in dense white streaks along direction of wind. Sea surface takes on a white appearance. Visibility affected.	Storm. Exception: If winds of 64 knots and above are associated with a tropical cyclone, "Hurricane" forecasts & warnings will be issued.
11	64-72	56-63	Exceptionally high waves; sea completely covered with long white patches of foam lying along direction of wind; edges of wave crests everywhere blown into froth. Visibility affected.	
12 or more	73 or more	64 or more	Air filled with foam and spray; sea completely white with driving spray. Visibility very seriously affected.	

SMALL-CRAFT, GALE, STORM, AND HURRICANE WARNINGS



EXPLANATION OF DISPLAY SIGNALS

Small-craft warning: One RED pennant displayed by day and a RED light ABOVE a WHITE light at night to indicate that wind and sea conditions, or sea conditions alone, considered hazardous to small-craft operations are forecast. Winds may range as high as 33 knots.

Important: The **Small-craft warning** covers a wide range of wind speeds and/or sea conditions. Also, "small craft" include boats of many designs and sizes. Therefore, boaters should regard the **Small-craft warning** display signal as an alert that wind and/or sea conditions potentially dangerous to their boats exist or are forecast. For more specific information they should obtain a detailed forecast by telephone or by listening to coastal weather forecasts and warnings over the local radio stations, Coast Guard radio, or the National Weather Service VHF-FM broadcasts.

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 of 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.

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.
MONTREAL, CANADA* 45°30.2'N., 73°33.0'W.	681																												
Cabot Strait 47°07.0'N., 60°17.0'W.	717	120																											
Gut of Canso (Lock) 45°39.0'N., 61°25.0'W.	1276	595	484																										
Portland, Maine 43°39.4'N., 70°14.7'W.	1318	637	526	100																									
Boston, Mass. 42°22.0'N., 71°03.0'W.	1311	630	519	203	163																								
NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	1534	853	742	426	386	223																							
NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	1682	1001	890	575	535	372	240																						
Philadelphia, Pa. 39°56.8'N., 75°08.3'W.	1838	1157	1046	734	694	531	417	392																					
Baltimore, Md. 39°16.0'N., 76°34.5'W.	1689	1008	896	584	544	381	267	242	150																				
CHESAPEAKE BAY ENT. 36°56.3'N., 75°58.6'W.	1716	1035	923	611	571	408	294	269	173	27																			
Norfolk, Va. 36°50.9'N., 76°17.9'W.	1729	1048	936	628	588	425	345	322	267	117	144																		
DIAMOND SHOALS 35°08.0'N., 75°15.0'W.	1948	1267	1155	847	807	644	564	541	486	336	363	219																	
Wilmington, N. C. 34°14.0'N., 77°57.0'W.	2014	1333	1221	913	873	710	630	607	552	402	429	285	151																
Charleston, S. C. 32°47.2'N., 79°55.2'W.	2088	1407	1295	987	947	784	704	681	626	476	503	359	227	102															
Savannah, Ga. 32°05.0'N., 81°05.7'W.	2172	1491	1379	1071	1031	868	788	765	710	560	587	443	315	197	145														
Jacksonville, Fla. 30°19.2'N., 81°39.0'W.	2479	1798	1690	1387	1347	1184	1109	1086	1031	881	908	764	667	572	543	462													
Key West, Fla. 24°33.7'N., 81°48.5'W.	2540	1859	1751	1448	1408	1245	1170	1147	1092	942	969	825	728	633	604	523	73												
STRAITS OF FLORIDA 24°25.0'N., 83°00.0'W.	2772	2091	1983	1680	1640	1477	1402	1379	1324	1174	1201	1057	960	865	836	755	305	232											
Tampa, Fla. 27°56.5'N., 82°26.7'W.	2977	2296	2188	1885	1845	1682	1607	1584	1529	1379	1406	1262	1165	1070	1041	960	510	437	347										
Pensacola, Fla. 30°24.0'N., 87°13.0'W.	3011	2330	2222	1919	1879	1716	1641	1618	1563	1413	1440	1296	1199	1104	1075	994	544	471	389	89									
Mobile, Ala. 30°42.5'N., 88°02.5'W.	3080	2399	2291	1988	1948	1785	1710	1687	1632	1482	1509	1365	1268	1173	1144	1063	613	540	502	288	269								
NEW ORLEANS, La. (via SW Pass) 29°57.0'N., 90°03.7'W.	3240	2559	2451	2148	2108	1945	1870	1847	1792	1642	1669	1525	1428	1333	1304	1223	773	700	697	504	491	441							
Port Arthur, Tex. 29°49.5'N., 93°57.6'W.	3242	2561	2453	2150	2110	1947	1872	1849	1794	1644	1671	1527	1430	1335	1306	1225	775	702	703	509	496	446	89						
Galveston, Tex. 29°19.0'N., 94°47.0'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					
Corpus Christi, Tex. 27°48.8'N., 97°24.0'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				
San Juan, P. R. 18°27.8'N., 66°06.7'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			
YUCATAN CHANNEL 21°50.0'N., 85°03.0'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 (Atlantic Ent.) 9°23.5'N., 79°55.3'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	
PANAMA CANAL (Pacific Ent.) 8°53.0'N., 79°31.0'W.																													

*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.*

COASTWISE DISTANCES

CAPE COD, MASS., TO NEW YORK, N. Y.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: New Bedford, Mass., is 74 nautical miles from New London, Conn.

	CAPE COD CANAL ENT. 41°46.8'N., 70°29.0'W.	NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	Nantucket, Mass. 41°17.2'N., 70°05.7'W.	Vineyard Haven, Mass. 41°27.3'N., 70°35.8'W.	Woods Hole, Mass. 41°31.4'N., 70°40.4'W.	New Bedford, Mass. 41°38.1'N., 70°55.1'W.	Newport, R. I. 41°29.8'N., 71°19.8'W.	Fall River, Mass. 41°42.4'N., 71°09.8'W.	Providence, R. I. 41°48.5'N., 71°24.0'W.	Great Salt Pond, R. I. 41°11.1'N., 71°34.9'W.	Stonington, Conn. 41°19.9'N., 71°54.6'W.	New London, Conn. 41°21.4'N., 72°05.4'W.	Hartford, Conn. 41°45.0'N., 72°39.0'W.	New Haven, Conn. 41°17.4'N., 72°54.5'W.	Stratford, Conn. 41°11.3'N., 73°07.3'W.	Bridgeport, Conn. 41°10.3'N., 73°10.8'W.	South Norwalk, Conn. 41°05.7'N., 73°24.7'W.	Stamford, Conn. 41°01.8'N., 73°32.3'W.	Montauk, N. Y. 41°02.8'N., 71°57.5'W.	Sag Harbor, N. Y. 41°00.2'N., 72°17.7'W.	Greenport, N. Y. 41°06.0'N., 72°21.5'W.	Port Jefferson, N. Y. 40°57.0'N., 73°04.5'W.	MONTAUK POINT, N. Y. 41°01.7'N., 71°47.3'W.	NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	Perth Amboy, N. J. 40°30.3'N., 74°15.7'W.	Elizabethport, N. J. 40°38.8'N., 74°11.2'W.	Port Newark, N. J. 40°41.8'N., 74°09.0'W.
CAPE COD CANAL ENT. 41°46.8'N., 70°29.0'W.																											
NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.	144																										
Nantucket, Mass. 41°17.2'N., 70°05.7'W.	69	85																									
Vineyard Haven, Mass. 41°27.3'N., 70°35.8'W.	43	88	29																								
Woods Hole, Mass. 41°31.4'N., 70°40.4'W.	22	92	33	7																							
New Bedford, Mass. 41°38.1'N., 70°55.1'W.	31	111	53	28	15																						
Newport, R. I. 41°29.8'N., 71°19.8'W.	54	111	71	45	38	38																					
Fall River, Mass. 41°42.4'N., 71°09.8'W.	69	126	77	51	44	54	16																				
Providence, R. I. 41°48.5'N., 71°24.0'W.	74	131	91	65	57	58	21	21																			
Great Salt Pond, R. I. 41°11.1'N., 71°34.9'W.	66	114	80	54	50	48	23	38	43																		
Stonington, Conn. 41°19.9'N., 71°54.6'W.	77	126	92	67	61	58	34	49	55	19																	
New London, Conn. 41°21.4'N., 72°05.4'W.	89	136	103	77	72	74	48	63	68	29	12																
Hartford, Conn. 41°45.0'N., 72°39.0'W.	140	187	155	129	125	124	98	113	118	80	66	62															
New Haven, Conn. 41°17.4'N., 72°54.5'W.	127	171	140	114	109	111	84	100	105	65	52	49	74														
Stratford, Conn. 41°11.3'N., 73°07.3'W.	132	176	147	121	117	113	90	105	110	72	59	54	81	15													
Bridgeport, Conn. 41°10.3'N., 73°10.8'W.	138	182	153	127	123	122	95	110	115	78	64	60	86	25	10												
South Norwalk, Conn. 41°05.7'N., 73°24.7'W.	151	195	166	140	135	135	108	124	129	91	77	73	101	36	26	21											
Stamford, Conn. 41°01.8'N., 73°32.3'W.	152	196	167	141	136	136	109	125	130	92	79	74	102	37	27	22	11										
Montauk, N. Y. 41°02.8'N., 71°57.5'W.	85	127	99	74	69	66	42	58	63	23	18	20	66	51	56	62	75	76									
Sag Harbor, N. Y. 41°00.2'N., 72°17.7'W.	100	143	114	88	83	81	57	72	77	39	29	27	64	49	54	60	73	74	21								
Greenport, N. Y. 41°06.0'N., 72°21.5'W.	99	142	113	87	82	80	56	71	76	37	28	25	62	47	52	58	71	72	22	11							
Port Jefferson, N. Y. 40°57.0'N., 73°04.5'W.	134	178	149	123	118	118	91	107	112	74	61	56	84	23	15	15	23	24	58	56	54						
MONTAUK POINT, N. Y. 41°01.7'N., 71°47.3'W.	76	113	89	63	59	60	35	51	56	15	19	28	75	62	65	74	84	85	16	32	30	68					
NEW YORK, N. Y. 40°42.0'N., 74°01.0'W.	182	223	196	171	166	166	139	154	159	121	109	104	131	68	57	52	40	33	105	103	102	52	122				
Perth Amboy, N. J. 40°30.3'N., 74°15.7'W.	202	223	216	191	186	186	159	174	179	141	129	124	151	88	77	72	60	53	125	123	122	72	123	20			
Elizabethport, N. J. 40°38.8'N., 74°11.2'W.	191	225	206	181	176	176	149	164	169	131	119	114	141	78	67	62	50	43	115	113	112	62	124	10	10		
Port Newark, N. J. 40°41.8'N., 74°09.0'W.	193	227	208	183	178	178	151	166	171	133	121	116	143	80	69	64	52	45	117	115	114	64	126	12	15	5	

Ambrose Light (40°27.5'N., 73°49.9'W.) to New York, 20.7 miles.

INSIDE-ROUTE DISTANCES

SOUTH SIDE OF LONG ISLAND
GREENPORT, N. Y., TO EAST ROCKAWAY INLET, N. Y.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Freeport is 61 nautical miles from Shinnecock Canal North End.

	Greenport 41°06.0'N., 72°21.5'W.	Sag Harbor 41°00.2'N., 72°17.7'W.	Riverside 40°55.0'N., 72°39.4'W.	Shinnecock Canal N. End 40°53.9'N., 72°30.3'W.	Shinnecock Inlet 40°50.3'N., 72°28.6'W.	Westhampton Beach 40°48.2'N., 72°38.4'W.	Moriches Inlet 40°45.8'N., 72°45.3'W.	Bellport 40°45.1'N., 72°56.0'W.	Patchogue 40°45.5'N., 73°01.2'W.	Bay Shore 40°42.8'N., 73°14.2'W.	Fire Island Inlet 40°37.8'N., 73°18.6'W.	Babylon 40°41.2'N., 73°18.9'W.	Amityville 40°39.6'N., 73°24.8'W.	Jones Beach 40°36.2'N., 73°30.8'W.	Jones Inlet 40°34.4'N., 73°34.9'W.	Freeport 40°37.6'N., 73°34.9'W.	Long Beach 40°35.7'N., 73°39.4'W.	East Rockaway Inlet 40°34.9'N., 73°45.4'W.	Rockaway Point * 40°32.4'N., 73°56.5'W.	NEW YORK (Battery)* 40°42.0'N., 74°01.0'W.	Manasquan Inlet, N. J. * 40°06.1'N., 74°01.9'W.
Sag Harbor	11																				
Riverside	21	22																			
Shinnecock Canal N. End	16	17	8																		
Shinnecock Inlet	21	22	13	5																	
Westhampton Beach	28	29	20	12	9																
Moriches Inlet	34	35	26	18	15	7															
Bellport	42	43	34	26	23	15	11														
Patchogue	48	49	40	32	29	21	17	6													
Bay Shore	57	58	49	41	39	30	27	16	13												
Fire Island Inlet	62	63	54	46	44	35	32	21	18	9											
Babylon	61	62	53	45	42	34	30	19	17	5	8										
Amityville	66	67	58	50	47	39	35	24	22	10	12	6									
Jones Beach	72	73	64	56	54	45	42	31	28	17	16	13	7								
Jones Inlet	76	77	68	60	58	49	45	35	32	21	20	17	11	4							
Freeport	77	78	69	61	58	49	46	35	32	21	21	18	12	4	4						
Long Beach	80	81	72	64	61	53	49	38	36	24	24	21	15	8	5	6					
East Rockaway Inlet	85	86	77	69	66	58	54	44	41	29	29	26	20	13	10	11	5				
Rockaway Point *	94	95	86	78	75	67	63	53	50	38	38	35	29	22	19	20	14	9			
NEW YORK (Battery)*	107	108	99	91	88	80	76	66	63	51	51	48	42	35	32	33	27	22	13		
Manasquan Inlet, N. J. *	116	117	108	100	97	89	85	75	72	60	60	57	51	44	41	42	36	31	27	40	

* Outside distances westward of East Rockaway Inlet.

DISTANCES ON HUDSON RIVER

NEW YORK, N.Y., TO TROY LOCK, N.Y.

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Poughkeepsie, N.Y., is 60 nautical miles from Albany, N.Y.

	NEW YORK (Battery) 40°42.0'N., 74°01.0'W.	Yonkers 40°56.1'N., 73°54.3'W.	Tarrytown 41°04.7'N., 73°52.2'W.	Nyack 41°05.4'N., 73°54.9'W.	Ossining 41°09.6'N., 73°52.3'W.	Haverstraw 41°11.8'N., 73°57.5'W.	Peekskill 41°17.3'N., 73°56.0'W.	West Point 41°23.1'N., 73°57.3'W.	Newburgh 41°30.1'N., 74°00.3'W.	Poughkeepsie 41°42.3'N., 73°56.5'W.	Hyde Park 41°47.3'N., 73°56.9'W.	Kingston 41°55.1'N., 73°59.0'W.	Saugerties 42°04.4'N., 73°56.7'W.	Catskill 42°13.0'N., 73°52.1'W.	Hudson 42°15.3'N., 73°48.1'W.	Athens 42°15.6'N., 73°48.5'W.	Coxsackie 42°21.0'N., 73°47.6'W.	Coeymans 42°28.5'N., 73°47.4'W.	Albany 42°37.9'N., 73°45.3'W.	Rensselaer 42°37.9'N., 73°45.1'W.	Troy 42°43.7'N., 73°41.8'W.	Watervliet 42°43.7'N., 73°41.9'W.	Troy Lock 42°45.1'N., 73°41.1'W.
16																							
24	9																						
25	10	2																					
29	14	6	6																				
33	18	9	10	5																			
38	23	15	15	11	[illegible]																		
45	29	21	22	17	13	8																	
53	37	29	29	25	21	15	8																
66	50	42	43	38	34	29	21	13															
71	55	47	48	43	39	34	26	18	5														
80	64	56	57	52	48	43	35	27	14	9													
89	74	66	66	62	58	52	45	37	24	19	12												
99	83	75	75	71	67	61	54	46	33	28	21	11											
102	86	78	78	74	70	64	57	49	36	31	24	14	5										
102	86	78	78	74	70	64	57	49	36	31	24	14	5	1									
108	93	85	85	80	76	71	63	55	42	37	30	21	11	7	6								
115	100	92	92	88	84	78	70	62	49	44	38	28	19	14	14	7							
126	110	102	102	98	94	88	81	73	60	55	48	38	29	24	24	18	10						
126	110	102	102	98	94	88	81	73	60	55	48	38	29	24	24	18	10	0					
132	116	108	108	104	100	94	87	79	66	61	54	44	35	30	30	24	16	6	6				
132	116	108	108	104	100	94	87	79	66	61	54	44	35	30	30	24	16	6	6	0			
134	118	110	110	106	102	96	89	81	68	63	56	46	37	32	32	26	18	8	8	2	2		

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

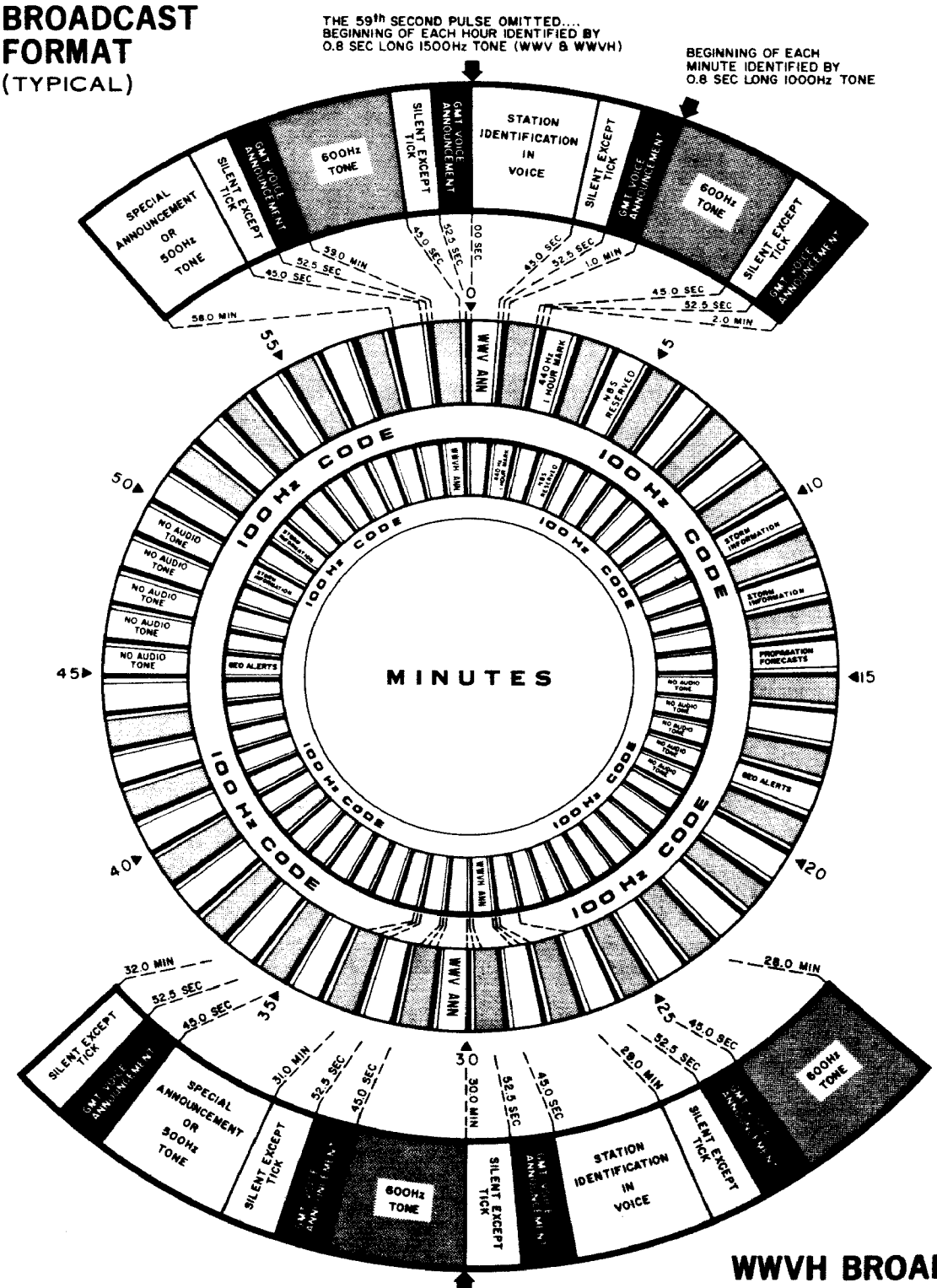
FEET TO METERS

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)

Form Approved. OMB No. 41-R2455

NOAA FORM 77-6
(4-71)

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: C325
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 34235-P71

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)*

INDEX

The numbers of the largest scale charts on which the names appear are in parentheses. Some geographic names are indexed more than once when more than one place has the same geographic name.

	Page
Abets Creek (120-SC)	208
Abiels Ledge (251)	117
Acabonack Harbor (362)	146
Acapesket (259)	99
Acoaxet (237)	122
Acushnet River (252)	119
Adams Fall (218)	172
Aids to navigation	15
Aids to navigation.	75
Aircraft procedures for distress incident	9
Albany (284)	241
Alder Island (120-SC)	212
Alleghany Rock (261)	105
Allen Harbor (236)	137
Allens Harbor (257)	95
Allyn Point (359)	160
Almy Rock (353)	126
Alpine (748)	236
Ambrose Channel (369)	218
Ambrose Light (1215)	215
America Ledge (236)	136
Amityville (120-SC)	211
Amityville Channel (120-SC)	211
Amityville Creek (120-SC)	211
Anchorage regulations	24
Anchorage Channel (369)	218
Anchorage Channel (541)	225
Anchorages.	76
Angelica Point (252)	118
Animal and Plant Health Inspection Service	3
Anthonys Nose (282)	238
Apponaganset Bay (252)	121
Apponaug Cove (278)	137
Areskonk Creek (120-SC)	207
Areys Pond (270)	91
Arlington (287)	233
Arnold Point (236)	129
Arthur Kill (285, 286)	230
Asia Rip (612)	77
Athens (283)	240
Atlantic Beach (120-SC)	213
Atlantic Highlands (369)	227
Atlantis Canyon (1108)	78
Aucoot Cove (251)	118
Aunt Lydias Cove (270)	90
Aunt Phebe Rock (223)	191
Automated Mutual-assistance Vessel Rescue System (AMVER)	4
Avery Point (293)	154
Babylon (120-SC)	210
Babylon Cove (120-SC)	210
Back River (251)	115
Bailey Rock (222)	191
Baker Island (358)	153
Baldwin (120-SC)	213
Baldwin Bay (120-SC)	212
Baldwin Harbor (120-SC)	212
Ballast Reef (221)	185
Bannister Creek (120-SC)	213
Barcelona Point (363)	148
Barker Point (223)	198
Barlows Landing (251)	114
Barneys Joy Point (237)	122
Barren Island (542)	221
Barrington (278)	131
Barrington River (278)	131
Barstow Rock (252)	119
Bartlett (359)	160
Bartlett Reef (214)	160
Bass Rip (1209)	78
Bass River (258)	95
Bassetts Island (251)	114
Bassing Harbor (270)	90
Battery (369)	217
Baxter Neck (259)	98
Bay of Fundy (120-SC)	212
Bay Ridge Channel (541)	225
Bay Shore (120-SC)	209
Bayonne (285)	231
Bayonne Bridge (285)	231
Bayview (252)	121
Beach Channel (542)	223
Beacon (282)	238
Bear Mountain (282)	238
Bear Mountain Bridge (282)	238
Bearings	1
Bearse Rock (258)	97
Bearse Shoal (250)	91
Beaufort Point (222)	191
Beaverdam Creek (120-SC)	207
Beaverhead (236)	136
Beavertail Light (236)	126
Beavertail Point (236)	126
Bedford Reef (362)	144
Belamose (267)	165
Belden Point (223)	192
Bell Island (221)	185
Belleville (287)	233
Bellmore Creek (120-SC)	212
Bellport (120-SC)	207
Bellport Bay (120-SC)	207
Belmont Island (745)	203
Bennets Neck (251)	114
Bergen Basin (542)	224
Bergen Beach (542)	223
Bergen Point (285)	231
Bermuda Lagoon (221)	183
Berry Creek Canal (287)	233
Big Fishkill Channel (542)	222
Big Mermaid (217)	169
Big Tom (223)	193
Bird Island (251)	118
Bird Island Reef (251)	118
Bird Island South Shoal (251)	118
Bird Rock (217)	169
Bishop and Clerks (258)	96
Bishop Rock Shoal (236)	128
Black Ledge (293)	158
Black Point (1210)	138
Black Point (214)	161
Black Point (353)	125
Black Rock (218)	171
Black Rock (220)	182
Black Rock Harbor (220)	182

	Page
Blackberry Creek (824-SC)	226
Blackboys (214)	161
Blackstone Rocks (217)	169
Blankinship Cove (251)	118
Block Canyon (1108)	78
Block Island (269)	140
Block Island North Light (269)	141
Block Island North Reef (271)	139
Block Island Sound (1211)	139
Block Island Southeast Light (269)	140
Bluefish Shoal (222)	189
Bluff Point (221)	183
Bluff Point (224)	195
Bluff Point (259)	98
Blyn Rock (217)	169
Bodkin Rock (266)	164
Bold Rock (221)	186
Bonnet Point (236)	135
Bonnet Shores Beach (236)	135
Borden Flats (350)	129
Bostwick Bay (362)	145
Boundary lines of inland waters	24
Boundary lines of inland waters	76
Bournes Pond (259)	99
Bowers Island (222)	188
Bowery Bay (226)	202
Branch (348)	108
Branchport (824-SC)	226
Branford Harbor (217)	169
Branford Point (217)	170
Branford Reef (217)	169
Branford River (217)	170
Brant Point (542)	223
Brant Point Light (343)	100
Brayton Point (350)	129
Breakneck Mountain (282)	238
Breakneck Point (282)	238
Breakwater Point (353)	125
Brenton Cove (236)	127
Brenton Point (236)	126
Brenton Reef (236)	126
Brickyard Point (224)	197
Bridge and cable clearances	13
Bridge-to-bridge Radiotelephone communication	22
Bridgeport (220)	180
Bridgeport Harbor (220)	180
Bridges	1
Brig Ledge (236)	136
Briggs Point (237)	123
Bristol (278)	131
Bristol Harbor (278)	131
Bristol Neck (278)	131
Bristol Point (353)	129
Broad Channel (120-SC)	213
Broad Channel (542)	223
Broad Creek Channel (120-SC)	212
Broadcasts by Coast Guard radio stations	247
Broadway (348)	108
Broken Ground (258)	96
Broken Part of Pollock Rip (250)	91
Bronx Kill (226)	202
Bronx River (226)	201
Bronx-Whitestone Bridge (223)	200
Brooklyn Bridge (745)	203
Brosewere Bay (120-SC)	213
Browing Ledge (237)	122
Brown Creek (120-SC)	208
Brown Point (217)	169
Browns Reef (217)	169
Brush Neck Cove (278)	137
Bucks Creek (257)	94
Bull Point (236)	127
Bullhead Bay (363)	150
Bullock Cove (278)	132
Bullock Point (278)	133
Buoys	17
Burns Point (219)	174
Burr Creek (220)	182
Butler Cove (251)	117
Butler Flats Light (252)	119
Butler Hole (250)	92
Butler Point (251)	118
Butter Ball Rock (236)	127
Buttermilk Bay (251)	116
Buttermilk Channel (541)	225
Buzzards Bay (1210)	112
Byram (East Port Chester) (222)	189
Byram Harbor (222)	188
Byram Point (222)	189
Byram River (222)	189
Cable and Anchor Reef (221)	184
Cables	1
Calf Islands (222)	188
Calf Pasture Island (221)	184
Calf Pasture Point (236)	137
Calves Island (215)	163
Canal Breakwater Light (251)	115
Canapitsit Channel (263)	111
Canarsie (542)	223
Canoe Place (120-SC)	205
Cape Cod (1208)	89
Cape Cod Canal (251)	115
Cape Higgon (264)	107
Cape Poge (261)	102
Cape Poge Bay (261)	102
Cape Poge Flats (261)	102
Captain Harbor (222)	187
Captains of the Port	246
Captree Island (120-SC)	210
Carlls River (120-SC)	210
Carlstadt (287)	233
Carman Creek (120-SC)	211
Carmans River (120-SC)	207
Cartwright Island (362)	145
Castle Hill (236)	127
Castle William (541)	225
Castleton-on-Hudson (284)	241
Cat Island (217)	169
Cataumet (251)	113
Cataumet Rock (251)	113
Catskill (283)	240
Catskill Creek (283)	240
Catumb Passage (358)	143
Catumb Rocks (358)	143
Catumet (251)	114
Caven Point (541)	225
Cayuga and Seneca Canals	244
Cedar Beach (361)	177
Cedar CreeK (220)	182
Cedar Hill (284)	241
Cedar Island (216)	167
Cedar Island (251)	117
Cedar Island Beach (120-SC)	211
Cedar Island Creek (251)	117
Cedar Island Point (251)	117
Cedar Point (221)	183
Cedar Point (363)	148
Cementon (283)	240
Centerboard Shoal (251)	118
Centerport Harbor (224)	195
Centerville (258)	97
Centerville Harbor (258)	97
Centerville River (258)	97
Centre Island (224)	196
Cerberus Shoal (362)	144
Chambly Canal	244
Champlain Canal	244
Channel markers, caution	17
Channel Rock (221)	184
Channel Rock (258)	97
Chapel Hill Channel (369)	218
Chappaquiddick Island (261)	102
Chappaquoit Point. (260)	113
Charles Island (219)	174
Charles Point (282)	238
Charles Reef (216)	167
Charles Rock (236)	136

	Page
Charlestown (271)	142
Charlestown Inlet (271)	142
Chart symbols and abbreviations	12
Chatham (257,270)	94
Chatham (270)	90
Chatham Bar (270)	90
Chatham Harbor (270)	90
Chatham Light (270)	90
Chatham Port (1208)	90
Chatham Roads (257)	94
Cheesequake Creek (286)	229
Chepiwanoxet Island (278)	137
Cherry Grove (120-SC)	209
Cherry Harbor (362)	145
Cherry Hill Point (362)	145
Chester Creek (266)	164
Chester Creek Bar (266)	164
Childs River (259)	99
Chilmark (264)	102
Chimney Corner Reef (217)	168
Chimney Sweeps (223)	192
Chimon Island (221)	184
Chocomount (358)	143
Chocomount Cove (358)	151
Cholera Bank (1215)	216
Church Point (353)	126
Cinder Creek (120-SC)	213
Citing Rock (236)	127
City Island (223)	192
City Island Harbor (223)	192
City Point (218)	171
Clam Island (217)	169
Clarks Cove (252)	121
Clarks Point (252)	119
Clason Point (226)	200
Clay Head (269)	140
Cleaves Point (363)	147
Cleveland Ledge Light (251)	115
Clinton (216)	167
Clinton Harbor (216)	167
Coast Guard	4
Coast Guard	246
Coast Guard radio stations	11
Coast Guard vessels, warning signals	19
Coast Guard Stations	247
Coast Pilots	1
Coast Pilots	245
Coasters Harbor Island (236)	127
Coatue Point (343)	100
Cobalt (266)	164
Cockenoe Harbor (221)	183
Cockenoe Harbor (221)	184
Cockenoe Island (221)	184
Cockenoe Reef (221)	184
Cockenoe Shoal (221)	184
Cockle Cove (257)	94
Coddington Cove (236)	128
Coddington Point (236)	128
Coecles Harbor (363)	147
Coeymans (284)	240
Coffin Rock (348)	109
Cohasset Narrows (251)	116
Cohoes (284)	243
Cold Spring (282)	238
Cold Spring Harbor (224)	196
Cold Spring Harbor (224)	196
Cold Spring Pond (363)	150
Cole River (353)	129
College Point (226)	200
College Point (226)	200
College Point Reef (226)	200
Collier Ledge (258)	97
Colonel Willie Cove (358)	152
Columbia Island (223)	191
Common Fence Point (353)	129
Common Flat (257)	94
Compass roses on charts	14
Compo Yacht Basin (221)	183
Compton Creek (369)	227
Con Hook (282)	238
Conanicut Island (353)	124
Conaskonk Point (286)	229
Coney Island (540)	224
Coney Island Channel (540)	224
Coney Island Creek (540)	224
Conimicut Light (278)	132
Conimicut Point (278)	132
Conklin Point (120-SC)	210
Conkling Point (363)	148
Connecticut River (215, 266, 267)	161
Connetquot River (120-SC)	208
Conscience Bay (361)	177
Constable Hook (285)	231
Constellation Rock (362)	144
Constitution Island (282)	238
Continental shelf	78
Contract Physician's Offices	248
Control of shipping in time of emergency or war	22
Control over movement of Vessels	64
Converse Point (251)	118
Cooper Bluff (224)	196
Copicut Neck (263)	111
Copicut Neck (263)	111
Copps Island (221)	184
Corey Creek (120-SC)	208
Corey Creek (363	149
Cormorant Reef (222)	188
Cormorant Reef (353)	125
Cormorant Rock (252)	119
Cormorant Rock (353)	125
Cornfield Point (215)	165
Cornfield Point Shoal (215)	165
Cornwall On The Hudson (282)	238
Corps of Engineers	5
Corps of Engineers	246
Corsair Canyon (1107)	78
Cos Cob Harbor (222)	187
Cotuit (259)	98
Cotuit Anchorage (259)	98
Cotuit Bay (259)	98
Cotuit Highlands (259)	98
Courses	1
Cove Harbor (221)	186
Cove Neck (224)	196
Cove Point (224)	196
Cow and Calf (217)	169
Cow Neck (363)	150
Coxens Ledge (237)	112
Coxsackie (284)	240
Craigville Beach (258)	97
Crane Neck Point (1213)	193
Crane Reef (215)	166
Crescent Beach (214)	160
Crimbo Point (219)	175
Cromeset Neck (251)	117
Cromeset Point (251)	117
Crooks Point (286)	228
Cross Rip Channel (1209)	92
Cross Rip Shoal (1209)	91
Croton Point (282)	237
Croton-on-Hudson (282)	237
Crow Head (362)	145
Crow Island (252)	119
Crow Shoal (362)	145
Crows Nest Mountain (282)	238
Crows Pond (270)	90
Cruising schedules	8
Cuban Ledge (223)	193
Cultivator Shoal (612)	76
Currents	1
Currents	79
Customs	3
Customs	248
Cutchogue Harbor (363)	149
Cutty Wow Rock (237)	123
Cuttyhunk (263)	111
Cuttyhunk Harbor (263)	111
Cuttyhunk Island (263)	111

	Page
Cuttyhunk Light (263)	111
Cuttyhunk Pond (263)	111
Danger signal	22
Danger Zone regulations	66
Dangerous Rock (363)	148
Daniels Island (259)	98
Danskammer Point (282)	239
Darien River (221)	186
Darrow Rocks (217)	170
Dartmouth Rock (252)	122
Dauntless Rock (222)	190
Davenport Neck (222)	191
Davids Island (223)	191
Davis Bank (612)	77
Davis Island (217)	169
Davis Park (120-SC)	208
Davis South Shoal (1107)	78
Davisville (259)	99
Davisville Depot (236)	136
Day Line Park (282)	238
Daylight saving time	87
Dead Horse Bay (542)	222
Deck officers	22
Deep Creek Meadow (120-SC)	212
Deep Reef (223)	192
Deep River (266)	164
Defense Mapping Agency Hydrographic Center (DMAHC)	5
Delancey Point (222)	190
Delaware and Hudson Canal (283)	239
Delaware and Raritan Canal (375)	230
Democrat Point (120-SC)	209
Dennis Port (257)	95
Department of Agriculture	249
Depths	1
Derby (219)	175
Dering Harbor (363)	147
Despair Island (236)	137
Destructive waves	18
Devils Bridge (264)	108
Devon (219)	175
Dewitt Point (283)	240
Diamond Reef (283)	239
Dickerson Channel (120-SC)	210
Dighton (353)	129
Disposal areas	14
Distances	2
Distress signals	7
Doanes Creek (257)	95
Dobbs Ferry (748)	236
Documentation	5
Documentation Offices	247
Dogfish Bar (258)	96
Dogfish Island (217)	169
Drawbridge operation regulations	45
Drawbridges	79
Dry Ledge (251)	117
Duck Creek (221)	183
Duck Island (216)	166
Duck Island Bluff (224)	194
Duck Island Harbor (224)	194
Duck Island Roads (216)	166
Duck Point (222)	191
Duck Pond Point (1212)	176
Dumping grounds	14
Dumping Grounds Regulations	66
Dumpling Rocks (252)	120
Dunbar Point (258)	97
Dundee Dam (287)	233
Dunderberg (282)	238
Dutch Island (236)	135
Dutch Island Harbor (236)	135
Dutch Kills (275)	203
Dyer Island (236)	129
East Bank (369)	219
East Bay (120-SC)	212
East Bay (258)	97
East Branch (120-SC)	206
East Branch (221)	186
East Branch (275)	203
East Channel (120-SC)	210
East Chop (261)	105
East Chop Flats (261)	105
East Clump (358)	151
East Crib (217)	169
East Crow Island (120-SC)	212
East Fort Point (224)	196
East Greenwich (278)	138
East Haddam (266)	164
East Hampton (362)	146
East Harbor (358)	151
East Indies Rocks (217)	170
East Ledge (216)	166
East Lyme (214)	161
East Mill Basin (542)	223
East Moriches (120NSC)	207
East Nonations (223)	191
East Norwalk (221)	185
East Norwalk Harbor (221)	185
East Passage (236)	126
East Point (358)	151
East Quogue (120-SC)	206
East Reef (217)	168
East River (217)	167
East River (223, 226, 745)	199
East River (251)	117
East Rockaway (120-SC)	213
East Rockaway Channel (120-SC)	213
East Rockaway Inlet (120-SC)	213
East White Rock (221)	184
East-West Channel (120-SC)	210
Eastchester (223)	193
Eastchester Bay (223)	193
Eastern Plain Point (362)	145
Eastham (1208)	90
Easton Point (236)	126
Eastport (120-SC)	206
Eatons Neck (224)	194
Eatons Neck Basin (224)	194
Echo soundings	14
Echo Bay (222)	191
Echo Island (222)	191
Eddie Woods Rock (258)	97
Edgartown (261)	102
Edgartown Harbor (261)	102
Edgartown Light (261)	102
Edgewater (746)	235
Edgewater Point (222)	190
Edwards Rock (263)	111
Edwards Shoal (265)	101
Eel Grass Ground (358)	153
Eel Pond (259)	99
Eel Pond (348)	109
Egg Island (120-SC)	212
Eightmile River (215)	164
Eldridge Shoal (259)	98
Elizabeth (285)	231
Elizabeth Islands (249)	108
Elizabeth River (285)	231
Elizabeth-Port Authority Marine Terminal (285)	232
Elizabethport (285)	231
Emerald Rock (222)	191
Endeavor Shoals (362)	144
Enfield Rapids	165
Englewood Boat Basin (747)	235
English Kills (275)	203
Erie Basin (541)	225
Erie Canal	243
Esopus (283)	239
Esopus Creek (283)	240
Esopus Island (283)	239
Esopus Meadow Light 11 (283)	239
Essex (215)	164
Essex Cove (215)	164
Esther Island (265)	100
Eustasia Island (266)	164

	Page
Eustis Rock (251)	114
Execution Rocks (223)	192
Fair Harbor (120-SC)	209
Fair Haven (218)	171
Fair Haven (824-SC)	226
Fairchild Basin (224)	196
Fairhaven (252)	119
Falkner Island (217)	168
Fall River (350)	129
Falmouth (260)	107
Falmouth Harbor (260)	106
Falmouth Heights (260)	107
Falmouth Inner Harbor (260)	107
False Channel Meadow (120-SC)	212
False Hook (369)	218
False Hook Channel (369)	218
Fanning Point (363)	148
Far Rockaway (542)	224
Farm River (217)	170
Farm River Gut (217)	170
Fayerweather Island (220)	182
Federal Communications Commission	5
Federal Communications Commission	249
Felix Ledge (263)	110
Ferry Point (215)	163
Ferry Point (286)	230
Fiddler's Cove (251)	114
Fields Point (352)	132
Fighting Island (120-SC)	212
Fire Island Inlet (120-SC)	209
Fire Island Light (120-SC)	209
Fire Island National Seashore (120-SC)	208
Fire Islands (120-SC)	210
Fish havens	14
Fish havens	5
Fish trap areas	14
Fishers Island (358)	143
Fishers Island Sound (358)	150
Fishing Cove (236)	136
Fishing Rip (612)	77
Fishtraps	5
Fishweirs	79
Fiske Rock (236)	128
Fitch Point (221)	185
Five Foot Rock (217)	169
Fivemile River (221)	185
Flanders (363)	150
Flanders Bay (363)	150
Flat Neck Point (222)	187
Flat Rock (214)	160
Flint Point (353)	125
Flint Point Ledge (353)	125
Floyd Bennett Field (542)	222
Flushing (226)	201
Flushing Bay (226)	200
Flying Point (217)	169
Flynns Knoll (369)	218
Fog signals	16
Fogland Point (353)	126
Foot Rocks (217)	169
Forbes Rocks (222)	189
Foreign Trade Zone No. 1	221
Forge River (120-SC)	207
Forties Rocks (222)	189
Fort Adams (236)	127
Fort Columbus (541)	225
Fort Hill (266)	164
Fort Lee (746)	235
Fort Phoenix (252)	119
Fort Point (359)	160
Fort Pond Bay (362)	145
Fort Schuyler (223)	199
Fort Slocum (223)	191
Fort Totten (223)	200
Fort Washington Point (746)	235
Fort Wetherill (236)	127
Fourfoot Rocks (222)	189
Fourteen Foot Channel (369)	218
Fox Hill (236)	135
Fox Island (236)	136
Fox Point (352)	132
Freeport (120-SC)	212
Freeport Creek (120-SC)	212
Frequency units	11
Fresh Creek (542)	223
Fresh Kills (286)	231
Friars Head (1212)	177
Frost Creek (222)	197
Frost Point (220)	183
Fuller Rock (352)	133
Gales Ferry (359)	159
Galilee (268)	142
Gallatin Rock (252)	118
Gallatin Rock (258)	97
Gangway Rock (223)	198
Gangway Rock (358)	143
Gannet Ledge (258)	97
Gannet Rocks (258)	97
Gardiners Bay (362)	145
Gardiners Island (362)	145
Gardiners Point (362)	145
Gardiners Rock (258)	96
Gardners Neck (353)	129
Garfield (287)	233
Garrison (282)	238
Gaspee Point (278)	132
Gay Head (264)	108
Gazelle Rock (258)	96
Gees Point (282)	238
General Grants Tomb (746)	235
General Rock (236)	136
Geographic range	15
George Washington Bridge (746)	235
Georges Bank (612)	76
Georges Rock (221)	184
Georges Shoal (612)	76
Gerristen (542)	222
Gerristen Creek (542)	222
Gerristen Inlet (542)	222
Giants Neck (214)	161
Gibbs Rock (251)	118
Gifford Ledge (260)	113
Gilbert Canyon (1107)	78
Gildersleeve (267)	165
Gilgo Beach (120-SC)	211
Gilgo Heading (120-SC)	211
Glen Cove (223)	197
Glen Cove Creek (222)	197
Glen Cove Landing (223)	197
Glen Island (223)	192
Glencove Harbor (223)	197
Glenwood Landing (223)	197
Goat Island (236)	127
Goat Island (358)	152
Goethals Bridge (285)	231
Goose Creek (363)	148
Goose Inlet (358)	151
Goose Island (223)	192
Goose Islands (217)	168
Goose Rocks (217)	168
Goose Rocks Shoals (217)	168
Gooseberry Island (236)	126
Gooseberry Neck (237)	122
Goshen Point (359, 214)	157
Goshen Point (359, 214)	160
Gosnold Island (263)	111
Gosnold Pond (263)	111
Gould Island, East Passage (236)	128
Gould Island, Sakonnet River (353)	125
Government Agencies	3
Governors Island (541)	225
Gowanus Bay (541)	225
Gowanus Canal (541)	225
Gowanus Flats (541)	225
Grace Point (269)	141
Grass Hassock Channel (542)	223

	Page
Grassy Bay (542)	224
Grassy Hammocks Rocks (221)	184
Grassy Island (348)	109
Grassy Point (282)	237
Grassy Rocks (222)	188
Gravesend Bay (540)	224
Gray Gables (251)	115
Great Captain Island (222)	188
Great Captain Rocks (222)	189
Great Cove (120-SC)	209
Great Eastern Rock (362)	144
Great Fresh Kills (286)	231
Great Gull Island (362)	144
Great Harbor (348)	108
Great Hill (251)	117
Great Hill Point (251)	118
Great Hog Neck (363)	149
Great Island (221)	186
Great Island Channel (120-SC)	211
Great Kills Harbor (286)	228
Great Knob (222)	190
Great Ledge (236)	136
Great Ledge (348)	109
Great Neck Creek (120-SC)	211
Great Peconic Bay (363)	150
Great Point (265)	99
Great Rip (1209)	78
Great River (120-SC)	208
Great River (259)	99
Great Rock (258)	96
Great Round Shoal (250)	91
Great Round Shoal Channel (250)	92
Great Salt Pond (New Harbor) (269)	141
Great Sippowesset Rock (260)	113
Great South Bay (120-SC)	208
Great South Beach (120-SC)	210
Great South Channel (1107)	78
Green Harbor (120-SC)	208
Green Island (120-SC)	211
Green Island (217)	169
Green Jacket Shoal (352)	133
Green Pond (259)	99
Greenport (363)	147
Greenport Harbor (363)	147
Greens Harbor (293)	157
Greens Ledge (221)	184
Greenville (541)	225
Greenwich (222)	188
Greenwich Bay (278)	137
Greenwich Cove (222)	187
Greenwich Cove (278)	138
Greenwich Harbor (222)	188
Greenwich Point (222)	187
Gregory Point (221)	185
Griswold Island (214)	161
Groton (293)	157
Groton Long Point (358)	153
Guilford (217)	168
Guilford Harbor (217)	167
Guilford Point (217)	167
Gull Island (263)	111
Gull Island (363)	148
Gull Point (278)	131
Gull Rock (216)	167
Gull Rocks (217)	170
Gull Rocks (236)	127
Guttenberg (746)	235
Hackensack River (287)	233
Haddam Island (266)	164
Hadley Harbor (348)	110
Hadley Rock (348)	109
Half Acre Rock (217)	167
Halfmile Rock (237)	122
Halfmoon Shoal (1209)	91
Halftide Rock (215)	166
Halftide Rock (251)	114
Halftide Rock (258)	96
Halfway Ledge (236)	136
Halfway Rock (236)	128
Halfway Rock (237)	123
Hallets Point (226)	202
Hallets Rock (258)	96
Hallock (Long Beach) Bay (363)	147
Hamburg (215)	164
Hamburg Cove (215)	164
Hamlin Point (260)	113
Hammett Cove (251)	118
Hammock River (216)	167
Hammonasset Point (216)	167
Hammonasset River (216)	167
Hammonasset State Park (216)	167
Hampton Bays (120-SC)	205
Handkerchief Shoal (250)	91
Handy Point (251)	114
Harbor entrances.	76
Harbor Bluff (258)	97
Harbor Ledge (221)	187
Harbor Neck (269)	141
Harbormasters	87
Harlem River (226, 274)	202
Harmon (282)	237
Harrison Island (222)	191
Hart Cove (120-SC)	206
Hart Island (223)	192
Hart Island Roads (223)	192
Hartford (267)	165
Harthaven (261)	103
Harwich Port (257)	95
Hashamomuck Pond (363)	148
Haskell Island (251)	118
Hastings-on-Hudson (748)	236
Hatchett Point (214)	161
Hatchett Reef (214)	161
Haunts Creek (120-SC)	212
Haverstraw (282)	237
Haverstraw Bay (282)	237
Hawes Shoal (265)	101
Hawtree Creek (542)	223
Hay Beach Point (363)	147
Hay Harbor (358)	151
Haycock Ledge (236)	126
Haycock Point (217)	169
Haydens Point (215)	164
Head of the Harbor (265)	101
Head of Bay (542)	224
Hecksher State Park (120-SC)	209
Hedge Fence (1209)	92
Heights	2
Helicopter evacuation	9
Hell Gate (226)	202
Hell Gate Bridge (226)	202
Hempstead Bay (120-SC)	211
Hempstead Harbor (223)	197
Hen and Chickens (1210)	112
Hen and Chickens (215)	166
Hen and Chickens (222)	188
Hen and Chickens (222)	190
Hen Cove (251)	114
Hen Island (222)	190
Hendrix Creek (542)	223
Herring River (257)	95
Hewlett Bay (120-SC)	213
Hewlett Point (223)	198
Hicks Beach (120-SC)	213
Hicks Island (362)	145
Hicks Ledge (222)	191
Higganum Creek (266)	164
High Hill Point (353)	126
High Island (217)	169
High Island (223)	192
High Rock (214)	160
High Tor (282)	237
Highland (Cape Cod) Light (1208)	90
Highland Falls (282)	238
Highlands (1208)	89
Highlands (824-SC)	226
Highlands of Navesink (1215)	215

Page
Highwater Rock (221) 187
Hitchcock Rock (222) 187
Hither Creek (265) 100
Hoadley Point (217) 168
Hoboken (745) 235
Hodges Rock (258) 97
Hoffman Island (540) 224
Hog Back (226) 202
Hog Back (293) 158
Hog Creek Point (362) 146
Hog Island (278) 131
Hog Island (278) 129
Hog Island Channel (120-SC) 213
Hog Neck (251) 117
Hog Neck Bay (363) 149
Holmes Hill (363) 149
Holmes Rock (226) 202
Holyoke 165
Hook of the Cape (1208) 89
Hook Mountain (282) 237
Hope Island (236) 137
Horse in Bank (1212) 177
Horse Neck (278) 137
Horseneck Beach (237) 122
Horseneck Point (237) 122
Horseshoe Cove (363) 150
Horseshoe Harbor (222) 190
Horseshoe Reef (293) 154
Horseshoe Shoal (1209) 92
Horton Point Light (1212) 175
Hospital Cove (251) 114
Hospitals 248
Housatonic River (219) 174
Howard Beach (542) 223
Huckleberry Island (223) 191
Hudson (283) 240
Hudson Canyon (1108, 1215) 78
Hudson Canyon (1215) 216
Hudson Channel (120-SC) 212
Hudson Heights (746) 235
Hudson River (745, 746, 748, 282, 283, 284) 234
Hudson River Channel (369) 218
Hull Cove (236) 126
Huntington (224) 195
Huntington Bay (224) 194
Huntington Harbor (224) 195
Hunts Point (226) 201
Hunts Rock Breakwater (252) 122
Hurricanes 82
Hutchinson River (223) 193
Hyannis (258) 97
Hyannis Harbor (258) 96
Hyannis Point (258) 97
Hyannis Port (258) 97
Hyde Park (283) 239
Hydrographer Canyon (1107) 78

Ice 86
Ida Lewis Rock (236) 127
Immigration and Naturalization 249
Immigration and Naturalization Service 5
India Point (352) 133
Indian Harbor (222) 188
Indian Kill (283) 239
Indian Point (282) 237
Indian Reef (217) 167
Indian River (216) 167
International distress signals 7
Intrepid Rock (358) 153
Inwood (542) 224
Iona Island (282) 238
Irvington (748) 236
Island Channel (542) 222
Island Creek (120-SC) 212
Island Park (120-SC) 213
Islip (120-SC) 209

Jacobs Point (363) 176
Jamaica Bay (542) 222

Page
James Creek (363) 150
Jamestown (236) 128
Jamestown-North Kingstown Bridge (236) 136
Jeffrey Point (217) 169
Jeffrey Rock (217) 169
Jennings Point (363) 148
Jersey City (745) 235
Jersey Flats (541) 225
Jerusalem (268) 142
Jessup Neck (363) 149
Jobs Neck (264) 110
Jockey Creek (363) 148
Joe Burris Ledge (237) 122
Johns Rock (214) 161
Johnson Point (217) 170
Johnsons Creek (220) 180
Jones Beach State Park (120-SC) 211
Jones Inlet (120-SC) 212
Jones Island (120-SC) 212
Jones Point (282) 238
Jones Rocks (222) 188
Jordan Cove (214) 160
Joshua Cove (217) 168
Joshua Point (217) 168
Juniper Point (348) 108

Katama Bay (261) 102
Keansburg (286) 229
Kellys Bay (258) 96
Kelsey Point (216) 166
Kelsey Point Breakwater (216) 166
Kettle Bottom Rock (236) 127
Keyport (286) 229
Keyport Harbor (286) 229
Kickamuit River (353) 129
Kill Pond Bar (257) 94
Kill Van Kull (285) 231
Kimberly Reef (216) 167
Kings Park (1213) 194
Kings Point (223) 198
Kingston (283) 239
Kingston Point (283) 240
Kingston-Rhinecliff Bridge (283) 240
Kitemaug (359) 160
Kitts Island (221) 183
Knox Point (263) 111

L'Hommedieu Shoal (1209) 92
La Guardia Airport (226) 201
Lackeys Bay (264) 110
Lagoon Pond (261) 106
Lake Champlain 244
Lake Montauk (362) 144
Lake Tashmoo (264) 107
Larchmont Harbor (222) 190
Latimer Reef (358) 153
Laurel (266) 162
Laurence Harbor (286) 229
Lawrence Point (226) 202
Ledwoods Island (358) 152
Lee River (353) 129
Leetes Island Quarry (217) 168
Leetes Rocks (217) 168
Legal public holidays 87
Lemon Creek (286) 228
Leonardo (369) 227
Lewis Bay (258) 97
Lewis Pond (258) 96
Liberty (Bedloe's) Island (541) 225
Lieutenant River (215) 163
Light and fog signal characteristics 2
Light Lists 4
Light Lists 246
Lighthouse Point (218) 172
Lights 15
Lindenhurst (120-SC) 211
Lionhead Rock (362) 146
Little Bay (223) 200
Little Bay (252) 119

	Page
Little Bird Island (251)	117
Little Captain Island (222)	188
Little Compton (353)	126
Little Fresh Kills (286)	231
Little Gull Island Light (362)	143
Little Gull Reef (362)	143
Little Harbor (348)	110
Little Hell Gate (226)	202
Little Ida Lewis Rock (236)	127
Little Island (251)	118
Little Island (259)	98
Little Island (260)	113
Little Mermaid (217)	169
Little Narragansett Bay (358)	152
Little Neck Bay (223)	199
Little Peconic Bay (363)	149
Little Pleasant Bay (270)	91
Little River (259)	99
Little Rock (214)	160
Little Round Shoal (250)	91
Little Seatuck Creek (120-SC)	206
Little Silver Creek (824-SC)	226
Little Southwest Rock (237)	122
Little Stony Point (282)	238
Little Whale (236)	135
Lloyd Harbor (224)	195
Lloyd Neck (224)	196
Lloyd Point (224)	196
Lobster pots	78
Local magnetic disturbances	14
Local Notice to Mariners	2
Locust Point (223)	193
Locust Point (824-SC)	226
Lone Rock (259)	98
Lone Rock (261)	103
Lone Rock (264)	108
Lone Rock (264)	110
Long Beach (120-SC)	213
Long Beach Point (251)	117
Long Beach Point (363)	147
Long Creek (120-SC)	212
Long Island (252)	119
Long Island Sound (1212)	156
Long Island State Park Commission (120-SC)	210
Long Neck Point (221)	186
Long Point (120-SC)	207
Long Point (251)	114
Long Point (278)	137
Long Sand Shoal (1212)	165
Long Shoal (265)	101
Longshore Town Marina (221)	183
Loran	18
Lord Cove (215)	163
Lords Passage (358)	143
Lovers Island (217)	169
Lower Bay (369)	218
Lucas Shoal (264)	107
Lumber Rock (237)	122
Luppatatong Creek (286)	229
Lydonia Canyon (1107)	78
Mackeral Cove (236)	127
Madaket Harbor (265)	100
Madison (216)	167
Madison Reef (216)	167
Magazine Point (282)	238
Main Channel (1209)	92
Main Creek (286)	231
Maltby Cove (217)	169
Mamaroneck (222)	190
Mamaroneck Harbor (222)	190
Manhasset Bay (223)	198
Manhassett Creek (824-SC)	226
Manhattan Beach (542)	222
Manhattan Beach (542)	221
Manhattan Bridge (745)	203
Manorhaven (223)	198
Manresa Island (221)	184
Mansfield Point (217)	170
Manursing Island Reef (222)	189
Marine Broadcast Notices to Mariners	2
Marine Historical Association Museum (358)	154
Marine Inspection Offices	247
Mariners Harbor (285)	232
Marion (251)	118
Marks Cove (251)	117
Marsh Island (278)	132
Martha's Vineyard (264)	102
Mashnee Island (251)	114
Mashomack Point (363)	148
Mason Island (358)	153
Mason Point (358)	153
Maspeth Creek (275)	203
Massachusetts Maritime Academy (251)	116
Mastic (120-SC)	207
Matawan Creek (286)	229
Matawan Point (286)	229
Matinecock Point (222)	197
Mattapoisett (252)	118
Mattapoisett Harbor (252)	118
Mattapoisett Ledge (252)	118
Mattapoisett Neck (252)	118
Mattituck (363)	176
Mattituck Inlet (363)	176
Matunuck (271)	142
Matunuck Point (271)	142
McBlair Shoal (1209)	78
McCurry Point (353)	125
Meadow Island (120-SC)	212
Meadow Island (251)	118
Measured Courses	249
Meeting House Pond (270)	91
Meetinghouse Creek (363)	150
Megansett (251)	113
Megansett Harbor (251)	113
Melton Ledge	158
Melville (236)	129
Menauhant (259)	99
Mendells Rock (251)	118
Menemsha (264)	107
Menemsha Basin (264)	107
Menemsha Bight (264)	107
Menemsha Creek (264)	107
Menemsha Pond (264)	107
Menunketesuck Island (216)	166
Menunketesuck River (216)	166
Mercator projection	14
Merrick Creek (120-SC)	212
Miamogue Point (363)	150
Mianus (222)	188
Mianus River (222)	188
Mid Hudson Bridge (283)	239
Middle Bay (120-SC)	213
Middle Beach (216)	167
Middle Cove (215)	164
Middle Ground (222)	191
Middle Ground (263)	111
Middle Ground (264)	107
Middle Ground (358)	152
Middle Ground Shoal (261)	103
Middle Ledge (263)	111
Middle Ledge (348)	109
Middle Reef (223)	191
Middle Rip (612)	77
Middle Shoal Rock (362)	144
Middletown (267)	165
Midland Beach (369)	228
Midway Shoal (362)	146
Milburn Creek (120-SC)	213
Milford Harbor (219)	174
Milford Point (219)	174
Mill Basin (542)	222
Mill Cove (236)	136
Mill Creek (363)	149
Mill Creek (363)	148
Mill Creek (542)	222
Mill Neck Creek (224)	197
Mill Pond (222)	190

	Page
Mill River (218)	171
Mill Rock (226)	202
Millstone Point (214)	160
Milton Harbor (222)	189
Milton Point (222)	189
Minesweeper signals	20
Mishaum Ledge (237)	112
Mishaum Point (252)	122
Mitchell River (257)	94
Mitchell Rock (236)	127
Mohegan Bluffs (269)	140
Money Island (217)	169
Monomoy Island (1209)	94
Monomoy Point (250)	91
Monomoy Shoals (250)	91
Montauk (362)	145
Montauk Harbor (362)	144
Montauk Point (362)	144
Montauk Shoal (362)	144
Montville Station (359)	160
Monument Beach (251)	115
Morgan (286)	229
Morgan Point (358)	153
Moriches Bay (120-SC)	206
Moriches Inlet (120-SC)	207
Morris Cove (218)	171
Morris Rock (224)	196
Moses Point (224)	196
Mosher Ledge (252)	119
Moshers Point (252)	121
Mosquito Cove (223)	197
Mott Point (223)	198
Motts Basin (542)	224
Mount Hope (353)	129
Mount Hope Bay (353)	129
Mount Hope Bridge (353)	129
Mount Misery (361)	177
Mount Misery Shoal (361)	177
Mount Sinai Harbor (361)	177
Mouse Island (358)	153
Mud (West Senix) Creek (120-SC)	207
Mud Creek (120-SC)	208
Mud Creek (120-SC)	210
Mud Gorge (1108, 1215)	78
Mud Gorge (1215)	216
Mumford Cove (293)	154
Muskeget Channel (264)	101
Muskeget Island (265)	100
Musselbed Shoals (278)	129
Mutton Shoal (264)	101
Mystic (358)	154
Mystic Harbor (358)	153
Mystic River (358)	154
Namequoit Point (270)	91
Namequoit River (270)	91
Nannaquaket Pond (353)	126
Nantucket (Great Point) Light (265)	99
Nantucket (343)	100
Nantucket Harbor (343)	100
Nantucket Island (265)	99
Nantucket Shoals (1209)	91
Nantucket Shoals (612, 1107, 1209)	77
Nantucket Shoals Lightship (612, 1107)	77
Nantucket Sound (1209)	91
Napatree Beach (358)	151
Napatree Point (358)	151
Napatree Point Ledge (358)	152
Napeague Bay (362)	145
Napeague Harbor (362)	145
Narragansett Bay (353)	124
Narragansett Pier (236)	135
Narraskatuck Creek (120-SC)	211
Narrow channels	22
Narrow Bay (120-SC)	207
Narrows (358)	154
Nashawena Island (263, 264)	110
Nasketucket Bay (252)	119
Nasketucket River (252)	119
Nassau Point (363)	149
National Ocean Survey	3
National Ocean Survey	245
National Weather Service	6
National Weather Service	248
Naugatuck River (219)	174
Nauset Bay (1208)	90
Nauset Beach Light (1208)	90
Nauset Harbor (1208)	90
Naushon Island (264)	110
Nautical charts	3
Nautical charts	12
Nautical Charts	245
Navesink River (824-SC)	226
Navigation Regulations	69
Nayatt Point (278)	132
Nebraska Shoal (271)	142
Ned Point (252)	118
Neds Creek (120-SC)	212
Negro Bar Channel (542)	224
Negro Heads (217)	169
Negro Ledge (252)	120
Negro Point (226)	202
Neguntatogue Creek (120-SC)	211
Neptune Island (223)	192
New Bedford (252)	119
New Bedford Harbor (252)	119
New Brighton (285)	232
New Hamburg (283)	239
New Haven (218)	170
New Haven Harbor (218)	170
New London (Southwest) Ledge (293)	158
New London (293)	157
New London Harbor (293)	157
New London Ledge Light (293)	157
New Milford (287)	233
New Rochelle (222)	191
New Rochelle Harbor (223)	191
New Suffolk (363)	149
New Windsor (282)	238
New York and New Jersey Channels (369)	228
New York City Department of Ports and Terminals	221
New York Harbor (369)	215
New York Harbor (369)	217
New York Maritime College (223)	199
New York Naval Shipyard (745)	203
New York State Barge Canal System	243
New York State Thruway Bridge (282)	236
Newark (287)	233
Newark Bay (285, 287)	232
Newburgh (282)	238
Newfoundland Reef (222)	187
Newport (236)	127
Newport Harbor (236)	127
Newport Neck (236)	126
Newton Rock (236)	126
Newtown Creek (275)	203
Niantic (214)	160
Niantic Bay (214)	160
Niantic River (214)	161
Nickersons Neck (270)	90
Nicks Point (120-SC)	212
Nicoll Bay (120-SC)	210
Nicoll Point (120-SC)	209
Ninigret Pond (271)	142
Nissequogue River (1213)	194
Noank (358)	154
Nobska Point (260)	107
Nobska Point Ledges (260)	107
Nomans Land (264)	108
Nominal range	15
Nonamesset Island (348)	108
Nonamesset Shoal (348)	109
Nonquitt (252)	121
Noroton Point (221)	185
North Bay (259)	98
North Brother (214)	161
North Brother Island (226)	201
North Channel (1209)	92

	Page
North Chatham (1208)	90
North Cove (215)	163
North Dumpling (358)	151
North Falmouth (251)	113
North Germantown (283)	240
North Haven Peninsula (363)	149
North Ledge (222)	190
North Manursing Island (222)	189
North Point (264)	110
North Race (363)	150
North River (745, 746, 748, 282, 283, 284)	234
North Sea Harbor (363)	149
Northport (224)	195
Northport Basin (224)	194
Northport Bay (224)	194
Northport Harbor (224)	195
Northwest Harbor (363)	148
Northwest Point (542)	224
Norton Point (261)	102
Norton Point (264)	107
Norton Point (540)	224
Norton Shoal (265)	101
Norwalk (221)	185
Norwalk Cove (221)	185
Norwalk Harbor (221)	184
Norwalk Islands (221)	183
Norwalk River (221)	184
Norwich (359)	160
Notice to Mariners	246
Notices to Mariners	2
Nova Scotia Bar (542)	223
Noyac Bay (363)	149
Noyes Rock (358)	153
Noyes Shoal (358)	153
Nutley (287)	233
Nyack (282)	237
Nye Ledge (252)	118
Nyes Neck (251)	113
Oak Beach (120-SC)	210
Oak Bluffs (261)	103
Oak Bluffs Harbor (261)	103
Oak Island (120-SC)	210
Oak Island Channel (120-SC)	210
Oak Neck Creek (224)	197
Oak Neck Point (222)	197
Oakland Beach (222)	189
Oakland Beach (278)	137
Obstructions	2
Occupessatuxet Cove (278)	132
Ocean Beach (120-SC)	209
Oceanic (824-SC)	226
Oceanographer Canyon (1107)	78
Oceanport Creek (824-SC)	226
Oceanside (120-SC)	213
Ohio Ledge (278)	131
Oil Pollution	21
Old Bridge (375)	229
Old Bull (353)	126
Old Clump (217)	170
Old Cock (237)	112
Old Ferry Point (223)	200
Old Field Point (1213)	193
Old Greenwich (222)	187
Old Harbor (269)	141
Old Lyme (215)	163
Old Man (264)	108
Old Man Shoal (1209	78
Old Mill Creek (542)	223
Old Mystic (358)	154
Old Neck Creek (120-SC)	207
Old Orchard Shoals (369)	228
Old Reef (271)	143
Old Sergeant (236)	136
Old Silas Rock (362)	144
Old South Shoal (1107)	78
Onset (251)	117
Onset Bay (251)	117
Orchard Beach (223)	192
Orchard Neck Creek (120-SC)	207
Orient (363)	147
Orient Harbor (363)	147
Orient Point (362)	146
Orient Shoal (1212)	175
Orion Shoal (250)	91
Orleans (270)	90
Orowoc Creek (120-SC)	209
Ossining (282)	237
Osterville (259)	98
Osterville Grand Island (259)	98
Oswego Canal	243
Otter Rocks (222)	188
Outer Island (217)	168
Outer Steamboat Rock (222)	190
Outer White Top (217)	167
Outpatient Clinics	248
Overpeck Creek (287)	233
Oyster Bay (224)	196
Oyster Bay (224)	196
Oyster Bay Harbor (224)	196
Oyster Pond (257)	94
Oyster Pond Reef (362)	146
Oyster Pond River (257)	94
Padanaram Breakwater (252)	122
Paerdegat Basin (542)	223
Palisades Interstate Park (747)	235
Paper Rock Shoal (266)	164
Paradise Point (363)	148
Parker Creek (824-SC)	226
Parker Flats (348)	109
Parkers River (258)	96
Parsonage Cove (120-SC)	213
Parsonage Island (120-SC)	213
Passaic (287)	232
Passaic River (287)	232
Patchogue (120-SC)	208
Patchogue Bay (120-SC)	208
Patchogue River (120-SC)	208
Patchogue River (216)	166
Patience Island (278)	137
Paw Wah Pond (270)	91
Pawcatuck Point (358)	152
Pawcatuck River (358)	152
Pawn Rock (237)	122
Pawtucket (278)	132
Pawtuxet (278)	132
Pawtuxet Cove (278)	132
Pea Island (223)	191
Peacock Point (222)	197
Peaked Hill Bar (1208)	89
Peartree Point (221)	186
Pease Ledge (263)	111
Peck Ledge (221)	184
Pecks Mill (219)	175
Pecks Rock (222)	187
Peconic River (363)	150
Peeks Kill (282)	238
Peekskill (282)	237
Pelham (223)	193
Penataquit Creek (120-SC)	209
Penfield Reef (220)	182
Penfield Reef Light (220)	182
Penikese Island (263)	111
Peningo Neck (222)	189
Penzance (348)	109
Penzance Point (348)	109
Pequonnock River (220)	180
Pequotsepos Brook (358)	154
Perth Amboy (286)	230
Peters Point (353)	129
Pettit Marsh (120-SC)	212
Phelps Bank (612)	77
Phelps Ledge (362)	144
Phillipsdale (278)	132
Phinneys Harbor (251)	114
Picket Rock (223)	198
Piermont (748)	236

	Page
Piermont Pier (748)	236
Pilotage,	87
Pine Creek Point (220)	182
Pine Grove (214)	161
Pine Island (222)	191
Pine Island (293)	154
Pine Island Channel (293)	157
Pine Marsh (120-SC)	212
Pine Neck (120-SC)	206
Pine Neck Point (120-SC)	206
Pine Orchard (217)	169
Pine Point (221)	185
Pine Point (362)	146
Pinetree Ground (237)	122
Piney Point (251)	118
Planet Rock (358)	154
Planting Island (251)	118
Planting Island Cove (251)	118
Playland (222)	189
Pleasant Bay (270)	91
Pleasure Bay (824-SC)	226
Plum Gut (362)	146
Plum Gut Harbor (362)	146
Plum Island (362)	146
Plum Island Rock (362)	146
Plum Point (223)	198
Plum Point (224)	196
Plumb Beach Channel (542)	222
Pocasset Harbor (251)	114
Pocasset River (251)	114
Point o' Woods (120-SC)	209
Point Comfort (286)	229
Point Gammon (258)	96
Point Judith Harbor of Refuge (268)	141
Point Judith Light (268)	141
Point Judith Neck (1210)	138
Point Judith Pond (268)	142
Point Lookout (120-SC)	212
Point Rip (265)	99
Pollepel Island (282)	238
Pollock Rip (250)	91
Pollock Rip Channel (250)	92
Polpis Harbor (265)	101
Pomham Rocks (352)	133
Pond Point (219)	173
Ponquogue Point (120-SC)	206
Popasquash Neck (278)	131
Popes Island (252)	119
Poplar Point (236)	136
Popponesset Bay (259)	98
Porgy Shoal (222)	189
Porpoise Channel (1213)	194
Port Authority of New York and New Jersey	221
Port Chester (222)	189
Port Chester Harbor (222)	189
Port Jefferson (361)	177
Port Jefferson Harbor (361)	177
Port Johnson (285)	231
Port Monmouth (369)	227
Port Morris (226)	201
Port Newark Terminal (287)	232
Port Reading (286)	231
Port Richmond (285)	232
Port Socony (286)	230
Port Washington (223)	198
Portland (267)	165
Pot Island (217)	169
Potash Bar (266)	164
Potowomut Neck (278)	137
Potowomut River (278)	137
Potter Cove (236)	128
Potter Cove (278)	131
Potter Pond (268)	142
Potunk Point (120-SC)	206
Poughkeepsie (283)	239
Powder Island (293)	158
Powell Cove (223)	200
Pratt Creek (266)	164
Premium Point (222)	191
Prince Cove (259)	98
Promised Land (362)	145
Promised Land Channel (362)	145
Prospect Hill (362)	144
Prospect Point (223)	198
Providence (278, 352)	132
Providence Point (278)	138
Providence River (278, 352)	132
Provincetown (580)	89
Provincetown Harbor (580)	89
Prudence Island (353)	124
Public Health Service	5
Public Health Service	248
Publications	245
Pugsley Creek (226)	200
Pumpkin Patch Channel (542)	222
Pumps, floatable	10
Quahaug Bar (251)	117
Quantuck Bay (120-SC)	206
Quantuck Canal (120-SC)	206
Quantuck Creek (120-SC)	206
Queensboro Bridge (226)	203
Quicks Hole (263)	110
Quicksand Point (237)	123
Quinnipiac River (218)	171
Quissett (260)	113
Quissett Harbor (260)	113
Quixes Ledge (218)	172
Quogue Canal (120-SC)	206
Quonochontaug (271)	142
Quonochontaug Pond (271)	142
Quonset Point (236)	136
Race Point (358)	143
Race Point Ledge (358)	143
Race Point Light (1208)	89
Race Rock (358)	143
Racehorse Channel (120-SC)	212
Radar	22
Radar	76
Radar reflectors	8
Radio	246
Radio aids to navigation	2
Radio bearings	17
Radio warnings and weather	10
Radio Weather Broadcasts	248
Radiobeacons	17
Rahway (285)	231
Rahway River (285)	231
Ram Head (363)	147
Ram Island (251)	118
Ram Island (252)	119
Ram Island (358)	153
Ram Island (363)	150
Ram Island Reef (358)	153
Ram Island Shoal (358)	153
Randall Bay (120-SC)	212
Randalls Island (226)	202
Rands Harbor (251)	114
Range Channel (120-SC)	210
Ranges	2
Rao Hook (282)	238
Rapid Rock (359)	158
Raritan Bay (286)	228
Raritan Bay Channel (369)	218
Raritan River (375)	229
Rat Island (223)	192
Red Bank (286)	228
Red Bank (824-SC)	226
Red Brook Harbor (251)	114
Red Hook Channel (541)	225
Red Ledge (348)	109
Red Reef (358)	153
Red Rock (222)	187
Red Rock (236)	136
Reeves Bay (363)	150
Reeves Creek (363)	150
Rensselaer (284)	241

	Page
Repairs	87
Reported information	2
Reports from ships	11
Restricted areas	5
Reynolds Channel (120-SC)	213
Rhode Island (353)	124
Rhode Island Rock (261)	103
Rhode Island Rocks (221)	187
Ribbon Reef (249)	112
Richelieu River	244
Richmond Creek (286)	231
Richmond Creek (363)	149
Riding Rock (217)	167
Rikers Island (226)	201
Rikers Island Channel (226)	201
Rip Van Winkle Bridge (283)	240
River Ledge (236)	135
Riverhead (363)	176
Riverhead (363)	150
Roanoke Point Shoal (1212)	177
Robbins Reef Light (541)	225
Robbins Rock (261)	106
Robert Moses (Fire Island) State Park (120-SC)	209
Robins Island (363)	150
Robins Island Rock (363)	150
Robinsons Hole (263)	110
Rock Island (278)	132
Rockaway Beach (542)	223
Rockaway Inlet (542)	221
Rockaway Point (542)	215
Rockaway Point (542)	221
Rocky Hill (267)	165
Rocky Point (1212)	175
Rocky Point (224)	196
Rocky Point (278)	138
Rodgers Rock (363)	150
Rogers Island (217)	169
Rome Point (236)	136
Romer Shoal (369)	218
Rondout Creek (283)	239
Roosevelt Memorial Basin (224)	196
Rose and Crown (1209)	78
Rose Island (236)	127
Roslyn (223)	198
Roton Point (221)	185
Round Cove (270)	91
Round Hill Point (252)	122
Round Rock (278)	137
Round Rock Island (236)	137
Routes	79
Rowayton (221)	186
Ruffle Bar (542)	222
Ruins (362)	145
Rumson (824-SC)	226
Rumstick Ledge (278)	131
Rumstick Neck (278)	131
Rumstick Point (278)	131
Rumstick Rock (278)	131
Rumstick Shoal (278)	131
Rutherford (287)	233
Ryder Cove (270)	90
Rye Beach (222)	189
Sabin Point (278)	133
Sachem Head (217)	168
Sachem Head Harbor (217)	168
Sachuest Point (353)	125
Sag Harbor (363)	148
Sag Harbor Cove (363)	149
Sailors and Soldiers Monument (746)	235
Sailors Haven (120-SC)	209
Sakonnet Harbor (353)	125
Sakonnet Point (353)	125
Sakonnet River (353)	125
Sales agents	3
Salmon Cove (266)	164
Salt Pond (1208)	90
Salt Pond Bay (1208)	90
Saltaire (120-SC)	209
Salters Point (252)	122
Sampawams Creek (120-SC)	210
Sampawams Point (120-SC)	210
Sampsons Island (259)	98
Sand Spit (363)	148
Sands Point (223)	198
Sandy Hook (369)	215
Sandy Hook (369)	225
Sandy Hook Bay (369)	225
Sandy Hook Channel (369)	218
Sandy Point (214)	161
Sandy Point (218)	171
Sandy Point (271)	139
Sandy Point (278)	138
Sandy Point (353)	125
Sandy Point (358)	152
Sandy Point (358)	151
Sankaty Head Light (265)	100
Saquatucket Harbor (257)	94
Sarah Ledge (359)	158
Sauga Point (236)	136
Saugatuck (221)	183
Saugatuck River (221)	183
Saugerties (283)	240
Saunderstown (236)	136
Saybrook Outer Bar (215)	162
Saybrook Point (215)	163
Sayreville (375)	230
Sayville (120-SC)	208
Scarborough Beach (1210)	138
School House Creek (363)	149
Schoolship Rock (261)	103
Schuyler Ledge (353)	125
Sconticut Neck (252)	119
Scotch Caps (222)	189
Scott Cove (221)	186
Scovill Landing (266)	164
Scow Creek (120-SC)	212
Scraggy Neck (251)	113
Scup Rock (236)	137
Sea Bright (824-SC)	226
Sea Cliff (223)	197
Sea Dog Creek (120-SC)	212
Seaflower Reef (358)	151
Seaford (120-SC)	211
Seaford Creek (120-SC)	211
Seal Ledge (236)	126
Seal Rock (214)	161
Seal Rock (236)	126
Seal Rock (236)	136
Seal Rock (236)	137
Seal Rocks (251)	118
Seal Rocks (251)	114
Seal Rocks (358)	151
Seapit River (259)	99
Seapuit River (259)	98
Search and rescue	7
Searchlights	22
Sears Point (257)	94
Seaside (214)	160
Seatuck Cove (120-SC)	206
Seatuck Creek (120-SC)	206
Sebonac Creek (363)	150
Secaucus (287)	233
Seekonk River (278, 352)	132
Seganus Thatch (120-SC)	210
Seguine Point (286)	228
Seiche	19
Seine Pond (258)	96
Seismic sea waves	18
Senator Shoal (258)	96
Sengekontacket Pond (261)	103
Senix Creek (120-SC)	207
Sesachacha Pond (265)	99
Setauket (361)	178
Setauket Harbor (361)	177
Seymour Point (221)	184
Shag Bank (218)	171
Shagwong Reef (362)	144

	Page
Shagwong Rock (362)	144
Shaw Cove (293)	157
Sheep Rocks (221)	184
Sheepshead Bay (542)	222
Sheffield Island (221)	184
Sheffield Island Harbor (221)	184
Sheffield Island Harbor (221)	183
Shellbank Basin (542)	223
Shelter Island Heights (363)	148
Shelter Island Sound (363)	146
Shelton (219)	175
Sherwood Point (220)	183
Shetucket River (359)	160
Shinnecock Bay (120-SC)	205
Shinnecock Canal (120-SC)	205
Shinnecock Inlet (120-SC)	205
Shinnecock Light (120-SC)	205
Ship Rock (222)	190
Shippan Point (221)	186
Shoal Harbor (369)	227
Shoal Point (220)	182
Short Beach (120-SC)	212
Short Beach (217)	170
Shovelful Shoal (265)	101
Shrewsbury River (824-SC)	226
Sias Point (251)	117
Siasconset (265)	100
Silver Beach Harbor (251)	113
Silver Eel Pond (358)	151
Sing Sing Prison (282)	237
Sippican Harbor (251)	118
Sippican Neck (251)	118
Sixmile Reef (1212)	165
Slocums Ledge (237)	122
Slocums River (237)	122
Sloop Channel (120-SC)	212
Sluice Creek (217)	167
Small-craft facilities	87
Smith Cove (214)	161
Smith Cove (222)	188
Smith Cove (363)	149
Smith Creek (286)	230
Smith Meadow (120-SC)	212
Smith Point (120-SC)	207
Smith Point (265)	100
Smith Reef (221)	186
Smiths Neck (252)	122
Smithtown Bay (1213)	193
Snipe Island (120-SC)	212
Snow Rock (252)	119
Snug Harbor (268)	142
Somerset (353)	129
Sommerville Basin (542)	223
South Amboy (375)	230
South Beach (369)	228
South Brother (214)	161
South Brother Island (226)	201
South Dartmouth (252)	121
South Dennis (258)	95
South Ferry (236)	135
South Ferry (363)	149
South Jamesport (363)	150
South Nonations (223)	191
South Norwalk (221)	185
South Oyster Bay (120-SC)	211
South Race (363)	150
South River (375)	230
South River (375)	229
South Somerset (353)	131
South Swansea (353)	129
South Troy (284)	243
South Wellfleet (1208)	90
South Yarmouth (258)	95
Southold (363)	148
Southold Bay (363)	148
Southport (220)	183
Southport Harbor (220)	182
Southwest Ground (258)	97
Southwest Ledge (251)	114
Southwest Ledge (271)	139
Southwest Ledge Light (218)	170
Southwest Point (236)	127
Southwest Reef (216)	166
Southwest Rock (258)	97
Sow and Pigs Reef (249)	112
Spar Island (353)	129
Special signals	19
Spectacle Island (217)	169
Speonk Point (120-SC)	206
Spindle Rock (258)	97
Spoil areas	14
Spuyten Duyvil Creek (747)	235
Squam Head (265)	99
Squash Meadow (261)	103
Squaw Island (258)	97
Squeteague Harbor (251)	114
Squibnocket Point (264)	108
St. Helena Island (217)	169
St. Patrick Rock (236)	127
Stage Harbor (257)	94
Stage Island (257)	94
Stamford (221)	186
Stamford Harbor (221)	186
Stamford Harbor West Breakwater Light (221)	186
Standard Time	87
Star Island (362)	144
State Boat Channel (120-SC)	210
Staten Island (369)	228
Staten Island Flats (369)	228
Staten Island Light (369)	218
Statue of Liberty (541)	225
Stepping Stones (223)	198
Stirling Basin (363)	147
Stone Horse Shoal (250)	91
Stone Island (216)	166
Stone Island Reef (216)	166
Stonington (358)	153
Stonington Harbor (358)	152
Stonington Point (358)	152
Stony Brook (1213)	194
Stony Brook Harbor (1213)	193
Stony Creek (217)	169
Stony Island (217)	168
Stony Islet (218)	171
Stony Point (221)	183
Stony Point (282)	237
Stony Point Dike (251)	117
Storm surge	19
Storm warning display	80
Storm King Mountain (282)	238
Stratford (219)	174
Stratford Point (219)	174
Stratford Shoal Middle Ground (1212)	175
Strawberry Point (252)	118
Strongs Creek (120-SC)	211
Strongs Point (120-SC)	211
Stump Creek (286)	229
Sturgeon Flats (261)	102
Stuyvesant (284)	240
Submarine cables and pipelines	13
Submarine canyons	78
Submarine emergency identification signals	20
Success Rock (223)	198
Succonnesset Point (259)	99
Succonnesset Shoal (259)	99
Succotash Point (268)	142
Sugar Reef (358)	143
Sugar Reef Passage (358)	143
Sumac Island (217)	169
Sunken Ledge (252)	118
Sunken Meadow (226)	202
Sunken Meadow Creek (1213)	194
Supplements	1
Supplies	87
Swan Pond (257)	95
Swan Pond River (257)	95
Swan River (120-SC)	208
Swash Channel (369)	218

	Page
Swift Creek (120-SC)	212
Swifts Beach (251)	117
Swinburne Island (540)	224
Tallman Island (223)	200
Tappan Zee (282)	236
Tarpaulin Cove (264)	110
Tarrytown (282)	236
Taunton (353)	129
Taunton River (353)	129
Taunton Rock (217)	169
Tavern Island (221)	185
Taylor Point (236)	128
Terminal Channel (369)	227
Terminal Channel (369)	218
Tern Island (270)	90
Terrys Creek (363)	150
Thames River (293, 359)	157
Thamesville (359)	160
Thatch Island (259)	98
Thatchbed Island (215)	164
The Bar (219)	174
The Blauzes (223)	192
The Bonnet (236)	135
The Bow Bells (251)	118
The Breachway (268)	142
The Cove (353)	126
The Cows (221)	187
The Dumplings (236)	127
The Gulf (219)	174
The Gut (221)	186
The International Ice Patrol	86
The Knob (260)	113
The Knubble (237)	122
The Little Cows (220)	182
The Maelstrom (283)	240
The Narrows (120-SC)	212
The Narrows (270)	91
The Narrows (541)	224
The Neck (257)	94
The Race (362)	143
The River (270)	91
The Sisters (236)	128
The Spider (369)	219
The Strait (348)	108
The Thimbles (217)	168
The Wildcat (237)	112
Thimble Island Harbor (217)	169
Thompson Cove (358)	152
Threemile Harbor (362)	146
Throgs Neck (223)	199
Throgs Neck Bridge (223)	200
Thurston Basin (542)	224
Tiana Beach (120-SC)	206
Tidal Current Charts	4
Tidal Current Charts	245
Tidal Current Tables	4
Tidal Current Tables	245
Tide Tables	4
Tide Tables	245
Time	2
Time signals	11
Tiverton (353)	126
Tobys Island (251)	114
Tom Point (223)	198
Tomkins Cove (282)	237
Tongue Point (220)	180
Tottenville (286)	230
Towage	87
Towing by Coast Guard	10
Town Cove (1208)	90
Town Creek (363)	148
Town Creek (824-SC)	226
Townshend Ledge (218)	171
Tracey Ledge (236)	127
Traffic separation schemes	21
Transport Rock (222)	189
Travers Island (223)	192
Triborough Bridge (226)	202
Trim Pond (269)	141
Tropical Cyclones	82
Troutmans Creek (824-SC)	226
Troy (284)	243
Troy Lock and Dam (284)	243
Truro (1208)	90
Tsunamis	18
Tubby Hook (747)	235
Tuckernuck Island (265)	100
Tuckernuck Shoal (265)	101
Tuthill Cove (120-SC)	206
Tuthill Point (120-SC)	207
Tuttles White Bank (1212)	177
Tuxis Island (216)	167
Twomile Ledge (237)	122
Twomile Rock (237)	122
Twotree Island (214)	160
Twotree Island Channel (214)	160
U.S. Coast Guard Academy (293)	159
U.S. Merchant Marine Academy (223)	198
U.S. Military Academy (282)	238
U.S. Naval Submarine Base (293)	159
Umbrella Point (222)	190
Umbrella Rock (222)	190
Uncle Daniels Point (542)	224
Under-keel clearances	1
Uniform State Waterway Marking System	18
Unionport (223)	200
Upper Bay (541)	225
Upper Nyack (282)	237
Usher Rocks (278)	131
Valiant Rock (362)	144
Veatch Canyon (1107)	78
Venetian Harbor (358)	153
Vernam Basin (542)	223
Verplanck Point (282)	237
Verrazano Narrows Bridge (541)	224
Vessel Bridge-to-Bridge Radiotelephone Regulations	23
Vineyard Haven (261)	105
Vineyard Haven Harbor (261)	105
Vineyard Point (217)	168
Vineyard Sound (1210)	105
Vixen Ledge (293)	154
Waackaack Creek (286)	229
Wading River (1212)	177
Wakefield (268)	142
Wallabout Bay (745)	203
Wamphassue Point (358)	153
Wappinger Creek (283)	239
Wappingers Falls (282)	239
Waquoit Bay (259)	99
Ward Point (286)	230
Ware Island (221)	187
Wareham (251)	117
Wareham River (251)	117
Warren (278)	131
Warren River (278)	131
Warwick Cove (278)	137
Warwick Neck (278)	137
Warwick Point (278)	137
Washington Canal (375)	229
Washington Shoal (362)	144
Wasque Point (264)	101
Wasque Shoal (264)	101
Watch (station) buoys	16
Watch Hill (120-SC)	208
Watch Hill (358)	143
Watch Hill Cove (358)	152
Watch Hill Passage (358)	143
Watch Hill Point (358)	143
Watch Hill Reef (358)	143
Watchogue Creek (120-SC)	209
Waterford (214)	161
Watervliet (284)	243
Wauwinet (265)	101
Wayland Island (217)	169

Page
Weather 80
Wee Captain Island (222) 188
Weehawken (745) 235
Weekapaug Point (271) 142
Weeks Point (223) 197
Weepecket Islands (264) 110
Weepecket Rock (249) 110
Weesuck Creek (120-SC) 206
Weir Creek (223) 193
Welches Point (219) 173
Welfare Island (Blackwells Island) (226) 203
Welfare Island Reef (Blackwells Island Reef) (745) 203
Welker Canyon (1107) 78
Wepawaug River (219) 174
Wequetequock Cove (358) 152
Werthein National Wildlife Refuge (120-SC) 207
West Babylon Creek (120-SC) 210
West Bank (369) 219
West Bank Light (369) 218
West Bay (259) 98
West Branch (221) 186
West Channel (120-SC) 210
West Chop (261) 105
West Cove (120-SC) 206
West Cove (358) 154
West Cove (358) 153
West Creek (120-SC) 209
West Crib (217) 169
West Crib (217) 169
West Crow Island (120-SC) 212
West Dennis (258) 95
West Falmouth (260) 113
West Falmouth Harbor (260) 113
West Gilgo Beach (120-SC) 211
West Harbor (358) 151
West Island (252) 119
West Islip (120-SC) 209
West Neck (224) 196
West Neck (363) 150
West Neck Bay (363) 149
West Neck Harbor (363) 149
West Passage (236) 135
West Point (282) 238
West River (217) 168
West River (218) 171
West Rock (216) 167
West Rock (222) 189
West Southwest Ledge (258) 96
Westbrook (216) 166
Westbrook Harbor (216) 166
Westchester (223) 200
Westchester Creek (223) 200
Westcott Cove (221) 186
Westerly (358) 152
Westhampton Beach (120-SC) 206
Westport (221) 183
Westport Harbor (237) 122
Westport Point (237) 122
Westport River (237) 122
Wethersfield Cove (267) 165
Weweantic River (251) 117
Whale Creek (275) 203

Page
Whale Rock (236) 135
Whale Rock (252) 119
Whale Rock (263) 111
Whale Rock (358) 153
Whaleback Rock (358) 153
Wheeler Rock (216) 167
Whistling 22
White Rock (214) 160
White Rock (221) 184
White Rock (293) 158
White Rock (358) 153
Whitestone (223) 200
Whitestone Point (223) 200
Wickets Island (251) 117
Wickford (236) 136
Wickford Cove (236) 136
Wickford Harbor (236) 136
Wickham Creek (363) 150
Wicopesset Island (358) 143
Wicopesset Passage (358) 143
Wicopesset Rock (358) 143
Wilbur Point (252) 119
Wild Goose Point (236) 136
Wild Harbor (251) 113
Wilkes Ledge (252) 120
Willets Point (223) 200
Williamsburg Bridge (745) 203
Willow Point (358) 154
Wilson Cove (221) 185
Wilson Head (222) 188
Wilson Point (221) 185
Winds 2
Windsor Locks 165
Wings Cove (251) 118
Wings Neck (251) 114
Winhole Channel (542) 223
Winnapaug Pond (271) 142
Winthrop Cove (293) 157
Wire drags 19
Woodbridge Creek (286) 230
Woodcleft Canal (120-SC) 212
Woodmere Channel (120-SC) 213
Woodmont (218) 171
Woods Hole (348) 108
Woods Hole (348) 108
Woods Hole Passage (348) 108
Woodsburgh (120-SC) 213
Woodsburgh Channel (120-SC) 213
Wooley Pond (363) 149
Woolsey Rock (222) 187
Worlds End (282) 238
Wreck Shoal (259) 98
Wrecks 78
Wychmere Harbor (257) 95

Yantic River (359) 160
Yellow Mill Channel (220) 180
Yonkers (747) 235
Youngs Point (363) 147
Youngs Rock (358) 151

Zachs Bay (120-SC) 211