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Robert M. White, Administrator
COAST AND GEODETIC SURVEY
James C. Tison, Jr., Director

United States Coast Pilot 2
ATLANTIC COAST
CAPE COD TO SANDY HOOK
Seventh (September 24, 1966) Edition

Corrected through NM- 39/66

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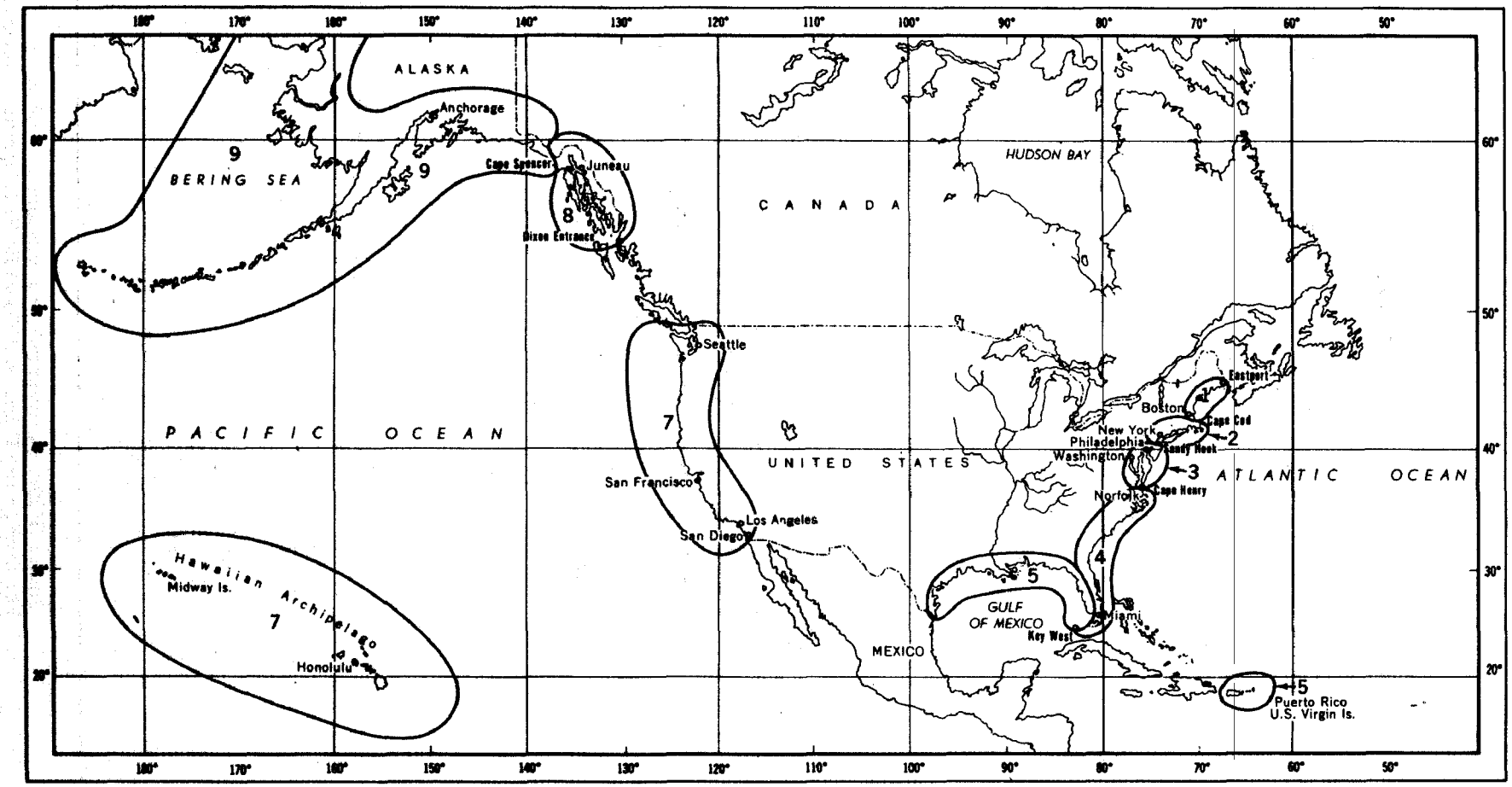
LIMITS OF UNITED STATES COAST PILOTS

Atlantic Coast

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

Pacific Coast

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



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Preface

United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook, Seventh (September 24, 1966) Edition, is based upon the work of the U.S. Coast and Geodetic Survey and includes the July–October 1965 field observations of Marine Information Specialist Salvatore Bente. Area information also was obtained from the U.S. Coast Guard, the U.S. Army Engineers, local port authorities, and others. The preceding Sixth (1960) Edition is canceled.

Cumulative Supplements, containing revisions and new information reported since edition date of Coast Pilot, usually are issued early each year. Free copies of Supplements may be obtained by completing the coupons in the back of this book and mailing them to the Coast and Geodetic Survey.

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1. GENERAL INFORMATION

UNITED STATES COAST PILOTS.—The C&GS 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. A new edition of each Coast Pilot is published at intervals ranging from 4 to 10 years. Cumulative **Supplements,** containing changes reported since dates of editions, are published early each year and are distributed free.

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

Bridges and cables.—Clearances of bridges and overhead cables are in feet above normal high water unless otherwise stated; clearances of drawbridges are for the closed position. They may be as-built, authorized, or reported, and are so identified on the charts. Also see charts for horizontal clearances of bridges; these are repeated in the Coast Pilots only when they are less than 50 feet and then only in terms of channel width or length of span.

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

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

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

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

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

Light and fog-signal characteristics.—These are not described, and light sectors are seldom defined. See Coast Guard Light Lists.

Radio navigational aids.—These are seldom described. See Coast Guard Light Lists.

Ranges.—These are not fully described. "A 339° range" means that rear range structure bears 339° from front structure. See Coast Guard Light Lists.

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

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

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

Sales agents for Charts, Coast Pilots, Tide Tables, Tidal Current Tables, and Tidal Current Charts of the Coast and Geodetic Survey are located in many ports of the United States and in some foreign ports. Orders mailed to C&GS headquarters should be accompanied by check or money order, made payable to C&GS, Department of Commerce.

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

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

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

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

(d) A vessel of the Coast and Geodetic Survey, when at anchor in a fairway on surveying operations, shall display from the mast during the daytime two black balls in a vertical line and 6 feet apart. At night two red lights

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

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

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

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

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

Coast charts, scales 1:50,000 to 1:100,000, are for inshore navigation leading to bays and harbors of considerable width and for navigating large inland waterways.

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

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

The **date of a chart** is of vital importance to the navigator. When charted information becomes obsolete, further use of the chart for navigation may be dangerous. Up-to-date charts should be obtained at regular intervals.

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

Echo soundings.—Most of the various types of echo sounder are calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated value by as much as 5 percent, depending upon the temperature and salinity of the waters in which the vessel is operating; the highest velocities are found in warm, highly saline water, and the lowest in icy, fresh water. Variation in the line voltage can also cause errors of 10 percent or more in reading. Echoes can be obtained from schools of fish; in fact, trawlers are using the sounders for that purpose. The most serious error commonly occurs where the depth is greater than the scale range of the instrument; a 400-fathom scale indicates 15 fathoms visually and graphically when the depth is 415 fathoms. Where possible, wide variations from charted depths should be checked by wire soundings.

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

Compass roses on charts.—The annual change in variation gradually introduces an error in the magnetic compass roses on charts. The compass roses are replotted for every new edition of the chart if the error is appreciable; and the amount and date of the variation and the

amount of annual change are stated for each compass rose. On some of the sailing and general charts the magnetic variation is shown by isogonic lines.

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

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

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

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

Tide Tables are issued annually by the Coast and Geodetic Survey in advance of the year for which they are prepared. These tables include predicted times and heights of high and low waters for every day in the year for a number of reference stations and differences for obtaining similiar predictions for numerous other places. They also include other useful information such as a method for 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 Coast and Geodetic Survey in advance of the year for which they are prepared. These tables include daily predictions of the times of slack water and the times and velocities of strength of flood and ebb currents for a number of waterways, together with differences for obtaining predictions for numerous other places. Also included is other useful information such as a method for obtaining the velocity of current at any time, duration of slack, coastal tidal currents, wind currents, combination of currents, and current diagrams. Some information on the Gulf Stream is included in the tables for the Atlantic coast.

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

The **COAST GUARD** has among its duties 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 and the Oil Pollution Act; inspection of vessels of the Merchant Marine; search and rescue; issuance of Merchant Marine licenses and documents; investigation of marine casualties and accidents, and suspension and revocation proceedings; destruction of derelicts; operation of aids to navigation, and publication of Light Lists and Local Notices to Mariners; and operation of ice breaking facilities.

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. It is unlawful, except in emergency or by special permit, to discharge oil into coastal navigable waters from any vessel.

Light Lists.—Aids to navigation, consisting of lights, fog signals, buoys, lightships, daybeacons, and electronic aids, are described in the Light Lists, which 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.

Local Notices to Mariners.—Changes and deficiencies in aids to navigation maintained by or under the author-

ity of the Coast Guard are published in Local Notices to Mariners issued by the District Commander of the area in which the aids are located. The local notices are intended for local navigation interests operating within the limits of a Coast Guard district. Changes in aids to navigation of the United States are also contained in the weekly **Notice to Mariners.** The weekly notices are intended for mariners and others who have a definite need for them in connection with extended sea-going activities or for those operating in several Coast Guard districts.

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

Radio messages should be prefixed "Coast Guard" and transmitted directly to 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 kc. Merchant ships may send messages relating to defects noted in aids to navigation through commercial facilities only when they are unable to contact a U.S. Government shore radio station. Charges for these messages will be accepted "collect" by the Coast Guard.

Lights.—The visibility of lights is given in the Light Lists and shown on the charts. The distances may at times be increased by abnormal atmospheric refraction and may be greatly decreased by unfavorable weather conditions, such as fog, rain, haze, or smoke. All except the most powerful lights are easily obscured by such conditions. In some conditions of the atmosphere white lights may have a reddish hue.

Navigational lights should be used with caution because of the following conditions that may exist:

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

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

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

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

The distance of an observer from a light cannot be estimated by its apparent intensity. The 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. The characteristic as charted and shown in the light list may not be recognized until nearer the light.

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

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

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

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

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

Sound travels through the air in a variable manner with or without the effects of wind and, therefore, the hearing of fog signals cannot be implicitly relied upon. Experience indicates that distances must not be judged only by the intensity of the sound; that occasionally there may be areas close to a fog signal in which it is not heard; and that fog may exist not far from a station, yet not be seen from it, so the signal may not be operating. It is not always possible to start a fog signal immediately when fog is observed.

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

During extremely heavy weather and due to their exposed locations, lightships may be carried off station without the knowledge and despite the best efforts of their crews. A lightship known to be off station will secure her light, fog signal, and radiobeacon and fly the International Code signal "PC" signifying "Lightship is not at anchor on her station."

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

Buoys.—The navigator should check the position by shore bearings, soundings, or other means, and not rely

entirely on a buoy being on its charted position and showing its proper characteristic. Buoys are liable to be carried away, shifted, capsized, or sunk as a result of storms, ice conditions, collision, or other accident. Lighted buoys may become extinguished or show improper characteristics, or sound buoys may not function because of storm, ice, or collision.

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

Radiobeacons.—A list and descriptive details of all marine radiobeacons are given in the Light Lists. There is included in these publications the procedure to follow for the use of radiobeacons for calibration of radio direction-finders as well as a list of special radio direction-finder calibration stations.

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

Radio bearings.—No exact data can be given as to the accuracy to be expected in radio bearings taken by a ship, since the accuracy depends to a large extent upon the skill of the ship's operator, the condition of the ship's equipment, and the accuracy of the ship's calibration curve. Mariners are urged to obtain this information for themselves by taking frequent radio bearings, when their ship's position is accurately known, and recording the results. Bearings of aircraft ranges and standard broadcast stations should be used with particular caution due to coastal refraction and lack of calibration of their frequencies.

Conversion of radio bearings to Mercator bearings.—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 list of radiobeacons in 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 definitely known, may serve as a radiobeacon for vessels equipped with a radio direction-finder, extreme caution must be exercised in their use. Stations established especially for maritime services are more reliable.

Loran.—A list of stations and descriptive details of the Loran System are given in the Light Lists. Instructions, tables, and charts of the Loran System are published by the Naval Oceanographic Office. The Coast and Geodetic 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 position used to establish the fix and by their angle of intersection.

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

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

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

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

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

Minesweeper signals.—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 similarly restricting visibility, whether by day or night, minesweepers while towing sweeps when in the vicinity of other vessels will sound whisle signals for a vessel towing (1 prolonged blast followed by 2 short blasts).

Improper use of searchlights prohibited.—No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way (46 CFR 78.27–1(a)). The International Code Signal "ZO" may be made by a vessel inconvenienced by the glare of a searchlight in order to apprise the offending vessel of the fact.

Unnecessary whistling prohibited.—The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States (46 CFR 78.23–1(a)).

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

Operators of disabled wooden craft and persons adrift in rubber rafts or boats that are, or may consider themselves to be, the object of a search, should hoist on a halyard or otherwise place aloft as high as possible any metallic object that would assist their detection by radar. Coast Guard cutters and aircraft are radar equipped and thus are able to continue searching in darkness and during other periods of low visibility.

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.

Note.—The above procedures are taken from the Convention on International Civil Aviation.

Merchant vessel 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 kc if equipped. Attempt to contact the aircraft on this frequency.

2. Maintain a radiotelegraphy watch on 500 kc. 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 kc or 522 kc.

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 ship's 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.

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

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

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

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

Submarine emergency identification signals.—The following flare signals, fired from a submerged signal ejector to 300 feet in the air, are made by United States submarines when in emergency:

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

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 addition to the red signal. Submarines also may use these other means of attracting attention: release of dye marker or air bubble; ejection of oil, and pounding on hull.

The **CORPS OF ENGINEERS**, U.S. Army, has charge of the improvement of the rivers and harbors of the United States and of miscellaneous other civil works which include the administration of the Federal laws enacted for the protection and preservation of navigable waters of the United States, the establishment of regulations for the use, administration, and navigation of navigable waters, the approval of plans of bridges, the alteration of obstructive bridges, the establishment of anchorage grounds and harbor lines, the removal of sunken vessels obstructing or endangering navigation, and the granting of permits for structures or operations in navigable waters.

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

Anchorage areas and restricted areas in most places are defined and regulations governing them are established by the Corps of Engineers. The regulations are enforced by the U.S. Coast Guard, and the areas are shown on the large-scale charts of the Coast and Geodetic Survey. Copies of the regulations may be obtained at the offices of the Corps of Engineers. The regulations also are copied into the appropriate Coast Pilots.

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 safety of navigation.

Fish havens.—These are artificial fishing reefs established in United States coastal waters to simulate the legitimate reefs and wrecks that attract fish. The Corps of Engineers issues permits to various interests, usually sport fishermen, to dump assorted junk ranging from old trolley cars to scrap building material in specified areas which may be of very small extent or may stretch many miles along a depth contour; old automobile bodies appear to be the favorite material of the reef builders. These underwater junk piles may rise only a few feet or as much as 10 feet (according to permit) above natural bottom, but the reef-builder's adherence to permit specifications can only be checked with a wire drag. Navigators should be cautious about passing over these artificial obstructions or anchoring in their vicinity.

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

Weather Bureau 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 Weather Bureau barometers and discuss weather information with bureau officials, are listed in the appendix. By international agreement, the Weather Bureau also shares in the operation of certain weather ships in the North Atlantic and North Pacific Oceans.

Marine meteorological service.—The collection of observations from ships at sea is conducted on a purely voluntary and cooperative basis. The Weather Bureau supplies shipmasters with blank forms, printed instrutions, 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. Storm warnings are prepared at regular district forecast centers and at special hurricane forecast centers. The warnings are distributed to the public through all neighboring Weather Bureau offices by radio, the press, and every other available means. During the West Indian hurricane season, June to November, inclusive, teletype circuits expedite the exchange of reports from the Atlantic and Gulf coasts; special reports are obtained from weather reconnaissance planes which fly near the storms and sometime into the storm centers.

Hurricane watch.—An announcement is issued by the Weather Bureau 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.

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

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

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

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

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

The **NAVAL OCEANOGRAPHIC OFFICE** is required to provide accurate nautical 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, and the American Practical Navigator (Bowditch). The weekly Notice to Mariners, a joint arrangement with the Coast Guard and the Coast and Geodetic Survey, contains corrections to charts and publications for both foreign and domestic waters; see appendix for coverage.

The **IMMIGRATION AND NATURALIZATION SERVICE** administers the laws relating to admission, exclusion, and deportation of aliens, the registration and fingerprinting of aliens, and the naturalization of aliens lawfully resident in the United States.

The designated ports of entry for aliens are divided into three classes. Class A is for all aliens. Class B is only for aliens who at the time of applying for admission are lawfully in possession of valid 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 alien may enter the United States until he has been inspected by an immigration officer. A list of the ports of entry for aliens is given in the appendix.

The **PUBLIC HEALTH SERVICE** administers hospitalization and outpatient treatment to legal beneficiaries of the Government; it also administers foreign and domestic quarantine laws and conducts medical examinations of aliens.

Quarantine.—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 inspected by the quarantine officer and granted pratique, except with the permission of the quarantine officer.

Sanitary inspection.—Vessels arriving at a port under the control of the United States from a foreign port shall be subject to sanitary inspection to ascertain whether there exists rodent, 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 Chief, Division of Foreign Quarantine, Public Health Service, DHEW, Washington, D.C., 20201.

Medical service.—United States merchant seamen are entitled to medical relief obtainable through the Public Health Service. A United States seaman is one engaged on board in care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service, on board, of those so engaged. Hospitals, outpatient clinics, and outpatient offices of the Public Health Service are located at the addresses given in the appendix. Free medical advice is furnished to seamen by radio.

RADIO.—The Federal Communications Commission controls radio communications in the United States and in all possessions except the Panama Canal Zone. Commission inspectors have authority to board ships to determine whether their radio stations comply with international treaties, Federal laws and Commission regulations. The commission has field offices in the principal United States ports. Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington, D.C., 20554, or from any of the field offices.

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

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

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

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

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

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

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

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

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

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

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

Certain local radio stations in the standard broadcast band have microphones installed in nearby Weather Bureau offices. From these stations forecasts, weather summaries, and warnings are broadcast on regular schedule. Stations in this area are listed in the annual Weather Bureau Coastal Warning Facilities Charts.

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

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

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

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

hour signal is a 1.3-second dash, which is much longer than the others.

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

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

Time announcements.—The audio frequencies are interrupted at precisely 2 minutes before each hour. They are resumed precisely on the hour and each 5 minutes thereafter. The beginnings of the periods, when the audio frequencies are resumed, are in agreement with the basic service of the U.S. Naval Observatory, and accordingly they accurately mark the hour and successive 5-minute periods.

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

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

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

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

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

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

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

These waves travel great distances and can cause tremendous damage on coasts far from their source. The wave of April 1, 1946, 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 seismic sea waves varies with the depth of the water, reaching 300 to 500 knots in the deep water of the open ocean. In the open sea they cannot be detected from a ship or from the air because their length is so great, sometimes a hundred miles, as compared to their height, which is usually only a few feet. Only on certain types of shelving coasts do they build up into waves of disastrous proportions.

There is usually a series of waves with crests 10 to 40 minutes apart, and the highest may occur several hours after the first wave. Sometimes the first noticeable part of the wave is the trough which causes a recession of the 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 Coast and Geodetic Survey 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 waves.—A considerable rise or fall in the level of the sea along a particular coast may result from strong winds and a sharp change in barometric pressure. In cases where the water level is raised, higher waves can form with greater depth and the combination can be destructive to low regions, particularly at high stages of tide. Extreme low levels can result in depths which are considerably less than those shown on nautical charts. This type of wave occurs especially in coastal regions

bordering on shallow waters which are subject to tropical storms.

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

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

2. NAVIGATION REGULATIONS

THIS chapter contains the sections of **Code of Federal Regulations, Title 33, Navigation and Navigable Waters,** that are of most importance in the areas covered by Coast Pilot 2. The sections are from Part 82, Boundary Lines of Inland Waters; Part 124, Control Over Movement of Vessels; Part 202, Anchorage Regulations; Part 203, Bridge Regulations; Part 204, Danger Zone Regulations; and Part 207, Navigation Regulations.

PART 82—BOUNDARY LINES OF INLAND WATERS:

82.1 General basis and purpose of boundary lines. 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, Buzzards Bay, Narragansett Bay, Block Island Sound, and easterly entrance to Long Island Sound. A line drawn from Chatham Light to Pollock Rip Lightship; thence to Great Round Shoal Channel Entrance Lighted Whistle Buoy GRS; thence to Sankaty Head Light. 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 Rockaway Point Coast Guard Station to Ambrose Channel Lightship; thence to Highlands Light (north tower).

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 vessels 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) [Revoked.]

(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.

(b) 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 shall be furnished.

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 202—ANCHORAGE REGULATIONS:

202.1 General. (a) The areas described in Subpart A of this part are designated as special anchorage areas pursuant to the authority contained in an act amending laws for preventing collisions of vessels approved April 22, 1940 (54 Stat. 150). Section 1 of the act amended Article 11 of the Navigation Rules for Harbors, Rivers, and Inland Waters Generally (33 U.S.C. 180), section 2 amended Rule 9 of the Navigation Rules for Great Lakes and Their Connecting and Tributary Waters (33 U.S.C. 258), and section 3 amended Rule 10 of the Navigation Rules for Red River of the North and Rivers Emptying into Gulf of Mexico and Tributaries (33 U.S.C. 319). Vessels not more than 65 feet in length, when at anchor in any special anchorage area, shall not be required to carry or exhibit the white anchor lights required by the Navigation Rules.

(b) The anchorage grounds for vessels described in Subpart B of this part are established, and the rules and regulations in relation thereto adopted, pursuant to the authority contained in section 7 of the River and Harbor Act approved March 4, 1915.

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

Subpart A—Special Anchorage Areas:

202.38 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.

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

202.45 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.

202.47 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.

202.48 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.

202.50 Stonington Harbor, Conn. Northerly of a line 150 feet north of and parallel to the main steamboat pier formerly owned by the New York, New Haven and Hartford Railroad Company; and easterly of a line extending from the northwest corner of said pier to the east abutment of the railroad bridge at the head of the harbor.

202.50a 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.

202.50b Mystic Harbor, Groton and Stoningham, 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″, longtitude 71°58′59″; thence to latitude 41°19′33″, longtitude 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.

202.51 Groton, Conn. The waters within an unnamed cove inclosed by a line between the most easterly land on Avery point at latitude 41°18′59″, longitude 72°03′42″, and the most southerly point of land on the west side of Baker Cove at latitude 41°19′03″, longitude 72°03′22″.

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, at any time, extend into the channel adjacent to the southern limit of the area. Fixed mooring piles or stakes are prohibited.

202.52 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.

202.54 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.

202.55 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) Area No. 3, at Essex. [Revoked.]

(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 area. 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 at Chester. Beginning at point about 600 feet southeasterly of the entrance of Chester Creek, at latitude 41°24′23″, longitude 70°25′41″; thence due south about 1,800 feet to a point at latitude 41°24′05″, longitude 72°25′41″; thence due east about 600 feet to a point at latitude 41°24′05″, longitude 72°25′32″; thence due north about 1,800 feet to a point at latitude 41°24′23″, longitude 72°25′32″; thence due west about 600 feet 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 the discretion of the local Harbor Master.

(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″, longtitude 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 principally be 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.

202.58 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 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.

202.60 Port of New York and vicinity. (a) **Huntington Harbor.** All of the Huntington Harbor anchorage ground described in 202.150.

(b) **New Rochelle Harbor, west and south of Glen Island.** That portion of Long Island Sound Anchorage No. 1 (described in 202.155) 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.

(c) **New Rochelle Harbor, east of Glen Island.** That portion of Long Island Sound Anchorage No. 1 (as described in 202.155(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 202.155) 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 202.155(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 202.155(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 202.155(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 202.155) 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 202.155) 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 202.155) 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 of 40°49′06″.

(j) Manhasset Bay, at Plandome. That portion of Long Island Sound Anchorage No. 4 (described in 202.155) 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.

(k) Little Neck Bay. That portion of Long Island Sound Anchorage No. 5 (as described in 202.155(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 202.155), 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 202.155) 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 202.155) 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 202.155) 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 202.155) 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 202.155) 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 202.155) 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.

(p) Hudson River, at Hastings-on-Hudson. Northward of a line on range with the northerly face of the clubhouse of the Tower Ridge Yacht Club; eastward of a line on range with the elevated tank of the Anaconda Wire and Cable Company and the channelward face of the northerly building on the water front of the said Company's property; and southward of a line on range with the first footbridge across the New York Central Railroad Company tracks, north of the Tower Ridge Yacht Club.

(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 202.155(h)(4).

(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.

(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 202.155(h)(1).

(s) Jamaica Bay. That portion of the waters on the westerly side of Jamaica Bay, westerly of a line ranging from Island Channel Buoy 17 through Island Channel Buoy 21, northward of a line ranging from Island Channel Buoy 17 to the north abutment of the Shore Parkway Bridge across Paerdegat Basin, and southward of a line ranging 310° from Island Channel Buoy 21.

(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.

(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" and 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.

Subpart B—Anchorage Grounds:

202.140 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 a 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 navigation laws in regard to lights, fog signals, or for otherwise violating the law.

202.142 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.

202.145 Narragansett Bay, R.I. (a) East Passage—(1) Anchorage A. East of Conanicut Island, west of a line bearing 9° from the easternmost of The Dumplings to latitude 41°30′30″, thence ranging 12° toward Fiske Rock Buoy, a line ranging 311°30′ from Bishop Rock Shoal Lighted Bell Buoy 8A, and a line ranging 351° from Rose Island Light; and south of latitude 41°32′07″ which parallel passes through a point 130 yards north of Gould Island Light; excluding the approach of the Jamestown Ferry, a zone 300 yards wide to the southward of a line ranging 103° from a point 100 yards 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 United States 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 will 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 75° from the northerly end of the pier on the northwesterly end of Gould Island towards the shore of Aquidneck Island; east of a line ranging 19° 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.

(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-a) 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) [Revoked]

(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 chuch 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.

202.147 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 a 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.

202.148 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.

202.150 Huntington Harbor, Long Island, N.Y. (a) The anchorage ground. Northwestward of a line ranging from New York Telephone Company pole No. 4J with a transformer on top along the northeast side of Mill Dam Road toward the southwest corner of a timber hopper on the Old Town Dock; westward of a line bearing 177° from the tower of Ferguson's Castle along the east side of New York Avenue; southeastward of a line bearing 234°12′ from the southeast corner of the main building of Knutson's Shipyard, north of the Town Park; eastward of a line bearing 35°55′ from the corner of the south abutment of the Mill Dam Road bridge across the Mill Pond spillway; and northeastward of a line bearing 111°33′ from the chimney at the north end of the house at the westerly end of Mill Dam Road.

NOTE: This anchorage ground is described as a special anchorage area in 202.60.

(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.

202.155 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 202.60.

(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.

(3) Anchorage No. 1–B. West of a line ranging from the point on the southwest side of the entrance to 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.

(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 202.60.

(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 202.60.

(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 is described in 202.60.

(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″, longtitude 73°52′21″; thence to latitude 40°47′20″, longtitude 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 202.60.

(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) Anchorage No. 12. [Revoked]

(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) [Revoked]

(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 51°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. 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 ap-

proaches 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. North of the east-west line passing through Gowanus Flats Lighted Gong Buoy 22 and Bay Ridge Channel Lighted Bell Buoy 1; east of a line bearing 355°45′ from Gowanus Flats Lighted Gong Buoy 22 to Gowanus Flats Lighted Bell Buoy 24, thence bearing 26°08′ through Gowanus Flats Lighted Bell Buoy 26 and Gowanus Flats Lighted Bell Buoy 28 to Gowanus Flats Lighted Bell Buoy 30; south of a line bearing 65°38′ from Gowanus Flats Lighted Bell Buoy 30 to Red Hook Channel Lighted Bell Buoy 11, thence bearing 118°46′ to Red Hook Channel Lighted Bell Buoy 9; west of a line bearing 172°50′ from Red Hook Lighted Bell Buoy 9 to Bay Ridge Channel Lighted Bell Buoy 7, thence 218°28′ through Bay Ridge Channel Buoy 5 and Bay Ridge Channel Lighted Bell Buoy 3 to a point at latitude 40°38′41.5″, longitude 74°02′34″ and thence 197°47′ to Bay Ridge Channel Lighted Bell Buoy 1. A fairway 600 feet wide crossing the anchorage, marked by buoys at each entrance, shall be excluded therefrom. Its northerly side is on range with Claremont Terminal Lighted Buoy 1, at the entrance to Claremont Terminal Channel, and the center of the head of the north pier of the Long Island Railroad Terminal at the foot of 64th Street, Bay Ridge, Brooklyn. 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, northward of the fairway, northward and eastward of Anchorage No. 21–B. Deep-draft vessels are required to use the western half of the anchorage, light-draft vessels are required to use the eastern half, and barges drawing 12 feet or less are required to use that portion of the anchorage southward of a line ranging from the end of the 39th Street Ferry rack (northeast rack), Brooklyn to Gowanus Flats Lighted Bell Buoy 28.

(ii) Anchorage No. 21–B (for steamers). That portion of Anchorage No. 21 southward of the fairway; and that portion of Anchorage No. 21, northward of the fairway, southward of a line ranging from the end of the 39th Street Ferry rack (northeast rack), Brooklyn, to Gowanus Flats Lighted Bell Buoy 28, and westward of a line ranging from the westerly point of Red Hook to the north corner of Pier 21 of the Pouch Terminal at Clifton, Staten Island.

(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 the 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″,

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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. South of Gedney Channel, west of a line ranging due north and south through Scotland Lightship, and north of a line ranging due east from Navesink Light: Provided, That no vessel shall anchor in South Channel.

(ii) Romer Shoal. Beginning at Gedney Channel Lighted Bell Buoy 2; thence to Ambrose Channel Entrance Lighted Whistle Buoy 1A; thence along the southwest side of Ambrose Channel to Ambrose Channel Lighted Whistle Buoy 9, and thence to Ambrose Channel Lighted Whistle Buoy 13; thence along a line ranging toward West Bank Light to its intersection with a line ranging from Ambrose Channel Lighted Buoy 15 to Chapel Hill Channel Buoy 14; thence to Chapel Hill Channel Buoy 14; thence to Swash Channel Lighted Gong Buoy 6; thence to Swash Channel Buoy 4A; thence to Romer South Edge Buoy 2S; and thence to Gedney Channel Lighted Bell Buoy 6 and along the north side of Gedney Channel 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-shape 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.

(g) Kill Van Kull; Anchorage No. 29. West of the westerly rack of the Bergen Point Ferry at Bayonne, New Jersey; north of a line ranging from the north end of Frank McWilliams, Inc., Pier 2, West New Brighton, Staten Island, to the southwest corner of the pier, foot of Humphreys Avenue, Bayonne; north of a line ranging 258° from the inshore end of the Bergen Point Ferry at Bayonne; thence north of a line ranging 90° from Bergen Point Light; thence southeast of a line running 55° to the shore at Bergen Point.

(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 202.60(r).

(2) Anchorage No. 35. North of Anchorage No. 29; east of lines ranging from the center of Bergen Point Light to the west pier of the west lift span of the Ceneral Railroad of New Jersey bridge, extending to a point off the north side of the pier of the Texas Company, and thence to a point 100 yards east of the east pier of the east lift span of the railroad bridge; and south of the bridge.

(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 202.60(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) Sheepshead Bay—(1) Anchorage No. 48–A. 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) Anchorage No. 48–B. South of the established United States 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 United States Pierhead Line on the north side of the bay; and east of the prolonged east side of East 27th Street.

(3) Anchorage No. 48–C. 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; west of 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.

(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) When applied for, a berth in an anchorage, if available, shall be assigned to any vessel by the Captain of the Port. He may grant revocable permits for habitually maintaining and using the same mooring space in an anchorage area, but no vessel shall occupy continuously a berth in an anchorage area when a vessel in regular traffic requires the berth or when navigation would be menaced or inconvenienced thereby. The Captain of the Port is authorized to issue permits for maintaining mooring buoys. The method of anchoring these buoys shall be as prescribed by the Captain of the Port. No vessel shall moor in any anchorage in such a manner as to interfere with the use of a duly authorized mooring buoy. In case of emergencies the Captain of the Port is hereby authorized to shift the position of any unattended vessel moored in or near any anchorage. No vessel shall be navigated within the limits of an anchorage at a speed exceeding six knots when in the vicinity of a moored vessel.

(8) Barge dispensing stations and stake boats may be anchored in such places as the Captain of the Port may designate, subject to the approval of the District Engineer, Corps of Engineers.

(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–B. On the New Jersey Flats, south of a line parallel to and 500 yards south of the National Docks (Black Tom) dredged channel; west of a line bearing 208° from the Torch, Statute of Liberty, and ranging

through National Docks Channel Buoy 1 and New Jersey Pierhead Channel North Entrance Buoy 4; north of a line ranging through the latter buoy and New Jersey Pierhead Channel North Entrance Lighted Buoy 6; northeast of a line bearing 313° being parallel to and 500 yards north of Caven Point Pier; and east of a line bearing 38° from the twin chimneys on Constable Hook, New Jersey, through the brick pump house on the inshore end of the trestle to Caven Point Pier.

(i) Vessels shall not anchor within 800 yards of Bedloe's Island, within 500 yards of any pier, or within 100 yards of the New Jersey Pierhead Channel.

(ii) No vessel using this anchorage shall carry more than 20 tons of high explosives.

(iii) No vessel carrying explosives of any kind shall anchor in this anchorage within 500 feet of any other vessel carrying high explosives; except that the Captain of the Port may authorize the placing of moorings not less than 500 feet apart within this area and the making fast thereto of not to exceed three barges at each mooring, provided the combined load of the barges at a mooring is not more than 20 tons of high explosives.

(iv) Insofar as practicable, in the use of this anchorage preference shall be given to vessels storing explosives for current consumption.

(v) In cases of great emergency and when weather conditions are such that it is impossible for barges, scows, or lighters loaded with more than 20 tons of high explosives to proceed to Gravesend Bay or Raritan Bay, or lie at anchor there, such vessels may anchor temporarily in the Jersey Flats anchorage, but in each case the Captain of the Port must be immediately notified, and such vessel will not remain so anchored without his special permission.

(vi) This area shall not be used by vessels which do not carry explosives except in cases of great emergency.

(2) 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″, and ranging 250 yards due west of Fort Lafayette; south of a line bearing 96° 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 vessels 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.

(3) Anchorage No. 49–D. In Raritan Bay, south of a line bearing 250° from West Bank Light; west of a line ranging 137° from the tower of former Princess Bay Light to the tower of former Waackaack Light; north of a line ranging 250° from Old Orchard Shoal Light to Boundary Daybeacon; and east of a line bearing 306° from Boundary Daybeacon.

(i) This area shall not be used by vessels which do not carry explosives except in cases of great emergency.

(4) 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 80°, 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.

(5) 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 2°, 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 explosives anchorages. (1) Anchorages Nos. 49–B, 49–C, 49–D, 49–F, and 49–G are reserved for vessels carrying explosives. All vessels carry-

ing explosives shall be within these areas when anchored, except as provided in subparagraphs (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.

202.156 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 238 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 203—BRIDGE REGULATIONS:

203.1 General. Drawbridges across navigable waters of the United States will not be opened to navigation for certain periods determined to be in the interest of public safety by the proper civil defense authorities during a major disaster or civil defense emergency indicated by a civil defense condition of "Air Raid Warning" (attack by enemy aircraft probable, imminent, or taking place) notwithstanding any general or special regulations heretofore or hereafter prescribed for the operation of any such drawbridge or drawbridges.

203.80 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.

203.81 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.

203.85 Sakonnet River, R.I.; State of Rhode Island highway bridge and New York, New Haven and Hartford Railroad Company bridge at Tiverton. NOTE: The drawspan of the highway bridge has been removed; regulations no longer applicable to it. (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.

203.87 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 water craft 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.

203.90 Providence Harbor, R.I.; bridges. (a) The regulations contained 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 Company 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 Company Tunnel Bridge, and the City of Providence Red Bridge at Waterman Street, across the Seekonk River.

(b) Except as otherwise provided in paragraph (c) 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 and night for the passage of vessels.

(c) Between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. daily the draws of the highway bridges across Seekonk River need not be opened for the passage of vessels other than loaded self-propelled cargo vessels and any assisting tugs: Provided, That the draws 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 of four distinct blasts of a whistle or horn.

(d) 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 by night shall be conspicuously displayed on the bridge.

(e) Point Street Bridge. Between 7:00 and 9:00 a.m. and between 4:00 and 6:00 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, Rhode Island: 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 draw tenders can be readily reached by telephone or otherwise at any hour of the day or night, in case of emergency.

203.95 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.

NOTE: As used in this section, the term "long blast" means a distinct blast of a whistle or horn of three seconds' duration, and the term "short blast" means a distinct blast of a whistle or horn of one second's duration.

(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 a 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.

203.100 Thames River, Conn.; The New York, New Haven and Hartford Railroad Company 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.

NOTE: As used in this section, the term "blast" means a distinct blast of a whistle or horn of one second's duration.

203.105 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 or 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 an-

swered 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.

203.110 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 th 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.

203.115 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.

203.120 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 m. 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.

203.121 West River, Kimberly Avenue Bridge between New Haven and West Haven, Conn. (a) The owner of or agency controlling the bridge shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draw for the safe passage of vessels.

(b) From April 1 to November 30, inclusive, between the hours of 6:00 a.m., and 12:00 midnight, local time, the draw will be opened on signal, except between 7:30 a.m. and 8:30 a.m., 12:00 noon and 12:15 p.m., 12:45 p.m. and 1:00 p.m., and 4:45 p.m. and 5:45 pm., during which times the draw will not need to be opened for vessel traffic. From December 1 to March 31, inclusive, at all hours of the day and night, and from April 1 to November 30, inclusive, between 12:00 midnight and 6:00 a.m., local time, the draw will be opened upon one hour advance notice given to the draw tender.

(c) The owner of or agency controlling the bridge shall keep 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, a copy of the regulations of this section, together with a notice stating exactly how the draw tender may be reached in an emergency and how he may be reached by telephone or otherwise.

(d) Signals: (1) Call signals for opening of draw—(i) Sound signals. Three short blasts of the horn or whistle.

(ii) Visual signals. To be used in connection 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 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.

(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.

203.125 Housatonic River, Conn.; bridges (highway and railroad) between Milford and Stratford, Conn., known as the Washington Bridge, and bridge of New York, New Haven and 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.

203.130 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) Pleasure Beach Highway Bridge for vessels of any class: 10:30 p.m. to 11:00 p.m.; 11:15 p.m. to 11:45 p.m.

(v) 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.

(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.

203.131 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.

203.135 Saugatuck River, Conn.; bridge of New York, New Haven and 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.

203.145 Norwalk River at Norwalk, Conn.; Washington Street Highway bridge and the New York, New Haven and 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—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 of 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.

203.150. 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. from 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 subpargaraph (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.

203.155 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) The bridges shall be opened promptly at any time, day or night, when the prescribed signal is given by an approaching vessel which cannot pass under the closed draw.

(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.

203.156 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 District Engineer, U.S. Army Engineer District, 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 Engineer, U.S. Army Engineer District 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.

203.160 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 waterline 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.

203.165 Newtown Creek, N.Y.—(a) City of New York highway bridge at Vernon Avenue. NOTE: Former bascule span bridge removed; regulations no longer applicable.

(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.

203.175 Jamaica Bay and connecting waterways, N.Y. (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 pas-

sage 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 bridges across North Channel (Grassy Bay) at Jamaica Bay Boulevard, Shellbank Basin at Nolins Avenue, and Hawtree Basin at Nolins Avenue. (1) On Sundays, holidays, and between 6:00 p.m. and 6:00 a.m., the draws of these bridges shall not be required to open for the passage of vessels: Provided, That 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: Provided further, That the draws shall be opened for the passage of other vessels unable to pass under a closed bridge on Sundays, holidays, or between 6:00 p.m. and 6:00 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 these bridges 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) [Reserved]

(d) City of New York highway bridge across Beach Channel at Jamaica Bay Boulevard. On Sundays and holidays from May 15 to September 15, inclusive, 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.: 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 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.

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(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.

203.180 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 the 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 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.

(e) 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.

(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 Engineer, Corps of Engineers, 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.

203.185 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 10 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 Engineer, Corps of Engineers.

(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.

NOTE: As used in the regulations in this part, the term "long blast" means a blast of five seconds' duration, and the term "short blast" means a blast of one second's duration.

(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 lattice-work 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) Dunn Memorial 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.

(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) Troy-Menands Bridge. [Revoked]

(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.

203.190 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. At least 24 hours' advance notice required.

(2) Bronx River; City of New York highway bridge at Westchester Avenue. At least 24 hours' advance notice required, except that the draw shall be opened for the passage of vessels owned, controlled or employed by the United States or by the City of New York, with the least possible delay upon receipt of oral or written notice.

(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. At least 24 hours' advance notice required, except 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, upon reasonable notice.

(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) Jamaica Bay, North Channel; New York City Transit Authority bridge at Hamilton Beach, Borough of Queens, New York, New York. At least 24 hours' advance notice required, except 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, upon reasonable notice.

(8) Richmond Creek; City of New York, highway bridge at Richmond Avenue, Staten Island. At least 24 hours' advance notice required.

(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; New York Central System bridge at New Hamburg. During the period May 15 to October 15, inclusive, a draw tender will be on duty from 5:00 a.m. to 9:00 p.m. At all other times at least 12 hours' advance notice required. Notice may may be given to the Chief Dispatcher, New York Central System, Albany, N.Y., or 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.

203.200 Newark Bay, Passaic and Hackensack Rivers, and their navigable tributaries; general regulations. (a) The draws shall be opened promptly, upon signal, for the passage of vessels during the day or night, except as prescribed in paragraph (b), (c), or (f) of this section.

(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 Engineer, Engineer Department at Large in charge of the locality, 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 said district engineer 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 engineer 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 District Engineer, Engineer Department at Large, in charge of the locality, 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.

203.210 Raritan River and Arthur Kill, and their navigable tributaries; bridges. (a) All drawbridges spanning Raritan River and Arthur Kill, and thir 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.

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

(ii) Visual signal. 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 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) 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 gauges 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 gauges 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 engineer 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) The regulations to govern the operation of the Ocean Avenue bridge across the mouth of the Shark River between Belmar and Avon-by-the-Sea, and to govern the operation of drawbridges across Manasquan River, its navigable tributaries and the Bay Head-Manasquan Canal, New Jersey, prescribed under the dates of March 29, 1933, and January 18, 1937, respectively, are hereby revoked.

(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 Lay, 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.

203.225 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 203.200.

(1-b) Hackensack River, New Jersey State Highway Department bridge at Little Ferry. At least six hours' advance notice 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.

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

(4) Elizabeth River; Union County Bridge at South First Street in the City of Elizabeth. At least three hours' advance notice required.

(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 203.215 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 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) Buzzards Bay in vicinity of Gull Island—(1) The area. The waters within a circular area with a radius of 1,000 yards having its center on Gull Island at latitude 41°26′46″, longitude 70°54′26″.

(2) The regulations. No vessel shall enter or remain in the area at any time except as authorized by the enforcing agency. The regulations in this paragraph shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

204.10 Narragansett Bay, R.I.; danger zones for naval operations. (a) Torpedo-testing range and prohibited area, Naval Base, Newport. (1) The torpedo-testing range. The waters within an area east of Conanicut Island and west of Prudence Island bounded as follows: Beginning at a point on the east shore of Conanicut Island at latitude 41°31′00″; thence 90° to longitude 71°20′48″; thence to latitude 41°31′45″, longitude 71°20′09″; thence to latitude 41°33′56″, longitude 71°19′30″; thence 346° to the south shore of Prudence Island; thence northerly along the west shore of Prudence Island to the north side of Coggeshall Cove; thence to the easternmost point of Patience Island; thence southwesterly and northwesterly along the shore of Patience Island to North West Point; thence 177° to the east shore of Conanicut Island; and thence southerly along the east shore of Conanicut Island to the point of beginning.

NOTE: All bearings in this section are referred to true meridian.

(2) The prohibited area. An area overlapping the torpedo-testing range bounded as follows: 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′40″; thence northwesterly to latitude 41°37′22″, longitude 71°21′15″; thence westerly to latitude 41°37′21″, longitude 71°21′23″; thence southerly to latitude 41°34′47″, longitude 71°21′06″; thence southwesterly to a point on the northeast shore of Conanicut Island at latitude 41°33′54″; thence southerly along the easterly side of Conanicut Island to the point of beginning.

(3) The regulations. (i) 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.

(ii) Anchoring in the torpedo-testing range outside the prohibited area is forbidden except in cases of great emergency, and vessels anchoring therein under such conditions shall move out of the area as soon as possible.

(iii) The danger zone shall be given a wide berth when possible in order to avoid danger from running torpedoes, damage to range installations, or interference with range operation. Danger from erratic torpedoes exist beyond the boundaries of the torpedo-testing range. All mariners are cautioned to keep alert, take special precautions, and take such evasive action as necessary.

(iv) The danger zone may, in case of necessity, be entered by vessels proceeding to or from the Naval Air Station, Quonset Point, the Construction Battalion Center, Davisville, or other points in the western part of Narragansett Bay, and passing between Conanicut Island and Gould Island, under the following conditions:

(a) When firing is in progress. In the case of major vessels making this passage, firing will be suspended on their approach to the danger zone or on request to the Range Officer, U.S. Naval Underwater Ordnance Station, Newport, R.I. (located at Firing Pier, Gould Island). Minor vessels making this passage must proceed with caution, avoid torpedos and observe orders from craft patrolling the zone which craft are identified by a square red flag. Other than as specified in this subparagraph, vessels shall not enter the danger zone while firing is in progress except by special arrangement through the Range Officer, U.S. Naval Underwater Ordnance Station, Newport, R.I. (located at Firing Pier, Gould Island), or through the Officer-in-Charge, Degaussing Station, if entering for operations on the magnetic range.

(b) When firing is not in progress. Vessels may make this passage without special precaution, except that diving tenders with divers down, identified by international "Four" flying a red flag with a diagonal white cross, shall be given a wide berth and passed at slow speed.

(v) A large red flag by day, an all around green light by night, will be displayed from the Firing Pier at the north end of Gould Island to indicate that torpedo firing is in progress or is about to begin. Torpedo firing may be expected at any time of the day or night, Sundays and holidays included.

(vi) When torpedo firing is in progress, a patrol boat will be kept in readiness and will give timely warning to vessels approaching the danger zone and will issue necessary orders and instructions regarding the navigation of the danger zone. Craft patrolling the danger zone are identified by a square red flag.

(vii) Orders and instructions issued by patrol craft or other authorized representatives of the enforcing agency shall be promptly carried out by vessels in or in the vicinity of the danger zone. The following emergency signals will be employed by patrolling aircraft:

(a) Emergency, stop and await instructions. Plane lands in front of, or drops smoke flat directly ahead of, the vessel.

(b) Emergency, torpedo heading toward you, maneuver to avoid. Plane zooms over the vessel in danger.

(viii) Nothing in this paragraph shall prevent the set-

ting of fish traps outside the prohibited area under permits issued by the Department of the Army, nor shall the passage of fishing vessels to and from authorized traps be unreasonably interfered with or restricted.

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

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 made-up 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; approximately 1,000 feet west of the Buzzards Bay Railroad Bridge; 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 Sandwitch 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 preceding 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:

	Minutes
Head tide	60
Fair tide	30
Slack tide	45

The minimum running time between the Administrative Office, Station 388 and Hog Island Channel entrance buoy No. 1, Station 661, is prescribed as follows:

	Minutes
Head tide	46
Fair tide	23
Slack tide	35

The running time at slack water will apply to any vessel which enters that portion of the canal between Stations 35 and 661 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 kc. are requested to keep their radio telephones tuned to that freqeuncy 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 permis-

sion 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 1 mile.

207.37 Jamaica Bay, Long Island, New York; seaplane restricted area. (a) The restricted area. An area in Jamaica Bay bounded as follows: Beginning at Island Channel Range Front Light; thence 157°00′ True, 1,125 yards to Island Channel Lighted Buoy 4; thence 113°00′ True, 3,000 yards through Big Fishkill Channel Lighted Buoy 3, and Runway Channel Lighted Buoy 2 to Runway Channel Lighted Buoy A; thence 194°00′ True, 250 yards to a point on a line ranging with Church Spire, Rockaway Beach; thence 238°00′ True, 3,275 yards to a point on a line ranging with the cupola, Rockaway Point Coast Guard Station No. 92; thence 326°00′ True, 465 yards to a point on a line ranging between the West Tower of the Twin Towers, Jacob Riis Park and the Westerly side of seaplane runway at south side of Naval Air Station, Floyd Bennett Field; thence 30°00′ True, 875 yards to Fourteen Foot Spot Lighted Buoy on a line ranging with the cupola, Rockaway Point Coast Guard Station No. 92; thence 344°00′ True, 3,000 yards through Island Channel Lighted Buoy 5 to Island Channel Buoy 7; thence 60°00′ True, 325 yards to the point of beginning; excluding therefrom Nova Scotia Bar defined by lines connecting the following buoys: Nova Scotia Bar Lighted Buoy, Island Channel Lighted Buoy 2, Runway Channel Lighted Buoy 5, Runway Lighted Buoy 3, and Beach Channel Lighted Buoy 1A.

(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 except 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 judgment, 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), on 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) Hudson River Reserve Fleet, Jones Point, New York.

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

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

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

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

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

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

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

(b) No vessels or other watercraft, except those owned or controlled by the United States Government, shall cruise or anchor between Reserve Fleet units, within 500 feet of the end vessels in each Reserve Fleet unit, or within 500 feet of the extreme units of the fleets, unless specific permission to do so has first been granted in each case by the enforcing agency.

(c) The regulations in this section shall be enforced by the respective Fleet Superintendents and such agencies as they may designate.

3. 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 navigator this area presents problems of unusual difficulty because of the off-lying shoals, strong and variable currents, large amounts of fog, and turbulence of wind and sea in the great storms that so frequently sweep it. A great volume of waterborne commerce also 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 the 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 had been developed into a series of bathing resorts.

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.

For a complete description of navigational aids, see the Light List.

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

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

Channels.—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 **202,** chapter 2, for limits and regulations.

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.

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.

Georges Bank (chart 612) 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 currents are rotary with no period of slack water. The velocity at strength is about 2 knots and the velocity of the minimum current which occurs about midway between the times of strength is about 1 knot. The flood sets northward and the ebb southward. The hourly velocities and directions of the tidal current are shown by means of current roses on Coast and Geodetic 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 (charts 612, 1107) 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 off-

shore. The easterly edge of the shoals has depths of 3½ 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°33′ 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 warnings** are displayed daytime only.

The various parts that make up Nantucket Shoals are the following:

Phelps Bank (chart 612), 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.

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 eastern and 6¼ fathoms on the western 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, 6¼, and 4½ fathoms, respectively. 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.

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 4 miles apart. A buoy is about 1.5 miles westward of the 2¾-fathom spot and another buoy on the east side 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. **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 and 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

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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 2½ 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, 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 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 aproximate 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.

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 dan-

gerous 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 No. 99, Sailing Directions for Nova Scotia, published by the Naval Oceanographic Office, Washington, D.C. They are shown on the Pilot Chart of the North Atlantic Ocean (H.O. 1400) and on the back of the Track Chart of the World (H.O. Chart 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 28 to 30 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 occurring 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 considerable 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 Lightship, 2.5 knots; Stone Horse Shoal, 4 knots; Great Round Shoal Channel Lighted Whistle Buoy GRC, Nantucket Entrance, 2.5 knots; Nantucket Shoals Lightship, 1 mile east of, 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; Bartlett Reef, 0.5 mile south of, Long Island Sound, 2.5 knots; 3 miles southward of Cornfield Point, 4 knots; Fire Island Lighted Whistle Buoy 2FI, 1.5 knots; Ambrose Channel Lightship, 2 knots.

WEATHER.—The appendix includes climatological tables for eight Atlantic coast localities and a table of fog signal operation. Also listed are Weather Bureau offices, storm warning stations, and radio stations which transmit weather information.

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 area lies within the heart of the belt traversed by these storms. As a result, changes of wind, temperature, and clouds are frequently abrupt and conditions are generally

variable. In summer and fall, tropical cyclones bring stormy weather although most of these storms assume extratropical characteristics by the time they reach the northern latitudes.

A principal area of storm formation is off the Middle Atlantic coast. Extratropical storms spawned in this area during the cooler months generally move northward or northeastward toward New England and New York. These coastal storms may, on occasion, produce strong winds and heavy precipitation.

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.

Extratropical cyclones.—In the winter, the center of the mean tracks followed by extratropical cyclone traverses the area covered in this Coast Pilot. Consequently, there are frequent shifts from the prevailing westerlies, and rapid changes in weather. 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.

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, owing to the fact that 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. On 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.—Tropical cyclones occasionally move northward into the area in late summer or autumn. 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.

HURRICANES.—Severe tropical cyclones of the North Atlantic Ocean are ordinarily referred to as West Indian Hurricanes, though actually many of these storms form, move, and die far out from the mainland and hundreds of miles from the West Indies. As a general rule these storms 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 fully developed tropical cyclone may affect an area covering tens of thousands of square miles.

Tropical cyclones occur over all the tropical oceans except the South Atlantic. They usually form in the tropical regions of the easterly trade winds. In the North Atlantic, hurricanes form over a wide range of ocean between the Cape Verde Islands and the Windward Islands, over the western part of the Caribbean Sea, and

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.

Tropical cyclones can be expected from May through November. However, the months of greatest frequency are August, September, and October, when hurricanes are most likely to be severe. During all of the season the chance of an intense storm developing is great enough to warrant careful watch of the weather elements in this area. The June hurricanes which form in the West Indian region usually move in a direction between west and north while they are south of 25° N. In late September, October, and November, hurricanes of this region are more likely to move in a direction between north and east, passing through the Yucatan Channel, or over Cuba, Florida, or the Bahamas. Of the hurricanes that come from the Atlantic into the West Indies, the majority occur in August and September. They generally move on a west-northwesterly course in low latitudes, some reaching the coast before curving toward the north and northeast. Late in the season, October or November, the movement of hurricanes that form east of the West Indies is often toward the north in the open Atlantic.

The average speed of movement of West Indian Hurricanes 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.

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

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

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

Bearings of center.—If an observer faces the wind, the storm center will likely be located 8 to 12 points to the right in the northern hemisphere. When the storm is distant it may be 10 to 12 points, and when the barometer has fallen 5 or 6 tenths of an inch it may be nearer 8 points.

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

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

If the wind shifts to the left, the vessel will be in the left or navigable semicircle. The helm should be put up and the vessel run with the wind on the starboard quarter, preserving the compass course, if possible, until the barom-

eter rises, when the vessel may be hove to on the port tack. If there is not sea room to run, the vessel can be put on the port tack at once.

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

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

Practical rules.—When there are indications of a hurricane, vessels should remain in port or seek one if possible. Changes in barometer and wind should be carefully observed and recorded, and every precaution should be taken to avert damage by striking light spars, strengthening moorings, and if a steamer preparing steam to assist the moorings. In the ports of the southern states hurricanes are generally accompanied by very high tides, and vessels may be endangered by overriding the wharf where moored if the position is at all exposed.

Vessels in the Straits of Florida may not have sea room to maneuver so as to avoid the storm track, and should try to make a harbor, or to stand out of the straits to obtain sea room. Vessels unable to reach a port and having sea room to maneuver usually observe the following rules:

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

Pilotage.—In the area covered by this Coast Pilot, pilotage, with a few unimportant exceptions, is compulsory for all vessels, both domestic and foreign, engaged in the foreign trade, but not for vessels in the domestic trade. Information for the more important ports is given in the description of the localities.

Towboats are available at the more important ports. For further information refer to the description of the port.

Harbormasters where appointed are mentioned in the text. They have charge of the anchorage and berthing of vessels.

Supplies.—General supplies, including fuel oil, diesel oil and fuel, gasoline, coal, 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 at New York. 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.

Standard time.—The region covered by this Coast Pilot uses eastern standard time, which is 5 hours slow of Greenwich mean time. Example: When it is 10 a.m. at Greenwich it is 5 a.m. at New York.

Daylight saving time.—The clocks are advanced 1 hour on the last Sunday in April and are set back to standard time on the last Sunday in October in the region covered by this Coast Pilot.

Legal holidays.—In the area covered by this Coast Pilot, the following holidays are observed throughout:

January 1, New Year's Day; February 22, Washington's Birthday; May 30, Memorial Day; July 4, Independence Day; Labor Day, first Monday in September; October 12, Columbus Day; November 11, Veterans Day; Thanksgiving Day, fourth Thursday in November; December 25, Christmas Day.

In addition, these holidays are observed as indicated:

Massachusetts: March 17, Evacuation Day in Boston and Suffolk County only; April 19, Patriots Day; June 17, Bunker Hill Day in Boston and Suffolk County only.

Rhode Island: May 4, R.I. Independence Day (banks and courts only); August 14, Victory Day; General Election Day, first Tuesday after the first Monday in November.

Connecticut: February 12, Lincoln's Birthday; Good Friday.

New York: February 12, Lincoln's Birthday; General Election Day, first Tuesday after the first Monday in November.

New Jersey: February 12, Lincoln's Birthday; Good Friday; General Election Day, first Tuesday after the first Monday in November.

4. OUTER CAPE COD AND 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 Chatham Light are generally less than 1 knot. Strengths of flood and ebb set northward and southward, respectively, along the coast. The time of current changes rapidly, 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, is one of the best harbors on the Atlantic coast with a sizable anchorage area and excellent holding ground. The historical town of **Provincetown** is on the northwestern side of the harbor where supply and repair facilities are available. 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 close northwestward of the monument.

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 40-foot 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.

Peaked Hill Bar includes shoals covered 14 and 16 feet about 4.5 miles east-northeast of Race Point Light and 0.6 mile offshore. 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 Cape Cod Light. Keeping in a depth of 20 fathoms will insure 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.

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. See appendix for **storm warning display.**

Just northward of Cape Cod Light is a reporting station by which vessels may communicate with Boston by using International Code of Signals. Prominent objects include a stone crenellated tower and three spherical radar domes on the summit of a ridge, 0.5 mile south of the light.

Five special purpose buoys, each painted in orange and white horizontal bands, extend in a line at intervals for about 3.3 miles east-northeastward of Cape Cod 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 Cape Cod 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 Cape Cod Light, are prominent. A tank stands out near the shore opposite **South Wellfleet,** 8.5 miles southward of Cape Cod Light.

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 shoalest entrance depth is about 3 feet at lowest tides. 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.**

Chatham, 11.5 miles southward of Nauset Beach Light, is on fairly high ground; several spires and a tall stack in the town are prominent. **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 **Chatham Harbor.** See appendix for **storm warning display.**

Chart 270.—Chatham Bar, 14 miles southward of Nauset Beach Light, is the eastern entrance to Chatham. 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 1964, 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.

Small craft can use an inside passage about 10.5 miles long from Chatham Bar to the head of navigation at **Orleans.** However, the channel to Pleasant Bay in unmarked and difficult to follow. The channel northward of Pleasant Bay is marked by seasonal private buoys. Local knowledge is required to navigate to Orleans.

A marina and boatyard 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, limited marine supplies, berthage, and a surfaced ramp are available. A marine railway can haul out craft up to 40 feet in length for hull and engine repairs or dry open or covered storage.

A boat basin is in **Aunt Lydias Cove,** a part of **Chatham Inner Harbor** between **Tern Island** and Chatham. In 1966, the basin and the channel leading to the basin were reported dredged to a depth of 6 feet. A fish pier is in the basin. Gasoline, diesel oil, and water are available at the pier.

Bassing Harbor, at the north end of Chatham Harbor, is the entrance to **Ryder Cove** and **Crows Pond.** Three conspicuous radio towers are on the south bank of Ryder Cove. There is a marina and boatyard on the south bank just east of the radio towers about 0.5 mile inside the entrance. A surfaced town ramp is close westward of the marina. Gasoline, water, ice, marine supplies, and moorings are available. A marine railway can haul out craft up to 25 feet in length for hull and engine repairs, and dry open or covered storage. In September 1964, there was reported to be 6 feet to the marina.

A country club is on **Nickersons Neck** and the concrete ramps of an old seaplane base are at the east end of the Neck.

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 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 Bay. The passage is marked by privately maintained seasonal buoys.

Little Pleasant Bay extends about 1.5 miles northward to Barley Neck. A town 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 September 1964, depths of 2 feet were reported in Namequoit River, and the channel into the pond was reported dredged to 3 feet. A marina and boatyard on the north bank of the pond has a marine railway that can haul out craft up to 50 feet in length for hull and engine repairs or dry open or covered storage. The yard has a 1½-ton crane and a gravel ramp.

An arm extends northward from the entrance to Namequoit River for about a mile to **Meetinghouse Pond.** A town landing and ramp are on the north bank of the channel leading into the pond. A marina and boatyard on the north bank of the pond has gasoline, water, ice, berthage and moorings in 6 to 10 feet of water, a ramp, and a 2-ton crane are available. The marine railway can haul out craft up to 50 feet in length for hull and engine repairs or dry open or covered storage. A town ramp is on the east bank of the pond southeastward of the marina.

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 from 6 to 22 miles. At the eastern entrance and within the sound there 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, a lightship, 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 11 to 17 feet, is eastward of Pollock Rip; **Twelvefoot Shoal,** covered 14 to 18 feet, is close southwestward of Broken Part of Pollock Rip.

Stone Horse, Little Round, and **Great Round Shoals** 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 9 to 17 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. A Federal project provides for a channel 30 feet deep through the shoals. 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. In July 1966, depths of 8 to 27 feet were in the eastern half of Pollock Rip Channel, between buoys 2 and 4; buoys mark the best water.

Pollock Rip Lightship (41°36.1′ N., 69°51.1′ W.), with red hull and the name POLLOCK in large white letters on the sides, is 3 miles northeastward of the entrance to Pollock Rip Channel; the light is 69 feet above the water. The vessel has a fog signal and a radiobeacon; the code flag signal and radio call sign is NNBS; **storm warning displays** are made during the daytime. A lighted whistle buoy about 1.3 miles southwestward of the lightship marks the eastern entrance to Pollock Rip Channel.

A lighted horn buoy 1.3 miles east-northeastward of Monomoy Point Light marks the site of the former Stone Horse Shoal Lightship which was discontinued in 1963.

Monomoy Point Light (41°32.3′ N., 70°00.7′ W.), 20 feet above the water and shown from a white skeleton tower on a white pile structure, is 0.4 mile south of Monomoy Point. The buildings of a former Coast Guard station are on the point about a mile north of the light. A lighted bell buoy is 700 yards south of the light.

Great Round Shoal Channel is used mostly by medium-draft vessels passing through the sound and sometimes by sailing vessels 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 the dredged **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. A Federal project provides for a channel 30 feet deep for 1.7 miles in Cross Rip Channel.

Cross Rip Lightship was replaced in 1964 by **Cross Rip Lighted Horn Buoy 21 (41°26.9′ N., 70°17.5′ W.)**, marking 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 harbor. 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 in Nantucket Sound and approaches are prescribed by Federal regulations; see **202.140** and **202.142,** chapter 2, for limits and regulations. A special small vessel anchorage is in Edgartown Harbor; see **202.38,** 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 Lighted Whistle Buoy H, 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 Entrance Lighted Whistle Buoy desiring to anchor, wind and sea permitting, should stand northwestward and anchor west of a line joining Bearse Shoal North End Buoy 2A and Chatham Bar Lighted Buoy 1. Anchorage may also be had in depths of 5 to 7 fathoms about 1.3 miles south-southwestward of Pollock Rip Entrance Lighted Whistle Buoy 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

navigating it. Vessels must take care to avoid the 24-foot shoal eastward of Cross Rip Shoal and the 17- to 22-foot shoals 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 Narragansett 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.

See appendix for **storm warning displays.**

Pilotage is not compulsory for vessels passing through Nantucket Sound; it is only compulsory for foreign and registered vessels entering or clearing the 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 towboat from the port of their depture.

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 are the approach to **Stage Harbor** and the prominent summer resort of **Chatham** on the hilly ground at the northeast shore of Nantucket Sound. Among the conspicuous landmarks are a radio tower, church spires, Chatham Light and adjoining signal tower, Stage Harbor Light, and an old abandoned lighthouse tower near it.

In 1965, the former entrance channel into Stage Harbor around **Harding Beach Point** was closed by a dike extending from Morris Island to the southeast end of the point. A landcut was dredged across the point about 200 yards southeastward of **Stage Harbor Light.** In April 1965, a dredged depth of 10 feet was available in the channel from Chatham Roads through the cut and for 0.5 mile northeastward in Stage Harbor; the channel is marked by buoys.

The narrow channel leading northerly from Stage Harbor through Mitchell River to Mill Pond 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 **harbormaster** at Town Hall. The channel in the inner part of Stage Harbor is marked by seasonal private buoys.

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 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 approach buoy about 0.8 mile west-southwestward of Stage Harbor Light. Anchorage may be had northward of the approach buoy in

about 28 feet. Boats continuing to Stage Harbor must be alert to find the narrow entrance to the channel about 900 yards off 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 is 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 in length 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. Town ramps are at the bridge and on **Sears Point.**

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 and a fish wharf. At 0.3 mile and 0.5 mile above the bend on the west bank there are two boatyards and marinas. The largest marine railway at the yards can haul out craft up to 50 feet in length for hull and engine repairs or dry open or covered storage. Gasoline, diesel fuel, water, ice, marine hardware, ramps, berthage, and moorings are available. A town ramp is on Oyster Pond River.

Bucks Creek, 1.6 miles northwestward of Stage Harbor Light, is used only at high water by local craft. The entrance between the jetties was reported to have 1½ feet in September 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.

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. The Exchange Building, a large square building with cupola, at **Harwich,** shows up well from seaward. A church spire about 0.5 mile westward of the harbor and a hotel on the west bank of the entrance are conspicuous.

In 1964, the controlling depth over the bar was reported to be 6 feet. The channel is marked by seasonal privately-maintained buoys. 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.

See appendix for **storm warning display.**

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. At the inner end of the channel are a marina and boatyard with a marine railway that can haul out craft up to 45 feet for hull and engine repairs or dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, berthage, lifts and ramps are available. A radio-equipped patrol boat enforces a **speed limit** of 5 m.p.h. The **harbormaster** supervises Wychmere Harbor, Allen Harbor, Herring River, and Round Cove in Pleasant Bay. He can be reached by phone (432-2233) for advice of moorings or local conditions.

Allen Harbor, about 4.8 miles west of Stage Harbor Light, has a narrow entrance between two jetties into **Doanes Creek.** Allen Harbor is at the head of the creek. The west jetty is marked by a seasonal privately maintained light. An elevated water tank north of the harbor is a good landmark.

In September 1964, the controlling depth in the entrance channel was reported to be 7 feet. Privately maintained seasonal buoys mark the channel. The harbor affords good shelter for small craft.

Allen Harbor Yacht Club is at the head of the harbor at the east end of the highway bridge. The pier and float was reported to have 6 feet alongside. A town landing and ramp at the west end of the bridge was reported to have little water alongside. A marina and boatyard on the west shore at the head of the harbor have a marine railway that can haul out craft up to 30 feet in length 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** can be reached by radiotelephone for local information; see Wychmere Harbor.

Herring River, 6 miles west of Stage Harbor Light, has a large prominent hotel on the west side of the entrance. A windmill is on the east side of the entrance. The entrance, between two small jetties, is subject to shoaling. A reported depth of about 5 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 September 1964.

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 channel 6 feet deep has been dredged inside the jetties and in the river to an anchorage basin in the lower part of the river. The entrance to the anchorage basin and the channel over the bar is subject to shoaling. In 1963, the controlling

depth in the entrance channel was reported to be 3½ feet, and that depth could be carried to the second highway bridge at South Dennis, 3.1 miles above the mouth.

Private seasonal buoys mark the channel to the second fixed bridge near **South Dennis.** A rocky area in the channel about 0.4 mile north of the breakwater light has been reported to be covered 3½ feet. 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 bank 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 in length 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 ramp are available. Town landings and ramps are on both sides of the river at and below the bridge.

Two marinas and a boatyard are north of the east end of the bridge and in the cove just above the bridge. Fuel, water, surfaced ramps, berthage, storage, and most other services are available at the marinas.

A highway bridge about 0.7 mile above the second bridge at South Dennis, has a 25-foot fixed span with a clearance of 12 feet.

In 1964, it was reported that 4 feet could be carried at high water to a marina and boatyard on **Kellys Bay** about 0.3 mile above the third highway bridge. A mobile lift at the yard can haul out craft up to 30 feet in length 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 the light off Bass River entrance. 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 seasonal private buoy.

Parkers River, about 1.2 miles west of Bass River, extends 1.3 miles northward to **Seine Pond.** The entrance, protected by a jetty, is reported to have a depth of 5 feet. Local fishermen and pleasure craft enter and moor in dredged slips on the east side of the river. About 0.2 mile above the mouth, a creek extends 0.5 mile westward to **Lewis Pond.** Small craft moor in the pool but there are no services on the pond or on the river.

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, a 41-foot white square pyramidal slatted structure, on a group of rocks where the 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 12 to 18 feet. A lighted gong buoy, 0.8 mile southward, 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 abandoned lighthouse tower on Point Gammon, the square gray stone church belfry on the hill overlooking Hyannis Port to the westward, Hyannis Port Yacht Club behind the breakwater, a large white hotel and motel, and the Hyannis Yacht Club northwestward of Dunbar Point.

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.

See appendix for **storm warning displays.**

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 portion 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 Bell Buoy 8, steer 54° to pass about 100 yards east of West-Southwest Ledge Lighted Bell Buoy, and thence 14° 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 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 depts 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.** There is a hospital in the town.

A Federal project provides for a channel 12 feet deep from Hyannis Harbor to the deep water in Lewis Bay, thence to the town wharf at Hyannis, with an anchorage basin 12 feet deep north of Harbor Bluff. In July 1965, the controlling depth was 10 feet to Dunbar Point, thence 11 feet in March 1965, to the head of the project. 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 each winter.

There are two boatyards and marinas, and an outboard marina at the head of the harbor. There are two town landings with ramps, one on each side and the other at the bulkhead on the west side of the head. The largest of the two marine railways can haul out craft up to 85 feet in length for hull and engine repairs and dry open or covered storage. There is a 25-ton travelift and a 5-ton crane. Gasoline, diesel fuel, water, ice, marine supplies, moorings, and berthage are available. Berthage is also available at the town landing at the bulkhead on the west side at the head. A **harbormaster** is in attendance and can be reached by radiotelephone (phone: 775–1707) for local information on moorings or berthage.

The ferries to Nantucket and Marthas Vineyard berth at the town landing on the west side. There is passenger bus and railroad freight service available to the town. Hyannis 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 the 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 westward of the 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 800 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 sufficiently 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 jettied entrance to East Bay has been dredged to a depth of 6 feet, but is subject to shoaling. **Centerville River,** which enters the north side of the bay, has been 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 bank of the river about 0.5 mile above the footbridge. A town landing is on the north bank just

above the tower. A town 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 south jetty.

Charts 259, 114—SC.—Cotuit Anchorage, 6.5 miles west of Point Gammon, 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.

West Bay, on the north side of Cotuit Anchorage and 19 miles west of Stage Harbor, has a jettied entrance about 150 feet wide. A seasonal light marking the east breakwater is privately maintained. A lighted bell buoy 1.7 miles southward and a seasonal lighted buoy 1 mile southeastward of the entrance mark the approaches. The bay is the approach to **Osterville,** a village on the east shore of the bay. An elevated water tank about 0.7 mile northeastward of the bridge is conspicuous. A reported depth of about 8 feet can be taken in the channel to the highway bridge.

Anchorage with about 7 feet of water may be found in the harbor north of the bridge at Osterville. Ice closes the bay for about 2 months each year. The depths at the wharves at Osterville are from 6 to 10 feet.

See appendix for **storm warning displays.**

Two marinas and boatyards are on either side of the channel just above the highway bridge. Both have marine railways, the largest can haul out craft up to 70 feet in length for hull and engine repairs and dry open or covered storage. The yard on the east side has a 20-ton travelift. Fixed 20-ton cranes are available at both yards. Gasoline, diesel fuel, water, ice, provisions, marine supplies, moorings, berthage, and ramps are available. The Wianno Yacht Club is on the east shore at the bridge. Berthage is available on **Baxter Neck** on the channel at the head of North Bay leading to **Prince Cove.**

A depth of 7 feet can be taken in the narrow channel eastward of **Little Island,** which separates West Bay and **North Bay.** Strangers should obtain local information for navigating North Bay, which has depths of 6 to 17 feet. The **harbormaster** at Osterville can be contacted by radiotelephone (phones: 428–2017, or at home: 428–6577) for local information on moorings or berthage. The highway bridge across the channel between Osterville and Little Island has a 31-foot bascule span with a clearance of 15 feet. The bridge is opened upon signal between 7:00 a.m. and 6:00 p.m. daily during June. From July through September the hours of operation are 7:00 a.m. to 8:00 p.m. daily. During the remainder of the year the bridge is unattended.

Cotuit Bay, northwestward of Cotuit Anchorage, is separated from West Bay by **Osterville Grand Island. Cotuit** is a village on the west shore of the bay. A church spire and two elevated water tanks are prominent. There is a town wharf and a ramp. Gasoline, water, ice, marine hardware, berthage, and moorings are available at a small marina and boatyard. Craft up to 5 tons can be hauled out for hull and engine repairs and dry open or covered storage. A dredged channel, with a reported depth of about 6 feet, leads from Cotuit Anchorage to off **Cotuit Highlands,** thence the channel, with a reported depth of about 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 6 feet is in the channel to North Bay. **Seapuit River,** south of Osterville Grand Island, connects Cotuit Bay and West Bay. The dredged channel in the river has a controlling depth of about 5½ feet. Cotuit Bay is usually closed by ice each winter. The town landing has a depth of about 5 feet at its face.

Popponesset Bay, west of Cotuit Anchorage, is shoal with depths of 1 to 4 feet in the greater part of the bay. A depth of 1 foot is reported at the entrance north of **Thatch Island.** A narrow shallow opening has eroded across **Popponesset Beach** opposite **Little Thatch Island.**

A small marina is on **Daniels Island** near the bridge to Popponesset Island. A 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 3 to 14 feet. A buoy marks the northern side. A channel between Eldridge and Wreck Shoals has depth 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 2 to 8 feet. The entrance, about 250 feet wide, is between two stone jetties each marked by a daybeacon. In 1965, the controlling depth in the entrance channel was reported to be 6 feet. A lighted buoy 0.6 mile west-southwestward of the jetties marks

the approach, and buoys mark a 5-foot channel through the bay. The Waquoit Yacht Club is on the west shore at the head of the bay.

Between Waquoit Bay and Falmouth Inner Harbor 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, west of Waquoit Bay, has a narrow entrance reported to have a controlling depth of 3 to 4 feet in 1964. The lighted buoy 0.6 mile off the entrance and a mid-channel buoy 500 yards off mark the approach. Seasonal privately maintained buoys mark the jettied channel into the pond.

In 1964, it was reported that 3 feet could be carried to the head of Eel Pond to a boatyard on the west bank at the mouth of **Childs River.** State Route 28 highway bridge crossing Childs River at the mouth has a 23-foot fixed span with a clearance of 5 feet. A marine railway at the boatyard can haul out craft up to 45 feet in length for limited hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel by truck, water, moorings, limited berthage, and marine supplies are available at the yard. A reported draft of about 3 feet can be taken through **Seapit River** and thence into the upper part of Waquoit Bay.

Menauhant is a summer resort on the west shore of Eel Pond and the east shore of **Bournes Pond.** Menauhant Yacht Club is on the west shore of Eel Pond. The entrance to Bournes Pond is reported closed to navigation by a fixed highway bridge.

Green Pond, 4.2 miles eastward of Nobska Point, has a narrow jettied entrance, which in September 1964, was reported to have a controlling depth of 7 feet. A privately maintained seasonal light marks the west jetty. A buoy 0.9 mile south-southwestward of the entrance marks the approach. The villages of **Davisville** on the east shore of the pond and **Acapesket** on the west shore 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 September 1964, it was reported that 7 feet could be carried to a marina and boatyard on the east shore at the bridge. The boatyard has a 7-ton travelift that can haul out craft up to 35 feet in length for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel by truck, water, ice, marine supplies, moorings and berthage in 7 to 9 feet, and a ramp are available.

Fuel, water, moorings, berthage, and a concrete ramp are available at an outboard marina on the west end of the bridge.

Other ports on the south side of Cape Cod westward of Green Pond are described in chapter 5.

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 19 to 22 feet extends about 1 mile northward from these buoys; a lighted bell buoy marks the northern side of the shoal water. In 1963, a rock covered 11 feet was located about 2.2 miles southeastward of Nantucket Light.

Squam Head, a summer resort, is 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.), 166 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 bus communication 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, several radio towers, and the cupola of a former Coast Guard station on the west side of the island near **Long Pond,** 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 fishing vessels and a few pleasure craft. Privately maintained 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, on the western side of Nantucket Island, is shoal with depths from 2 to 10 feet. A channel, marked by privately maintained buoys, floats, and markers, has been dredged to about 6 feet from Madaket Harbor into **Hither Creek.** In 1964, a depth of about 5 feet could be carried over the bar entering from Nan-

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tucket Sound. Local knowledge is required to enter the harbor from north or southwest. A public boat landing and a boatyard are in Hither Creek. A railway at the boatyard can haul out craft up to 30 feet in length for hull and engine repairs and dry open or covered storage. Fuel, berthage, and marine supplies are available.

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 ferries from Woods Hole and Hyannis carry passengers, vehicles, lumber, seafood, and general cargo. A passenger ferry also operates from Falmouth in summer.

Prominent from offshore are: a standpipe about 1.5 miles west of Nantucket; a gilded cupola atop a church clock tower, 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.—In 1962, the controlling depth was 13 feet in the entrance channel to Nantucket Harbor and to an anchorage area eastward of the wharves.

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.

A 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 **202.142,** 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 steamboat wharf.

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 or, draft permitting, in Polpis Harbor.

Routes.—Vessels approaching Nantucket Harbor from Pollock Rip Channel can set a direct course from Handkerchief Lighted Whistle Buoy H to the bell buoy off the entrance. Approaching from the channel northward of Cross Rip Lighted Horn Buoy 21, pass to the eastward of Tuckernuck Shoal Lighted Bell Buoy 1, and then head for the 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.

Fogs are frequent during the summer months and are apt to shut in almost without warning. Except in severe winters, 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** and **storm warning display.**

A Public Health Service **outpatient office** is in Nantucket.

There is a **harbormaster** but no pilot service. The larger fishing vessels may act as towboats in emergencies.

The depths at the wharves range from 6 to 13 feet. The most northerly large wharf is the steamboat wharf. A submerged pier and the remains of a pier uncover at low water off the next pier southward. Unpainted pile dolphins mark the former pierhead. The water eastward of the dolphins is foul. Submerged piers extend off the next pier southward and off the southernmost wharf, the northern one of which is marked by a private buoy. Vessels proceeding to any of the wharves should exercise caution to avoid these submerged piles. North of the steamboat 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.

There are marinas, service wharves, and a boatyard at Nantucket. The boatyard, 0.5 mile southward of the steamer pier, has a 20-ton travelift that can haul out craft up to 55 feet in length for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, moorings, and berthage are available.

There is communication with the mainland by ferry. An airline operates daily between New York and Boston. Bus and taxicab transportation are 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 12 feet. **Long Shoal,** northwestward of Shovelful Shoal, is covered 3 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 slue 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 aviation light near the center of the island; a chimney on a house eastward of **Chilmark** in the western part; a church spire near Chilmark; a tall radar dome 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. **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 buoys. 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 fishermen.

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.

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 end of the jetty on the west side of the head of Edgartown outer harbor. A wooden tower and flagpole about 0.2 mile northwestward of the light, a church belfry in the town, a microwave tower 1.3 miles southwestward, and a standpipe 0.8 mile southward are prominent.

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 in the town. In 1964, the controlling depth was 16 feet from the sound 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.

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; for limits and regulations, see **202.1** and **202.38**, chapter 2.

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 15 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 had a least depth of 10 feet in 1965.

Routes.—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; for predictions, see the Tidal Current Tables. The average velocity is about 1 knot.

Fogs are prevalent during the summer months 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. The tidal currents keep the inner harbor open except for a few days at a time during severe winters. See appendix for **storm warning display.**

There are no pilots for Edgartown Harbor. Towboats are seldom used, and none are available. Fishing craft will act as tugs in an emergency.

A Public Health Service **outpatient office** is located in Edgartown. The **harbormaster** has control of the anchorage of vessels in the harbor; he will usually be found at the Town Wharf. He can be reached by phone: Edgartown 137. Copies of harbor regulations may be obtained from the harbormaster. A great many yachts and pleasure craft use the harbor in the summer.

The depth at the Town Wharf is 25 feet. Depths at the other wharves are about 11 feet. There are two marinas, a boatyard, and a yacht club. The boatyard has a marine lift that can haul out craft up to 38 feet in length for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel, water, ice, marine supplies, moorings, and berthage are available.

A small ferry operates between Edgartown and Chappaquiddick Island. No schedule is maintained, but the ferry runs on call. There is frequent bus service to Oak Bluffs, Vineyard Haven, and other island points. Ferries connect Oak Bluffs and Vineyard Haven with Woods Hole, Falmouth, and Hyannis. Through railroad passenger trains run from Woods Hole to New York and there is bus service to Boston. Paved roads connect all points on the island.

Sengekontacket Pond, about midway between Edgartown and Oak Bluffs, has two entrances which are shoal. The northerly entrance is preferable, and is navigated by boats of 2-foot draft or less. Both entrances are crossed by fixed highway bridges which have 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 60° 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 1965, the depth in the entrance and the basin was reported to be 8 feet. East Chop Yacht Club is on the north side of the basin and several private piers are on the west side. The town wharf extends along the bulkhead on the south and east sides of the basin. Free berthage with electricity, in 8 feet of water, a ramp, and free guest moorings are maintained by the town. Gasoline, diesel fuel, water, ice, some marine supplies, moorings, and

berthage are available. Martha's Vineyard hospital is on the beach road close westward of the town. A **harbormaster** is at the town wharf. He can be reached by phone: Vineyard Haven—238W or 945.

Oak Bluffs Wharf, about 0.2 mile southward of the breakwater light, is reported to have a depth of 13 feet at the head. There is regular ferry service from the wharf to Woods Hole and Hyannis. Regular 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

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 have been designated in Vineyard Sound; see **202.140**, 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 3.0 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; also Tidal Current Charts, Narragansett Bay to Nantucket Sound.

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 bell buoy, 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 breakwater which is about 2 feet above high water is on the flats on the western side of the harbor near the head. A light is on the southeastern end of the breakwater; a fog signal is sounded at the light.

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.

Anchorages.—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 11 to 14 feet.

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 0.5 mile northward of the breakwater light.

Tides and currents.—The mean range of tide is about 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.

See appendix for **storm warning displays.**

The **harbormaster** has control of the anchoring of vessels in the inner harbor; he will usually be found at the boatyard on the southeast shore of the harbor or at the municipal wharf about 200 yards north of the ferry wharf. He can be reached by phone: Vineyard Haven-400.

Pilots and towboats are not available; however, fishing boats will act as tugs in an emergency.

The ferry wharf at the head of the channel has a depth of 24 feet at the outer face. The ferry slip angles off the north side of the wharf. There are several other wharves, a marina, and two boatyards. The largest marine railway can haul out craft up to 40 feet in length for hull and engine repairs and dry open or covered storage. The yacht club is on the north shore of the harbor. Gasoline, diesel fuel, water, ice, marine supplies, and berthage are available at the wharves, marina, and boatyards. Free guest moorings are maintained by the town off the municipal wharf and other moorings can be hired from the boatyards and marina. The Martha's Vineyard hospital is on the beach road near Oak Bluffs. An **outpatient office** of the Public Health Service is at Edgartown.

The ferries maintain year-round service from Woods Hole and other ferries and excursion boats operate in summer from Hyannis and Falmouth. Air service is available from Martha's Vineyard airport about 4 miles south of the town.

Lagoon Pond, eastward of the town, is entered through a jettied channel which has a controlling depth of about 4 feet. It is used by local pleasure and fishing craft. Depths in the pond range from 5 to 25 feet with shoaler depths near the shore. **Robbins Rock** is off the west shore halfway down the pond. A highway bridge crossing the entrance has a 30-foot bascule span with a clearance of 15 feet. The bridge will be opened day or night upon advance notice to the bridge tender who works at a nearby garage.

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 craft 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 **202.140,** chapter 2, for limits and regulations of the anchorage areas.

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 shoals 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 tidal lagoon about 0.7 mile long and less than 0.1 mile wide. A tall standpipe about 1.5 west of Falmouth is one of the most prominent landmarks in this vicinity. The yacht club dock and flagpole are conspicuous from close inshore. The entrance to the harbor is protected by two jetties; a light is shown from the end of the west jetty. In 1963 the controlling depth was 10 feet in the entrance channel decreasing to 8 feet in the inner harbor.

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.

See appendix for **storm warning displays.**

There are four marinas and three boatyards in the Inner Harbor and town wharves at the bulkheads on either side just inside the entrance. The Falmouth Marina, operated by the town, on the west side halfway up the harbor has berths, moorings, water, and a free concrete ramp. A **dockmaster** is in attendance and can be reached by phone: Falmouth 548–9796.

There are six marine railways at the boatyards in the harbor, the largest of which can haul out craft up to 100 feet in length for hull and engine repairs and dry open or covered storage. There is also a 25-ton travelift, a 6-ton marine lift, and cranes up to 10 ton capacity.

Gasoline, diesel fuel, fresh water, ice, marine supplies, berthage, and moorings are available. A ferry operates

in summer to Vineyard Haven and 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.

See appendix for **storm warning display.**

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 is a landlocked pond on the northwest side of Martha's Vineyard. In 1960, the narrow entrance to the lake was dredged to 6 feet. Privately maintained seasonal buoys mark the channel through a shoal area just inside the entrance. General depths in the lake are from 3 to 10 feet.

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 with depths of 25 to 60 feet, sticky bottom. 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, is about 3 miles eastward of Gay Head Light. The entrance to the creek is protected by two stone jetties. The east jetty is marked by a light. A bell buoy 300 yards northwestward of the light marks the approach.

Menemsha is a small fishing village on Menemsha Basin on the north shore just inside the entrance. The creek extends about 0.7 mile southward from the entrance to **Menemsha Pond,** a rectangular basin about 1 mile long and 0.7 mile wide. The pond has general depths from 2 to 18 feet with the deepest water in the southern half of the basin.

In October 1965, the controlling depth was 10 feet to Menemsha Basin, thence 8 feet to Menemsha Pond. Buoys and a seasonal privately maintained daybeacon mark the channel.

Tides and currents.—The mean range of tide in Menemsha Bight is 3.0 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 free moorings in the basin or the pond, or berthage at the public facilities at the Ducher Dock on the northeast side of the basin. Commercial fishermen 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. A harbormaster is in attendance at the Ducher Dock.

Gasoline, diesel fuel, water, ice, and marine supplies, are available. There is bus service to Vineyard Haven and 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.

No Mans Land is a prominent, high, rocky island about 5.5 miles southward of Gay Head. 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** has been designated surrounding No Mans Land; see **204.5,** chapter 2, for limits and regulations.

Several sunken rocks and ledges are in the passage between No Mans 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 a narrow passage from Vineyard Sound to Buzzards Bay between the southwestern tip of Cape Cod and **Nonamesset Island,** the easternmost of the Elizabeth Islands. Little and Great Harbors comprise the eastern portion of Woods Hole; Hadley Harbor is in the western portion. The passage is 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 Vine-

yard Sound or Buzzards Bay. The deepest draft entering Great Harbor in 1963 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. 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 Fish and Wildlife Service and the Marine Biological Laboratory are also prominent.

Channels.—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 frequently 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 Strait is the passage leading westward from Great Harbor into Woods Hole and thence into Buzzards Bay. In March 1963, the midchannel controlling depth was 12 feet through The Strait from Great Harbor to Woods Hole.

Broadway is the southerly of the two entrances to The Strait; in March 1963, the controlling depth was 12 feet. The northerly entrance from Great Harbor into The Strait is a straight reach and is deeper. It is preferred over Broadway with its sharp turn, which is difficult in strong currents.

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.—For limits and regulations of deepwater anchorages in the vicinity of Woods Hole, see **202.140,** chapter 2. An anchorage at the head of Great Harbor is about 0.2 mile square. Depths are irregular, ranging from 20 to 60 feet; the holding ground is poor. Shoals covered 5 to 9 feet are northwest of the anchorage. About 200 yards northwest of the Fish and Wildlife wharf is good anchorage in depths of 30 to 48 feet. Small craft can find good protection 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,** awash and 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 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 1.3 feet off Little Harbor at the east end of the passage, about 1.8 feet off Woods Hole Oceanographic Institution, and 3.6 feet off Hadley Harbor at the west end of the passage. Strong northwesterly winds may lower the water in the passage as much as 2 feet.

In The Strait, the narrowest part of the passage southward of Penzance Point, the velocity of the tidal current is about 3.5 knots. For predictions, see the Tidal Current Tables. Hourly velocities and directions are shown on Tidal Current Charts. Both the velocity of the current and time of slack water are effected 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 Fish and Wildlife wharf, the currents are barely perceptible, and vessels at anchor lie head to the 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.

See appendix for **storm warning display.**

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 Buoy 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.—On the eastern side of Great Harbor are the Woods Hole Pier of the Woods Hole-Martha's Vineyard and Nantucket Steamship Authority, where the ferries land, and the railroad depot. North of this wharf are the buildings and wharf of the Woods Hole Oceanographic Institution; the wharves of the Marine Biological Laboratory; the wharf, basin, and buildings of the Fish and Wildlife Service; the Town Pier; and several private landings. Depths at the principal piers vary from 11 to 30 feet. A breakwater extends about 90 yards southwestward from the south end of the Fish and Wildlife 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 to 20 feet. In 1964, the narrow entrance to the pond was reported to have a 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 emergency, local authorities keep the bridge closed from 8:30 p.m., to 6:30 a.m., from 7:45 a.m. to 8:30 a.m. and for a period of fifteen minutes before and after arrival and departure of the ferries and trains. From September 15 to June 15, the bridge is opened on 2-hour intervals from 7 a.m. to 7 p.m. 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 and can be reached by phone: (KI-8-0861). There is rail passenger and bus service during the summer and bus service during the remainder of the year.

Little Harbor, the easternmost cove in Woods Hole, is a base for Coast Guard operations. A buoyed channel with a controlling depth of about 17 feet leads from Vineyard Sound to a turning basin off the Coast Guard wharf on the west shore. 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, 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. A mooring buoy is available. 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. Predictions and detailed information may be obtained from the Tidal Current Tables and Tidal Current Charts.

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. Bouys 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 bouy, 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. For predictions, see the Tidal Current Tables, and for the hourly movement, the Tidal Current Charts.

Penikese Island, grassy and hilly, is about 1.3 miles northwesteward of **Knox Point,** the northwestern extremity of Noshawena 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. A **danger area** is centered on Gull Island; see **204.5,** chapter 2, for limits and regulations.

Local magnetic disturbance.—Differences of as much as 3° from normal variation have been observed on Cuttyhunk Island between Buzzards Bay and Vineyard Sound.

Cuttyhunk Harbor is formed by the bight between Nashawena Island and **Cuttyhunk Island,** the westernmost 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 northward. Weatherbound 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, a lookout tower on the highest part of the 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 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, has depths from 3½ to 14 feet. The channel is used by small local craft. A rocky shoal, covered 3½ feet, is in the middle of the southern entrance.

The buoys at this entrance are often dragged off station by strong currents and heavy seas. This channel should never be used during a heavy ground swell. With southerly winds, heavy seas will break across the entrance.

Channels.—A Federal project provides for a 10-foot channel from Cuttyhunk Harbor into Cuttyhunk Pond to a turning basin at the westerly terminal in the pond and an anchorage basin in the eastern part of the pond north of the channel. In 1963, the controlling depth was 9½ feet in the entrance channel and 9 feet in the basin. The jettied entrance is marked by a light on the north jetty and a daybeacon on the south jetty. A buoy marks the entrance to the channel.

Anchorages.—Small craft can anchor in Cuttyhunk Pond in depths of 9 to 10 feet. Anchorage may be had in depths of 12 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 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 Cutty-

hunk 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. For predictions, see the Tide Tables, Tidal Current Tables, and the Tidal Current Charts.

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 are available on the island. The harbormaster can be reached by phone on 966-9295. There is daily launch service with New Bedford and 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 exercise 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°0.2.0′ 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 danger zone and fishtrap area in the vicinity. Two anchorage areas are off the western entrance to Cape Cod Canal; for limits and regulations, see **202.140**, chapter 2.

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 18 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. For predictions, see the Tide Tables, and the Tidal Current Tables; set and drift of the tidal current at hourly intervals are given on the Tidal Current Charts.

Ice.—The head of Buzzards Bay and the harbors in that vicinity are generally closed to navigation during the winter months. The approaches to the harbors on the eastern shore are rendered dangerous by drift ice. In severe winters this 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 bouys when endangered by ice.

See appendix for **storm warning displays.**

Pilotage.—All vessels requiring a pilot, coming from offshore and bound for eastern ports via Cape Cod Canal, can contact the Cape Cod Canal Pilots through the Boston Marine operator by radiotelephone or radio "PILOTIN", or by phone: (Buzzards Bay) 759–5571. Upon advance notice of 4 to 6 hours, pilots will meet vessels at the west end of Cleveland Ledge, or by special request at Brenton Reef Light. The pilots maintain 24-hour service. The pilot boat is painted black with buff housing with the name PILOT in white on the bows, and flies the code flag P. The pilot boat is equipped with radiotelephone, 2350 kc.

Towboats are available at New Bedford for work in the inner harbor only. Special arrangements are necessary for towboats to assist vessels in Cape Cod Canal.

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, which in 1964, was reported to have a depth of 12 feet. Anchorage can be found in the middle of the harbor in depths of 11 to 18 feet, sticky bottom. Local craft generally anchor in the northeastern part of the harbor off the yacht club or off a boatyard at **Quissett** on the northeast shore of the harbor. The boatyard has an t-shaped pier and a float which was reported to have about 15 feet alongside. The two marine railways can haul out craft up to 35 feet in length for hull and engine repairs, and dry open or covered storage.

Gasoline, water, ice, berthage, moorings, and some marine supplies are available.

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 privately maintained 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 seasonal lighted bell buoy and two buoys marking reefs extending westward from both entrance points. A rock, covered 4 feet, is 700 yards eastward of the end of the south jetty.

In 1964, it was reported that 6 feet could be taken through the narrow 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. Gasoline, diesel fuel, water, ice, berthage and moorings, and some marine supplies are available at the wharf which was reported to have 6 feet alongside.

See appendix for **storm warning displays.**

Routes.—To enter, steer east by south 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, 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 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 **202.1**, and **202.40**, chapter 2, for limits and regulations.

There is a town wharf and surfaced ramp in the basin. Water, ice, and provisions can be obtained.

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 9 feet can be carried to an anchorage in depths of 18 to 22 feet. **Cataumet Rock,** covered 7 feet and marked by a buoy, is on the south of the entrance; Seal Rocks are on the north side.

Fiddler's Cove is a small-craft harbor on the south shore 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 privately maintained light marks the entrance and privately maintained red and black pile beacons mark the channel. Gasoline, diesel fuel by truck, water, ice, berthage, and moorings are available. There is a surfaced ramp and craft up to 40 feet in length can be hauled out for engine repairs and dry open or covered storage. In 1964, 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; no facilities were observed in 1964.

Squeteague Harbor, northward of Megansett, is entered through a narrow channel from the head of Megansett Harbor. The privately marked channel has a reported depth of about 4 feet. The village of **Cataumet** is northeast of the harbor.

Seal Rocks, partly bare at half tide and marked by a buoy, are about 0.3 mile southwestward of Scraggy Neck, on the north side of Megansett Harbor entrance. 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 lies between Scraggy Neck and Wings Neck. **Bassett Island** separates the inner part of 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. From 0.3 mile eastward of Eustis Rock to Bassett Island the harbor is shoal.

A narrow buoyed channel with a depth of about 6 feet leads north of Bassett Island to the inner part of Pocasset Harbor. **Barlows Landing** at the northeast end of the harbor, has a depth of 1½ feet. From Eustis Rock a draft of 6 feet can be carried through a natural buoyed channel southeastward to a small anchorage with depths of 8 to 15 feet in **Hospital Cove.** 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 and **Hen Cove** are eastward of Bassett Island. Channels into Red Brook Harbor, marked by buoys, round the north and south ends of Bassett Island. Craft drawing up to 6 feet can be taken through the northerly channel and 4 feet via Hospital Cove through the southerly channel. Mariners should stay in the buoyed channel through Hospital Cove. Two rocks, that bare at halftide and marked by a buoy, are 0.2 mile northwestward of **Long Point.**

A conspicuous tower resembling a lighthouse is at a marina on the east shore about 500 yards southeastward of **Handys Point.** There is a 12-ton Travelift and a marine railway at the marina that can haul out craft up to 50 feet in length. A boatyard is in the cove on the east shore about 300 yards south of the marina. Its marine railway can haul out craft up to 45 feet in length. Hull and engine repairs and dry open and covered storage are available at both places.

Gasoline, diesel fuel, water, ice, marine supplies, berthage, and moorings are available. There was reported to be 9 feet at the berths at the marina and 7 feet at the boatyard. See appendix for **storm warning displays.**

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 are displayed from a tower on Wings Neck; see **207.20,** chapter 2, for details.

See appendix for **storm warning displays.**

Pocasset River, close northeastward of Wings Neck, has been dredged to 6 feet as far as the highway bridge. The entrance is protected by jetties. The bridge has a fixed span with a clearance of 7 feet. Only very small boats go above the bridge. A boatyard on the south bank at the bridge has a marine railway that can haul out craft up to 40 feet in length for hull and engine repairs and dry open or covered storage. Gasoline, diesel fuel by truck, water, berthage, and some supplies are available. A town wharf is on the north bank at the bridge. Berthage and water are available at the floats.

Tobys Island, on the south side of Phinneys Harbor, is connected to the mainland by a causeway.

Phinneys Harbor, northward of Pocasset River, is entered between **Mashnee Island** and Tobys Island through a buoyed channel with depths of 13 to 30 feet. A light is at the bend of the channel which leads to a small-boat anchorage inside. Mashnee Island is no longer an island but is 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, a crane, 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 and marina are on the south bank between the bridges. A marine railway can haul out craft up to 35 feet in length for hull and engine repairs and dry open or covered storage. There is a 5-ton mobile lift at the marina.

Gasoline, diesel fuel by truck, water, ice, marine supplies, berthage, and moorings, and a surfaced ramp are available.

Fuel, water, and berthage are available at a pier at **Gray Gables** on the south side of the cove across the canal from Taylor Point. A town 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.

Regulations governing use, administration, and navigation of Cape Cod Canal are given in 207.20, chapter 2.

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; approximately 1,000 feet west of the Buzzards Bay Railroad Bridge; at the westerly entrance of Hog Island Channel at Wings Neck and 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 two tanks on the mainland northeastward of Hog 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 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 Cape Cod Canal. The controlling depths are published in Notice to Mariners and shown in tabulated form on the latest print of the chart. 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 **202.140,** chapter 2, for limits and regulations.

In May 1964, the mooring basin on the east side of the channel abreast Hog Island, close southwestward of the landcut, had a controlling depth of 24 feet in the northern part and 28 feet in the southern part. In May 1964, the mooring basin just inside the eastern entrance to the canal, had a controlling depth of 19 feet except for a depth of 7 feet in the northeastern corner of the basin. In 1964, the small boat basin on the south side of the channel just inside the eastern entrance to the canal, had a controlling depth of 8 feet. There are tieup dolphins in the mooring basins at both ends of the canal.

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 **207.20,** chapter 2, for operating regulations. The highway bridge at Bourne, 9 miles above Cleveland 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.

See Appendix for **storm warning displays.**

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.

The pilot boat is painted black with buff housing with the name PILOT in large white letters on the bows, and flies the code flag P. The boat is equipped with radiotelephone—2350 kc.

Pilots can be obtained by radio, telegraph (PILOTIN) or radiotelephone—phone: (Buzzards Bay) 759–5571, or through the Canal Dispatcher (see Communications). They may also be obtained by making a signal off either of the canal entrances. Advance notice is advisable. See **207.20(j)** Management of vessels, chapter 2, for Corps of Engineers directive on Cape Cod Canal pilotage.

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 1965, the reported 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.

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. There are grids in the basin on which small craft can be ground out for emergency repairs. Temporary berthage and anchorage are also available at the basin. A seafood freezer plant is in the basin.

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, Plaza 9–4431; bridge-to-bridge radiotelephone 156.65 mc.; ship-to-shore telephone station at Scituate (call letters WOU); radiotelegraph station at Chatham (call letters WCC) thence messages are relayed by telephone to the canal authority.

The radiotelephone at the canal office in the village of Buzzards Bay is in continuous operation. Call letters are WUA21 and the frequency is 2350 kc. Only calls on that frequency or on 2182 kc. can be answered.

Vessels equipped to communicate on 2350 kc. are requested to keep their radiotelephone 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, Massachusetts.

Buttermilk Bay, at the northeast end of Buzzards Bay has general depths of 2 to 7 feet. A narrow buoyed channel and **Cohasset Narrows** connect the bay with Cape Cod Canal. A Federal project provides for a channel 7 feet deep across the sand bar in the channel to Cohasset Narrows. In July 1964, the controlling depth was 4 feet for a width of 100 feet. Two bridges cross Cohasset Narrows; the railroad bridge has a bascule span with a clearance of 6 feet; the drawspan has never been in operation, the bridge being used as a fixed bridge. The highway bridge has a fixed span with a clearance of 9 feet. The only facilities in Buttermilk Bay are small piers for shallow-draft boats.

Butler Cove, on the western side of Cohasset Narrows southwesterly of the bridges, has depths of 3 to 5 feet.

Onset Bay, the approach to the village of **Onset,** is entered by a 15-foot project channel between **Sears Point** and **Hog Neck.** In April 1964, the controlling depth was 11 feet.

Wickets Island is a high and wooded islet in the middle of the bay, marked by a large dwelling. Strong currents frequently tow under the buoys in the entrance channel. A rock covered 8 feet is about 75 yards northeast of Hog Island Channel Light 11, near the entrance channel.

A special anchorage area is in Onset Bay; see **202.1** and **202.45,** chapter 2, for limits and regulations. Depths in the approach range from 8 to 15 feet. Additional anchorage may be found off the town wharf in depths of 9 to 15 feet. The wharf has a depth of about 14 feet at its face; the office of the harbormaster is on the wharf. Gasoline, oil, water, ice, and some supplies can be obtained. A boatyard with a marine railway can haul out craft up to 65 feet in length for engine and hull repairs. Dry storage can be obtained. Bus and limited railroad service are available.

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.

The Sand Spit (Stony Point Dike), a sandspit breakwater about 5 feet high, extends about 1.8 miles south-southwesterly from Stony Point to Abiels Ledge. The

breakwater protects Hog Island Channel. **Abiels Ledge,** between the channel and the south end of the dike, is covered by 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 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 8 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. The river offers no anchorage except in the channel. Highway and railroad bridges over the river above the wharves have 28-foot fixed spans with 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. Current predictions for Wareham River may be obtained from the Tidal Current Tables. The river **ices** over for short periods each winter.

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 from 5 to 11 feet. **Speed** in the harbor channel is limited to 5 knots. Gasoline, water, and a limited amount of marine supplies are available. A boatyard has a marine railway capable of hauling out craft up to 40 feet in length. Depths are 6 feet alongside the boatyard wharf. Bus and rail communications serve the town.

Cedar Island 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. A 6-foot channel has been 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.

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,** an isolated 17-foot spot 1.1 miles southward of Bird Island, is marked by a 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, the conspicuous house and flagpole on Converse Point, and several tall radio masts at the head of the bay. The standpipes on Sippican Neck and in Marion can also be seen for a considerable distance.

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.

Blankenship 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 privately maintained 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

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by private seasonal buoys.

The mean range of **tide** in Sippican Harbor is 4.0 feet. **Ice** usually closes the harbor about a month or more each winter. The depth at the wharf at Marion is about 5 feet. Three boatyards with marine ways are in the vicinity. The largest ways can handle vessels up to 50 feet in length. Dry storage is available. One yard has some marine supplies; its dock has about 5 feet alongside. Gasoline, diesel fuel by truck, water, ice, marine supplies, and provisions are available. The **harbormaster** can usually be found at the boatyard in Marion.

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 in length 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. Rocky, shoal water surrounds 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 **Sconticut Point,** has 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. By water 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 Sconticut 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 Palmer Island; the inner harbor consists of the area north of the island 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 and petroleum products, lumber, fish, and textiles; exports are soft drinks and frozen fish. Commercial fishing craft operate from the ports. The deepest draft entering is about 28 feet.

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, 3 miles west of the channel is conspicuous. Just northwest of the old tower on Round Hill Point are several radio towers. **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** and **Crow Islands** in the inner harbor.

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. 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 will be closed on the approach of a hurricane. Lights marking the eastern and western sides of the opening are shown from the top of each of the two gate operations houses, 45 feet above the water. A fog signal is sounded from the west barrier light.

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, 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 0.5 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 **202.140,** 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 on the south side.

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. Deep-draft vessels should pass through the west opening. See **203.80,** chapter 2, for drawspan regulations. About 1 mile above this drawbridge is the Coggeshall Street Bridge, formerly a drawspan which now remains closed. It has a clearance of 4 feet. About 2 miles above the Coggeshall Street Bridge is a fixed bridge with a clearance of 6 feet.

Tides.—The mean range of tide is about 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. See appendix for **storm warning displays.**

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 ice in the harbor.

Pilotage.—Pilotage is compulsory for foreign vessels and U.S. vessels under registry. 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 due to weather or other reasons, anchor about 0.5 mile southward of the lighted bell buoy.

Towage.—Although vessels usually proceed to and from the harbor without assistance, towboat aid sometimes is needed in docking and undocking large vessels. Tugs are available for such use, and arrangements for such services are generally made through ships' agents or directly by shipping companies.

Quarantine.—The Public Health Service conducts quarantine inspection of vessels and their crews at dockside. There is no quarantine hospital in New Bedford. Vessels with quarantinable diseases on board are remanded to ports having such facilities. The Public Health Service maintains an outpatient office. The United States contract hospital is St. Lukes. New Bedford has several hospitals.

Customs and Immigration.—New Bedford is a port of entry and marine documents are issued. The Immigration Service is controlled through Boston.

Harbor regulations.—The New Bedford 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 docks. State laws forbid pollution and dumping of refuse and rocks inside the harbor. The harbormaster has an office on Pier 3.

Wharves.—The State Pier at the foot of Union Street, has three deep-water berths, adequate to dock modern design vessels; 600 feet on the north side, 775 feet on the south side, and 450 feet on the east side; depths of 30 feet are reported alongside. The State Pier borders a 30-foot deep anchorage and turning basin. Covered and open storage is available; potable water is available if necessary.

In addition to the State Pier, there are numerous privately owned piers.

Supplies.—Diesel oil, water, gasoline, provisions, and supplies of all kinds are available. Bunker fuel oil is handled in adequate quantities and by rapid delivery rate. Several docks and yards supply diesel oil. The water is excellent for domestic and boiler use; a water boat services it to craft at anchor and several piers sell fresh water.

Repairs.—Three boatyards are at Fairhaven and one at New Bedford. The largest marine railway can haul out craft up to 130 feet in length, 500 tons in weight, and 13 feet in draft. Facilities are available for making repairs to boilers, dynamos, and machinery. Iron, brass, or bronze castings are obtainable. Adequate wet and dry storage is offered. In 1965, derrick lighters, some having air compressors, and diving equipment were 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.

Apponagansett 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. 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 **203.81,** chapter 2, for drawspan regulations. 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 50 feet in length.

See appendix for **storm warning displays.**

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 are several radio masts.

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. The mouth of the river is between **Horseneck Point,** 2.7 miles northeast of Gooseberry Neck, and **The Knubble,** a protruding mound of granit 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 use 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.

Two highway bridges cross at Westport Point, about 2 miles above the mouth. The first, a hand-operated swing bridge, has a channel width of 34 feet in the north draw and 29 feet in the south draw, and a clearance of 6 feet. The second, about 250 yards above the swing bridge, has a 49-foot bascule span with a clearance of 21 feet at the center. 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 Light, 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. For current predictions, see the Tidal Current Tables.

At Westport Point are two piers where fishing and pleasure boats tie up. 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 in length 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

Chart 353.—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 (Aquidneck 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 12 miles up the channel, and thence a depth of about 35 feet 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 **202.145,** 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 one mile 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 029° for about 9 miles to a position 0.4 miles 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.

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 between 1 and 1.5 knots occur at the bridges in Seekonk River, a velocity of about 2 knots in the narrows at the mouth of Kickamuit River, and a velocity of approximately 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.

Refer to Tidal Current Tables and Tidal Current Charts for predictions and details of the current movement.

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.

See appendix for **storm warning displays.**

Pilotage.—Pilotage is compulsory for foreign vessels and U.S. vessels under register when proceeding north of a line extending from Point Judith to Brenton Reef Light, thence to Sakonnet Point. State pilots are available in the vicinity of Brenton Reef Light, but on request some will board at Block Island Southeast Lighted Whistle Buoy, or Block Island North Reef Lighted Bell Buoy 1BI. The pilot boats are equipped with VHF and medium frequency radiotelephones. Arrangements should be made through ships' agents or directly by shipping companies; 24-hour service is provided.

Sakonnet River, on the easterly side of Narragansett Bay, is betwen 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.

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 and Charts for further details. 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. A dredged depth of about 8 feet is in the harbor. A yacht club wharf on the east shore of the harbor has a depth of about 5 feet alongside. Gasoline, diesel fuel, limited supplies, and minor hull repairs are available.

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 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 northwest 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. A marine railway at Tiverton can haul out craft up to 55 feet in length; gasoline, diesel fuel, water, ice, some marine supplies, and complete engine and hull repairs are available. Bus communication is also available.

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; the overhead power cable below the fixed bridge has a clearance of 95 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 0.8 mile north 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.

In 1965, construction was started on the new Narragansett Bay Bridge, a fixed highway bridge, over East Passage, between Jamestown and Newport. Temporary steel survey towers, with piers close inside, have been erected in the channel during construction of the bridge; towers and piers are marked by lights. Mariners are urged to exercise extreme caution when transiting the channel and to proceed between Pier 1E (Tower 2) on the east side of the channel, and Pier 1W (Tower 1) on the west side of the channel; clear width between piers is about 510 yards.

Brenton Reef Light (41°25.6′ N., 71°23.3′ W.), 87 feet above the water, is shown from a tower on a red square superstructure on black piles. The name BRENTON, in large white letters, is on each side and the piles are floodlighted at night. A fog signal and 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 south of the point.

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 a light; a fog signal is at the light. A Coast Guard station is on the hill northeast of the light. **Butter Ball Rock,** a small bare rock about 0.2 mile south of the light, is marked by a bell buoy.

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. **Fort Wetherill** is on the point. On the eastern arm of the point is a prominent building with a cupola. Buoys mark 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, 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.

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.—Many prominent objects will be seen whether the approach is from southward or northward: The red and gray buildings on Goat Island; a white building of the yacht club near Ida Lewis Rock in the southerly part of the harbor; a spherical gas tank near the southerly end of the waterfront; a brick stack which is the tallest object on the waterfront; church spires in the town; the buildings of the training station and Naval War College on Coasters Island in the north part of the harbor; and a tower and 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 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. In 1965, the depth into the inner harbor was reported to be about 19 feet.

Anchorage areas have been designated in the outer and inner harbor and, except in emergencies, vessels must anchor in these areas; see **202.145,** 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, 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.

The breakwater at the north end of Goat Island should be given a berth of 150 yards. Lights and buoys mark the island and its shoal areas.

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 rock covered 1 foot and marked by a buoy is about 100 yards south of Rose Island. **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, about midway between Rose and Coasters Harbor Islands, are marked by a light and buoys. Vessels may pass as close as 100 yards eastward and westward of the light, but shoals and rocks extend over 200 yards northward and about 300 yards southward of the light. Deep-water channels extend between Gull Rocks, Rose, and Coasters Harbor Islands. The channel between the rocks and Coasters Harbor Island is the safer one for strangers. A rock covered 17 feet is 0.3 mile north-northwestward of Gull Rocks Light, and is marked by a buoy.

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 south of the island; a buoy marks the rock. Numerous buildings are on the island. Three highway bridges connecting the island to Newport have fixed spans with a width of 31 feet and a clearance of 3 feet.

The western portion of the outer harbor is generally free of dangers northward of The Dumplings.

Tides.—Daily predictions of the times and heights of high and low waters for Newport are given in the Tide Tables. The mean range of tide is 3.5 feet.

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 further details.

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.

See appendix for **storm warning displays.**

Pilotage.—See pilotage at the beginning of this chapter.

A **towboat** is available at Newport Harbor. Towboats may also be obtained from Providence on about three hours' notice.

Quarantine.—Vessels bound for Newport and subject to quarantine inspection are boarded at dockside. There

is no quarantine hospital at Newport. A vessel arriving with quarantinable diseases on board is refused entry and is remanded to one of the larger ports where quarantine facilities are available. A Public Health Service outpatient office and a Naval hospital are at Newport.

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

Immigration.—There is no immigration office in Newport. An official from the Providence Office visits Newport when necessary on call from the Collector of Customs. All foreign ships are inspected.

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 at the principal piers range from about 11 to 18 feet alongside.

Supplies.—Diesel oil, diesel fuel, bunker oil, gasoline, water, provisions, and marine supplies may be obtained at Newport. Facilities are available for supplying diesel directly to vessels from storage tanks. Arrangements can be made for delivery of bunker oil by barge and tank truck. Water for drinking and boiler purposes is available at most of the oil company wharves.

Repairs.—There are several boatyards and marinas in Newport. The largest marine railway can haul out craft up to 180 feet in length. Complete small-craft engine and hull repairs can be made.

Communications.—Newport has bus and rail freight communications. A ferry operates between Jamestown and Newport. In the summer months 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. There are two boatyards at Jamestown. The largest marine railway can haul out craft up to 80 feet in length; gasoline, water, ice, some marine supplies, and complete engine and hull repairs are available.

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 north 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,** submerged rocks 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; depths of 33 to 35 feet are alongside. Several tanks and navy buildings on shore are conspicuous. A lighted range in the cove provides ships a guide for making the north side of the inner berth of Pier 2.

Danger zone.—A naval torpedo testing range is in the vicinity of Gould Island; see **204.10,** chapter 2, for limits and regulations.

Gould Island, a military establishment, 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 East Passage buoyed channel 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 Melville range. North of Dyer Island is a reef with depths of 10 to 18 feet.

Melville, a naval fueling facility, is on the west shore of Rhode Island, east of Dyer Island. Depths alongside the fueling piers range from 17 to 35 feet. An elevated tank here is prominent.

Near **Arnold Point,** about 2 miles north of Melville on Rhode Island, is a large prominent lumber mill with a conspicuous stack and elevated tank adjoining it. A privately maintained channel with a depth of about 26 feet 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 over 35 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 cotton manufacturing center as well as a distribution point of petroleum products. Principal products handled through the port are petroleum products, latex, oil, coal, and some lumber.

Somerset, about 5.3 miles, and **Dighton,** about 7.5 miles above Fall River, are towns on the west bank 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. A boatyard with marine railway that can handle craft up to 40 feet in length is at **South Swansea** on the west shore of **Gardners Neck.** Gasoline, water, ice, marine supplies, storage, and limited engine and hull repairs 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.

In 1960, the dredged channel 0.2 mile north of **Common Fence Point** at the north end of Rhode Island, thence along the Tiverton waterfront, had a controlling depth of 35 feet. A side channel, dredged to 32 feet and marked by buoys and a private lighted range, leads northwestward from the main channel to a powerplant wharf on the east side of Brayton Point.

The controlling depth in the channel in Taunton River above Fall River is about 9 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.

Anchorage.—There are no designated anchorages for Fall River Harbor. 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. A 25-foot deep anchorage basin is abreast the town. Depths of 26 to 32 feet are on the east side of the harbor off the wharves. The **harbormaster** controls the anchoring and berthing of vessels in the main harbor.

Bridges.—At Fall River three highway bridges cross Taunton River. The first, a fixed bridge at the State Pier, has a clearance of 135 feet. The second, Slades Ferry Bridge about 0.8 mile above the fixed bridge, has a bascule span with a clearance of 7 feet. The third, Brightman Street Bridge, about 0.2 mile above Slades Ferry Bridge, 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, and the fixed railroad bridge about 0.2 mile upstream from Weir Bridge have clearances of 9 feet. Drawspan regulations are given in **203.87,** chapter 2. The overhead power cables crossing Taunton River have clearances as follows: at Fall River, 145 feet; at Dighton, 150 feet.

Tides.—The mean range of tide at Fall River is 4.4 feet and at Taunton 2.8 feet.

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. For further details see the Tidal Current Tables.

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.—See pilotage at the beginning of this chapter.

Towboats are used by the larger vessels and those bound into Taunton River. Towboats are obtained from Providence.

Quarantine.—Vessels subject to quarantine are boarded at dockside. There is no quarantine hospital or detention station; cases of quarantinable contagious diseases aboard ship which would be permitted by law to land are cared for at Fall River General Hospital. A Public Health Service outpatient office is here.

Customs.—Fall River is a customs port of entry where marine documents are issued. The customhouse is in the Federal Building about 0.8 mile from the wharves.

Immigration.—There is no Immigration Service office in Fall River; immigration matters are handled at Providence.

Wharves.—The State Pier, leased to a private operator, and the City Pier to the northward, in poor condition and rarely used, are the only public piers in Fall River.

The State Pier, used principally for general cargo, has 620 feet of berthing space on the south side, and 398 feet on the west side. Reported depths of about 35 feet are on the south side, and 18 to 35 feet on the west side. The battleship USS MASSACHUSETTS, World War II memorial, is berthed along the north side of the State Pier. Depths alongside the private wharves and piers at Fall River range from about 10 feet to 35 feet. The State Pier has about 96,000 square feet of covered storage space. Some of the piers have rail connections. General cargo at the port is usually handled to and from vessels by ships' tackle.

The **speed** limit is 5 knots in the channel off the docks.

Supplies.—Diesel oil, gasoline, fuel oil, water, provisions, and marine supplies can be obtained in Fall River. Fuel oil bunkering facilities are available at a terminal in the north end of the harbor. Water is available at most of the wharves.

Repairs.—Facilities for major repairs and for drydocking deep-draft vessels are not available at the port; the nearest facilities are at Boston.

Small-craft repair facilities are at Fall River, **South Somerset** opposite Fall River, Taunton, and at Dighton. The largest marine railway in the area can handle craft up to 50 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

Communications.—A railroad operates freight service between Boston and Fall River. Bus and taxi service are available.

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 two tanks on high ground back of the town. The town has freight railroad service and bus communications. 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 20 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; see **202.145**, 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 about 4.0 feet.

See appendix for **storm warning display.**

Gasoline, diesel fuel, water, and marine supplies are available in Bristol Harbor. Depths at the pier and wharves range from 9 to 13 feet. A light is on the end of the Coast Guard depot wharf. There are two boatyards, one specializing in steel hull building with a 175-foot marine railway, and a yacht club in the harbor; a 60-foot marine railway is also available. Complete engine and hull repairs can be had.

Potter Cove, on the northeast side of Prudence Island, is a small nearly landlocked harbor. Buoys mark the entrance channel off **Gulf 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 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 16 to 18 feet in mid-channel, 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** and **Rumstick Ledge,** which bare at low water, are on the westerly part of the shoal.

About 0.5 mile above the mouth of Barrington River are a fixed highway bridge and a railroad trestle with a minimum 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 encountered in Barrington River.

Diesel oil, diesel fuel, gasoline, water, and provisions 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 haul out 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 banks of the upper navigable channel of the river. The ports chief waterborne commerce is in petroleum products, crude oil, cement, lumber, scrap metal, 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 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 May 1966, depths of 6 feet were available to and in the turning basin, and in the anchorage basin. 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 haul out craft up to 55 feet in length. Gasoline, water, ice, limited marine supplies, and complete engine and hull 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. In 1965, a depth of 6 feet could be taken through the buoyed entrance and inner channels to the mooring and turning basin in the northern part of the cove; depths of about 5 feet are in the basin. In 1965, a mooring basin in the southern part of the cove on the west side of the inner channel had depths of 6 feet. The largest marine railway in the cove can haul out craft up to 50 feet in length; gasoline, water, ice, storage, travelifts, marine supplies, and complete engine and hull 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 and a low square tower on Nayatt Point are also prominent in the approach to the river.

Channels.—The Federal project for Providence River provides for a channel 35 feet deep from deep water in Narragansett Bay off Popasquash Neck to **Fox Point** near the junction of Providence and Seekonk Rivers. The channel is well marked with navigational aids.

Caution.—Any vessel drawing 34 feet should not attempt passage of Providence River Channel except at such times as the stage of tide provides the greatest depths available. Time of docking should be set so that the vessel will enter Rumstick Neck Reach not earlier than 2 hours before high water and not later than the time of high water for vessels whose draft is within 2 feet of the controlling depth at mean low water. Vessels with drafts that are within 6 inches of the controlling depth should not attempt passage at any time without lightening their loads.

The Federal project for Seekonk River provides for a channel 16 feet deep from Red Bridge at Providence to the wharves at Pawtucket, and thence to Division Street Bridge. The channel is marked by buoys.

A channel leads from the main channel in Providence River to a turning basin a the Naval Reserve Training Center southwestward of **Fields Point.** The channel is marked by buoys, and has a depth of about 12 feet, with similar depths 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 Pawtucket 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. Some 300 yards southerly of this bridge is an overhead cable with a clearance of 145 feet. A fixed highway bridge about 300 yards north of Point Street Bridge has a clearance of 26 feet.

In 1966, a hurricane barrier was under construction across Providence River just above Fox Point. When completed, this structure will include three gates which normally will be kept in the raised position until the approach of hurricane weather. The clearances of 22½ feet vertically and 36 feet horizontally of each of these gates will restrict traffic to those dimensions.

In Seekonk River, an overhead power cable crossing at **India Point,** 0.5 mile above the mouth, has a clearance of 145 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, 40 feet; Tunnel Bridge, bascule span, 17 feet; and Red Bridge, swing span,

13 feet. In 1966, a new fixed highway bridge was under construction over the river about 1.4 miles above the entrance; design clearance is 42 feet. Just below the State Pier at Pawtucket are overhead power cables with clearance of 125 feet.

All drawbridges in both rivers are covered by operating regulations given in **203.90,** chapter 2.

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.

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 1.5 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. For further information, see the Tidal Current Tables.

Weather.—The prevailing winds are northwesterly except in July, when southwesterly as well as northwesterly winds occur. The heaviest gales are usually from the northwest.

Fog is more prevalent during the winter and spring months, and is most frequent with easterly and southerly winds. Northerly and westerly winds will usually clear the fog.

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 kept broken up in the channels to the principal wharves by the traffic in the harbor.

See appendix for Providence **climatological table** and **storm warning displays.**

Pilotage.—See pilotage at the beginning of this chapter.

Towboats are available in Providence. Large vessels usually require the assistance of a tow to proceed to the wharves.

Quarantine.—Vessels subject to quarantine inspection are boarded at the dock unless they carry infectious cases or come from ports of known or suspected infection, in which event they are boarded at anchor or intercepted prior to arrival. There is no quarantine hospital at Providence. When quarantinable diseases are found aboard, the patients are sent to Charles V. Chapin Hospital.

A Public Health Service outpatient office is in Providence. Seamen will be admitted to Roger Williams General Hospital for other than contagious diseases.

Customs.—Providence is a customs port of entry and marine documents are issued.

Immigration.—The officer in charge of immigration has his office in the Federal Building. There is no immigration detention station at this port.

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.—Most of the wharves at Providence are reserved for the exclusive use of their owners or operators. The State Pier is about 0.4 mile south of Fox Point on the east bank of the river. This pier has 596 feet of berthing space on each side and 120 feet of space at the face; depths alongside are reported to be 16 to 35 feet. About 20 acres of open storage area are available at the pier for public use. The municipal wharf, owned and operated by the City of Providence, is on Fields Point. The wharf provides about 3,350 feet of berthing space, about 140,000 square feet of covered storage, and 40 acres of open storage; depths of 30 to 35 feet are reported alongside. Some of the wharves are served by railroad connections. General cargo at the port is usually handled to and from vessels by ships' tackle. Crawler and truck cranes may be obtained from rental firms in Providence and vicinity. The principal wharves at Pawtucket have depths of 9 to 14 feet alongside.

Supplies.—Diesel oil, gasoline, fuel oil, water, provisions, and marine supplies of all kinds are available. Oil bunkering facilities, for deep-draft vessels, are located opposite the municipal wharf on the easterly side of the river near **Kettle Point,** and northward of the municipal wharf on the westerly side of the river. Delivery is made directly to vessels from pipelines. Fuel tank barges are also available for bunkering anywhere in the harbor. Water is available at most of the wharves in the harbor.

Repairs.—Facilities are not available at Providence 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. Small-craft facilities with marine railways in the vicinity can handle craft up to 50 feet in length for engine and hull repairs.

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. 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 pavillion 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 pavillion 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. A square wooden rock crib is about 120 yards west of Fox Hill.

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 marine railway in the southeastern part of the harbor can handle craft up to 50 feet in length for engine and hull repairs; gasoline, water, ice, and some marine supplies 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 attached to a dwelling, 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 16 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 45 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.

Anchorge areas designated for Narragansett Bay include Dutch Island Harbor; see **202.145,** chapter 2, for limits and regulations.

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 50 feet to a depth of 5 feet; a buoy marks the shoal. In the southeastern part of the harbor is a shallow cove.

Tidals 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.

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 wtih 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, 12 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 west 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 South. 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 chimney about 1 mile south of town, the North Kingstown standpipe, 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 is restricted to a width of about 150 yards by the breakwaters and the shoals off Sauga and Poplar Points. The breakwaters are marked by lights. 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. The channel in the cove extends between flats, many of which are dry at low water. In 1965, a midchannel depth of 8 feet could be taken to the highway bridge. The channel above the large marina, on the east side of the channel, is marked by numerous piles which are used as moorings as far as the highway bridge.

In 1964, a depth of 12 feet could be carried in the channel in Mill Cove, to the 6-foot deep anchorage at the head of the cove.

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 least depth of 7 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 by 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 14 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 occassionally encountered.

There are several small-craft facilities and boatyards at Wickford. The largest marine railway can haul out craft up to 60 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull 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 pier 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. A midchannel depth of 32 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 1964, the channel to Davisville Depot had a depth of 30 feet, thence 28 feet in the turning basin and to the piers; depths of about 30 feet are alongside the piers.

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** are off the eastern side of Hope Island, and **Gooseberry 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. **Old Sow Rock,** bare at low water, is on the south side of the entrance channel.

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. **Calf Pasture Rock,** covered 2 feet, is 500 yards northeasterly of the point.

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, 3 feet high, and several rocks awash or covered, are about 0.7 mile eastward of Potowomut River entrance.

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 74 feet. Buoys mark the entrance from the southward, and a lighted bell buoy marks the northeastward 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 (Old Warwick Cove), in the northeastern part of Greenwich Bay, has a shallow, narrow entrance. A shoal, bare at low water, extends about 150 yards eastward from the western entrance point. In 1964, with local knowledge, depths of 5 to 13 feet could be carried in the privately marked natural channel from the entrance

for 0.7 mile to the Warwick Cove Boatyard. Above this point, depths shoal from about 2 feet to bare at the head. 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. Several marinas and boatyards are in the cove. The largest lift in the cove can haul out craft up to 15 tons in weight; gasoline, water, ice, marine supplies, storage, and engine and hull repairs are available.

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 is in the northwestern part of Greenwich Bay. In 1963, a depth of 6 feet could be taken in the dredged channel to a point just eastward of the railroad bridge about 0.7 mile above the entrance; the channel is buoyed. Small-craft facilities in the cove can provide gasoline, diesel fuel, water, ice, and marine supplies. Craft up to 15 tons can be hauled out for engine and hull repairs. The **harbormaster** in the cove controls berthing and anchorage; contact can be made 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 northwestward 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. The general depths in the cove, except in its upper end, are 8 to 10 feet. 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 about 4.0 feet.

There are several boatyards in the cove; the largest marine railway, near the entrance to the cove, can haul out craft up to 100 feet in length and 9 feet in draft. Gasoline, water, diesel fuel, ice, marine supplies, wet and dry storage, 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 0.7 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.

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7. BLOCK ISLAND SOUND

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 more important ports or harbors of refuge in the Block Island Sound area are Point Judith Harbor, Great Salt Pond, Stonington, Mystic Harbor, Gardiners Bay, and Greenport.

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 depth of 23 feet. It is marked by a lighted bell buoy. 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 in heavy weather.

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.

Between the inner patch 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, Long Island and Block Island Sounds.

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.

Pilots for Long Island Sound board vessels at 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.), and Brenton Reef Light (41°25.6′ N., 71°23.3′ W.) on advance request. 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.

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 0.3 mile even by small craft; the shoaling is generally abrupt in approaching the island.

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, 58 feet above the water, is shown from a brown 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 northwest of Block Island Southeast Light. In 1965, the controlling midchannel depth in the entrance channel was 13 feet, with depths of 14 feet in the inner harbor anchorage, and depths of 15 feet in the basin in the southeast corner of the inner harbor, except for a 12-foot depth at the west side of the basin entrance. 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 complete engine and hull 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 buoy is close northward of the breakwater, and a bell buoy 600 yards northeastward. The end of the breakwater on the west side at the entrance to the inner harbor is marked by a light. An aero light is at the airport about a mile westward of the 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.

Shoaling has constricted the marked channel to less than 200 feet in width at a point just north of the Coast Guard station on the inner part of the south side of the entrance. Shoaling also is making out more than 200 yards north-northeasterly from the outer end of the breakwater. In June 1965, the controlling midchannel depth into the pond was 16 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 controlling depth of about 2 feet leads to **Trim Pond** where local fishing craft are moored. A large marina is about 0.3 mile westward of the ferry landing in Great Salt Pond. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available. A reported depth of about 16 feet is at the face of the marina's dock.

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 predications.

See appendix for Block Island **climatological table** and **storm warning display.**

Communications.—During the summer there is 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. A ferry operates daily from Galilee to Great Salt Pond or Old Harbor, carrying mail, passengers, freight, and vehicles. The island has telephone service to the mainland. Air service is also available.

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, connected with a white dwelling. A fog signal and a radiobeacon are at the station. See appendix for **storm warning display.** About 100 yards north of the light is a Coast Guard station. A lighted whistle buoy is 1.7 miles southward of the light. A prominent elevated water tank is 1.8 miles north of the light.

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 steamers and sailing vessels, except with a heavy southerly or southeasterly 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 having depths of 14 to 18 feet, and the southernmost one having depths of 14 to 16 feet, and 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 is 400 yards wide, and has a controlling depth of about 24 feet, with deeper water in western half of the entrance.

The western entrance to the Harbor of Refuge is 500 yards wide, with 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.

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 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 5 feet draft or less during a heavy blow. The east jetty is marked at its end by a daybeacon.

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. The State Piers at Galilee and Jerusalem are under the control of a State pier superintendent; his office is at the head of the Galilee State Pier.

A channel, 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 May 1965, the controlling depth in the channel from the Harbor of Refuge to the State Pier at Jerusalem was 12 feet, thence 7 feet to Buoy 2A, and thence about 5½ feet to the turning basin at Wakefield. The controlling depth in the branch channel to Galilee was 15 feet, with depths of about 5 to 10 feet in the anchorage areas.

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 approximately 15 minutes just inside the entrance and 50 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. See Tidal Current Tables for predictions.

A Public Health Service **outpatient office** is 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. The largest marine railway in the area can haul out craft up to 60 feet in length, and 6 feet in draft. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

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.** The channel has depths of 2 to 4 feet and is crossed by a fixed highway bridge with a clearance of 5 feet. 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 boul-

ders 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. A reported depth of about 2 feet can 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 Ninigret Pond; launching ramps are at both facilities. The overhead power cable over the entrance has a clearance of 10 feet.

Quonochontaug, 10.8 miles west 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 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.** 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 covered rock is about 100 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. The wreck of a vessel with one mast showing 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 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 20 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.

A naval **restricted 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.

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.—Predicted times of slack water and times and velocities of strength of current are given in the Tidal Current Tables. In the middle of The Race, the flood sets 315° and the ebb 120°, with average velocities of 3.3 knots and 4.3 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.

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°06.4′ W.),** 91 feet above the water, is shown from a gray-granite tower, 81 feet high, attached to a red dwelling on a pier. A radiobeacon and fog signal are at the station. 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 12 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 299°, and ebb 133°. 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 13 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. A radiobeacon and fog signal are at the station. See appendix for **storm warning displays.**

Surrounding Montauk Point for about 4 miles is a shoal area that has been closely developed; 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 **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 1965, the controlling depth in the channel was 8 feet to the yacht basin east of Star Island.

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 bar, about 0.4 mile southward of the southern end of the island, extends partially across Lake Montauk in a southwesterly direction from the eastern shore. The bar, with reported depths of 3

feet, restricts navigation to the southern part of the lake.

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 on Star Island. See appendix for **storm warning display.**

There are several small-craft facilities on both sides of the entrance to Montauk Harbor, and a yacht club and marina 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 are in the southeastern end of the bay.

Montauk, a summer resort at the southeast end of the bay, is the terminus of the Long Island Railroad. In 1965, the raliroad pier at Montauk was not in use. 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, is entered northeastward of **Hicks Island.** It is reported that vessels with drafts of about 5 feet can enter. The harbor is especially useful in northeasterly weather when the adjoining bays are unsafe. The entrance is very narrow, and 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 Gardiners Island, and terminates at **Crow Shoal.** The shoal has depths of 3 to 10 feet and is marked by a buoy. An obstruction covered 12 feet is 300 yards west 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.

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 Gov-

ernment 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 the outer ends. 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.

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 the light. A ferry from New London stops here during the summer. There is a marina about 0.1 mile westward where gasoline and water are available; controlling depth is about 6 feet in the marked channel leading to the marina. A launching ramp is here.

See appendix for **storm warning display.**

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. 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, has been improved by dredging. In 1961, the controlling depths were 10 feet from Gardiners Bay to the light near the south end of the harbor, and thence about 8 feet to the basin at the head. Privately maintained seasonal buoys mark the channel. A private light is on the north end of the east jetty. A public commercial landing with reported depths of 8 feet is on the east side of the channel about 0.6 mile from 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 currents** have a velocity of about 3 knots through the entrance.

There are several boatyards with marine railways and marinas on the east and south sides of Threemile Harbor. The largest marine railway in the area can haul out craft up to 75 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, marine supplies, storage, lifts, and cranes are available. 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.

See appendix for **storm warning display.**

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. Some drift ice is at Greenport but not sufficient to interfere with navigation. In the south arm of Shelter Island Sound, the ice is sufficiently heavy at times to be destructive to structures exposed to it.

Diesel oil, 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 a house on 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. A depth of about 4½ feet can be taken over the bar and into the harbor. A marina and boatyard are in the harbor. A marine railway at the boatyard can haul out craft up to 55 feet in length; 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 an abandoned lighthouse consisting of a white tower and dwelling on concrete foundation.

Shoals with 10 to 12 feet on them 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 northeast 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.

Long Beach Bay makes eastward from Orient Harbor on the north side of Long Beach Point. The bay is shallow and has no comercial 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 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 is on the south side of the waterfront.

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 of the shoal areas in the basin. The **harbormaster** for Greenport Harbor controls anchoring and berthing in the basin. The **speed** limit is 6 knots. Several marine railways for small boats are in the basin; craft up to 45 feet in length can be hauled out for complete engine and hull repairs. Gasoline, diesel fuel, water, ice, and marine supplies are available.

Several boatyards and shipyards with marine railways, and a well-equipped machine shop are in Greenport. The largest marine railway can handle craft up to 400 tons and 15 feet in draft. Facilities are available for building and making repairs on hulls, engines, and machinery.

Supplies of all kinds can be obtained. Diesel fuel, diesel oil, gasoline, and fresh water are obtainable at the docks of the several oil companies, and also at the many small-craft facilities at Greenport. A ferry plies between Greenport and Shelter Island. Bus service connects Greenport and Orient Point where a ferry operates to New London during the summer.

Dering Harbor, southward of Greenport and at the northwest end of Shelter Island, is a favorite anchorage for yachts and motorboats. A shoal with 5 to 7 feet over its outer part extends halfway across the entrance from the southwest point, and is marked by a buoy. Depths in the harbor range from about 12 to 15 feet just inside the entrance to 8 or 9 feet near the shores. 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 entrance buoy in 18 to 36 feet. A marina in the harbor can provide gasoline, diesel fuel, water, ice, marine supplies, and complete engine repairs. **Shelter Island Heights** is a village on the southwest 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 just northward of the point. 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; a small marine railway, gasoline, and water are available.

Mill Creek is the entrance to **Hashamomuck Pond,** about 1.1 miles westward of Conkling Point. In May 1965, the 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 opening 15 feet wide with a clearance of 5 feet.

On the opposite 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. Gasoline, diesel fuel, water, ice, marine supplies, storage, lifts, and cranes are available. Provisions can be obtained at Southold.

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 little used except 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 for 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 standpipe and a gas tank with a silver colored spherical tank adjoining it are conspicuous landmarks.

In entering Sag Harbor, the breakwater should not be rounded 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 breakwater 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; 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. Gasoline, storage, marine supplies, water, ice, and complete engine and hull repairs are available in Sag Harbor; a marine railway in the harbor can handle craft up to 15 tons. A railroad serves the town.

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 14 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 jetty at the northeast end of a small island that separates the harbor from the sound, and the channel follows along the north side of this island. A landing is on the west side of the harbor, 0.5 mile above the mouth. A private seasonal light is shown on the end of the jetty. A boatyard with marine railway can handle craft up to 50 feet in length for engine and hull repairs. Gasoline, water, ice, and some marine supplies are available.

Noyack 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.

Jessup Neck is a long narrow strip, partly high and wooded, separating Noyack Bay from Little Peconic Bay. The north end of the neck is a sandspit from which a

shoal with 5 to 11 feet over it extends nearly 0.4 mile north-northwestward, and is marked by a lighted buoy.

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 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 are 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 is about 7 feet. The channel is marked by stakes and the entrance by a privately-maintained seasonal light. 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 and boatyard are in the harbor; the marine railway at the boatyard can handle craft up to 40 feet in length. Gasoline, water, ice, marine supplies, and complete engine and hull repairs are available.

Wooley Pond, a mile northeastward of North Sea Harbor, is entered through a dredged channel which in 1964 had a controlling depth of 6½ feet.

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.

Haywaters Cove, Broadwaters Cove, and **Mud Creek** are entered by small boats at high water through a narrow entrance at the north end of Cutchogue Harbor. **East Creek** has been dredged to 8 feet through its entrance to a basin inside about 6 feet deep.

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 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. A privately-maintained seasonal light on a pile with a bronze-colored square daymark marks the entrance. The depth to the boatyard at the head of the basin was reported to be about 6 feet in 1965. The marine railway at the boatyard can haul out craft up to 40 feet in length.

New Suffolk has several boatyards and marine railways, the largest of which can handle boats up to 72 feet in length; gasoline, diesel fuel, water, ice, marine supplies, travelifts, and complete engine and hull repairs are available.

Wickham Creek, 0.7 mile north of New Suffolk, has a depth of about 3 feet at the entrance. Fishing boats tie up to slips in this basin. Private drum buoys and bush stakes mark the dredged channel at the entrance during the summer. Gasoline, water, ice, some marine supplies, and hull repairs are available in the basin; a launching ramp is here.

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 mile offshore from **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 west 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 Southhampton. A dredged channel with a depth of about 5 feet is staked by the town of Southampton. 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, 1.1 miles east of Shinnecock Canal entrance, is entered through a dredged channel which in June 1964 had a depth of 6½ feet. The entrance to the pond is marked by a privately maintained approach light and buoy.

South Jamesport is a village on **Miamogue Point,** on the north shore in the westerly part of the bay. 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. In 1965, a reported depth of about 6 feet could be taken to the marina at South Jamesport. A travelift at the marina can handle craft up to 15 tons for engine and hull repairs. Gasoline, lubricants, water, ice, guest moorings, and marine supplies are available. The town has railroad passenger and bus service.

Riverhead, on the **Peconic River** 4 miles westward of South Jamesport, is at the head of navigation. In 1964, the channel leading from deep water in Great Peconic Bay through Flanders Bay and in Peconic River had a centerline controlling depth of 6 feet to within 50 yards of the head of navigation near Peconic Avenue. The channel is well marked with navigation aids.

Flanders Bay is the scene of considerable small boat activity. A yacht club is at Riverhead; gasoline and water are available.

Meetinghouse Creek, which enters the northwestern part of Flanders Bay through a dredged channel, is marked at the eastern side of the entrance by a private light. In 1965, the channel had a controlling depth of 7 feet. A marina is in the creek; gasoline, water, ice, outside storage, and some marine supplies are available.

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 which 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.

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 284° and the ebb 113°.

In the channel south of Ram Island Reef, the velocities of flood and ebb are 1.4 and 1.9 knots, respectively. The flood sets 264° and the ebb 035°. The direction and velocity of the current are affected by strong winds which 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 by 13 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 depth of 12 feet. Foul ground extends halfway across the entrance of West Harbor to a bare rock, which should be given a berth of nearly 100 yards; 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 engine repairs are available. The head of the harbor is used by boats drawing less than 5 feet which enter by the narrow channel eastward of **Goose Islet.** 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, 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.

See appendix for **storm warning displays.**

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. The sandspit extending 1.5 miles northward from Napatree Point to **Sandy Point** is bare except for a section 0.4 to 0.6 mile northward of Napatree Point which was broached during the 1938 hurricane.

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 5 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 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 fishweirs. 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 dredged channel extends generally southeasterly across the bay into Pawcatuck River to Westerly. In May–June 1965, the centerline 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. There is shoal water 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 rocks and shoal water are near the edges of the channel.

In the dredged channel northward of Sandy Point, the currents have a velocity of 1.3 knots. The flood sets eastward, the ebb westward. See the Tidal Current Tables for predictions and Tidal Current Charts for hourly velocities and directions.

Watch Hill Cove, in the southeastern part of Little Narragansett Bay, is used by small craft. In May–June 1965, the buoyed dredged channel leading to the cove had a controlling depth of 7 feet for a width of 100 feet. Depths of 8 to 10 feet are inside the cove and at the wharves. See **202.1** and **202.47,** chapter 2, for limits and regulations of the special small-vessel anchorage area in the cove.

Gasoline, water, ice, marine supplies, storage, and engine and hull repairs are available in Watch Hill Cove.

Foster Cove is just northward of Watch Hill Cove. A rock covered by 1 foot is about 200 feet southwestward from the point on the north side of the entrance to the cove. Caution is recommended to avoid this rock which is unmarked.

Pawcatuck River, entered just south of **Pawcatuck Point,** extends about 4 miles to Westerly. Waterborne commerce on the river is principally in petroleum products.

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 marine railway that can haul out boats up to 45 feet in length. Gasoline, water, ice, marine supplies, storage, and engine and hull repairs are available in the cove.

There is a yacht club pier in **Thompson Cove,** 2 miles above Pawcatuck Point. See **202.1** and **202.48,** chapter 2, for limits and regulations of the special small-vessel anchorage in the cove.

Westerly, 4 miles above Pawcatuck Point, is an important manufacturing town. Depths at the wharves range from 7 to 9 feet.

See appendix for **storm warning displays.**

There are several boatyards and marinas 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 haul out craft up to 55 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, wet and dry storage, and complete engine and hull repairs are available.

Wequetequock Cove, at the northern end of Little Narragansett Bay, is shallow. A narrow unmarked channel leads into the cove eastward of **Ledwoods Island.** A depth of about 4 feet can be taken as far as **Goat Island** about a mile above Sandy Point.

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 daybeacon. A special small-vessel anchorage area has been designated in Stonington Harbor; see **202.1** and **202.50**, chapter 2, for limits and regulations.

See appendix for **storm warning display.**

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, a town on the railroad, has bus service to Westerly and New London. Commerce is mostly 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 boatyards and small-craft facilities at Stonington. The largest marine railway in the area can haul out craft up to 60 feet in length. Gasoline, diesel fuel, water, ice, outside storage, marine supplies, and complete engine, hull, and electronic repairs are available; guest moorings can be had.

A **harbormaster** and **deputy harbormaster** are at Stonington.

Noyes Rock, 0.4 mile southward of **Wamphassuc Point,** has a least depth of 9 feet, and is marked by a buoy. **Noyes Shoal,** with 8 to 15 feet over it, is nearly 1.5 miles long in a west-northwesterly direction; its easterly and westerly ends are marked by buoys.

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 6 feet, marked by buoys. **White Rock,** about 0.8 mile northeastward of Eel Grass Ground, is bare and prominent, and is marked by a daybeacon. **Red Reef,** covered 1 foot, is 0.2 mile north of White Rock, and is marked by a daybeacon.

Mason Island, 2.5 miles west of Stonington Harbor, is joined to the mainland by a fixed bridge with 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 **202.1** and **202.50a,** 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 is 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 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 is marked by a daybeacon. 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.

Mystic Harbor, about 6 miles westward of Watch Hill Point, is the approach to the towns of Noank and Mystic. In April–May 1965, the controlling depth over the 50-foot midchannel width through the harbor to the Marine Historical Association wharf, 0.6 mile above the highway bridge at Mystic on the Mystic River, was 9 feet.

Special small-vessel anchorage areas are in Mystic Harbor; see **202.1** and **202.50b,** chapter 2, for limits and regulations.

Routes.—To enter from eastward, lay a west-northwestward course from south of the lighted bell buoy marking Napatree Point Ledge for a little over 3 miles to 250 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 abaft the beam. Then follow the buoyed channel.

From westward, proceed cautiously from about 100 yards or more southward of the buoy off Groton Long Point on a northeasterly course for about 0.3 mile to the buoy about 0.2 mile east of the point, giving it a berth of over 100 feet. 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. The depths at the principal wharves vary from 8 to 13 feet. Gasoline, diesel fuel, water, and ice are available at the small-craft facilities on the east side of Noank. A marina and a boatyard are in **West Cove** at Noank. A 40-foot marine railway at the boatyard can haul out craft for engine and hull repairs; gasoline, diesel fuel, water, ice, storage, and marine supplies are available in the cove.

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 9 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 in length. 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. Gasoline, water, some engine parts, and marine supplies can be obtained.

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.

There are several boatyards and marinas on the northern end of Mason Island. A 30-feet marine railway and a 12-ton travelift are available, as well as gasoline, water, ice, marine supplies, and complete engine and hull repairs.

The railroad bridge over Mystic River below Mystic has a swing span with a clearance of 4 feet. The channel leads through the west side of the draw. The highway bridge at Mystic has a bascule span with a clearance of 4 feet. See **203.95,** chapter 2, for drawspan regulations.

Mystic, a town about 2 miles above Noank, has several marinas and boatyards. The largest marine railway can handle craft up to 110 feet in length. Travelifts, gasoline, water, ice, marine supplies, outside storage, and complete engine and hull repairs are available. 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, bark JOSEPH CONRAD, schooner AUSTRALIA, and arctic schooner BOWDOIN 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 unmarked channel is very narrow; boats of about 5-foot draft can be taken to the **Narrows,** and thence depths are 1 and 2 feet to **Old Mystic.** A fixed highway bridge crossing the Narrows has a clearance 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, about 2 miles west of Mystic Harbor, is entered by a channel about 0.4 mile long, marked by private buoys and daybeacons. The dredged channel has a depth of about 5 feet.

Horseshoe Reef, 0.5 mile southward of Mumford Cove entrance, is bare 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.

The cove indenting the mainland northward of Pine Island and eastward of **Avery Point,** marked by a light, 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 Avery Point Light. Gasoline, ice, and a 14-ton travelift 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 **202.1** and **202.51,** chapter 2, for limits and regulations.

8. EASTERN LONG ISLAND SOUND

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. This chapter describes the eastern portion of the sound following the north shore to and including the Housatonic River and then the south shore to and including Port Jefferson Harbor.

In this region there 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, and 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.

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 sailing vessels, when meeting unfavorable winds on 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 Matinicock Point, and 0.5 knot eastward of Hart Island.

About 1.5 miles east-southeastward of Bartlett 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 and Charts for predictions.

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.

Pilots board vessels bound for Long Island Sound ports in the vicinity of Brenton Reef Light, and on request off Block Island Southeast Lighted Whistle Buoy, or off Block Island North Reef Lighted Bell Buoy 1BI, and in some

cases by prior arrangements off the entrances to the major ports on Long Island Sound. 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 kc., or on 2182 kc. Pilotage, where required for the major ports on Long Island Sound, is discussed under the name of the port.

Charts 293, 359.—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.

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 being about 32 feet. Petroleum products, molasses, sulphuric acid, woodpulp, 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 About half a mile northward is **Shaw Cove,** a dredged basin, with depths of 8 to 16 feet. The railroad bridge over the entrance has a swing span with a clearance of 3 feet; see **203.105,** chapter 2, for drawspan regulations. Just north of this bridge is a fixed small-boat opening with a clearance of 5 feet.

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 Southwest Ledge; a fog signal is sounded at the station.

Other prominent features in approaching New London Harbor are: New London Harbor Light, on the west side of the entrance channel; Avery Point Light; the training tank at the submarine base; the monument at Fort Griswold; 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.

Pine Island Channel, between Pine Island and Black Ledge, has a rocky and very broken bottom on which the least found depth is 12 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.

A shoal spot covered 8 feet was reported in 1964 as existing about 500 yards south-southwestward of Eastern Point.

Anchorages.—Anchorage areas have been designated in New London Harbor; see **202.147,** chapter 2, for limits and regulations. Special small-vessel anchorage areas have been designated in Greens Harbor; see **202.1** and **202.52,** 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. **Southwest Ledge,** marked by New London Ledge Light, has a least depth of 7 feet. **Black Ledge,** just to the northeastward of Southwest Ledge, has a rocky islet on it which is 2 feet above high water. 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,** with ½ foot over it, is 125 yards eastward of **Powder Island** and is marked by a buoy.

Bridges.—The only bridges across Thames River below Norwich are the two near Winthrop Point. The first is the railroad bridge, which has a bascule span with a clearance of 30 feet; see **203.100,** chapter 2, for drawspan regulations. Just above it is the high-level fixed highway bridge with a clearance of 135 feet.

Tides and currents.—The mean range of tide at New London is about 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

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are often embarrassed in light winds, after getting in past the light, by strong surface currents setting out even on the flood.

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 sailing vessels may navigate with comparative safety in ordinary winters; and even in severe weather it is rare that a stoppage of navigation occurs for sailing vessels of more than a week's duration. 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 sailing vessels are much hindered in their movements during the months of January, February, and March.

The prevailing winds are southwesterly in summer and northwesterly in winter. See appendix for **storm warning displays.**

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. Pilots usually board vessels from a launch southeastward of Sarah Ledge Lighted Gong Buoy 1; refer to discussion at beginning of chapter for other boarding places.

Towage.—Towboats are available at New London. Vessels usually proceed to the upper harbor without assistance, although a towboat may be required in entering with a head wind and contrary current. Large vessels require a towboat for docking.

Quarantine.—Vessels subject to quarantine are boarded at dockside for inspection. New London has one public and several private hospitals. The Lawrence Memorial Hospital on Ocean Avenue is used for emergency treatment. A Public Health Service outpatient office is in New London.

Customs.—New London is a customs port of entry and marine documents are issued.

Immigration.—No officials of the Immigration Service are stationed at this port. The necessary officers may be obtained from Hartford by arrangements with the New London customs office.

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.—The port's principal terminal, the State Pier, operated by the Connecticut Terminal Company, Inc., is the easterly of the two long piers southwestward of the Thames River bridges. It is a modern general cargo steamship terminal with 200 feet of berthing space along the face, 1,000 feet along the south side, and 1,020 feet along the north side of the pier. Depths of 31 feet are along the face, 28 to 33 feet along the south side, and 33 feet along the north side. The U.S. Navy controls all spaces with the exception of the south side. The terminal is available to all ships upon payment of charges. General cargo storage facilities, both open and covered, are available. Electricity, and potable and feed water connections are at the pier. Rail trunk connections serve the terminal.

There are numerous private wharves open for public use upon advance notice on both banks of the river. Depths alongside the private facilities range from 9 to 35 feet.

Supplies of all kinds are available in large quantities. Bunkering services for deep-draft vessels are available on the east bank of the river at Groton. The oil wharf has 625 feet of berthing space with about 36 feet alongside. Diesel oil and gasoline can be obtained. Oil companies are prepared to supply fuel on 48 hours' notice either by barge or tank truck at any wharf. An ample supply of pure water for drinking or boiler use is available at the principal piers, wharves, and marinas.

Repairs.—A floating drydock, one graving dock, and three marine railways are available in the port. 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.

A repair yard, on the west side of the Thames River, about 1 mile north of the drawbridge, has three marine railways, the largest of which can haul ships up to 2,500 tons; the cradle has a length of 330 feet and a width of 56 feet. The plant is equipped to make repairs to steel and wooden vessels, engines, and boilers. It specializes in repairs to large yachts. A privately dredged channel with a reported depth of 19 feet leads to the shipyard from the main channel in the vicinity of Bailey Point Light. The entrance is marked by privately maintained dolphins.

Several companies in New London are in the business of wrecking, salvage, and marine contracting work. They are equipped with pumps, diver's outfits, floating equipment, and other gear.

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–June 1965, 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 August 1961–April 1966, midchannel depths of 24 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 nagivational aids.

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, 135 feet high with red lights atop, is prominent.

Just below **Gales Ferry,** on the east bank 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 on the face. The northeast end of the dock is in ruins. An overhead power cable with a clearance of 175 feet crosses the river 0.5 mile above the station near **Kitemaug.**

Allyn Point, on the east bank 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 bank 8 miles above New London, has a long fuel pier with a red light on the channelward end, and on the shore is a building with several stacks. Southward of the pier there are numerous piles in the water. In 1966, a bridge was under construction across the river about 0.2 mile southward of Fort Point.

Mohegan Dike, just below Fort Point, has settled and is entirely submerged at the higher tides except for a rock which is about 75 feet abreast of a row of piling shoreward of the dike. Caution should be observed in the vicinity of the dike.

The red brick buildings of the Norwich State Hospital are on a bluff just north of Fort Point and are a conspicuous landmark.

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 1965, waterborne commerce to Norwich consisted of an occasional load of rock salt. Small boats generally anchor in Shetucket River just above the fixed bridges at Norwich, which have a minimum clearance of 13 feet.

Chart 214.—Bartlett Reef, about 3 miles southwestward of New London Ledge Light, has depths of 2 to 12 feet, with rocks awash at low water near the northern end. The reef is about 1.3 miles long and in a general north-south direction and about 0.3 mile wide. The north end of the reef is marked by a buoy, and the south end by a light and bell buoy. A lighted whistle bouy is about 0.7 mile southward of the reef.

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 by sailing vessels 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** 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 a stone quarry. A cove with depths of 9 to 15 feet is on the west side of the point. A reef with 2 feet over it is just off the mouth of this cove, and is marked by a private stake.

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 11 feet is about midway between Little Rock and the cove at Millstone Point. 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 sailing vessels and tows. The general depth of the bay is about 19 feet, the water shoaling 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.

Niantic River, at the northeast end of the bay, is navigable with local knowledge. The entrance is through a narrow passage crossed by two bridges. The railroad bridge has a bascule span with a clearance of 11 feet; the highway bridge has a swing span with a clearance of 9 feet. See **203.110,** chapter 2, for drawspan regulations.

The river has a natural channel which is reported frequently shifting and changing. It is marked by pri-

vately maintained daybeacons from the entrance to Sandy Point; aids are shifted to conform to the changing channel. Small craft can go about 3 miles above the entrance 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. Strangers attempting to enter Niantic River are cautioned to pass through the bridges either at slack water or against the current.

A depth of about 4 feet is reported available through the channel to Smith Cove. The entrance to the cove is marked by privately maintained daybeacons.

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 velocities of flood and ebb are 1.6 knots and 0.8 knot, respectively. It has been reported that much greater velocities may be expected under storm and freshet conditions. See Tidal Current Tables for predictions.

Ice generally closes the river to navigation for about 3 months during the winter.

Smith Cove is on the west side of the river about 1 mile above the entrance. A boatyard with a marine railway is in the cove.

There are several boatyards and marinas with marine railways just above the entrance to the river on the west bank at Niantic, and on the east bank opposite Niantic at Waterford. The largest marine railway in the area can haul out craft up to 45 feet in length. Gasoline, water, ice, travelifts, storage, marine supplies, and complete engine and hull repairs are available at Niantic, Waterford, and 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, on which the least found depth is 21 feet, extends 0.4 mile south of the southwest side of the point.

The bight between Black Point and Hatchet Point 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 6 feet, is 250 yards off the west side of Black Point. **Blackboys,** two rocks bare at low water, are 0.4 mile southward of Griswold Island, and are marked by a buoy. A rock, covered 3 feet, is about 0.2 mile southward of Blackboys and is marked by a buoy. **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 off 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 **202.1** and **202.54,** chapter 2, for limits and regulations.

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 coal.

The river water is fresh at and above Deep River.

The river is under improvement by dredging and the construction of dikes. 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 shoaling may occur from freshets and ice jams.

Channels.—A Federal project for Connecticut River provides for a channel 15 feet deep to Hartford.

The 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 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, Lord Island, Eddy Rock Light vicinity, and Mouse Island Bar vicinity; see **202.1** and **202.55,** chapter 2, for limits and regulations.

Dangers.—Saybrook Outer Bar, which obstructs the mouth of Connecticut River, is shifting, with depths of 2 to 9 feet extending nearly 2 miles off the mouth; it is

marked off its southeastern end by a lighted bell buoy. At the westerly side of the river there are entrance jetties protecting the dredged channel. The bar eastward of the jetties has several natural channels with depths of 6 feet, but they are subject to shifting and are not reliable.

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, with navigation through the west draw; 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; 44 miles, fixed highway at Hartford, 81 feet; 44.9 miles, fixed highway, 46 feet; 45.2 miles, fixed highway, 39 feet; and 46 miles, fixed railroad, 30 feet. Drawspan regulations are given in **203.115,** chapter 2.

Overhead cables across Connecticut River have a least clearance of over 100 feet, except 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 approximately at 4.5 and 6.5 hours later, respectively, than at the entrance. At Saybrook jetty the mean range of the tide is about 3.5 feet while at Haddam it is about 2.5 feet and at Hartford about 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 the jetties. For times and velocities of currents at a number of locations in Connecticut River, the Tidal Current Tables should be consulted.

During the ebb, there is a strong current which 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.

See appendix for Hartford **climatological table** and **storm warning displays.**

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 river are at Saybrook Point; strangers are advised to take a pilot. Pilot services are generally arranged for in advance through ships' agents or directly by shipping companies; pilots board vessels abreast of Saybrook Point from a launch. In emergencies, pilots can be contacted on 2738 kc.

Supplies and repairs.—Gasoline, diesel fuel, water, ice, and marine supplies are available at the principal towns and landings along Connecticut River. Boatyards along the river can effect engine, hull, and radio repairs.

Chart 215.—Saybrook Point is a village 1.4 miles northward of Saybrook Breakwater Light. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine, hull, and radio repairs are available at the several marinas and repair facilities at Saybrook Point, and southward of **Ferry Point,** about 2 miles northward of Saybrook Point. The largest marine railway in the area can handle craft up to 60 feet in length.

North Cove, 0.7 mile northward of Saybrook Point, has a dredged small-boat basin that affords excellent anchorage. In 1965, the dredged channel to the cove had a controlling depth of 10 feet. Buoys mark the cove entrance.

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 Connecticut River just below the railroad bridge. Pipestakes 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 and to about 0.2 mile above the second bridge. A fixed railroad bridge, 0.4 mile above the entrance, has a clearance of 11 feet. About 0.3 mile above that bridge is a fixed highway bridge with a clearance of 6 feet.

Small-craft facilities with marine railways are northward of the entrance to Lieutenant River. The largest marine railway 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. A yacht yard here specializes in building and repairing of small sail boats. A **harbormaster** is at Old Lyme.

The passage to the east and north of **Calves Island,** about 1 mile above the railroad bridge, is used extensively by small craft in the summer, particularly when the traffic is heavy in the main channel. In 1966, shoaling was reported in the passage on the north side of Calves Island; caution is advised.

Haydens Point, about 4.6 miles above Saybrook Point, is marked by a light. Between the light and the shore there is foul ground.

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 7 feet was available in the buoyed channel.

There are excellent small-craft facilities at Essex. The largest marine railway in the area can handle craft up to 110 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, storage, marine supplies, travelifts, and cranes are available.

Special anchorage areas for small craft are at Essex; see **202.1** and **202.55,** chapter 2, for limits and regulations.

Hamburg Cove and **Eightmile River** indent the east bank of the Connecticut River, 6 miles above Saybrook Point. The controlling depth in the dredged channel to the turning basin at **Hamburg,** a village at the head of navigation, is about 6 feet. There are boulders in places outside the dredged channel. The entrance channel is outlined by grassy flats on each side and is buoyed. Privately maintained seasonal daybeacons mark the best water to the town of Hamburg. Piles used as moorings are in the center of the turning basin. A marine railway at Hamburg can handle craft up to 50 feet in length; gasoline, water, ice, and limited marine supplies are available. Complete engine and hull repairs are also available.

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 the landing at **Deep River** and crosses **Chester Creek Bar** through a swash channel to **Chester Creek.**

There are several small-craft facilities on Chester Creek, and a marina is about 0.3 mile southward of the landing at Deep River. A 35-foot marine railway, lifts, cranes, gasoline, water, ice, storage, marine supplies, and complete engine and hull repairs are available in the area. An anchorage area for small craft is in Chester Creek; see **202.1** and **202.55,** chapter 2, for limits and regulations.

The Chester-Hadlyme vehicular ferry crosses the river near **Fort Hill,** 2 miles above Eustasia Island.

The shoal off the west bank of the river, just north of **East Haddam,** 13.3 miles above Saybrook Point, 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.

The shoal off the east bank of the river opposite **Higganum Creek,** 5.5 miles above East Haddam, is extending westward.

After passing through the channel in **Paper Rock Shoal,** 9.7 miles above East Haddam, favor the south bank of the river to about 300 yards southeastward of **Bodkin Rock,** then cross to the north bank and pass it close-to.

Chart 267.—The shoal on the north side of the channel northwestward of Bodkin Rock has rocky patches partly bare at extreme low water.

Caution is recommended when rounding the point about 1.5 miles above Bodkin Rock to avoid a submerged crib in the water off 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 in length 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.

Gildersleeve, about 2.5 miles above Portland on the east side of the river, has a small boatyard where gasoline, water, ice, marine supplies, and engine and hull repairs can be obtained.

Above **Belamose,** 6.5 miles above Portland, the river narrows, the land is much lower, and the curves more pronounced. The channel follows the outside bank in the curves. At **Rocky Hill,** a mile above Belamose, a ferry crosses the river to South Glastonbury.

Wethersfield Cove, on the west side of the river 14 miles about Portland, has a narrow dredged entrance which in 1965 had a controlling depth of 6 feet through mid-channel. 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 in the cove.

A **harbormaster** is at the town marina in the cove; a launching ramp is available at the facility.

The bulk fuel handling plant of the Hartford Electric Company's power plant on the west bank of the river is the only remaining commercial dockage at **Hartford.** A flood control dike is along this bank from just north of Charter Oak Bridge to Memorial 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 7 to 15 feet; bottom hard and lumpy. Shoaling is abrupt on both sides, but especially on the south side, where the 5-fathom curve is only 200 yards from it in places. In 1964, shoaling to 16 feet was reported on the south side. The shoal is marked at its eastern end by a buoy, and lighted sound buoys on the south side and west end.

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 depths less than 36 feet in which the bottom is rocky and broken. The least found depth is 23 feet, but the area has not been fully developed.

Sixmile Reef 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.

Chart 215.—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 from the point is **Halftide Rock,** which is surrounded by foul ground.

Chart 216.—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 1965, the centerline controlling depth was 7 feet to the highway bridge. There are several small-craft facilities on the river. The largest marine railway can handle craft up to 65 feet in length for engine and hull repairs; gasoline, diesel fuel, water, ice, storage, and marine supplies are 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 gasoline, water, ice, storage, marine supplies, and engine and hull repairs; a 12-ton travelift 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 light. In April 1965 the controlling depth was 8 feet in the entrance channel, marked by buoys, to the turning basin at **Clinton.** Above the turning basin, the mid-channel 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 in length for engine and hull repairs; water, storage, and some marine supplies are available.

See appendix for **storm warning displays.**

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 in length for engine and hull repairs; gasoline, diesel fuel, 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 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 depths 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 on its inner part, extends 0.2 mile southwestward from the point, and is marked by a buoy, northeastward of which tide rips frequently occur. When rounding the point, vessels should pass westward of the buoy as a matter of safety.

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, 0.2 mile south of **Middle Beach,** is high and rocky. A privately maintained light is on the west side of Middle Beach. Between the island and the shore the water is shallow and the ground foul. Rocks, bare at low water, are 200 to 600 yards eastward of the island. A steel bulkhead in ruins, the top of which is awash at high water, extends from shore to **Gull Rocks,** a high bare

ledge about 300 yards east-northeastward of Tuxis Island. A cluster of rocks, bare at low water, is 300 yards east-southeastward of the ledge.

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. A rock, bare at low water, is 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.

Chart 217.—Guilford Harbor, a bight 5.5 miles westward of Hammonasset Point, is used only by small craft. 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. The approach channel is marked by buoys. Strangers should obtain local information before entering. Stakes and fish traps may exist northward of **Riding Rock,** 0.6 mile northwestward of Half Acre Rock.

In June 1964, the controlling depth was 6 feet in the dredged channel through Guilford Harbor and East River, to the mouth of **Neck River,** about 0.7 mile above Guilford Point, and 6 feet in the side channel in **Sluice Creek,** 0.3 miles above Guilford Point.

Boats of 6-foot draft can be taken up **East River** at high water to the fixed railroad bridge, about 1.8 miles above Guilford Point. The bridge has a clearance of 4 feet. An overhead power cable about 0.3 mile below the bridge has a clearance of 45 feet. Small-craft facilities on East River and Sluice Creek can provide gasoline, water, ice, and some marine supplies. A marine railway on Sluice Creek can handle craft up to 40 feet in length for limited engine and hull repairs.

West River empties into the western side of Guilford Harbor. 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 in length; gasoline, water, marine supplies, and complete engine and hull repairs are available.

See appendix for **storm warning display.**

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 taken between Goose Islands and Falkner Island taking care to avoid the shoals and reefs extending from the islands. Falkner Island is marked by a light and a lighted bell buoy off the northern end; a radiobeacon and fog signal are at the light. A lighted bell buoy is off the southern end of Stony Island.

From Indian Reef westward there 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 the shoals is buoyed. To insure 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 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 south 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 off the south end 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, marked by a buoy, 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 with a depth of about 7 feet.

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 likewise 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, there are two channels leading through The Thimbles. The deeper and clearer one is entered between **Wayland Island** and the buoys marking the foul area around **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.

The other channel continues northerly from off Wayland Island, past **Smith Island** on the east, northwesterly around **Cut in Two Islands,** and thence westward between **Governor Island** and **Potato Island.** The least depth in this channel is about 10 feet.

Stony Creek, a village on the railroad, extends southward to **Flying Point.** A small marina is on the point northeastward of **Frisbie Island;** a reported depth of about 2 feet can be taken to this facility. Gasoline, a 1-ton crane, marine supplies, inside storage, and a ramp are available. The village dock, for residents only, is about 250 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 channel, with a reported depth of 12 feet, leads northeastward to a quarry wharf. Private range lights and a range daybeacon mark the channel. A small turning basin marked by piles is eastward of the wharf.

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 range marks the entrance outside the breakwater. Gasoline, ice, and water may be obtained at the yacht club landing.

From Brown Point to Brandford 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 from 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 local 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. Broken ground, on which the least found depth is 11 feet,

extends about 0.2 mile northwestward from the boulders. **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,** and the same distance off the hotel boat landing. The landing has a depth of 2½ feet at its end.

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 1965, a midchannel depth of 8½ feet could be taken in the dredged channel from Branford Harbor 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 marine railway can handle craft up to 40 feet in length; lifts, gasoline, diesel fuel, water, ice, marine supplies, and complete engine, hull, and radio repairs are available.

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 private basin on the southwest side of the point is well protected in all but southerly winds.

Gull Rocks, consisting of small islets and sunken rocks, extend about 0.5 mile southwestward from shore on the esatern side of the entrance to a cove westward of Johnson Point. A rock bare at half tide is in the northwestern part of the cove about 350 yards southward of **Short Beach.** At the northwest end of the cove is a boat landing with a depth of 2 feet alongside.

Farm River Cut, 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 cut can haul out boats up to 40 feet in length for engine and hull repairs. **Old Clump** is a bare rock about 400 yards south of the bight.

East Haven River, about 1.5 miles westward of Branford Harbor, is used by local craft at high water. A midchannel depth of about 2 feet can be taken to the fixed bridge with a 4-foot clearance about a mile above the mouth. A 55-foot marine railway is just below the bridge on the west side of the river; gasoline, water, and limited marine supplies are available.

East Indies Rocks, about 0.4 mile south of the entrance to East Haven River, cover at half tide and are marked by a buoy; 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 East Haven 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 East Haven River are thickly settled. Bus communication is available from here to New Haven.

Chart 218.—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 sides of the channel north of Sandy Point. Waterborne commerce in the harbor consists of petroleum products, coal, scrap metal, lumber, rock salt, sand and gravel, 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: the Soldiers and Sailors Monument on East Rock, the Harkness Tower at Yale University, and a large gas tank with red-and-white checkerboard band around the top. 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.

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 Kimberly Avenue Bridge, 1.6 miles above the mouth. In July–August 1963, the controlling depth was 12 feet for a width of 100 feet from the entrance to the Kimberly Avenue Bridge. 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 which branches into an east and west fork to the Grand Avenue Bridge, 0.6 mile above the mouth. In February 1966, the midchannel controlling depth in the entrance channel was 6 feet, and thence 5 feet through the west fork and 3½ feet in the east fork.

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 February 1966, the midchannel controlling depth was 16 feet to Ferry Street Bridge, and thence 12 feet to Grand Avenue Bridge.

Anchorages.—Inside West Breakwater and the southwest half of Luddington Rock Breakwater, anchorage is available for vessels up to 22-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 winds.

An anchorage basin on the west side of the main channel southward of New Haven Long Wharf is frequently used, but 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 to 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, 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. 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.

The Kimberly Avenue Bridge over West River has a bascule span with a clearance of 7 feet.

See **203.120** and **203.121,** chapter 2, for drawspan regulations.

Tides.—The mean range of tide is about 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 1.3 knots. The flood sets 050° and the ebb 200°. Ebb velocities are increased by freshets. For predicted times and velocities of currents, the Tidal Current Tables should be consulted.

Ice generally obstructs navigation to some extent for sailing vessels from December to March, sometimes extending 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 have a tendency to clear the harbor of ice if the formation is light; southerly winds are apt to force in drift ice from the sound.

The prevailing winds are south and southwesterly in summer and northerly during the rest of the year.

See appendix for New Haven **climatological table** and **storm warning displays.**

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; 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. Pilots are available on a 24-hour basis. The usual place for boarding is about 2 miles southward of the New Haven sea buoy; pilots board from tugs which are equipped with VHF and medium frequency radiotelephones. Pilots services are generally arranged for in advance through ships' agents or directly by shipping companies; 24-hours advance notice is requested. Pilots carry portable radiotelephones which are used in docking and undocking vessels.

Towage.—Commercial towboats are available in New Haven. Vessels usually proceed to the harbor without assistance. Advance notice of 24-hours is required for towboat service; arrangements are made through ships' agents or directly by shipping companies. Tugs have VHF frequencies 156.30, 156.65, 156.80, and 156.95 mc.; also 2182 and 2738 kc.

Quarantine.—Medical inspection is made by the U.S. Public Health Service contract physician, who is also quarantine officer for Bridgeport. New Haven has many public and private hospitals and sanatoriums. A Public Health Service outpatient office is here.

Customs.—New Haven is a port of entry and marine documents are issued.

Immigration.—No immigration officials are stationed at New Haven. The necessary officers can be secured from Hartford.

The **harbormaster** has charge of the berthing and anchoring of vessels. Harbor regulations are not strictly defined. The harbormaster's headquarters are at the Wyatts Dock, just below Tomlinson Bridge.

Wharves.—The deep-draft facilities are along the north and east sides of the inner portion of New Haven Harbor. Depths at these wharves range from 18 to 35 feet alongside. 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 (West Haven) about 12 feet.

Two general cargo handling facilities, owned and operated by New Haven Terminal, Inc., dealing in foreign and domestic trade, are on the east bank opposite New Haven Long Wharf. North Dock, the northerly of the two facilities, provides 640 feet of berthing space with about 25 feet alongside. The New Haven Terminal Pier, to the southward, provides 500 feet of berthing space along each side, with depths of 25 feet along the north side, and 31 feet along the south side; a depth of about 18 feet was reported about 10 yards off the end of this pier. Both facilities have rail connections, modern cargo handling equipment, and ample covered and open storage areas. Most of the other facilities in New Haven Harbor are served by rail connections.

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.—There are no facilities available at New Haven for making major repairs or for drydocking deep-draft vessels; the nearest such facilities are at Boston, Mass., and New York. Above and below the waterline repairs can be made to fishing vessels, tugs, and barges. A shipyard with marine railway is at West Haven on the west side of the harbor; vessels up to 130 feet in length can be hauled out for engine and hull repairs. Machine shops in the area can make repairs to machinery, boilers, and fabricate shafts and other pieces of equipment.

Small-Craft Facilities.—There are excellent repair facilities on the east and west side of the harbor, and on Quinnipiac River. The largest marine railway in the area can haul out craft up to 120 feet in length for engine and hull repairs; travelifts, cranes, gasoline, diesel fuel, water, ice, storage, and marine supplies are available.

Chart 219.—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 **Burns Point** and Milford Harbor Light at the head of The Gulf; the light marks the end of a jetty on the east side of the entrance. The harbor is used chiefly for recreational boating, and for the receipt of shellfish and fish.

A dredged channel leads from The Gulf to about 400 feet above the Town Wharf, 0.7 mile above the entrance to Milford Harbor. In June 1966, controlling midchannel depths were 9 feet to the south end of an anchorage basin, on the west side of the channel about 250 yards above Burns Point, and thence 5 feet to the head of the channel; depths of 6 feet were in the anchorage basin, except for depths of 1½ feet along the western edge of the basin. Buoys mark the entrance channel.

A jetty, partly bare at half tide, extends southward from Burns Point. It is about 75 feet westward of the dredged channel. A yacht club with a float landing is on the north side of Burns Point. Caution is advised to avoid striking the south end of the jetty, which is marked by a buoy and is covered 2 feet. There are several boatyards and marinas in Milford Harbor. The largest marine railway in the area can handle craft up to 60 feet in length; travelifts, gasoline, diesel fuel, water, ice, marine supplies, and engine and hull repairs are available.

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. A buoy marks the end of a shoal which extends 250 yards east-northeastward from the island. A rocky shoal extends 0.4 mile southward from the island and is marked by a lighted bell buoy. Northward of Charles Island is 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 are occupied by 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.

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 nonnavigable **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 bituminous coal and lignite to the powerplant at Devon. 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 a light. The outer section of the breakwater shows at high water, but the inner section is covered at three-quarter tide.

In February 1963, the controlling depth in the dredged channel of Housatonic River was 13 feet to just below Culver Bar, 4.3 miles above the mouth; above this point the controlling depth is about 3 feet to Derby and Shelton.

Stratford is a town on the west bank 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, 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. There are several small-craft facilities at Stratford. The largest marine railway in the area can haul out craft up to 50 feet in length for engine and hull repairs. Gasoline, diesel fuel, lifts, water, ice, marine supplies, and launching ramps are available.

Devon is on the east bank 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 bank of the river about 8.6 miles above the entrance, is connected to **Derby** by two bridges; the town has several important factories. In 1965, 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 0.4 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, and above it are two fixed bridges, with clearances of 17 and 30 feet.

Regulations for drawspans on Housatonic River are given in **203.125**, chapter 2.

Tides.—The mean range of tide at Stratford is 5.5 feet and at Shelton, 5 feet. The time of the tide becomes later and the range diminishes in progressing up the river. At Stratford the tide occurs about 0.8 hour later than at the entrance while at Shelton high water is about 1.8 hours later and low water about 2.8 hours later, respectively, 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 there is a strong westerly set on the flood. 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. For current predictions and further details, the Tidal Current Tables should be consulted.

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 there 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 the strong westerly currents. The channel is marked by buoys and lights to Stratford, and by steering midchannel courses no difficulty should be encountered.

Pilots and **towboats** can be obtained at New Haven.

Chart 1212.—Stratford Shoal Middle Ground, 5.4 miles south of Stratford Point, is covered by depths of 4½ to 16 feet, and is marked by a light and buoys. The shoal area extends 1 mile north, 0.9 mile northeast, and 0.5 mile south of the light.

Stratford Shoal (Middle Ground) Light (41°03.6′ N., 73°06.1′ W.), 60 feet above the water, is shown from a gray granite octagonal tower projecting from a house on a pier. A radiobeacon and fog signal are at the station. See appendix for **storm warning display.**

North Shore of Long Island.—From Orient Point 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 which 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 which 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, the inlet can be entered by strangers without great danger. In 1965, the midchannel controlling depth in the dredged channel to the turning basin at Mattituck, about 1.8 miles above the entrance, was 6½ feet, and thence 7 feet in the turning basin. From the remains of Old Mill Bridge at **Waterville,** the channel to Mattituck is marked by seasonal private markers. The overhead power cable about a 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 about 4.5 feet at the entrance. The inlet is rarely closed by **ice.**

Several marinas and a boatyard are inside the inlet. A 25-ton travelift 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 here.

Jacobs Point, about 11 miles southwestward of Horton Point Light, is the site of an open roadstead offshore mooring oil facility at **Northville,** Long Island. The mooring area about 1 mile northward of Jacobs Point is marked at the western end by a lighted bell buoy. A steel mast, red and white, about 1 mile eastward of Jacobs Point, and a church spire to the southward are prominent.

Vessels calling at this facility are moored during daylight hours only and during slackwater before ebb tide current commences and during the first four hours of the ebb tide current. The **tidal current** periods are substantially the same as at The Race. Unmooring is accomplished at most anytime subject to unusual adverse tidal currents and weather conditions. Strong winds from the north and northwest are experienced during the winter and spring. Tide during maximum ebb and flood often reaches 3.5 to 4 knots.

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 through ships' agents; advance notice is required.

A **Mooring Master** and working crew will board the vessel from a launch off the moorings about 1 hour prior to scheduled mooring. The Mooring Master will pilot the vessel into the moorings, supervise the mooring and unmooring operation, and the connecting and disconnecting of the submarine hoses.

Communication with the shore and launch is via portable VHF radiophone. This equipment is on continuously during the vessel's stay in Northville. The Mooring Master's crew maintains a radio watch and constant communication with the shore for general purposes and emergencies.

Bunker and fresh water facilities are not available at Northville. Small quantities of provisions may be obtained at local stores in **Riverhead,** about 4 miles inland. There are no ballast disposal facilities at the terminal: U.S. antipollution regulations are rigidly enforced.

New York City is the **port of entry** for Northville.

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 **Friar 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. **Tuttles White Bank** is a high white bluff 0.6 mile westward of Wading River.

Chart 361.—**Mount Sinai Harbor,** 22.5 miles westward of Mattituck Inlet is marked by a low break in the beach nearly 1 mile long. 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 off the outer end of the east jetty. In 1965, dredging operations by sand and gravel companies were in progress in the harbor. The entrance had a reported controlling depth of about 8 feet, in 1965. Two privately dredged, maintained, and marked channels, about 15 feet deep, on either side of a small craft mooring area, extend in an east-west direction in the upper part of the harbor. Depths of 18 to 30 feet were reported in the northwesterly part of the harbor; caution is advised in selecting anchorage. A yacht club, and a town marina are in the north side of the harbor on the south side of **Cedar Beach.** **Speed** in the harbor is 5 m.p.h. A small boatyard at the extreme southern end of the harbor can be reached only at high tide. The approach to the boatyard is not well marked; extreme 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 between two converging jetties, each of which is 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.

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 1962, a controlling depth of 25 feet was available in the improved dredged channel in Port Jefferson Harbor from the entrance to an oil pier at the southern end. The channel is marked by buoys and a private lighted range.

Shoals with little depth are on both sides of the channel from the entrance to the lighted buoy 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 covered wreck, unmarked, is in the northeast part of 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 north-

erly weather for any draft able to get inside. Considerable shoaling has occurred along the edges; caution is advised in selecting anchorage, and in moving around in the basin.

The mean range of **tide** is about 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 industry of the port is the dredging and shipping of sand and gravel; shell fishing and distribution of petroleum products comprise the other maritime industries. There are excellent small-craft facilities at the head of the harbor. Lifts can haul out craft up to 10 tons for complete engine and hull repairs. Gasoline, water, ice, wet and dry storage, and marine supplies are available.

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 35 feet is alongside the oil pier on the west side of the harbor about 400 yards from the head. The powerplant pier about 150 yards to the northwestward has a reported depth of 30 feet alongside.

Communications.—Port Jefferson is served by railroad and bus. A ferry operates to Bridgeport, Conn., during the summer months.

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 1964, 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 private buoys.

Setauket is a village on the south shore of Setauket Harbor about 1 mile above the entrance.

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9. WESTERN LONG ISLAND SOUND

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. It is described in this chapter in the following sequence: Bridgeport to Throgs Neck on the north, Old Field Point to Willets Point on the south, East River, and Harlem River.

In this region there are 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 and in the harbor. 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. See Table of Hours of operation of Fog Signals, in the appendix.

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.

Pilots board vessels bound for Long Island Sound ports in the vicinity of Brenton Reef Light, and on request off Block Island Southeast Lighted Whistle Buoy, or off Block Island North Reef Lighted Bell Buoy 1BI, and in some cases by prior arrangements off the entrances to the major ports on Long Island Sound. 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 kc., or on 2182 kc. Pilotage, where required, for the major ports on Long Island Sound is discussed under the name of the port.

Chart 220.—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, scrap iron, and coal.

Prominent features.—The principal landmarks include a group of seven stacks at **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 Poquonock River, the radio towers at Pleasure Beach, and Bridgeport Harbor Light. The rays of an aero light 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, Johnson Creek, Yellow Mill Channel, and Poquonock 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 Poquonock River.

Just north of **Tongue Point,** a dredged channel with a depth of about 7 feet leads to private facilities.

Johnson Creek, northward of Pleasure Beach, is entered eastward of Tongue Point through a marked channel. A midchannel controlling depth of about 11 feet can be taken to the 6-foot deep anchorage 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. Private yacht clubs and two oil-receiving piers are on the creek.

Yellow Mill Channel, entered just above the first bend in the main channel, has flats that largely bare at low water on both sides of the channel. In April 1965, the controlling midchannel depth was 16 feet through the turnpike bridge and 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, and about 0.1 mile above it, is a fixed turnpike bridge with a clearance of 40 feet. Depths at the wharves are 8 to 15 feet.

Poquonock River, the most westerly of the tributaries, is easily followed by small craft, but larger vessels may need the assistance of a towboat to get around the sharp bends. In April 1965, a controlling midchannel depth of about 14 feet could be carried in the channel to the head just below the Bershire Avenue dam. Depths at some of the wharves are 10 to 15 feet, but there is little depth at the others.

Type, distance above Steel Point, and clearance of bridges over Poquonock 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; regulations governing operation of the drawspans over Poquonock River are given in **203.130** and **203.131,** chapter 2.

Anchorages.—Inside the breakwaters, on the east side about opposite Pleasure Beach, there is an anchorage area with depths of 23 to 40 feet, and on the northwest side is an anchorage with depths of 15 to 25 feet. The rest of the harbor area consists of broad and shallow sand flats. An anchorage area is in Johnson Creek; see **202.148,** chapter 2, for limits and regulations.

Vessels sometimes anchor off the entrance for shelter in strong northerly winds; the holding ground is good.

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 about 6.8 feet. Daily predictions of the times and heights of high and low waters are given in the Tide Tables.

Currents.—In the entrance channel between the breakwaters, the velocity of flood or ebb is about 0.7 knot. For predictions, see the Tidal Current Tables. Inside the harbor the currents are generally weak.

Prevailing winds are southwesterly in the summer and northwesterly in winter.

Ice does not interfere seriously with navigation. The tributaries of the harbor are closed at times. In Bridgeport Harbor winds from the north and northwest clear the harbor of drift ice, and winds from southeast through 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.

See appendix for Bridgeport **climatological table** and **storm warning displays.**

Pilotage is compulsory for foreign vessels and U.S. vessels under registry. Pilots board vessels off the entrance sea buoy; 24-hour service is available, and arrangements for such services are generally made through ships' agents or directly by shipping companies. In emergencies, pilots can be arranged for on 2182 kc.

Towage.—Towboats may be obtained from New York or New Haven upon advance notice.

Quarantine.—Vessels arriving from foreign ports, other than from Canada, anchor outside the breakwater where they are boarded for inspection or are inspected at dockside. Release from quarantine is made by a Public Health Service doctor who will come on call from New Haven.

The city has several public and private hospitals. Bridgeport Hospital is a United States contract hospital. Contagious cases are handled at either Bridgeport General Hospital or St. Vincents Hospital in Bridgeport.

Customs.—Bridgeport is a Customs District headquarters, and marine documents are issued. The customhouse is in the Federal Building. Vessels may enter or clear at any time.

Immigration Service.—No officials of the Immigration Service are stationed at this port, but they may be obtained from Hartford.

Harbormaster.—The control of the port is vested in the harbormaster who is appointed by the city.

Wharves.—Depths alongside the principal privately owned and operated facilities range from 8 to 35 feet. Most of the facilities at Bridgeport are of the marginal-type wharf, particularly in the constricted tributaries. The municipal dock, a marginal-type wharf, is on the west bank of the Poquonock River, just below the Connecticut Turnpike Bridge. The dock, in poor condition, has depths of about 10 to 15 feet alongside. The city owned recreational pier, seldom used for mooring vessels, is on the northwest end of Pleasure Beach; depths at the end are about 20 feet. Arrangements for the use of the private waterfront facilities can be made through ships' agents or directly with their respective owners.

Supplies.—Diesel oil, diesel fuel, gasoline, fuel oil, lubricants, water, provisions, and marine supplies can be obtained in Bridgeport. By special arrangements ocean-going vessels can procure fuel oil by tank truck; towboats are supplied with diesel oil in the same manner.

Repairs.—Facilities are not available at the port 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. Above and below the waterline repairs to fishing boats, tugs, and recreational craft can be made in Bridgeport. Excellent facilities are available to effect complete engine and hull repairs to small craft. The largest marine railway in the area can handle craft up to 150 feet in length.

Communications.—Air, rail, and bus communications serve the city of Bridgeport. Ferry service to Port Jefferson is available through the summer months.

Black Rock Harbor, 2 miles west-southwestward of the Bridgeport main harbor entrance, is part of the Bridgeport Federal project, although not connected with it otherwise than by the sound. Black Rock Harbor and **Cedar Creek** comprise the approach by water to the large factories of the western part of Bridgeport.

In 1962, a controlling midchannel depth of 14 feet could be taken from the entrance to the junction of east and west branches in **Cedar Creek,** thence 17 feet in east and west branches. The channel is marked by buoys and lights for about 1.7 miles above the entrance.

Anchorage exposed only to southeasterly winds can be found off the entrance, northeast of the bar that makes out from Shoal Point to Black Rock. Depths are 18 to 22 feet. On either side of the dredged channel, westward of Fayerweather Island, small craft drawing less than 6 feet can select anchorage as far as the yacht club. Depths at some of the wharves are 10 to 15 feet.

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, 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.

Yacht clubs are on the northwest side of the harbor eastward of **Grover Hill,** and an old stone landing which shows at low water extends 150 yards from shore just northward of the southerly landing.

Burr Creek, northward of Black Rock, on the west side of the channel, is the site of the Bridgeport city 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. A **harbormaster** is available.

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. In 1965, a rock, covered about 1 foot, was reported about 40 yards south of the daybeacon. About 0.2 mile northward of Black Rock are **The Little Cows,** consisting of rocks awash at low water.

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. In April 1965, the dredged channel had a midchannel controlling depth of 9 feet to the anchorage basin, about 0.5 mile above the breakwater, and thence about 6 feet in 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 marina are on the west side of the harbor; depths of about 6 feet are alongside the town landing, and about 8 feet alongside the yacht club landing. Gasoline, water, ice, and some marine supplies can be obtained. A 35-foot marine railway at the town marina can haul out craft for engine and hull repairs. A **harbormaster** is at Southport.

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.

Chart 221.—Saugatuck River, 6 miles westward of Penfield Reef Light and northward of Cockenoe Island, is shallow and full of ledges and boulders. The river 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 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** at the east side of the entrance. Anchorage for small craft, sheltered from all winds, can be had 75 to 100 yards off the beach westward of **Bluff Point,** at the west side of the entrance.

The channel in Saugatuck River is narrow and crooked; vessels should proceed with caution, preferably on a rising tide. The controlling depths are about 6 feet to Duck Creek, thence about 3 feet to the end of the buoyed section at **Stony Point** just below Saugatuck; above this point, depths are less than 3 feet to Westport.

A privately dredged channel with a depth of 6 feet leads to **Compo Yacht Basin,** also known as Cedar Beach Yacht Basin, in the bight to the northwestward of Cedar Point. The entrance is marked by private navigational aids. A yacht club with landing and mooring facilities is in the basin. Gasoline and fresh water are available at the landing.

Longshore Town Marina, a private bulkheaded basin, is entered through a 200-foot wide channel on the north side of the river, about 0.6 mile northwestward of Cedar Point. Private buoys mark the west side of the channel southward of **Kitts Island;** in 1965, a reported midchannel depth of about 5 feet was available. On the west side of the basin is a prominent concrete tower. Gasoline, water, and a launching ramp are in the basin.

Duck Creek, on the west side about 0.6 mile above Bluff Point, is the site of a private yacht club; a reported depth of about 8 feet is available in the creek. The entrance and basin are privately marked. Gasoline, diesel fuel, water, and ice are available.

The large basin southward of Duck Creek is privately owned and maintained 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 travel 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 135 feet. The Connecticut Turnpike Bridge, 0.1 mile above, has a clearance of 60 feet. About 0.1 mile farther up is a highway bridge with a swing span having a clearance of 6 feet; see **203.135,** chapter 2, for drawspan regulations.

Westport, a town at the head of navigation, is about 1.4 miles above Saugatuck.

There are several boatyards on the Saugatuck River. The largest marine railway can handle craft up to 150 feet in length; gasoline, water, ice, marine supplies, and complete hull and engine repairs are available.

Norwalk Islands, privately owned with the exception of Ram Island which is 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 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. **Peck Ledge,** on the western side of Cockenoe Harbor entrance, is marked by a light.

Cockenoe Harbor, westward of Cockenoe Island, is

marked by a light northeastward of Peck Ledge. The best anchorage is in depths of 12 to 25 feet, northward and northwestward of the light.

Routes.—From eastward, pass southward of Cockenoe Island Shoal Lighted Bell Buoy 24, steer **254°** until Peck Ledge Light bears northward 285°, then steer for the light until up with Channel Rock buoy, and then pass eastward and northward of the light at a distance of 200 to 300 yards.

From westward, give the edge of the shoals a good berth until Peck Ledge Light bears westward of 348° and then steer north and pass 400 yards eastward of the light and midway between Channel Rock buoy and Peck Ledge bell buoy.

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 a tower; **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-southwestward 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, also known as **Norwalk Harbor,** is entered between Greens Ledge and the mainland. The harbor is used frequently in the fall and winter. Depths range from 12 to 20 feet in the anchorage northwestward of Sheffield Island. The shoal flats on the north side of the harbor have rocks and boulders in places.

Tavern Island, with many houses, is just northwestward of the beginning of the dredged channel. There is foul ground on all sides of this island.

Norwalk River, on the north side of Long Island Sound, northward of Norwalk Islands and about 39 miles east of New York, is commercially important. The dredged channel extends 3 miles northeasterly from Sheffield Island Harbor between **Manresa Island** on the west and **White Rock** and numerous islets and foul ground on the east, to the first highway bridge at South Norwalk; thence it continues another 1.3 miles northerly to Norwalk. The tall stack, lighted on top by red lights, on Manresa Island, is very prominent and can be seen for many miles from sea.

In 1965, the controlling midchannel depth was 11 feet through the entrance channel, and thence in 1964, 12 feet to the bridges, above which the centerline depths were about 7 feet to Norwalk. In 1964, a controlling depth of 7 feet was available in the channel to the head in East Norwalk Harbor. A shoal covered about 6 feet, temporarily marked by a buoy, is reported inside the entrance channel about 80 yards 068° from Norwalk Channel Light 11.

Gregory Point, marked by a clubhouse and wharf, is on the east side of Norwalk River 0.5 mile above the entrance. The boat basin immediately eastward of Gregory Point, locally known as **Norwalk Cove,** has a reported depth of about 6 feet in the entrance channel, with about 8 feet in the eastern part of the basin; facility is privately maintained.

South Norwalk is an important commercial and manufacturing city on the west bank about 1.5 miles above the mouth. 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.

The first highway bridge, at South Norwalk, has a bascule span with a clearance of 8 feet. The railroad bridge, just above it, has a clearance of 16 feet. The overhead power cable near the railroad bridge has a clearance of 160 feet. About 0.6 mile above the railroad bridge is a turnpike fixed bridge with a clearance of 60 feet. See **203.145,** chapter 2, for drawspan regulations.

Just north of **Fitch Point,** at East Norwalk, there is a small-boat anchorage basin with depths of 6 feet.

Norwalk is a city on both banks of Norwalk River at the head of navigation, 1.3 miles above South Norwalk. 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.

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. For predictions, the Tidal Current Tables should be consulted.

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.

Towage.—Towboats can be obtained from City Island, N.Y., or New Haven, Conn.

Quarantine.—This service is available from Bridgeport when required. One public hospital and several private sanatoriums are available in the city.

Customs and Immigration.—Norwalk is not a port of entry, but is included in the Bridgeport customs district, where matters pertaining to customs and immigration are handled.

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. Travelifts, 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 Point, on the north shore of Sheffield Island Harbor, has an oil-receiving wharf with depths of 11 to 16 feet alongside. A depth of about 8½ feet can be taken to the wharf from 100 yards westward of the buoy about 0.2 mile east-southeastward of Noroton Point. A yacht club is northward of the wharf. Good anchorage for small craft in 3 to 6 feet can be had between Wilson Point and the northern part of Bell Island.

Noroton Point, on **Bell Island,** is marked by a flagpole and a prominent house with a cupola. About 300 yards northward of the point are rocks bare at low water. **Pine Point,** just westward of Noroton Point, has a wharf with a depth of about 15 feet at its 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,** almost bare at low water, extends 300 yards off **Roton Point,** and is marked by a buoy.

Fivemile River, a narrow inlet about 0.9 mile north of Greens Ledge Light, is about 1 mile long, and shallow except in the dredged channel. The controlling depth is about 5 feet to within 0.2 mile of the head.

Along the small-craft facility wharves, depths decrease from 6 to 3 feet. 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. Extensive small-craft facilities are on the river; the largest marine railway can haul out craft up to 65 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, marine supplies, and storage are available.

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 in the entrance to this cove about 1.25 miles 291° from Greens Ledge Light.

Long Neck Point has many summer residences and boat landings on both sides of the point. Shoals extend about 0.3 mile off the point.

From Long Neck Point westward to Shippan Point there are many reefs and boulders, and the bottom is very broken, necessitating caution. It 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 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.

Smith Reef, comprising two rocks which uncover 2 feet and marked at the south end by a lighted buoy, is 0.9 mile southwestward of Long Neck Point. **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 a mile westward of Long Neck Point, has depths of about 5 feet. Local knowledge is necessary to avoid several rocky areas in the approach to the harbor. A depth of about 3 feet can be carried across the bar at the entrance to the harbor.

In 1966, a controlling depth of 7 feet for a middle width of 50 feet could be carried in the channel from Long Island Sound through **Westcott Cove,** just west of Cove Harbor, to the south limit of the lagoon at the head of the cove. The buoyed channel has shoaled to 5 feet along the edges.

A small but well-protected yacht anchorage with a boatyard is on the west side at the head of the cove. The marine railway here can haul out craft up to 80 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

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. The entrance to the harbor, between breakwaters, is marked by buoys and a lighted range. **Shippan Point,** the eastern point at the entrance, is surrounded by rocks which show at low water. Commerce in the harbor is principally in petroleum products, bituminous coal and lignite, sand and gravel, and crushed rock.

Stamford is a manufacturing city on the peninsula between the east and west branches.

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 with red base at the east end of the west breakwater. A fog signal is sounded at the light.

Channels.—In 1965, the midchannel controlling depth was 15 feet from the entrance to the junction of **East** and **West Branches**, and thence in 1963, 15 feet to the turning basin at the head of West Branch. In 1965, a hurricane barrier was under construction across East Branch, about 300 yards northward of **Ware Island.** The main channel in East Branch is closed; a temporary bypass channel westward of the main channel, project depth 12 feet, will be used until construction of the barrier is completed about July 1967. The channels are well marked by lights and buoys.

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.** 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 East Branch is usually navigable throughout the year. In West Branch, the channel is closed by ice for about 6 weeks in most years. Ice forms in the harbor each winter and extends usually as far as the light. 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.

See appendix for **storm warning displays.**

No particular directions are required. The range favors the west side of the channel and does not show plainly until eastward of Stamford Harbor 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.

Pilotage is compulsory for foreign vessels and U.S. vessels under registry. There are no pilots available at Stamford; pilots must be engaged before arriving. Arrangements for pilot services are generally made in advance through ships' agents or directly by shipping companies.

Towage.—Towboats may be obtained from New York or New Haven upon advance notice.

Customs, Immigration, Quarantine.—Stamford is in the Bridgeport customs district, but is not a port of entry. Customs, immigration, and quarantine services are performed at Bridgeport unless special arrangements have been made with the proper officials. A **harbormaster** is at both West and East Branches at Stamford.

Wharves.—Commercial wharves along the East Branch are of the bulkhead and apron type and all are privately owned. Some are open to the public. Spur tracks from the railroad serve properties on both sides of the channel. In West Branch, the wharves are of the same general type as those in East Branch; all are privately owned.

Supplies.—Gasoline, diesel fuel, provisions, and marine supplies are available. Water can be had at most of the wharves. Bunker fuel oil and diesel oil are available in several grades in adequate quantities. There are no bunkering facilities in the stream.

Repairs.—There are excellent repair facilities in both East and West Branches. The largest marine railway can haul out craft up to 200 feet in length; complete engine and hull repairs are available.

Communications.—Stamford has rail and bus service.

Chart 222.—**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 westward 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 and Mianus River to Mianus; the midchannel controlling depth is about 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 anchorage area** is in Cos Cob Harbor; see **202.1** and **202.58,** chapter 2, for limits and regulations.

There are several dangers off the entrance to 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 is prominent on the east side of Cos Cob Harbor, about 0.5 mile above the entrance. A large powerplant with a prominent stack is on the west side just below the first bridge.

Mianus River is crossed by a railroad bridge with a bascule span having a clearance of 20 feet; see **203.150,** chapter 2, for drawspan regulations. The fixed highway bridge about 0.4 mile northward has a clearance of 45 feet. The overhead power cables near the railroad bridge have a clearance of 105 feet.

Several marinas and boatyards line the west side of the river from above the railroad bridge to the head of navigation. The largest marine railway in the area can haul out craft up to 80 feet in length for engine and hull repairs. Gasoline, water, ice, marine supplies, and wet and dry storage are available.

Mianus, at the head of navigation on the river, is the site of a sand and gravel company wharf. Barges carrying sand and gravel, and crushed rock ply the river.

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 is on the north side of Captain Harbor and northeastward of Field Point. In 1962, a midchannel controlling depth of 10 feet could be carried in the dredged channel for about 0.8 mile, and thence 9½ feet to near the head of the harbor. The channel is buoyed for about 0.8 mile. Two anchorage basins, one at the head, and the other just southward, are off the west side of the channel. In April 1962, depths of 5½ and 7 feet, respectively, were in the anchorage basins.

Greenwich is a city on the railroad. The wharves are along the point on the east side of Greenwich Harbor. The city has a **harbormaster.** Several private yacht and boat clubs are in the harbor; gasoline, water, and limited marine supplies are available. 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 and marked by a lighted buoy, should be given a berth of 100 yards. **Bowers Island,** just westward 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, and is marked near its southeast end by a light. A summer resort and landing are on the island, which is fringed with reefs. 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 is not recommended.

Great Captain Island Light (40°58.9′ N., 73°37.4′ W.), 73 feet above the water, is shown from a white tower 51 feet high on the south gable of a granite dwelling on the southeast part of the island. A fog signal is sounded at the light.

A **measured nautical mile** on bearing **060°** is off the south sides 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 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 to 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 is protected by a breakwater which is marked at the south end by a light. The lower section of the river forms the boundary between New York and Connecticut.

The navigable part of **Byram River** extends in a dredged channel to a fixed bridge about 1.2 miles above its mouth. In 1962, the controlling depth was 12 feet in the channel from deep water in Long Island Sound to Fox Island, thence 6 feet to the turning basin about 1.4 miles above the mouth.

A fixed highway bridge over the river about 0.4 mile above its mouth has a clearance of 60 feet.

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. Between the boat landing and the south breakwater the area is reserved for swimming. Bus service is available to New York City and Connecticut shore points.

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 marked by a seasonal private daybeacon.

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.

Milton Harbor channel leads from about 400 yards northward of Milton Point to the city boat basin and marina below **Mill Pond.** The privately maintained and marked channel had a reported depth of less than 2 feet in 1963. Several 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.

In 1965, a midchannel controlling depth of 10 feet was in the entrance channel to the intersection of East and West Branches. In May 1966, midchannel depths of 6½ feet were available to the head of East Branch Channel, 9 feet in the branch channel north of the east basin anchorage area, and about 10 feet in east basin in 1963; and thence in May 1966, 6 feet in West Branch Channel and in west basin anchorage area. East basin is usually filled with moorings of local craft. The mean range of tide is about 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 4 m.p.h. is enforced within the limits of the inner harbor and channels.

See appendix for **storm warning display.**

The town of **Mamaroneck** extends from both sides of the harbor; commerce in the harbor consists of building material and petroleum products. Rail and bus services are available.

Supplies and repairs.—There are several boatyards and marinas in Mamaroneck Harbor. The largest marine railway can handle craft up to 50 feet in length; gasoline, diesel fuel, water, ice, marine supplies, storage, and complete engine and hull repairs are available.

Foul ground continues from eastward of Delancey Point southwesterly 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 6 feet near **Great Knob,** which is 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 Lachmont Harbor are maintained by the yacht club.

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 months. 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 **202.155,** chapter 2, for limits and regulations. Vessels should not anchor near the sewer outlet in the middle of the bay. On the northwest side of Echo Bay a dredged channel leads to the wharf at Beaufort Point and to a turning basin. Northward from the turning basin the area is shoal and extensive mud flats bare at low water. Southwesterly of the turning

basin, the depth varies from 9 to 2 feet at the head of navigation. The depth in the entrance channel to the turning basin is about 10 feet.

New Rochelle is a city on the western shore of Echo Bay. Principal waterborne commerce are sand, gravel, and petroleum products.

A masonry wharf, municipally controlled, forms the northeast side of **Beaufort Point** and affords berthing space. A city police patrol boat usually docks here. Gasoline, water, and other supplies can be obtained. Several marine railways are available; the largest can haul out craft up to 40 feet in length for hull and engine repairs. See appendix for **storm warning displays.**

Communications.—Railroad and bus service to New York City and points in Connecticut are available.

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 two houses. A small private landing is on the west side of the island. Southwestward of the island are two bare rocks and a long bare ledge.

Chart 223.—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 Notations** and **South Notations** are rocks which uncover 4 feet between Middle Reef and Hart Island. South Notations 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 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.

Communications.—A Government ferry operates between Neptune Island, New Rochelle, and Fort Slocum throughout the year. Railroad and bus lines connect with New York and points in Connecticut.

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 to 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 has a controlling depth of about 6 feet to within 0.1 mile of the head, and thence about 5 feet to the head.

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 **202.1, 202.60,** and **202.155,** chapter 2, for limits and regulations.

Several yacht clubs, marinas, and boatyards are in New Rochelle Harbor. Gasoline, diesel fuel, 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. For about 0.7 mile northward of the light, the broken bottom is covered by depths ranging from 5 to 19 feet.

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 is between Davids Island and Glen Island. Westward and southward of Goose Island are several bare rocks. A rock breakwater nearly surrounds Goose 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. See appendix for **storm warning displays.**

Adjoining the yacht club is a boatyard with a marine railway which can haul out boats up to 45 feet in length. Engine and hull repairs can be made; diesel fuel, gasoline, lubricants, ice, water, and marine supplies are available.

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 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 prison buildings of New York City. A high brick chimney near the middle of the southeast side, and a stack in the south part of 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. Markers at the southern tip of the island used at one time to mark a measured course serve as useful landmarks.

Rat Island is a high bare rock about 0.4 mile west of Hart Island. **The Blauzes,** partly bare at high water, 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 bridge having a swing span with a clearance of 12 feet. **Currents** at the bridge are variable, and at times exceed 1.5 knots; see 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. The east side is industalized with several shipyards and establishments connected with marine activities.

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** which is a small rocky patch covered 25 feet. Other general and special **anchorage areas** are in the vicinity; see **202.1, 202.60,** and **202.155,** chapter 2, for limits and regulations.

A long recreational fishing pier is at **Belden Point,** the south end of City Island. The western shore of Hart Island and the wharves on City Island should be given a clearance 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.—In the winter drift ice sometimes interferes with navigation to the extent that sailing vessels are obliged to take a towboat.

Pilotage.—The Hell Gate (East River), and Inter-Port Coastal Pilots maintain a pilot and reporting station at the end of a pier at the Consolidated Yachts, Inc., facility about 0.4 mile northward of Belden Point on the eastern side of City Island. Pilot services are generally arranged for through ships' agents or directly by shipping companies; 24-hour service is available. Bridge-to-bridge communication, 156.65 mc. is used by both the Hell Gate and coastal pilots. Passing vessels are reported by land telephone to the Martime Exchange, New York City, by the reporting station at City Island. Hell Gate pilots board vessels off Execution Rocks. Coastal pilots board vessels at pre-arranged ports, off Brenton Reef Light, off Block Island Southeast Lighted Whistle Buoy, or off Block Island North Reef Lighted Bell Buoy 1BI; refer to discussion at beginning of chapter.

Supplies.—Diesel oil, 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 an 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.

The buoyed channel through the bay follows in general the eastern shore to the mouth of **Hutchinson River.**

Depths of about 7 feet can be taken in the dredged river channel to the junction of East Y and West Y, and thence shoaling at the junction to bare at the northern ends of East Y and West Y at the head of the river. The channel is buoyed for about 2 miles above the railroad bridge.

Special small-craft anchorages are in Eastchester Bay; see **202.1** and **202.60**, 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 a mile above the 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 mouth, and clearance as follows: bascule, 0.3 mile, vertical clearance 13 feet, horizontal clearance limited to 49 feet when leaves are open; rolling lift, 0.4 mile, 8 feet; overhead power cable at bridge, 130 feet; bascule, 0.8 mile, 30 feet; bascule, 1.9 miles, 31 feet; bascule, 2.1 miles, 5 feet; overhead pipeline, 2.4 miles, 130 feet; bascule, 2.5 miles, 5 feet and horizontal clearance of 40 feet when open. In 1966, the bascule bridge 2.1 miles above the mouth was being replaced by a fixed bridge at the same location. See **203.155,** chapter 2, for drawspan regulations.

Eastchester is a village on the west bank 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 bank 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; the entrance is marked by private daybeacons. Rocks which 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.

Chart 1213.—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. Reported depths of about 8 feet are in the southwesterly channel, and about 6 feet in Porpoise Channel. The channels in the harbor 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. Gasoline, water, ice, and marine supplies are available. A 35-foot marine railway, just inside the entrance, can haul out craft for engine and hull repairs.

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 is a shallow crooked stream whose mouth is about 4 miles westward of Stony Brook. Rocks and shoals, bare at low water, are on the bar outside the entrance. The dredged channel from the entrance into the river, has a reported depth of about 8 feet. Gasoline, water, and ice are available on the river. About 0.5 mile southwestward of the mouth of the river is a State hospital, a prominent group of buildings with green roofs, and two large red brick chimneys. Farther westward is a standpipe. The railroad station is **Kings Park.**

Chart 224.—About 10.5 miles westward of Old Field Point Light and 2.7 miles southeastward of Eatons Neck Point, is a small bight privately maintained with a reported depth of about 10 feet, and formed by gravel dredges working into the high bank. The entrance to the bight is marked on the east side by a breakwater, marked at its end by a light, and a lighted buoy on the west side; the aids are privately maintained. The stack of a power and light company on the east side of the bight is prominent. The basin is closed to general navigation.

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.** The basin is entered through a 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 is reported through the entrance to the head of the buoyed channel. 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 for another 1.8 miles northerly there are broken ridges.

Huntington Bay, just westward of Eatons Neck, is an excellent anchorage for large vessels, protected against all but northerly winds. 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 being 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 Tidal Current Tables for prediction.

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.

On the north side of **Bluff Point,** on the eastern side of Northport Bay, is an extensive sandspit which is conspicuous from a northwesterly direction.

Northport Harbor is at the southeastern end of Northport Bay. In 1965, 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. 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.

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.

Northport is a village with rail and bus communications on the eastern shore of Northport Harbor. The dark gray chimney of the powerplant is prominent. 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.

Marinas, yacht clubs, and boatyards are in the harbor. The largest marine railway can haul out craft up to 60 feet in length; travelifts, cranes, gasoline, diesel fuel, water, ice, marine supplies, and hull, engine and radio repairs are available.

See appendix for **storm warning displays.**

Centerport Harbor is a shoal bight on the south shore of Northport Bay just eastward of the entrance. In 1965, 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 is on the west side of the harbor just below the bridge; this facility can only be reached at high tide. Hull and engine repairs and water are available.

Huntington Harbor, at the southwest end of Huntington Bay, has a dredged channel through the entrance to a turning basin off Old Town Dock; in 1965, the dock was leased to a private concern. The New Town Dock southward of Old Town Dock, is under the control of the town harbormaster and is used by sand and gravel barges. The **harbormaster** controls all moorings in the harbor, and has his office at the head of the harbor. A boulder reef on the west side of the entrance channel extends out to Lloyd Harbor Light. The tidal currents have an estimated velocity of 2 knots in the entrance channel.

A depth of about 8 feet can be taken in the channel from Huntington Bay to the anchorage at the head of the harbor. The channel is marked by lighted and unlighted aids and mark the best water; the unlighted aids are privately maintained and seasonal. See **202.1** and **202.150,** chapter 2, for limits and regulations for anchorage area.

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.

See appendix for **storm warning display.**

Huntington Hospital, well lighted at night, and a lighted radio tower westward of the cupola at the head of the harbor, are prominent. A **speed** limit of 5 m.p.h. is enforced in the harbor.

There are several marinas and boatyards in the harbor. Craft up to 12 tons can be hauled out for engine and hull repairs. Gasoline, diesel fuel, water, ice, storage facilities, lifts, and marine supplies are available. The town of Huntington maintains several launching ramps.

Lloyd Harbor extends westward from Huntington Bay nearly to Oyster Bay, from which it is separated by a narrow strip of beach at high water. Vessels drawing less than 7 feet can anchor just inside the entrance, where the depths are 7 to 11 feet. An abandoned light tower is about in the middle of the entrance.

Oyster Bay, on the south side of the sound about 5 miles westward of Eatons Neck Light, lies between Lloyd Neck and Rocky Point. 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. A fog signal is sounded at the light.

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, with a least depth of 2 feet, is about 0.5 mile eastward of Lloyd Point and marked by a daybeacon.

About 0.6 mile southwestward of Lloyd Point is a long jetty on the south side of the entrance to a pond which 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 mid-channel course through the entrance. It is used considerably by local boats as an anchorage and harbor of refuge. The holding ground is good.

In 1965, 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 a 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. See appendix for **storm warning display.**

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 seminary on the hill of **West Neck,** on the east side of the harbor, is prominent. The harbor is free of dangers if the shores be given a berth of about 0.3 mile, the depths being 15 to 18 feet to near its head.

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 here can provide gasoline, engine and hull repairs, water, ice, marine supplies, and overnight moorings.

Special small craft **anchorage areas** are in Cold Spring Harbor and Oyster Bay Harbor; see **202.1** and **202.60,** 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.

About 200 yards westward of the wharf, a dredged channel with a reported depth of about 4 feet, leads 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 with two marine railways, westward of the entrance to Memorial Basin, can haul out craft up

to 150 feet in length for engine and hull repairs; gasoline, diesel fuel, water, ice, marine supplies, and storage are available.

Just northwestward of **Brickyard Point** there are two rocks bare at low water. About 300 yards north-northwestward is a rock with 4 feet over it. None of these rocks are marked, and caution is advised. In this area there are extensive oyster beds privately owned and marked by stakes.

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.

Chart 222.—Oak Neck Point, 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 Matinicock Point.

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.

Matinicock 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.

Chart 223.—Hempstead Harbor, 4 miles wide at the entrance between Matinicock 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 **202.1** and **202.60,** 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 water 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.

See appendix for **storm warning displays.**

There are several marinas and small-craft repair facilities in Glen Cove Creek. The largest marine railway can handle craft up to 100 feet in length. Travelifts, gasoline, diesel fuel, water, ice, wet and dry storage, marine supplies, and engine and hull repairs are available.

The southern part of Hempstead Harbor is entered through a dredged channel from the entrance at Bar Beach which extends southerly to a point about 520 yards above Roslyn Old Town Wharf. In 1964, the controlling depth in the buoyed channel was 6 feet to a point opposite Old Town Wharf, and thence bare to the head of the harbor; shoaling was reported in the area between buoys 12 and 16.

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 power plant 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 power plant to Bar Beach has a clearance of 90 feet. Depths of about 8 feet are available at the Glenwood Landing wharves.

A large boatyard here has several marine railways, the largest of which can handle craft up to 100 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, storage, and complete engine and hull repairs are available.

Roslyn is a village on the railroad at the head of the harbor.

The head of Hempstead Harbor south of Bar Beach has extensive flats, and the narrow channels require local knowledge. The dam at Willow Avenue is the head of navigation.

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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. For predictions, the Tidal Current Tables should be consulted.

See appendix for **storm warning displays.**

In severe winters **ice** has been known to close navigation about six weeks during January and February.

The shore between Prospect Point and **Mott Point,** 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 and 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 in the bay may be selected according to draft, but the usual places are eastward of Plum Point in depths of 6 to 10 feet and off the waterfront of Port Washington in depths of 8 to 12 feet. The bottom is soft and affords good holding ground. Anchorage areas are in Manhasset Bay; limits and regulations are given in **201.1, 202.60,** and **202.155,** chapter 2.

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.

See appendix for **storm warning displays.**

Plum Point, marked by a clubhouse, 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 55 feet in length; travelifts, 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 is on the west side of the entrance to Manhasset Bay. A boulder reef, mostly bare at low water, extends about 0.2 mile northward of the point, and is marked by a lighted buoy.

Stepping Stones Light (40°49.5′ N., 73°46.5′ W.), 46 feet above the water, is shown from a brown dwelling, on 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. An t-pier on the point partially encloses a boat basin which had a reported depth of about 11 feet in 1965.

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 is in depths of 4 to 7 feet 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 travelift in the area can haul out craft up to 8 tons.

Anchorage areas are in Little Neck Bay; limits and

regulations are given in **202.1, 202.60,** and **202.155,** chapter 2.

Charts 223, 226, 745.—East River is the 14-mile-long tidal strait which 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. From the Battery to Port Morris, a distance of 9 miles, both sides of East River 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.

Anchorages.—Defined anchorage areas in East River are shown on the charts; see **202.1, 202.60,** and **202.155,** 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. Daily predictions for Willets Point and the Battery are given in the Tide Tables.

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.

Daily predictions of slack water and times and velocities of strengths of currents in Hell Gate are given in the Tidal Current Tables together with differences for predicting the currents at other places in East River. Directions and velocities of currents in East River for each hour of the tidal cycle will be found in Tidal Current Charts, New York Harbor.

Weather.—See appendix for **storm warning displays** along the shores of East River.

Pilotage.—See Pilotage in chapter 11, New York Harbor.

Towage.—Vessels intending to employ a tug should arrange to do so before proceeding westward of Rikers Island.

Reporting station.—Vessels are reported from City Island to the Maritime Exchange, New York, N.Y.

Chart 223.—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; reported depths of about 25 feet are alongside. To the northwestward is the Navy's 255-foot long T-pier; reported depths of about 20 feet are alongside.

See appendix for **storm warning displays.**

Throgs Neck Bridge, a highway suspension bridge with a clearance of 138 feet, crosses East River from Throgs Neck to the Long Island shore. A fog signal is sounded beneath the main channel span.

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 as an anchorage basin 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.

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 or 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 the shallow bight between Old Ferry Point and Clason Point, 0.7 mile to the westward. The improved channel is buoyed for nearly a mile from East River to the narrow part of the creek. Waterborne traffic consists chiefly of petroleum products and sand, gravel, and crushed rock.

In 1965, the midchannel controlling depths in Westchester Creek were 9 feet from East River to **Castle Hill Point,** and thence 6 feet to **Westchester.**

The highway bridge over Westchester Creek at **Unionport,** 1.5 miles above East River, has a bascule span with a clearance of 14 feet; see **203.156,** chapter 2, for drawspan regulations. Small-craft facilities are on the creek above Castle Hill Point and at Unionport. Gasoline, water, ice, marine supplies, storage, and engine and hull repairs are available; the largest marine railway can haul out craft up to 55 feet in length.

Chart 226.—Clason Point 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, travelifts, 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 Field, 0.6 mile to the southwest. A dredged channel, marked by buoys and lights, extends 1.8 miles south-southeastward from East River to **Flushing Creek,** at the head of the bay, and to the extensive small-craft facilities westward of that creek. In 1963, the controlling depth was 15 feet to Flushing Creek entrance, and to the ι-shaped pier and marina at the head of the bay, and thence 6 feet into the Worlds Fair Marina to the westward. In 1963, a depth of 15 feet was available in Flushing Creek to near the head of navigation at the I.R.T. 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-vessel **anchorage areas** are in Flushing Bay; see **202.1** and **202.60,** 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 ι-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.

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 Field.** The approach to Bowery Bay is from westward of Rikers Island.

Bronx River, on the north side of East River, is entered through the shallow bight between Clason Point and Hunts Point, 1.1 miles to the westward. Waterborne traffic on Bronx River consists chiefly of sand, gravel, and crushed rock.

A narrow dredged channel, marked by buoys, leaves East River about 0.4 mile east of Hunts Point and leads north-northwestward in Bronx River for 2.2 miles to East 172d Street. In 1965–1966, the controlling depths were 6½ feet for a middle width from the channel entrance to the Bruckner Boulevard Bridge, thence 10 feet to the Westchester Avenue Bridge, and thence in 1964, 2 feet to East 172d Street. The river is being filled in above East 172d Street.

The mean range of **tide** is 6.9 feet at Hunts Point and at Westchester Avenue Bridge.

Three bridges cross the navigable part of Bronx River. Bruckner Boulevard Bridge, 1.0 mile above the mouth of Bronx River and 1.7 miles from East River, has a bascule span with a clearance of 27 feet. Westchester Avenue Bridge, 1.3 miles above the mouth, has a bascule span with a clearance of 14 feet; see **203.190,** chapter 2, for

drawspan regulations. The elevated railway structure over Westchester Avenue Bridge has a fixed span with a clearance of 61 feet. The railroad bridge, 1.4 miles above the mouth of Bronx River and 2.1 miles from East River, has a rolling-lift span with a clearance of 8 feet, but the draw is no longer opened; see **203.190,** chapter 2.

Hunts Point is on the north side of East River about 4 miles west of Throgs Neck. The marginal wharves which extend 0.3 mile northeastward from the point have depths of 25 feet alongside. The buoyed approach to the wharves has depths of 18 to 30 feet. Small craft anchor in depths of 9 to 17 feet on the flats east of the approach channel.

Rikers Island, in the middle of East River between Hunts Point and La Guardia Field, 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. A ferry slip is at the northwest end of the island; services to North Brother Island and Port Morris is available.

East River main channel with project depth of 35 feet leads northward of Rikers Island. A much-used anchorage is in depths of 21 to 30 feet between the south side of the channel and the flats off the northeast side of the island.

North Brother Island, 0.3 mile northwest of Rikers Island, is occupied by municipal buildings, many of which were at one time hospitals. 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 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 extensive rail terminals to and from which car floats are taken through East River. A privately maintained fog signal is at a ferry terminal at Port Morris.

A buoyed channel, marked with a privately maintained lighted range, leads from deep water east of North Brother Island past the west side of Rikers Island to a turning basin on the west side of Bowery Bay. In April–May 1966, the controlling depth for a width of 300 feet was 26 feet from the entrance to the turning basin; thence 28 feet in the basin.

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 **202.1, 202.60,** and **202.155,** chapter 2, for limits and regulations. In 1966, a fixed highway bridge was under construction across the bay to connect the Queens with Rikers Island.

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. The narrow channel which leads from eastward to the wharves on Lawrence Point is marked by privately maintained buoys.

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.

Sunken Meadow is the reclaimed area now joined to the northeast end of Wards Island. A light marks the main-channel side of the filled area.

Little Hell Gate, which separates **Wards Island** from Randalls Island, is a narrow unmarked passage which extends westward for 0.8 mile from East River to Harlem River. The minimum clearance is 32 feet under the three fixed bridges that cross the passage. Navigation of Little Hell Gate should not be attempted even by small craft.

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, on the south end of Wards Island, is marked by a light. **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 rocks, above water, 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 occupied by Corps of Engineers buildings and 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 June 1964–February 1965, the controlling depth was 13 feet, except for scattered shoals with minimum depths of 11 feet between Sherman Creek and 207th Street Bridge, and a 9-foot shoal in the vincinity of Broadway Bridge, about 4.7 miles and 5.6 miles, respectively, above the entrance to Harlem 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 **203.160,** chapter 2, for drawspan regulations. Minimum clearance under fixed bridges exceed 100 feet.

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 **light,** 56 feet above the water, is shown from a gray stone tower on the north 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.

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 0.4 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 and 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 February 1962, the controlling midchannel depths in the improved channels were 16 feet in Newton Creek to the south side of Maspeth Creek, thence 11½ feet to English Kills and East Branch, and in January–February 1965, 14 feet in East Branch. In 1961–1965, the midchannel depth in English Kills was 14 feet to Metropolitan Avenue Bridge, thence 8 feet to about the railroad bridge. Maspeth Creek and Dutch Kills in February 1962 had respective depths of 14 and 11½ feet.

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.

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. 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 **203.165,** chapter 2 for drawspan regulations.

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.

Seamans Church Institute Light (40°42.1′ N., 74°00.6′ W.), 216 feet above the water, is shown from a tower on the Manhattan side of East River 0.2 mile from the Battery. A **time ball** on the tower is dropped at noon each day.

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

Chart 1108.—The south coast of Long Island has a general trend of 247° for 68 miles from Montauk Point to 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 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.

A 12-foot square raft, marked at each corner by 2 fixed white lights and moored to a red buoy, is about 5 miles 121° from Jones Inlet Light; the raft is privately maintained.

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 cables across the canal have a least clearance of 20 feet. The lock about midway in the canal has a width of 100 feet and a depth of 4.5 feet over the sills. The gates are opened to allow the current to set south through the canal and are closed to prevent the water from Shinnecock Bay to flow back into Great Peconic Bay. Boats can always go through as the gates will be opened when necessary. The signal for opening the lock is 3 blasts of the boat whistle or horn. At the railroad bridge the current has an average velocity of 1.5 knots; see the Tidal Current Tables for predictions. Swirls occur at 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. In June 1965, the controlling depth in the waterway was 5 feet for a width varying from 100 to 50 feet, from the south end of Shinnecock Canal to a point in Great South Bay opposite Patchogue, a distance of about 29.2 miles, except for a depth of 3 feet for a width of 50 feet in the reach from west end of Quogue Canal to Speonk Point.

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. The largest marine railway 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.

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 radiobeacon are at the light. Private lights are on the jetties at the entrance to the inlet.

The east jetty extends about 120 yards beyond the light marking it. A marina is westward of Shinnecock Light; gasoline, diesel fuel, water, ice, and some marine supplies can be obtained; a launching ramp is here.

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 bascule span with a clearance of 10 feet at the center. A Coast Guard station is on Ponquogue Point. See appendix for **storm warning display.**

Entrances to the small coves on the northeast side and the east end of Shinnecock Bay have depths of about 3 feet.

Pine Neck, 2.3 miles westward of Ponquogue Point, is low, flat, and sandy. The 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 channel with a reported depth of 6 feet leads to **Tiana Beach,** a small summer resort on the south side of Shinnecock Bay.

Weesuck Creek, on the north side near the western end of Shinnecock Bay, has a dredged channel with a reported depth of about 3½ feet to the head of navigation. Two boatyards with marine railways are along the creek. The largest railway can haul out craft up to 65 feet in length for engine and hull repairs; gasoline, water, ice, storage, and some marine supplies are available. The post office is at **East Quogue.**

Quogue Canal, depth 5 feet, connects Shinnecock Bay with Quantuck Bay. The canal is crossed by a highway bridge with a bascule span having a clearance of 15 feet. The overhead power cable across the canal has a clearance of 80 feet. Gasoline, water, and ice are available at the east end of the canal.

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; shoaling was reported in the canal near Light 1. The two highway bridges with bascule spans crossing the canal have 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 is a dredged channel leading to a yacht basin at **Westhampton Beach.** The channel is along the west bank in the bight, and is marked by lights and buoys. A dredged cut leads up to Main Street in Westhampton Beach. A depth of about 3½ 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 42 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. About 0.3 mile westward is a small basin used by local craft; the entrance is between two short jetties. The depth at the mouth of the basin is about 2 feet, but inside the basin the depths are greater than 5 feet.

Seatuck Cove, on the north side of Moriches Bay, had in 1965, a reported depth of about 2 feet to the landing at **Eastport,** on the point which separates the two creeks at its head. About 0.2 mile southward of the landing a shoal extends from the east side and is sometimes marked by a stake. A water tank close northwestward at the head of Seatuck Creek, the westerly creek, is prominent. Gasoline, water, and ice can be obtained at a small-craft facility on the west bank just inside East Branch, the easterly creek. A 7-ton lift here can haul out craft for engine and hull repairs.

Hart Cove, westward of Seatuck Cove, has depths of 4 to 6 feet. Small-craft facilities are near the head on the west side of the cove. Gasoline, water, ice, storage, and marine supplies can be obtained. The largest marine railway can handle craft up to 26 feet in length for engine and hull repairs.

Tuthill Cove, locally known as **West Cove,** is on the north side of Moriches Bay, 1.5 miles westward of Seatuck Cove. It has depths of 1 to 3 feet. **East Moriches** is on the north side of the cove. Several small-craft facilities are along the east side of the cove, and westward of Tuthill Point. Gasoline, water, ice, marine supplies, and storage are available.

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. See appendix for **storm warning display.** 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 subject to frequent changes and should be used only with local knowledge of latest conditions.

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 marine railway in the creek can handle craft up to 30 feet in length; gasoline, water, ice, marine supplies, and complete engine and hull repairs are available. **Areskond Creek** to the westward is used as a harbor by yachtsmen. The entrance is marked by a private light.

Senix Creek, 0.6 mile westward of Orchard Neck Creek, has a narrow entrance. A reported depth of about 4 feet can be carried in the dredged channel to about 0.5 mile above the entrance with local knowledge. Private lights mark the end of the breakwater and the east side of the entrance. A 35-foot marine railway is available in the creek; gasoline, water, ice, marine supplies, storage, and complete engine and hull repairs can be had.

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 West Senix Creek. The creek is used mostly by local residents.

Old Neck Creek, northwestward of West Senix Creek, has a depth of about 8 feet. A marina inside the entrance on the east side has a launching ramp; gasoline, wet and dry storage, and complete marine services are available.

Forge River, at the northwest end of Moriches Bay, has a dredged depth of 8 feet in the channel to the town dock and turning basin, thence 7 feet to the head of navigation. The town dock is available only to the local residents, however, overnight transient berths are available.

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. **Long Point** is on the west side of the entrance, and is marked by a private seasonal light.

Bellport, a town on the north side of Bellport Bay, has a wharf with 5½ feet at its end. The approach is clear. Gasoline, water, and supplies can be obtained.

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, 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.

Mud Creek, on the northeast side of Great South Bay, has a large marina where gasoline, diesel fuel, water, ice, a 20-ton travelift, marine supplies, and complete engine and hull repairs are available. A reported depth of about 4 feet is available in the creek; a private seasonal light marks the entrance.

Swan River is about 0.5 mile west of Mud Creek. A depth of about 6 feet can be taken through the entrance channel, marked by a private seasonal light, to the head of navigation about 1 mile above the mouth.

Patchogue Creek, on the north side of Great South Bay, 3.7 miles west of Bellport, has a buoyed approach channel. A Federal project provides for a 10-foot channel from Fire Island Inlet in Great South Bay to Central Basin, and thence 8 feet to the head of navigation in Patchogue Creek. In April 1963, the controlling depth was 8 feet through **Patchogue Bay** to the head of the project. There is a 1-foot shoal on the east side of the creek which is marked by private interests. The west side of the entrance is protected by a breakwater with a light on the outer end. The east side is protected by a bulkhead and a short jetty extending southward from it. A private light is near the end of the jetty.

Several marinas and boatyards with marine railways and lifts are on Patchogue Creek. Marine railways up to 110 feet and lifts up to 36 tons are available. Gasoline, diesel fuel, storage, water, ice, marine supplies, and complete engine and hull repairs can be had on the creek. Diesel oil is delivered by truck to the wharves.

Patchogue, the principal town on Great South Bay, is important as a distributing point for most of the major oil companies. A large oil terminal is on the west side of the town with depths of more than 10 feet along the face of the wharf. Elsewhere the depths at the wharves vary from 3 to 9 feet. A yacht club is near the entrance of the creek. See appendix for **storm warning display.** Passenger ferry service, summer only, is available to **Davis Park** on Fire Island.

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. The controlling depth in the channel is about 6 feet through the entrance, thence 4 feet for 0.4 mile, and thence about 3 to 2 feet to the head of navigation just below the fixed highway bridge. An obstruction covered 2½ feet is reported about 500 yards south-southeastward of the west jetty light.

There are several marine railways on the creek, the largest of which can handle craft up to 60 feet in length; gasoline, water, travelifts, marine supplies, and complete engine and hull repairs are available.

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. See appendix for **storm warning display.** Passenger ferry service, summer only, is available from Sayville to Fire Island.

Westward of the entrance to Green Harbor are several wharves which are extensively used by the local oyster industry. Gasoline, water, and ice can be obtained here.

Connetquot River, locally known as **Great River,** 3 miles westward of Brown Creek, has a depth of 2½ 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 residence with tower is on the north shore of the entrance.

There are several small-craft facilities on the lower east side of the river. A boatyard with a 40-foot marine railway here can haul out craft for engine and hull repairs. Gasoline, water, ice, storage, and marine supplies are available. Transients can be accommodated. **Great River** is a village on the west side of the river.

Cherry Grove, a summer resort across Great South Bay from Connetquot River, has a boat landing extending out to a depth of 4½ feet. 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 and provisions can be obtained. Ferry service is maintained between these settlements and Bay Shore, a town northwestward on the north shore of Great South Bay.

On the north shore of Great South Bay, in the vicinity of **Nicoll Point,** is **Hecksher State Park.**

Great Cove, on the north side of Great South Bay about 4 miles westward of Nicoll Point, has depths of 4 to 8 feet.

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 has a reported depth of about 5 feet and is sometimes marked by private buoys. A private seasonal light marks the west edge of the 2-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 50-foot marine railway, and a 25-ton travelift are available. Several fish packing plants are on the creek.

Bay Shore is a large fishing center on the northwest shore of Great Cove. A standpipe and a large gas tank are prominent. The town landing near the entrance of Penataquit Creek has a reported depth of about 4 feet at its end; a red light on a pole is at the southern end. 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. See appendix for **storm warning display.**

A marina partly surrounded by a bulkheaded sandspit is at the entrance to Penataquit and Watchogue Creeks. The entrance channel has a reported dredged depth of about 10 feet, and leads between the northeast end of the sandspit and a private seasonal light marking the northerly side of the channel. Gasoline, water, and ice are available.

Penataquit Creek forms a well protected boat basin at Bay Shore. There are several boatyards and marinas on the creek. The largest marine railway can handle craft up to 50 feet in length; gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs are available.

Watchogue Creek, locally known as **West Creek,** is just westward of Penataquit Creek. The largest marine railway on the creek can haul out craft up to 100 feet in length; gasoline, diesel fuel, water, marine supplies, storage, and complete engine and hull repairs are available. The depth alongside the bulkhead landing is about 6 feet.

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. In May 1966, a controlling depth of about 10 feet was available in the inlet. Buoys marking it are frequently shifted to mark the best water. Mariners are cautioned to seek local knowledge of latest conditions prior to entering. Navigation of the inlet is difficult even with relatively calm seas. 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.

A lighted whistle buoy, outside the 15-fathom curve, about 9.5 miles southward of Fire Island Light marks the approach to Ambrose Channel Lightship from points eastward.

The **Robert Moses Bridge** over Fire Island Inlet, 2.1 miles inside the entrance, has a clearance of 66 feet at the center of the fixed span.

The **currents** in Fire Island Inlet, after crossing the bar, have a velocity of about 2.5 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 during the months of January and February of severe winters the inland channels through Great South Bay are closed to navigation because of **ice** conditions.

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 cover 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, has a depth of about 7 feet. These channels are marked with buoys which 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 4 m.p.h. in areas designated as basin or anchorage.

A turning basin at the eastern extremity of the channel at **Captree Island,** just inside Fire Island Inlet, has a depth of about 10 feet.

A highway bridge over the State Boat Channel, connecting Oak Beach with Captree Island, has a bascule span with a clearance of 29 feet. The fixed span of this bridge over the inside passage in Great South Bay between Captree Island and **Conklin Point** has a clearance of 60 feet.

In 1966, a bridge and causeway east of and parallel to the fixed span between Captree Island and Conklin Point was under construction. Due to construction, numerous lights, buoys, and piles are in place and mariners should exercise caution when navigating in this area.

From opposite the northeastward point of **Oak Island** a dredged channel has a depth of 6 feet, and extends northwestward for a distance of about 1.2 miles to Great South Bay. The northern entrance about 2 miles southeastward of Babylon is marked by a lighted buoy and the channel proper is marked by private daymarkers.

Babylon is a town near 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. 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 boatyards with marine railways along the creek. The largest marine railway can haul out craft up to 60 feet in length; gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs are available.

Carll River, westward of Sampawams Point, has a dredged depth of about 4 feet, which has been cleared of grass and leads in a northerly direction from the entrance. The largest marine railway on the river can handle craft up to 70 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

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. The channel, marked by private buoys, has a reported depth of about 6 feet in the entrance. The largest marine railway in the creek can handle craft up to 40 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available. 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 10 feet.

Seganus Thatch, westward of Captree Island, has a boatyard with a marine railway that can haul out boats up to 65 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available. Alongside the bulkhead there is a depth of 4 feet.

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.

About 0.4 mile southward of the town of **Lindenhurst** on **Neguntatogue Creek,** several small boatyards have marine railways that can haul out craft up to 60 feet in length; gasoline, diesel fuel, travelifts, water, ice, storage, marine supplies, and complete engine and hull repairs are available. The controlling depth is about 7 feet in the 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.

Great Neck Creek, westward of **Strongs Point,** has depths over 10 feet for the entire length, a distance of about 1 mile. Lifts can haul out craft up to 15 tons in weight; gasoline, water, marine supplies, and complete engine and hull repairs are available along the creek.

Amityville Creek, on the north side of the western extremity of Great South Bay, has a reported depth of about 4 feet. 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 with a reported depth of about 4 feet, 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 mile westward of Amityville Creek, has a reported dredged depth of about 3 feet. A marine railway at the head can handle craft up to 40 feet in length for complete engine and hull repairs; gasoline, water, and marine supplies are available. A yacht club is eastward of the creek.

Carman Creek, about a mile westward of Amityville Creek, is used by boats drawing about 3 feet. The largest marine railway on the creek can haul out craft up to 50 feet in length for complete engine and hull repairs; gasoline, diesel fuel, water, ice, marine supplies, and storage are available.

South Oyster Bay, lying between Great South Bay and

Hempstead Bay, is shoal over its greater part. A channel marked with brush and stakes, 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.

A **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.

Charts 579A, 579B, 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 which 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.

Charts 579B, 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 west end of the basin is reserved for swimming.

Great Island Channel, 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 several boatyards and marinas at Seaford and in the immediate vicinity. Craft up to 100 tons can be hauled out for complete engine and hull repairs. Marine railways, cranes, water, ice, storage, gasoline, diesel fuel, and marine supplies are available.

The Jones Beach Causeway has the following clearances: fixed span across the State Boat Channel from Jones Beach State Park to Green Island, 14 feet; bascule span between Green Island and Great Island, 16 feet; and fixed span across Island Creek, 11 feet.

A channel with a depth of about 7 feet leads northward from the State Boat Channel and westward of Green Island to the entrance of **Island Creek.**

A channel with a depth of about 6 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 4 feet. The channel joining Sloop Channel on the south through **Swift Creek** and **Neds Creek** to East Bay has a depth of about 4 feet. The channel between **False Channel Meadow** and Pettit Marsh has a depth of about 7 feet.

The Meadowbrook State Parkway has the following clearances: bascule span across Sloop Channel between Jones Beach State Park and **Jones Island,** 22 feet; fixed span between **West Crow Island** and **Pettit Marsh,** 14 feet; and fixed span between Pettit Marsh and **Fighting Island,** 12 feet.

The Loop Parkway has the following clearances: fixed span over Swift Creek between West Crow Island and **Meadow Island,** 21 feet; bascule span between Meadow Island and **Alder Island,** 21 feet; and fixed span over Reynolds Channel between Alder Island and Point Lookout, 20 feet.

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 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.** See appendix for **storm warning display.** The entrance through the inlet is marked by buoys which are frequently shifted in position to mark the best water.

In February 1966, a midchannel depth of 5 feet was available in the dredged channel through Jones Inlet to the Loop Parkway Bridge over Long Creek, except for a 3-foot depth in the channel in 40°35′28″ N., 73°34′26.8″ W. Greater depths can be obtained in the waterway with local knowledge.

The **tidal current** in the inlet has a velocity of about 3 knots; see the Tidal Current Tables for predictions. The mean range of **tide** is about 4 feet.

A wreck with 6 feet over it is about 0.7 mile northeastward of the light on Jones Inlet jetty. The masts are exposed at lowest water. Another wreck, about 0.8 mile northwestward of the jetty light, consists of large pieces of iron and bares ½ foot at low water. It is usually marked by a buoy.

Point Lookout is a village on the east end of the barrier beach on the west side of Jones Inlet. Small-craft facilities are just eastward of the bridge; gasoline, marine supplies, and minor repairs are available. See appendix for **storm warning display.**

Long Creek 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, has a depth of about 8 feet. Several boatyards and marinas are along the creek where gasoline, diesel fuel, 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, has a depth of about 4 feet. **Woodcleft Canal,** westward of and connecting with the channel on the northern extremity of Hudson Channel, has 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. Several boatyards are at Freeport. The largest marine railway can haul out craft up to 50 feet in length; travelifts, gasoline, diesel fuel, water, ice, marine supplies, storage, and complete engine and hull repairs are available. See appendix for **storm warning displays.**

An anchorage area is in **Randall Bay** at the northeast end of **Baldwin Bay**; see **202.156,** chapter 2, for limits and regulations.

A channel with a depth of about 4 feet passes through **Scow Creek** to **Baldwin Harbor.** A channel connecting Baldwin Harbor with Randall Bay has a depth of about 4 feet.

Millburn Creek, a dredged channel extending northward to **Baldwin** from Baldwin Bay, has depths of 3 to 5 feet. The channel is marked by private seasonal barrel buoys. A dredged channel with a depth of about 5 feet 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 canal leading west from Cinder Creek.

A secondary channel extending northwestward through **Cinder Creek** and westward of **Parsonage Island** to Middle Bay has a depth of about 2 feet.

Charts 579A, 120–SC.—Long Beach is a seaside resort on the outer beach about 4 miles west of Point Lookout. The waterfront on the bayside has been bulkheaded.

The highway bridge crossing Reynolds Channel between Long Beach and **Island Park** has a bascule span with a clearance of 20 feet; see **203.180,** chapter 2, for drawspan regulations. The railroad bridge about 0.2 mile westward of the highway bridge has a swing span with a clearance of 3 feet.

Just westward of the railroad bridge, a 10-foot dredged channel passes through Island Park. 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 joins Reynolds Channel southwestward of Island Park and leads to **Oceanside.** The depth in the channel is about 12 feet to the oil dock below **Oceanside Beach,** thence 5 feet to a point where it joins East Rockaway Channel. Some of the wharves of the oil companies and railroad at Oceanside are in ruins.

Extensive small-craft facilities are on the south side of Island Park, and on the east side at the south end of Hog Island Channel, and at Oceanside. Marine railways, lifts, gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs are available.

East Rockaway Channel, a dredged channel marked by privately-maintained buoys, has a depth of about 3 feet.

East Rockaway can be reached by small craft with a draft of about 5 feet through Hog Island Channel. Several boatyards are at East Rockaway. The largest marine railway can handle craft up to 65 feet in length; gasoline, water, ice, diesel fuel, marine supplies, and complete engine and hull repairs are available. See appendix for **storm warning displays.**

Broad Channel, which joins Reynolds Channel eastward of **Hicks Beach** and leads to **Hewlett Bay** and Macy Channel, has a depth of about 6 feet.

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 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 a dredged channel with 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 **203.180,** chapter 2, for drawspan regulations.

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 should not be attempted without local knowledge in bad weather and heavy seas.

A light is on the outer end of the jetty on the east side of the entrance to East Rockaway Inlet. A gong buoy is southward of the light. A Coast Guard station is inside the inlet at Atlantic Beach. See appendix for storm

warning display. The entrance through the inlet is marked by buoys which are frequently shifted in position to mark the best water.

A Federal project for East Rockaway Inlet provides for a channel 12 feet deep from the entrance to Reynolds Channel. In 1965, the channel was at project depth.

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

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.

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 Channel Lightship 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 each 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.

About 8 miles westward of Jones Inlet is East Rockaway Inlet which is the extreme western entrance to the inland waterway. The inlet entrance is marked by a breakwater with a light on its seaward end. Between the two inlets the shoreline is closely built up with large communities. Elevated tanks, towers, and other tall structures are prominent in this area.

Rockaway Point, 17 miles westward of Jones Inlet, is the southwestern extremity of Long Island and the eastern entrance to New York Lower Bay. A breakwater, marked at its seaward end by a light and fog signal with a radiobeacon inshore, extends southward from the point. Rockaway Inlet forms a large deep entrance to Jamaica Bay.

Ambrose Channel Lightship (40°27.6′ N., 73°50.2′ W.), off the entrance to New York Harbor, has a red hull with the name AMBROSE in large white letters on the sides. The light is 56 feet above the water. The lightship has a fog signal and a radiobeacon. Code flag signal and radio call sign is NNBA. See appendix for **storm warning display.**

Sandy Hook, the southern entrance point to New York Harbor, is low and sandy. Near the northern extremity of Sandy Hook are a Coast Guard Station, and two tall observation towers from which coastwise and foreign vessels are reported to the Maritime Exchange in New York City. 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. About 0.6 mile northward of the light and on the north end of the hook is a fog signal mounted on a building near the outer beach, and a loran station.

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, 12 fathoms between Fire Island Light and Barnegat Lightship, and 10 fathoms southward of Barnegat Lightship.

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 Fire Island Lighted Whistle Buoy 2FI to Barnegat Lightship, 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 while on both sides of it sand predominates.

Cholera Bank, about 10 miles southeastward of Ambrose Lightship, 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 months 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 Channel Lightship. 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 Bell Buoy 2A and westward of the meridian passing through Ambrose Channel Lightship.

Tides.—Daily tide predictions for Sandy Hook are given in the Tide Tables.

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. At Ambrose Channel Lightship the velocity is about 0.2 knot. 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.

For predicted times and velocities of the tidal currents at a number of locations in the coastal waters, the Tidal Current Tables should be consulted.

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. Should the wind be easterly 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 at Nantucket Shoals Lightship and 1.5 knots at Fire Island Lighted Whistle Buoy 2FI 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.

At Fire Island Lighted Whistle Buoy 2FI 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.

Channels.—Ambrose Channel, the principal entrance, extends from the sea to deep water in Lower Bay.

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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.

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.

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. 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 15 feet and is unmarked.

Anchorages.—Anchorage areas have been prescribed for the Port of New York by Federal Regulations; see **202.1, 202.60,** and **202.155,** 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.

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 10 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, and a privately maintained light about 0.3 mile southeastward of Swinburne Island, 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 in 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 section of Ambrose Channel and diagonally across the outer 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 sould 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. Daily predictions of slack water and strength of current are given in the Tidal Current Tables.

In Hudson River the velocities of the flood and ebb

currents off the Battery are 1.5 and 2.3 knots, respectively. Off Forty-second Street the velocities for flood and ebb strengths are 1.7 and 2.3 knots, respecitvely.

The direction and velocity of the current throughout New York Harbor for every hour of the tidal cycle is shown in the Tidal Current Charts, New York Harbor.

Weather.—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.

Navigation of the channels in the Port of New York 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 interefered with seriously for only short periods of time.

Weather forecasts or information is available by calling directly to the U.S. Weather Bureau, New York, via telephone or radiotelephone.

See appendix for New York **climatological table** and **storm warning displays.**

Pilotage is compulsory for foreign vessels and U.S. vessels under registry entering or departing from the Port of New York. Vessels entering New York Harbor through Lower Bay are served by a pilot boat stationed inside of Ambrose Channel Lightship (Sandy Hook Pilots). Vessels entering the harbor through Long Island Sound and Hell Gate are boarded by pilots at Execution Rocks.

Pilot services, available on a 24-hour basis, are generally arranged for in advance through ships' agents or directly by shipping companies. In emergencies pilots can be requested on 2738, 2638, and 2182 kcs.

Reporting stations.—Vessels are reported to the Maritime Exchange at New York from City Island, Sandy Hook, and Quarantine.

Quarantine.—The quarantine headquarters and boarding station are just above Fort Wadsworth at Rosebank, Staten Island. Vessels requiring quarantine inspection are boarded at the anchorage off the station, or in some special instances are permitted to go to the pier and undergo inspection.

A hospital and an outpatient clinic of the Public Health Service are in the port area.

Customs.—New York is a port of entry and marine documents are issued.

Immigration.—Inspectors of the Immigration and Naturalization Service board ships at dockside, enroute to dockside while in the harbor, or at the quarantine headquarters at Rosebank, Staten Island. The Immigration Service should be notified by radiotelephone or telephone upon the desertion of crew members or discovery of stowaways as soon as possible.

Harbor regulations.—The administration of the Port of New York and the enforcement of its laws is vested in no single body, but is 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 have 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 **Collector of the Port** is a U.S. Customs official who is charged with the enforcement of the general navigation laws under Customs supervision. His jurisdiction includes the collection district of New York on both the New York and New Jersey sides. The police powers necessary for the enforcement of these laws are vested in the United States Coast Guard which maintains patrols and reports violations to the proper authority. The collector's office is in the Custom House.

The **Captain of the Port,** an officer of the U.S. Coast Guard, is charged with the issuance of anchorage and explosive permits. His office is on Governors Island.

The **New York City Department of Marine and Aviation** administers the piers along the New York waterfront within the city limits. The office is at the Battery Maritime Building.

The **Port of New York Authority,** and 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.

Wharves.—The Port of New York has extensive waterfront facilities that can accommodate the deepest draft vessels. The major steamship passenger terminals are along the east side of Hudson River (North River) above the Battery. General cargo terminals are throughout the harbor, but principally along the east side of the Hudson River, east side of Upper New York Bay, and at Port Newark, and Elizabeth, N.J. Oil receiving and bunkering facilities are at Bayonne and Linden, N.J., Gulfport, Staten Island, and Brooklyn. Grain handling facilities are at Jersey City and Brooklyn. There are many piers along both sides of the East River: east bank, mostly general cargo facilities; west bank, general cargo and municipal facilities. The major railroads serving the Port of New York maintain many waterfront facilities on the New Jersey side of the Hudson River and west side of Upper

New York Bay. Traffic on the Passaic and Hackensack Rivers is mostly in petroleum products, and other liquid cargoes.

Due to the size and the large number of waterfront facilities in the Port of New York, a complete and detailed description of the wharves and piers in New York Harbor may be obtained from the **Port Series,** a Corps of Engineers publication. The wharves and piers of New York City along the waterfronts of the Hudson and East Rivers are numbered beginning at the Battery and following in sequence eastward along the East River and northward along the Hudson River.

The **Foreign Trade Zone** at Stapleton, Staten Island, is an enclosed, isolated, and policed area under the supervision of Federal Customs officials. Good facilities for loading and unloading cargo are at the two slips which have depths of about 30 feet alongside. If reshipped to foreign ports, the goods may leave this zone without payment of duty. Further detailed information may be obtained from the Department of Marine and Aviation, Battery Maritime Building.

Supplies and repairs.—The Port of New York has excellent facilities for providing the shipping industry with all types of marine supplies, provisions, and repairs. The extensive shipyards in Brooklyn, Hoboken, Staten Island, Queens, and Perth Amboy, can effect major repairs to hull, electronic equipment, machinery, and propulsion plants. Drydocking facilities in the port can accommodate some of the largest ocean-going vessels. The largest floating drydock has a lifting capacity of 25,000 tons, an overall length of 700 feet, and a maximum clear inside width of 100 feet. The largest graving dock 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. Several salvage companies are also available to perform all types of salvage work.

Towage.—Towboats of all types are available in the Port of New York. Services can be arranged for through ships' agents or directly by shipping companies.

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 and a radiobeacon is inshore. A shoal area with depths of 6 to 17 feet is westward of the entrance channel. A submerged obstruction has been reported 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. See appendix for **storm warning display.**

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.

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 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. A private light marks the outer limit of an outfall sewer which extends southward from the bay. **Anchorage areas** have been prescribed for Sheepshead Bay; see **202.155,** chapter 2, for limits and regulations.

Small-craft facilities in the bay can provide gasoline, diesel fuel, water, ice, marine supplies, and a 20-foot marine railway is available for minor hull and engine repairs. A fuel barge is in the bay during the summer months.

Transportation to New York by train and bus is available, as well as ferry service to Rockaway Point.

Gerritsen Inlet, northward of Rockaway Inlet, is the approach channel to the boat basin at **Gerritsen.** The channel through the inlet is marked by buoys; midchannel depths of about 12 feet are available as far as the numerous wharves and float landings near the head of **Plumb Beach Channel.** In 1966, a depth of 5 feet was in Gerritsen Inlet Channel just north of buoy 7. The fixed highway bridge over the inlet has a clearance of 35 feet. **Gerritsen Creek** and **Mill Creek** extend in a northwesterly direction from the highway bridge. Submerged wrecks

are reported in both creeks. A fixed highway bridge crossing Mill Creek has an 18-foot channel span with a clearance of 13 feet.

There are several small-craft facilities with marine railways along Plumb Beach Channel. Gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available.

Dead Horse Bay, eastward of Gerritsen Inlet, has depths of 10 to 30 feet and a float landing in the upper part.

Island Channel with depths of 16 feet or more begins just eastward of Barren Island and leads in a northerly direction 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. These channels have a depth of about 6 feet.

Floyd Bennett Field, on Barren Island, is the site of a Naval Air Station. A marginal wharf, on the southeast extremity of the island, is 1,800 feet in length and has a depth of about 24 feet alongside.

Mill Basin is northward of Barren Island on the west side of Jamaica Bay. In 1965, a reported midchannel depth of about 16 feet could be taken to the north end of the basin. There are several small-craft facilities in the basin that can provide gasoline, diesel fuel, water, ice, marine supplies, storage, and engine and hull repairs. The largest marine railway can haul out craft up to 50 tons.

A highway bridge across Mill Basin between Barren Island and Brooklyn has a clearance of 34 feet; see **203.175,** chapter 2, for drawspan regulations. See appendix for **storm warning displays.**

East Mill Basin is about 0.4 mile northeastward of Mill Basin. A midchannel depth of about 14 feet can be taken to the head of the basin. Small-craft facilities in the basin can provide gasoline, water, ice, marine supplies, storage, and engine and hull repairs. Marine railways up to 20 tons are also available.

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 fishing station 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 fixed highway bridge across the creek near the entrance has a clearance of 21 feet.

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, crossing Island Channel just south of Howard Beach, has a bascule span with a clearance of 20 feet; see **203.175,** chapter 2, for drawspan regulations.

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 50 feet in length; gasoline, diesel fuel, water, ice, and marine supplies are available. A highway bridge across the basin near the mouth has a bascule span with a clearance of 10 feet; see **203.175,** chapter 2, for drawspan regulations.

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 **203.190,** chapter 2, for drawspan regulations.

Rockaway Beach is a popular summer resort on the barrier beach forming the southern extremity of Jamaica Bay. There is communication with New York by trains and buses. Excursion boats operate between New York and Rockaway Beach during the summer only. Gasoline, provisions, and some boat supplies are available.

Beach Channel, on the north side of Rockaway Beach, has a least depth of 15 feet from Rockaway Inlet to the Cross Bay Boulevard bridge, and 11 feet to the wharves near the railroad bridge 0.5 mile eastward. In 1966, a shoal, bare at mean low water, was about 100 yards southeastward of channel light 7.

A **measured nautical mile** on bearing 056° 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 bascule span with a clearance of 21 feet; see **203.175,** chapter 2, for drawspan regulations. The railroad bridge over Beach Channel, 0.6

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 with a least depth of 16 feet, extends 1 mile northward to Grassy Bay from the junction of Beach Channel with Grass Hassock Channel. A lighted buoy marks the junction of the three 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. A 50-foot marine railway is at the head of the basin; gasoline, water, ice, and engine and hull repairs are available.

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. A controlling depth of about 15 feet is available in the entrance and branch channels; the channels are marked by buoys. In 1966, a depth of 3 feet was 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.

An overhead power cable across Motts Basin has the following clearances: 70 feet over the northerly arm; 95 feet over the southerly arm, and 60 feet over the cut on the south side of the southerly arm. 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 dredged entrance channel and channel in the bay; lights and buoys 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. A yellow brick circular tank tower about 40 feet high on the southwestern side of the entrance, and several oil storage tanks at the head of the basin on the eastern shore, are conspicuous. Coastal tankers and sand-and-gravel barge tows constitute most 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.

Coney Island Channel, a buoyed passage along the south side of Coney Island, has a controlling depth of about 15 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 explosive anchorage areas have been prescribed in the bay; see **202.155,** 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. An obstruction has been reported in the entrance to the creek. 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 0.7 mile above the mouth. One bascule bridge and three fixed bridges cross the creek; least clearance is 3 feet. See **203.190,** chapter 2, for drawspan regulations.

A buoyed channel with at least depth of 15 feet leads from deep water northward of Coney Island to off the docks in the eastern part of Gravesend Bay. Several private yacht and boat clubs, and a marina are in the area. A 30-ton crane is available at the marina for hauling out craft; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs can be had.

Swinburne Island and **Hoffman Island** are artificial islands on West Bank across the Ambrose Channel from Coney Island. Buildings are prominent on both the islands. 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 Lafayette. 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. A fog signal is sounded from **Fort Lafayette,** the brownstone structure on the edge of the flats 300 yards from the Long Island shore.

The Quarantine Station, numerous deep-draft piers, in-

cluding the Foreign Trade Zone, a Coast Guard base, 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.** There are depths of 30 feet in Gowanus Bay and Gowanus Creek to Sigourney Street, 0.1 mile below Hamilton Avenue, thence 18 feet to Hamilton Avenue where shoaling to 8 feet has been reported. There are several shipyards in the Gowanus Bay area. The largest floating drydock is on the north side of Gowanus Creek; it has a lifting capacity of 7,500 tons, length of 460 feet, 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, 93 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.

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; a private lighted range marks the channel.

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 station.

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. The channel leading to the pier on the west side of the island has a depth of about 14 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 20 feet. This channel, through connecting branch channels, leads to the **Caven Point** Army Terminal Pier, Lehigh Valley Railroad Pier, and the Pennsylvania Railroad Terminal piers at **Greenville.** The Bayonne Terminal Pier, to the southward of Pennsylvania 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.

Chart 369.—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.

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 **Island Beach** 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.

A **danger zone** of an army mine practice area is in Sandy Hook Bay, close southward of Sandy Hook Point; see **204.19,** chapter 2, for limits and regulations.

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.

A midchannel depth of about 6 feet can be carried in Shrewsbury River from Sandy Hook Bay to the Branchport Avenue Bridge at Long Branch, and about 6 feet in Navesink River to a turning basin and anchorage at Red Bank; greater depths are possible with local knowledge. The channels are well marked with navigational aids.

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.

See appendix for **storm warning displays.**

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. The largest marine railway in the area can handle craft up to 85 feet in length; gasoline, diesel fuel, water, ice, storage, marine supplies, and complete engine and hull repairs 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. 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** as a bascule span with a clearance of 15 feet at the abutments.

A boatyard with marine railway at Seabright can handle craft up to 30 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, storage, marine supplies, and a 10-ton travelift are available. At Rumson, a 40-foot marine railway, and a 7-ton travelift are available; gasoline, water, ice, diesel fuel, marine supplies, and complete engine and hull repairs can be had.

A highway bridge across **Pleasure Bay,** at the southeast end of Shrewsbury River, has a swing span with a clearance of 7 feet. **Branchport,** a small town on the east side of Pleasure Bay, is the head of navigation.

There are several small-craft facilities with marine railways in Pleasure Bay; the largest railway can handle craft up to 55 feet in length for engine and hull repairs. Gasoline, water, ice, storage, and marine supplies are available.

The dredged channels in **Little Silver Creek, Town Neck Creek,** and **Oceanport Creek,** on the west side of Shrewsbury River, have controlling depths of about 5 feet, and are marked by private daybeacons.

A fixed highway bridge with a clearance of 25 feet crosses the westerly part of Shrewsbury River, just eastward of its junction with Parker and Oceanport Creeks.

The tributaries of the Shrewsbury River in the southeasterly and southwesterly parts are crossed by bridges with the following clearances: **Manhassett Creek,** fixed highway, 6 feet; **Troutmans Creek,** fixed highway, 6 feet; Shrewsbury River, at **Gooseneck Point,** highway with fixed span, 25 feet; **Oceanport Creek,** railroad with swing span, 4 feet; and **Parker Creek,** fixed railroad, 4 feet; See **203.215** and **203.225,** chapter 2, for drawspan regulations.

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 gasoline, diesel fuel, water, ice, storage, marine supplies, and engine and hull repairs. A 40-foot marine railway and a 7-ton travelift are available. Depths of about 5 feet can be taken to the small-craft facilities.

Fair Haven is about 1 mile above the bridge at Oceanic on the south side of Navesink River. Two yacht clubs and a boatyard are at Fair Haven. A marine railway at the boatyard can handle craft up to 65 feet in length for engine and hull repairs; gasoline, water, ice, marine supplies, and storage are available. Depths of about 5 feet can be taken to the small-craft facilities.

Red Bank, a town near the head of navigation on the Navesink River, has several boatyards with marine railways. The largest marine railway can handle craft up to 60 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, marine supplies, and wet and dry storage are available. Depths of about 6 feet can be taken to the boatyards.

The dredged channel, extending about 1.5 miles above the landings at Red Bank, has a midchannel depth of about 5 feet and is privately marked by buoys.

Chart 369.—Atlantic Highlands is a town on the south side of Sandy Hook Bay about 2 miles west of Sandy Hook. A long wharf extending into the bay, formerly a railroad terminal and in poor condition, has about 12 feet at its end, and is used for summer excursion boats to New York. A petroleum loading platform with mooring dolphins, is about 0.5 mile westward of the wharf about

0.5 mile offshore. The loading platform has about 10 feet at its end, and is used for transfer of petroleum products to nearby storage tanks. Piles, ruins of former wharves, are between the long wharf and the loading platform. A breakwater with a light on the outer end extends eastward from the railroad wharf and forms an anchorage basin which has a controlling depth of about 6 feet. The entrance to the basin is marked by private range lights. Small-craft facilities are at the southwest end of the anchorage. Gasoline, diesel fuel, water, ice, storage, launching ramps, marine supplies, travelifts, and engine and hull repairs are available here.

Leonardo is a town about 3.5 miles westward of Sandy Hook. A trestle, about 1.6 miles long, leads offshore across the flats to two deepwater Navy ammunition handling piers which extend up to 1.9 miles from shore. The waters adjacent to the piers and the trestle are **prohibited** to navigation; see **202.155(f)**, chapter 2, for rules and regulations. **Terminal Channel**, leading to an anchorage and turning basin off the deepwater piers, in August 1962, had a controlling depth of 32 feet. The buoyed channel, eastward of the piers, leading shoreward to an ammunition barge loading pier, has a controlling depth of 17 feet. Vessels of near that draft should proceed with caution, and as slowly as possible, in order to avoid disturbing possible sunken deadheads near the channel edges, which may cause damage to propellers.

A small boat basin is about 0.4 mile eastward of the pier at Leonardo. In 1965, the dredged channel leading to the boat basin had a midchannel depth of 3 feet; private lights and buoys mark the channel.

Gasoline, diesel fuel, water, marine supplies, and minor engine repairs are available in the basin. A boatyard with marine railway capable of handling craft up to 30 feet in length is about 0.5 mile eastward of the boat basin. Gasoline, diesel fuel, marine supplies, and complete engine and hull repairs are available here. Leonardo has railroad communications to New York and other points.

Compton Creek, 4 miles west of Sandy Hook, is entered through **Shoal Harbor**. In November 1961, the controlling depths were 12 feet from Sandy Hook Bay to the first bend in the creek, and thence 8 feet to Main Street Bridge, 0.4 mile above the mouth. About 0.1 mile above this bridge the channel shoals to less than 2 feet. The creek is navigable by small boats for 1 mile to the railroad bridge and is used extensively as a harbor of refuge by small fishing craft. The creek is crossed by a highway bridge with a swing span, 0.4 mile above the mouth, with a clearance of 4 feet and several fixed bridges upstream with minimum clearance of 2 feet.

Belford is on the west side of Compton Creek. A boatyard with marine railways here can haul out craft up to 90 feet in length for engine and hull repairs; gasoline, water, ice, marine supplies, and storage 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. There are several small-craft facilities fronting Port Monmouth on the bay side. Gasoline, water, storage, 7-ton crane, marine supplies, and engine and hull 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, and then steer for the fairway bell buoy 1 mile eastward of New Dorp Beach in range with 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 channel extending through Lower Bay, the northern part of Raritan Bay, to the junction with Arthur Kill; project depth is 35 feet.

Anchorages.—See **202.155**, 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 two 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.

See appendix for **storm warning displays.**

Pilotage for ports in the States of New York and New Jersey is compulsory for foreign vessels and U.S. vessels under registry. Vessels bound for Perth Amboy, South Amboy, or up the Raritan River and Arthur Kill, and desiring a pilot, are served by a pilot boat stationed inside of Ambrose Channel Lightship. Pilot services, avail-

able on a 24-hour basis, are generally arranged for in advance through ships' agents or directly by shipping companies. In emergencies pilots can be requested on 2738, 2638, and 2182 kcs.

Towage.—Towboats are used by the larger vessels. Numerous towboats are available in New York Harbor.

Quarantine.—Quarantine is under the jurisdiction of the quarantine authorities of the Port of New York located at Rosebank, Staten Island.

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. A dredged channel leads from deep water in Lower New York Bay to the entrance of the harbor in the vicinity of the westerly end of **Crookes Island,** thence along the westerly side of the harbor to the head. In 1962, the controlling depth in the channel was 9 feet. The easterly 30 feet of the channel at Crookes Point bares. The channel is marked by a lighted range and buoys. **Great Kills Light** is shown from a red skeleton tower on concrete base east of the entrance channel. A private light and fog signal mark the end of the jetty extending from **Crookes Point** on the east side of the channel. See appendix for **storm warning display.**

Great Kills, on the west side of Great Kills Harbor, has several boatyards with marine railways; the largest railway can handle craft up to 80 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, all types of storage, and complete engine and hull 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 marine railway can handle craft up to 50 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, and marine supplies are available.

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 **203.215,** chapter 2, for drawspan regulations. A small marina on the creek can haul out craft up to 4 tons in weight for minor engine and hull repairs; 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 wharf on the west side of Point Comfort is in ruins and no longer used. Railroad connections with New York and points east and south are available.

Keyport Harbor, 3 miles westward of Point Comfort, is a shallow harbor between **Conaskonk Point** and **Matawan Point.** The controlling depth in the buoyed channel leading from Raritan Bay to within 0.6 mile of the former steamboat dock, in ruins at Keyport, is about 7 feet, and thence decreasing gradually to 2 feet or less at the dock.

Matawan Creek, entered at the head of Keyport Harbor, is very shoal with depths of about 2 feet; greater depths can be obtained with local knowledge. The creek is used mostly by local craft. Small-craft facilities on the creek can provide gasoline, water, ice, storage, and marine supplies. The largest marine railway can handle craft up to 60 feet in length for engine and hull repairs.

Keyport is on the east side of the entrance to Matawan Creek. The mean range of **tide** is about 5 feet. There are good small-craft facilities on the southeast side of Keyport Harbor at Keyport. Craft up to 30 tons in weight can be hauled out for engine and hull repairs. Gasoline, water, ice, marine supplies, and storage are available. Vessels proceed to the boatyards at high water.

Railroad and bus service is available to New York and other points.

A privately dredged channel about 25 feet wide in places leads from the former steamboat dock at Keyport to a small-boat basin at the entrance to **Luppatatong Creek,** 0.3 mile southwestward. 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 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 wrecks, bare at low water, 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 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. 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 in length; gasoline, diesel fuel, water, ice, 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. In 1964, the midchannel controlling depth in Raritan River Cutoff Channel was 20 feet. The controlling midchannel depths in the dredged channels in Raritan River are as follows: In 1959, 25 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 1963, 25 feet in Titanium Reach to the National Lead Company dock (Titanium Pigment Company), thence 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 bridge has clearance of 135 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, 134 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, 90 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. Operating regulations for bridges with drawspans are given in **203.210,** chapter 2.

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 railroad 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, on the south side of the entrance to Raritan River, is an important port for the shipment of petroleum products, coal, and building materials. The principal wharves have depths of about 19 feet alongside. Water, provisions, 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,** which had its entrance to the Raritan River at New Brunswick, was closed to navigation in 1933.

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.

Anchorages.—Anchorage areas have been prescribed for Arthur Kill; see **202.155,** 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.

Repairs.—Several ship and boat repair yards are in Perth Amboy. Drydocks are available, the largest of which can handle vessels of 2,300 tons in weight, 240 feet in length, 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; water is available and gasoline can be obtained nearby. 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.** The midchannel controlling depth in the dredged channel in the creek is 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 **203.225,** chapter 2, for drawspan 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; a depth of about 4 feet with deeper water inside is available. The creek is used principally by small craft.

There are several boatyards with marine railways along Smith Creek. The largest marine railway can handle craft up to 50 feet in length; gasoline, diesel fuel, water, ice, marine supplies, and complete 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 Kill 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; see **203.190,** chapter 2, for drawspan 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. A midchannel depth of about 5 feet can 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, 37 feet; Lawrence Street, swing, 3.8 miles, 6 feet; State Route 25, fixed, 3.9 miles, 23 feet; Milton Avenue, fixed, 4.2 miles, 4 feet; Monroe Avenue, fixed, 4.4 miles, 7 feet. Drawspan regulations are given in **203.210,** chapter 2.

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.

Elizabeth River enters Arthur Kill from westward at Elizabethport. The midchannel depth in the river is 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. Drawspan regulations are given in **203.225,** chapter 2. 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. Extensive through traffic and large factories are 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.

An **anchorage area** is on the north side of the channel in Kill Van Kull near Bayonne Bridge; see **202.155,** chapter 2, for limits and regulations.

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 96-ton crane at the marina can haul out craft for engine and hull repairs; 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 in weight and 500 feet in length. 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.

Elizabeth Channel, Federal project depth 35 feet, extends northwestward from its junction with the Newark Bay channel.

Anchorages.—Anchorage areas have been prescribed for Newark Bay; see **202.1, 202.60,** and **202.155,** 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 **203.200,** chapter 2, for drawspan regulations.

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 is about 12 feet.

The **Elizabeth-Port Authority Marine Terminal,** operated by the Port of New York Authority, is on Newark Bay in Elizabeth, New Jersey, on the south side of Elizabeth Channel south of Port Newark. The facility is about 8 miles from the Narrows via Kill Van Kull, and the 35-foot Elizabeth Channel. It is adjacent to the New Jersey Turnpike and Newark Airport in the heart of the New Jersey industrial area, about 25 minutes by truck from Manhattan.

The terminal in 1965, partially completed, had available four vessel berths along the 2,500-foot bulkhead on the south side of the channel, and one 815-foot berth at the head of the channel. Depths at the head range from 23 to 26 feet, and from 27 to 34 feet along the bulkhead on the south side of the channel.

The terminal is served by five 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.

Port Newark Terminal, operated by the Port of New York Authority, 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. The facilities include, 31 deep-draft berths, with six additional planned, many transit and storage areas, and excellent cargo handling facilities. The terminal is served by five major railroads, each providing lighterage service to and from shipside and the wharves. Depths alongside the piers range from 30 to 35 feet.

Channels.—Federal project depth in Branch Channel and Inshore Channel, leading to the terminal from the main channel in Newark Bay, is 35 feet.

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 **203.200,** chapter 2, for drawspan regulations.

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 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 May 1965, the midchannel controlling depth in the Passaic River was 30 feet to just downstream of the Lincoln Highway Bridge. Above this point a depth of about 14 feet can 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 **203.200,** chapter 2, for drawspan regulations. The Second Street and Eighth Street bascule span highway bridges at Passaic remain in the closed position with a clearance of 5 feet; see **203.225,** chapter 2. 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. Gasoline, diesel fuel, 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 January, 1966, the midchannel controlling depths in the Hackensack River were 29 feet to the Lincoln Highway Bridge, and thence 25 feet to the turning basin 3.5 miles above the mouth. Above this point a depth of about 11 feet can be taken 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 50 feet at the twin State Route 3 bridges at Secaucus; the bridges are about 7.6 miles above the mouth. The minimum clearance of the bridges with drawspans is 2 feet at Hackensack, 14.2 miles above the mouth. See **203.200** and **203.225,** chapter 2, for drawspan regulations. 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. For predictions consult the Tide Tables. The river has little freshet flow, and 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 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 a mile above the entrance. The fixed span of the highway bridge has a clearance of 40 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. A dam forms the head of navigation on the creek 0.8 miles above the mouth.

12. HUDSON RIVER

Charts 745, 746, 747, 748, 282, 283, 284.—Hudson River, sometimes called **North River** in New York City, has its source in the Adirondack Moutains, 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. The principal cities on the riverbanks above New York are Yonkers, Newburgh, Poughkeepsie, Kingston, Albany, and Troy.

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.

In 1966, the controlling depth was 32 feet to Albany, except for the channel along the New Jersey Weehawken-Edgewater waterfront between 90th Street and 156th Street, Manhattan, where the controlling depth was about 29 feet.

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 six-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 months 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 cur-

rents 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.

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 registry. Pilotage north of Yonkers is provided by the Hudson River Pilots Association. Arrangemnts for pilot services are generally made in advance through ships' agents or directly by shipping companies; 24-hour service is provided. Pilots board vessels coming from sea off Stapelton, Staten Island, from a launch. Bridge-to-bridge communication on 156.65 mc. is maintained by the pilots on the Hudson River. Launch service is not available at Yonkers. By mutual agreement with the Sandy Hook pilots, the Hudson River pilots board vessels in midstream anywhere in New York Harbor and proceed up the Hudson River. For vessels proceeding to Long Island Sound and eastward, Hudson River pilots debark at the Battery, and Hell Gate pilots take over; again by mutual agreement.

Towage.—Tugs are available in New York Harbor; see Chapter 11.

Quarantine, customs, and immigration.—Matters pertaining to these services for places along Hudson River are handled at the Port of New York. See Chapter 11, New York Harbor.

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.—The New York City side of the river is mostly parkway for the length of the chart. On the New Jersey side are the piers of **Guttenberg,** 5.5 miles above the Battery; **Hudson Heights,** 6.5 miles; **Edgewater,** 7.5 miles; and **Fort Lee,** 9.5 miles from the Battery.

Sailors and Soldiers Monument, on the New York side of Hudson River 6.2 miles above the Battery, is a prominent landmark at 89th Street and Riverside Drive, Manhattan.

General Grants Tomb, on the New York side 7.7 miles above the Battery, is prominent at 123rd Street and Riverside Drive, Manhattan.

George Washington Bridge, 10 miles above the Battery, 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 bank 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, on the New York City side of Hudson River 11 miles from the Battery, has several small-boat landings.

Spuyten Duyvil Creek, which is entered on the New York City side of Hudson River 12 miles above the Battery, is marked by the railroad drawbridge 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. Small craft up to 55 feet can be accommodated; gasoline, water, and ice are available.

Yonkers, on the east side of Hudson River 15.5 miles above the Battery, adjoins the north side of New York City. Waterborne commerce is in petroleum products, sugar and syrup products, cement, sand, and other building materials. The depths alongside the private terminals range from 8 to 30 feet; there were no public docking facilities in 1965.

Small-craft marine supplies, gasoline, diesel fuel, water, ice, and complete engine and hull repairs are available; a 20-ton lift is also available at one of the boatyards. A diving and salvage company can effect underwater repairs.

Chart 748.—**Alpine** is a prominent landing on the New Jersey side of Hudson River 16 miles above the Battery. A boat basin here, operated by the Palisades Interstate Park Commission, affords shelter for numerous small craft; 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 **202.1** and **202.60,** chapter 2, for limits and regulations.

Hastings-on-Hudson in on the east side of Hudson River 19 miles above the Battery. There are several stacks and tanks along the waterfront, and the floodlights are prominent at night. The T-head pier of the Tappan Tanker Terminal, near the southern end of the waterfront, has a depth of 35 feet alongside. A yacht club, on

the north side of the town, is adjoined by a **special anchorage area** for small vessels; see **202.1** and **202.60**, chapter 2, for regulations and limits. A small boatyard with marine railway is southward of the tanker terminal. Craft up to 40 feet in length can be hauled out for minor repairs; outside storage is available.

The **boundary line** between the States of New Jersey and New York extends northwestward from a point on the west bank of Hudson River 19 miles above the Battery. The river is 0.8 mile wide at this point.

Dobbs Ferry is a town on the east side of Hudson River 20.5 miles above the Battery. An oil storage receiving facility here has about 10 feet at the loading dolphins. A marina on the north side of town can provide gasoline, water, ice, outside storage, and effect minor engine and hull repairs; a 15-foot wide wooden launching ramp is available.

Irvington, on the east bank 22 miles above the Battery, 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 about 1,000 feet of berthing space with reported depths of 17 to 25 feet alongside.

Piermont is on the west side of Hudson River 22 miles above the Battery. A grassy earthen embankment extends 0.8 mile channelward from the Piermont shores. The Erie Railroad has a terminus at the inner end of the embankment; several stacks and buildings are prominent. Piermont Pier, privately owned and in poor condition, is on the outer end of the embankment; about 16 feet is reported alongside the face. The dredged channels which lead to the pier from Hudson River main channel have controlling depths of about 16 feet. The outer end of the pier is marked by a light.

Several small-craft facilities are at Piermont. Craft up to 7 tons can be hauled out for repairs; gasoline, diesel fuel, water, ice, marine supplies, storage, and complete engine and hull repairs are available.

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, 23.5 miles above the Battery, 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, on the east side of Hudson River 24 miles above the Battery, has about 1 mile of developed waterfront, part of which has been improved by dredging.

In 1965, the controlling depths in the improved channels in Tarrytown Harbor were 12 feet in the waterfront channel, and 12 feet in the access channels leading northwest and southwest of the waterfront channel to deep water in Hudson River. 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 range, bearing **048°**, marks the best water in 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 southward of the principal wharves has a 20-ton travelift; gasoline, diesel fuel, water, ice, marine supplies, and complete engine and hull repairs are available at Tarrytown.

Nyack, on the west side of Tappan Zee 25 miles above the Battery, has depths of about 8 feet alongside the principal wharves. A boatyard at Nyack has a marine railway that can handle craft up to 60 feet in length for complete engine and hull repairs; the railway can only be used at high tide. Gasoline, water, ice, dry and wet storage, and marine supplies are available.

Upper Nyack, about 0.6 mile north of Nyack, has a boatyard with several marine railways that can haul out vessels up to 100 feet in length; the boatyard wharf has depths of about 8 feet at the face. 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 27 miles above the Battery. The summit is only 0.3 mile inland and is very prominent from the river.

Ossining is on the east side of Tappan Zee 28.5 miles above the Battery. 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. A marina at the north end of town can haul out craft up to 15 tons in weight; gasoline, water, ice, marine supplies, and complete engine and hull repairs are available.

From Hook Mountain northward to Haverstraw, the west bank of the Hudson River rises precipitously to heights of more than 500 feet.

Croton Point, on the east side of Hudson River 30 miles north of the Battery, is a long peninsula that extends 1.5 miles channelward from the main shore. The New York Central Railroad has repair shops at **Harmon,** near the inner end of Croton Point; a high stack is prominent. See appendix for **storm warning display.**

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 31.5 miles from the Battery. The wharf of a sand and gravel company here has a depth of about 5 feet alongside.

High Tor, 820 feet high, is on the west side of Haverstraw Bay 32 miles above the Battery. **Haverstraw Aero Light (41°11.3′ N., 73°57.9′ W.),** 966 feet above the water, is shown from a prominent tower on High Tor.

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Haverstraw is on the west side of Haverstraw Bay 32.3 miles north of the Battery. There are several abandoned brickyards along the waterfront.

Grassy Point is on the west side of Haverstraw Bay 34 miles from the Battery. An industrial pier on the south side of the point with a light on its outer end, has a depth of about 18 feet alongside. Small-craft facilities and a boat basin with a reported depth of about 5 feet are on the north side of Grassy Point. Gasoline, water, ice, storage, marine supplies, lifts up to 8 tons, and engine and hull repairs are available.

Stony Point, on the west side of the Hudson River 35 miles above the Battery, is marked at the outer end by a light; a fog signal is at the light.

Verplanck Point is on the east side of the Hudson River 35.5 miles from the Battery. Gray eroded banks of tailings from a trap-rock plant are prominent on the northwest side of the point. Small-craft facilities on the point can provide gasoline, water, ice, and marine supplies; a marine railway here can handle craft up to 40 feet in length for engine and hull repairs.

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 stack, lighted on top, is conspicuous on the point.

Tomkins Cove, on the west side of the Hudson River 36 miles north of the Battery, 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. An overhead power cable crossing the river north of Tomkins Cove has a clearance of 160 feet.

The west side of Hudson River between Tomkins Cove and Jones Point, 2 miles to the northeastward, is a **restricted area** set aside for berthage of a Maritime Administration Reserve Fleet; see **207.900,** chapter 2, for regulations.

Peekskill is at the head of a shallow bight on the east side of Hudson River 38 miles above the Battery. A 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. Controlling depths are about 6½ feet in the south channel, 8 feet in the north channel, and 5 feet in the channel west of the wharves.

A boatyard with marine railway at Peekskill can handle craft up to 65 feet in length for engine and hull repairs. Gasoline, water, ice, and marine supplies are available.

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 **Roa Hook,** on the north side of Peekskill, has a reported depth of about 18 feet alongside.

Peeks Kill Creek, on the north side of Peekskill, is very shallow. The railroad bridge over the entrance has a bascule span with a clearance of 3 feet; see **203.190,** chapter 2, for drawspan 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 on the west side of Hudson River 38 miles north of the Battery. 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, on the west side of the Hudson River, 40 miles above the Battery, is controlled by the Palisades Interstate Park Commission. A tall stack and a light shown from a skeleton tower on the north side of the island are 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, 1,305 feet high, is on the west side of Hudson River 40.3 miles north of the Battery. The summit of the mountain is about a 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 on the east side of Hudson River 40.5 miles north of the Battery. **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, 40.6 miles above the Battery, crosses Hudson River from Bear Mountain to Anthonys Nose. The suspension span has a clearance of 155 feet.

Con Hook is a small island on the west side of Hudson River 43 miles above the Battery; a light marks the channel side of the island. 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, so precautions should be taken to avoid it.

Highland Falls is on the west side of Hudson River 44 miles north of the Battery. A tower is prominent at the **Ladycliff School for Women.**

Garrison is on the east side of Hudson River 45 miles above the Battery. The yacht club fuel dock here has depths of about 20 feet at the pumps, and the slips can accommodate vessels up to 60 feet in length. Gasoline, water, electricity, and some supplies are available.

West Point, on the west bank of Hudson River 45.5 miles north of the Battery, 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 of the riverbank.

A **special small-craft anchorage area** is at West Point; see **202.1** and **202.60,** 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 the shallow area along the west bank.

Worlds End, a sharp bend in Hudson River 46 miles above the Battery, 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, on the upper side of Worlds End, is on the east side of Hudson River 46.5 miles north of the Battery. **Magazine Point,** on the channel side of the island, is marked by a light.

Crows Nest Mountain, 1,403 feet high, is prominent on the west side of Hudson River 47 miles from the Battery.

Little Stony Point, on the east side of Hudson River 48 miles north of the Battery, is the site of a rock quarry, and the hopper structure is prominent.

Storm King Mountain, 1,355 feet high, is prominent on the west side of Hudson River 49 miles above the Battery.

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 on the west bank of Hudson River 50 miles from the Battery. The wharf at Cornwall is in ruins. A boat club and a yacht club here can provide gasoline and water; guest moorings and a launching ramp are available.

Pollepel Island, on the east side of Hudson River 50 miles from the Battery, 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, on the west bank of the Hudson River 53 miles above the Battery, is a major petroleum distribution center. Most of the piers of the major oil companies are at **New Windsor,** the sourthern 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; 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 165 feet at the center, crosses the river between Beacon and Newburgh. Lights and a fog signal are on the bridge.

Danskammer Point, on the west side of Hudson River 58 miles north of the Battery, is marked by a light with fog signal. A conspicuous powerplant is located here. 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 on the east side of Hudson River 58.5 miles above the Battery. A dredged channel extends from the entrance to just below **Wappingers Falls,** 1.6 miles above the mouth; a controlling depth of about 5 feet is available. The entrance to the creek from Hudson River is marked by buoys. Caution should be exercised in the upper part of the creek because of the numerous snags. 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 **203.190,** chapter 2, for drawspan regulations. The nearby overhead cable has a clearance of 43 feet over the creek. The highway bridge 300 yards above the railroad bridge has a swing span with a clearance of 11 feet. The overhead power cable 1.5 miles above the mouth has a clearance of 31 feet. In 1966, a bridge was under construction in the vicinity of the highway swing bridge.

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.

New Hamburg is just north of the entrance to Wappinger Creek. A 12-ton travelift, gasoline, water, ice, marine supplies, and engine and hull repairs are available at a marina here.

Poughkeepsie, on the east bank of Hudson River 66 miles above the Battery, 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.

A yacht club at Poughkeepsie, just below the highway bridge, has a float landing with a depth of about 6 feet alongside, and a marine railway that can haul out boats up to 42 feet in length; gasoline, water, ice, some marine supplies, and complete engine and hull repairs are available.

Gasoline, water, ice, marine supplies, and minor engine repairs can be had at a marina on the east side of the river about 3 miles north of Poughkeepsie; a 6-ton crane is also available to haul out small craft.

The city pier along the 1-mile waterfront of Poughkeepsie, about 0.2 mile above the highway bridge, is in ruins and no longer used. The lumber marginal wharf at the northern end of the waterfront has about 600 feet of berthing space with a reported depth of about 35 feet alongside. There are several bulk oil receiving wharves southward of the highway bridge with reported depths alongside ranging from 8 to 14 feet.

Hyde Park, on the east bank of Hudson River 71 miles above the Battery, is the birthplace of Franklin Delano Roosevelt, the 32d President of the United States. The residence and library are about 0.4 mile inland.

Esopus Island, in about the middle of Hudson River 73 miles above the Battery, 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 east side of Hudson River 73.8 miles above the Battery. A small boat basin with a dredged depth of about 8 feet is at the entrance to Indian Kill; private lights mark the north and south entrance points to the boat basin. Gasoline, water, ice, minor engine repairs, and a 20-foot concrete ramp are available in the basin. Supplies can be obtained nearby.

Esopus Meadow Light, 75.8 miles above the Battery, 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 sounded 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 on the west side of Hudson River 79 miles above the Battery. The entrance is between two long dikes marked by lights and a fog signal on the north dike. The lower 2-mile portion of the 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.

Channels.—A dredged channel extends from the entrance of Rondout Creek close to the north dike and the bulkhead at Kingston for 1.5 miles upstream. In 1965, controlling depths of 11 feet were reported to the highway bridge, thence 10 feet to the railroad bridge, and thence 5 feet to **Eddyville,** 3 miles above the mouth. The head of navigation is at the lock of the abandoned **Delaware and Hudson Canal,** 3.3 miles above the mouth.

Bridges.—A highway suspension bridge with a clearance of 86 feet crosses Rondout Creek 1.2 miles above the mouth. A fixed railroad bridge with a clearance of 144 feet crosses the creek 2 miles above the mouth.

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 in the area can handle craft up to 40 feet in length for engine and hull repairs. Gasoline, diesel fuel, water, ice, marine supplies, 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, on the west bank of Hudson River 80 miles above the Battery, 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 82.7 miles above the Battery. The fixed channel spans have a clearance of 132 feet. A depth of 4 feet is about 1.1 miles northward of the bridge in 41°59′40″ N., 73°56′24″ W.

Esopus Creek is entered on the west side of Hudson River 88.5 miles above the Battery. 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. A controlling depth of about 4 feet is at the entrance, thence 10 feet to a private marina, 0.7 mile above the mouth. The mean range of tide is about 4 feet. Above the marina several shoals bare at low water and there are many large boulders. Small craft, with local knowledge, use this area as an anchorage, but it should be avoided by strangers. A dam crosses the creek about 1.3 miles above the mouth. A marine railway at Saugerties can haul out craft up to 130 feet in length; gasoline, water, diesel fuel, ice, some marine supplies, and limited engine and hull repairs are 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 on the west side of Hudson River near **Cementon,** 92.5 miles above the Battery. 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 is entered on the west side of Hudson River 97.5 miles above the Battery. **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 fixed 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 bank of Catskill Creek from the entrance to Catskill. A boatyard in the bight on the north side of the creek, 0.6 mile above the mouth, has a marine railway that can haul out boats up to 55 feet in length. Gasoline, diesel fuel, water, ice, marine supplies, and complete electronics, engine, and

hull repairs are available. The landing here has depths up to 20 feet. Berthing facilities, engine and hull repairs, gasoline, diesel fuel, water, ice, and marine supplies are also available on the south side of the creek, 0.8 mile above the mouth.

Rip Van Winkle Bridge crosses the Hudson River 98.7 miles above the Battery. 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, 102 miles above the Battery, is on a slope that rises from the east bank of the Hudson River. Waterborne commerce is in cement 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 were active in 1965. 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 gasoline, water, ice, limited marine supplies, and can make minor engine repairs.

Chart 284.—Coxsackie is on the west side of Hudson River 108 miles above the Battery. 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 is on the west side of the river 115 miles above the battery. A boatyard here has a travelift that can haul out craft up to 12 tons for engine and hull repairs; gasoline, diesel fuel, water, ice, and marine supplies are available. A **special anchorage area** for small craft is at Coeymans; see **202.1** and **202.60,** chapter 2, for limits and regulations. In 1965, a **22-foot shoal** was reported in the channel about 200 yards 171° from Upper Hudson River Light 49.

A fixed railroad bridge with a clearance of 139 feet crosses the Hudson River 117.8 miles above the Battery. The fixed highway bridge about 150 yards above the railroad bridge has a clearance of 135 feet.

Castleton-on-Hudson, is on the east side of the river 119 miles above the Battery. Gasoline and fresh water may be obtained at the boat club.

Cedar Hill, is on the west side of the river 120 miles above the Battery. A **special anchorage area** for small craft is just below Cedar Hill; see **202.1** and **202.60,** chapter 2 for limits and regulations. Gasoline may be obtained at the yacht club; space for transients is available.

Albany, on the west bank of the Hudson River 126 miles above the Battery, 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, sand, gravel, crushed rock, and iron and steel scrap are also handled.

The Albany Port District includes the lower harbor between points 2.3 miles and 0.2 mile below the Dunn Memorial Bridge, and the upper harbor extending northward of this point to the northern limits of Albany on the west bank and **Rensselaer** on the east bank.

Channels.—The Federal project depth is 32 feet from New York Harbor to Albany. Above Port of Albany, the controlling depths are about 15 feet to Dunn Memorial Bridge, thence 12 feet to Troy Lock and Dam.

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.—Dunn Memorial Bridge, which crosses Hudson River 126.2 miles above the Battery, has a lift span with a clearance of 41 feet down and 139 feet up. In 1965, a fixed highway bridge was under construction 0.2 mile above the lift bridge; clearance will be 64 feet. The railroad bridges, 0.4 and 0.8 mile above Dunn Memorial Bridge, have swing spans with a least clearance of 25 feet. See **203.185,** chapter 2, for drawspan regulations. Overhead power cables in the vicinity of these bridges have a minimum 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.

See appendix for Albany **climatological table.**

Pilotage information for the Hudson River is given at the beginning of this chapter.

Towage.—Towboats are available at New York and Cohoes.

Quarantine.—Most of the foreign vessels calling at Albany have undergone quarantine inspection at previous U.S. ports of call. In the rare instances when they have not, quarantine inspection is performed at Albany piers.

A Public Health Service outpatient office is at Albany. Patients requiring emergency hospitalization are placed in Memorial Hospital; all other hospital cases are sent to the Public Health Service hospital on Staten Island.

Customs.—Albany is a port of entry and marine documents are issued. Customs officials are in the Federal Building.

Immigration.—Immigration inspections are conducted by officials at the piers; offices are in the Federal Building.

Harbor regulations.—Local rules and regulations for the port are handled by the Albany Port District Commission.

Wharves.—There are 30 or more modern well-equipped

waterfront facilities with depths up to about 32 feet alongside at Albany and Rensselaer engaged in the shipment and/or receipt of petroleum products, foreign and domestic general cargo, molasses, grain, scrap metal, and building materials. The major portion of these facilities are on the west bank of the Hudson River at Albany. General cargo at the port is usually handled by ships' tackle. Crawler and truck cranes up to 100 tons may be obtained from rental firms in Albany.

The Port of Albany, owned and operated by the Albany Port District Commission, at the southern part of the city, is the major shipping terminal in the port. The terminal consists of a 4,070-foot long concrete bulkhead wharf with reported depths of 30 to 32 feet alongside. There are transit sheds, warehouses, open storage areas, a grain elevator of 13.5 million bushel capacity, and molasses storage tanks at the terminal.

Depths of 12 to 32 feet are reported alongside the oil handling facilities at Albany.

Waterfront facilities at Rensselaer, on the east side of the river, consist mainly of a 1,200-foot long bulkhead lumber terminal wharf, operated by the Albany Port District Commission, and oil terminal storage facilities. Depths of about 30 feet are reported alongside the lumber wharf, and 12 to 32 feet alongside the oil facilities.

The Delaware and Hudson, and the New York Central Railroads serve the Albany-Rensselaer port area. 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.

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, gasoline, marine supplies, and other provisions are available.

Gasoline, diesel fuel, and water for small boats can be obtained at the yacht club on the east side of the river just south of Dunn Memorial Bridge.

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.

Communications.—Albany is served by air, rail, and highway communications.

In 1965, a fixed highway bridge was under construction across the Hudson River just above Albany, 127.8 miles above the Battery; clearance will be 60 feet.

A fixed highway bridge crossing the Hudson River at **South Troy,** 130.5 miles above the battery, has a clearance of 61 feet. The overhead power cables between Albany and Troy have a least clearance of 88 feet. Red lights are shown from the suspension towers on both banks of the river.

Troy, on the east side of Hudson River 132 miles above the Battery, 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, 132.2 miles above the Battery, has a swing span with a clearance of 31 feet. The railroad bridge 0.5 mile upstream has a lift span with a clearance of 24 feet down and 129 feet up. See **203.185,** chapter 2, for drawspan regulations.

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 at the island just south of 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, and fresh water. Each place has a marine railway that can haul out boats up to 50 feet in length for hull and engine repairs.

The **Troy Lock and Dam** is about 8 miles above Albany and 133.7 miles above the Battery. 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. Navigation regulations of the lock and operating regulations of the dam are given in **207.50** and **207.60,** chapter 2.

See appendix for **storm warning display.**

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. Rules and regulations governing navigation and use of the canals are published by the State of New York Department of Public Works, Albany, N.Y.

Controlling dimensions of channels, locks, and bridges.—The channels are 12 feet deep at normal pool level, and the minimum widths are 75 feet in earth, 94 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 latter 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, 23¼ 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 U.S. Lake Survey, Corps of Engineers, U.S. Army, Detroit, Michigan. Charts and pilot information for the Richelieu River, Chambly Canal, and other Canadian waters is published by the Canadian Hydrographic Service, Ottawa, Canada.

APPENDIX

COAST AND GEODETIC SURVEY.—Coast Pilots, Nautical Charts, Tide Tables, Tidal Current Tables, and Tidal Current Charts are sold by the U.S. Coast and Geodetic Survey, Washington Science Center, Rockville, Md. 20852 (Counter sales: Room 1125, Commerce Building, Washington, D.C.), or its distribution centers at New York and San Francisco, and by authorized sales agents located in many ports of the United States and in some foreign ports.

Distribution centers: New York Field Office, U.S. Coast and Geodetic Survey, Room 602, Federal Office Bldg., 90 Church Street, New York, N.Y. 10007; West Coast Field Director, U.S. Coast and Geodetic Survey, Room 121, Customhouse, San Francisco, Calif. 94126.

Field offices:

Boston: Tenth Floor, Customhouse, Boston, Mass. 02109.

New York: Room 602, Federal Office Bldg., 90 Church Street, New York, N.Y. 10007.

Norfolk: Atlantic Marine Center and East Coast Field Director, 439 West York Street, Norfolk, Va. 23510.

Coast Pilot books:

U.S. Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod, 1965.

U.S. Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook, 1966.

U.S. Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry, 1966.

U.S. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West, 1964.

U.S. Coast Pilot 5, Atlantic Coast—Gulf of Mexico, Puerto Rico, and Virgin Islands, 1962.

U.S. Coast Pilot 7, Pacific Coast and Hawaii, 1963.

U.S. Coast Pilot 8, Alaska—Dixon Entrance to Cape Spencer, 1962.

U.S. Coast Pilot 9, Pacific and Arctic Coasts, Alaska—Cape Spencer to Beaufort Sea, 1964.

Distances Between United States Ports, Third (1961) Edition.

A Coast Pilot should be used only by reference to the latest supplement which can be obtained free from the headquarters office and distribution centers of the Coast and Geodetic Survey, and from the 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.
Long Island Sound and Block Island Sound.
New York Harbor.
Delaware Bay and River.
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 U.S. Coast and Geodetic Survey: for sale by C&GS 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 U.S. Lake Survey, Detroit, Mich.

Foreign countries: Published by U.S. Naval Oceanographic Office; for sale by that office and its sales agents.

Coast Pilots.—Coasts of the United States and Possessions: Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Great Lakes Pilot: Published and for sale by U.S. Lake Survey, Detroit, Mich.

Foreign countries (Sailing Directions): Published by U.S. Naval Oceanographic Office; for sale by that office and its sales agents.

Tide and Tidal Current Tables, and Tidal Current Charts.—Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Notices to Mariners may be obtained free from the following: Local Notices to Mariners—District Commander of the local Coast Guard district; Weekly Notice to Mariners, Part I (Atlantic and Mediterranean) and Part II (Pacific and Indian Oceans)—U.S. Naval Oceanographic Office; Weekly Notice to Mariners, Great Lakes—Commander, Ninth Coast Guard District, Cleveland, Ohio.

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 U.S. Naval Oceanographic Office; 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, Atlantic and Mediterranean Area (H.O. Pub. No. 118A); Radio Weather Aids, Pacific and Indian Oceans Area (H.O. Pub. No. 118B); Weather Station Index (H.O. Pub. No. 119); and International Code of Signals, Vol. II—Radio (H.O. Pub. No. 104); Published by U.S. Naval Oceanographic Office; for sale by that office and its sales agents.

Miscellaneous.—The Nautical Almanac, and American Ephemeris and Nautical Almanac: Published by United States Naval Observatory: for sale by Superintendent of Documents and his sales agents.

American Practical Navigator (Bowditch) (H.O. Publication No. 9), and International Code of Signals, Volume I—Visual (H. O. Publication No. 103): Published by U.S. Naval Oceanographic Office; for sale by that office and its sales agents.

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 I (port administration and services) published by Maritime Administration, U.S. Department of Commerce; Part II (port conditions and facilities) published by Corps of Engineers, U.S. Army. Both parts are for sale by the Superintendent of Documents.

CORPS OF ENGINEERS, U.S. ARMY.—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: 111 East 16th St., New York, N.Y. 10003.

The New York District includes western Vermont, small portions of western Massachusetts, Connecticut, north-central 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.—Commander, First Coast Guard District, 1400 U.S. Customhouse, Boston, Mass. 02109. Waters of jurisdiction: Maine; New Hampshire; Massachusetts; Rhode Island, with the exception of Watch Hill Light Station; and the ocean area north of a line from Watch Hill south to Montauk Point Light, thence 112°.

Captain of the Port offices:

Boston, Mass: Coast Guard Base, 427 Commercial St., Boston, Mass. 02109.

Providence, R.I.: 409 Federal Building, Providence, R.I. 02903.

Commander, Third Coast Guard District: Governors Island, New York, N.Y. 10004. Waters of jurisdiction: Rhode Island from Watch Hill, Connecticut, New York, New Jersey, Pennsylvania, and Delaware, but excluding the Chesapeake and Delaware Canal.

Captain of the Port offices:

New London, Conn.: Coast Guard Mooring, Fort Trumbull, New London, Conn. 06320.

New York, N.Y.: Governors Island, New York, N.Y. 10004.

Albany, N.Y.: Room 313, Federal Building, Albany, N.Y. 12207.

Coast Guard Stations.—The stations listed here are in the areas 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. Aerial identification numbers, where assigned, follow the name of the station.

Cape Cod Canal, Mass. (No. 32), 41°46.5′ N., 70°30.0′ W. East entrance to canal near Sandwich.

Race Point, Mass. (No. 34), 42°04.7′ N., 70°13.4′ W. 1.5 miles northeast of Race Point Light.

Chatham, Mass. (No. 42), 41°40.3′ N., 69°57.0′ W. Southeastern Cape Cod near Chatham Light.

Woods Hole, Mass., 41°13.2′ N., 70°40.0′ W. On east side of Little Harbor, about 450 yards northward of Juniper Point.

Brant Point, Mass. (No. 47), 41°17.4′ N., 70°05.5′ W. On west side of entrance to Nantucket Harbor, near Brant Point Light.

Gay Head, Mass. (No. 49), 41°21.0′ N., 70°45.9′ W. West end of Martha's Vineyard near Menemsha Light.

Castle Hill, R.I. (No. 53), 41°27.7′ N., 71°21.7′ W. On west shore of Newport Neck near Castle Hill Light.

Point Judith, R.I. (No. 55), 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.

Fishers Island, N.Y. (No. 59), 41°15.4′ N., 72°01.9′ W. In Silver Eel Pond on west end of island.

New London, Conn., 41°20.7′ N., 72°05.7′ W. At Fort Trumbull on west side of the main channel northward of Greens Harbor.

Block Island, R.I. (No. 62), 41°11.7′ N., 71°35.3′ W. On Block Island, west side at entrance to Great Salt Pond Harbor.

Eatons Neck, N.Y. (No. 64), 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, N.Y. (No. 65), 41°04.1′ N., 71°55.6′ W. In Montauk Harbor, Long Island, N.Y.

Shinnecock, N.Y. (No. 72), 40°51.0′ N., 72°30.3′ W. East side of Ponquogue Point, 1.3 miles northwest of Shinnecock Inlet.

Moriches, N.Y. (No. 76), 40°47.2′ N., 72°45.0′ W. 1.0 mile north of Moriches Inlet, on Moriches Bay.

Fire Island, N.Y. (No. 83), 40°37.5′ N., 73°15.6′ W. Near west end of island, 1.9 miles west of Fire Island Light.

Short Beach, N.Y. (No. 88), 40°35.4′ N., 73°33.4′ W. Near Jones Inlet, opposite Meadow Island.

Atlantic Beach, N.Y. (No. 90), 40°35.5′ N., 73°44.5′ W. North side Atlantic Beach, 0.25 mile west of bascule bridge.

Rockaway, N.Y. (No. 92), 40°34.3′ N., 73°53.4′ W. On Rockaway Beach, 2.5 miles east of Rockaway Point.

Staten Island, N.Y. (St. George Base), 40°38.5′ N., 74°04.4′ W. At the northeast end of Staten Island.

New York, N.Y., 40°41.5′ N., 74°01.0′ W. On Governors Island.

Sandy Hook, N.J. (No. 97), 40°28.2′ N., 74°00.8′ W. Bay side 0.5 mile south of point of Sandy Hook.

CUSTOMS DISTRICTS.—The first port listed in each district is the headquarters port. An (*) asterisk precedes the names of ports authorized to issue marine documents.

Massachusetts District: The limits are the State of Massachusetts.

Ports of entry: *Boston, *Fall River, *New Bedford.

Rhode Island District: The limits are the State of Rhode Island.

Ports of entry: *Providence, *Newport.

Connecticut District: The limits are the State of Connecticut.

Ports of entry: *Bridgeport, *Hartford, *New Haven, *New London.

New York District: That part of the State of New York not expressly included in the districts of Buffalo, Rochester, and St. Lawrence, and also the counties of Sussex, Passaic, Hudson, Bergen, Essex, Union, Middlesex, and Monmouth in the State of New Jersey.

Ports of entry: *New York, N.Y., and *Albany, N.Y.; *Perth Amboy, N.J.

PUBLIC HEALTH SERVICE.—*Quarantine stations* where supervision of quarantine and medical examination of aliens are performed:

Boston, Mass.; 5th Floor, Section A East, Boston Army Base.

Rosebank, Staten Island, N.Y.

Additional ports at which quarantine inspection and/or medical examination of aliens are performed:

Provincetown, Falmouth, Woods Hole, New Bedford, Fall River, Mass.; Tiverton, Newport, Portsmouth, Melville, Providence, R.I.; Groton, New London, New Haven, Bridgeport, Conn.; Greenport, Northport Peekskill, Albany, N.Y.; Bayonne, Newark, Carteret, Leonardo, N.J.

Hospitals:

Staten Island, New York; Stapleton.

Outpatient Clinic:

New York, N.Y.; 67 Hudson Street.

Outpatient Offices:

Edgartown, Mass.: North Summer Street.
Fall River, Mass.: 302 Highland Ave.
Nantucket, Mass.: 41 India Street.
New Bedford, Mass.: 166 Cottage Street.
Provincetown, Mass.: 322 Commercial Street.
Newport, R.I.: 105 Pelham Street.
Providence, R.I.: 1413 Broad Street.
Wakefield, R.I.: 25 Mechanic Street.
New Haven, Conn.: 1172 Chapel Street.
New London, Conn.: 293 Montauk Ave.
Albany, N.Y.: 612 Madison Ave.

IMMIGRATION AND NATURALIZATION.—Offices of these services are in the following ports covered by this Coast Pilot:

Connecticut:

Hartford: U.S. Post Office Building, 135 High Street.

New Jersey:

Newark: 1060 Broad Street.

New York:

Albany: Room 442, U.S. Post Office Building.
New York: 20 West Broadway.

Rhode Island:

Providence: Federal Building, U.S. Courthouse, Exchange Place.

FEDERAL COMMUNICATIONS COMMISSION.—District field offices of the Commission in this area are:

Boston, Mass., U.S. Customhouse.

New York, N.Y., Federal Building, 641 Washington St.

WEATHER BUREAU.—Barometers may be compared with standards at the following offices:

Boston, Logan International Airport.
Nantucket, Weather Bureau Office at Airport.
Block Island, Weather Bureau Office at Airport
Providence, Theodore F. Green Airport, Hillsgrove, R.I.
New Haven, Tweed-New Haven Airport.
Bridgeport, Operations Building, Municipal Airport.
New York City, 30 Rockefeller Center.

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 the 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 kc. and 2182 kc., respectively. Safety broadcasts are preceded by the safety signal: TTT for radiotelegraph; SECURITE for radiotelephone. After the preliminary signal 500 kc. and 2182 kc., the station shifts to its assigned working medium frequency for the radiotelegraph broadcast and 2670 kc. for the radiotelephone transmission.

Scheduled broadcasts.—The following Coast Guard radio stations make scheduled broadcasts, preceded by a preliminary call on 500 kc. and 2182 kc., at the times and frequencies indicated:

Radiotelegraph:

NMF, Boston, Mass., 472 kc., 1150 and 1950 EST.
NMY, New York, N. Y., 486 kc., 1200 and 2000 EST.

Radiotelephone:

NMF, Boston, Mass., 2670 kc., 1140 and 2340 EST.
NMY, New York, N.Y., 2670 kc., 0720 and 1920 EST.
NMK, Cape May, N.J., 2670 kc., 0600 and 1800 EST.

Note: Stations NMF and NMY do not carry weather forecasts except when they contain marine weather warnings; station NMK includes marine weather forecasts in each scheduled broadcast.

Voice distress, safety, and calling frequencies guarded by the Coast Guard.—The International radiotelephone distress and calling frequency 2182 kc. and the International calling and safety frequency 156.8 mc. of the maritime mobile VHF-FM band are guarded continuously in the area covered in this book by the Coast Guard stations listed below. Stations preceded by an asterisk (*) guard 156.8 mc. only, and those preceded by a dagger (†) guard 2182 kc. only.

Massachusetts: Cape Cod Canal, Race Point, Chatham, Woods Hole, Brant Point and Gay Head.

Rhode Island: Castle Hill, Point Judith, and Block Island.

Connecticut: *New London and †Falkner Island.

New York: Fishers Island, †Stratford Shoal, Eatons Neck, †Execution Rocks, Montauk, †Montauk Point, Shinnecock, Moriches, Fire Island, Short Beach, Atlantic Beach, Rockaway (Fort Tilden), *Staten Island (St. George Base), and *New York (Governors Island).

New Jersey: Sandy Hook.

Radiotelephone broadcasts of weather information.—Regular broadcasts of weather forecasts, storm warnings, and other information are made in plain language by commercial coastal harbor radiotelephone stations. Regular scheduled times:

WOU, Boston, Mass. On 2506 and 2450 kc. at 0520, 0620, 1120, 1720, and 2320 e.s.t., and 1 hour earlier during daylight time. Warnings on receipt and 20 minutes past odd hours.

WOX, New York, N.Y. On 2522, 2590, and 2482 kc. (daytime only) at 0715 and 1915 e.s.t. Warnings on receipt and 15 minutes past odd hours (winter) and even hours (summer).

WAQ, Ocean Gate, N.J. On 2558 kc. at 0715 and 1915 e.s.t. Warnings on receipt and 15 minutes past even hours.

Weather broadcasts by harbor radiotelegraph stations.—Regular broadcasts of weather forecasts (storm warnings on receipt) and other weather information are made by commercial coastal harbor radiotelegraph stations as follows:

WCC, Chatham, Mass. On 436, 2036, and 6376 kc., at 0750, 1150, and 1950 e.s.t. Warnings on receipt, on 436, 2036, 4367 (night), 6376, 8586, 12925.5, 13033.5, 16973.6 (day), and 17271.2 (day) kc.

WSL, Amagansett, N.Y. On 418 and 8658 kc. at 0000; on 418, 8514 and 13024.5 kc. at 0600 e.s.t.; on 418, 8514, 13024.5 and 17021.6 at 1200 and 1800 e.s.t. On 418, 8514, 8658, 12997.5, 13024.5, 13078.5, 16997.6 and 17021.6 at 0850 and 1650 e.s.t. Warnings on receipt (same frequencies as for 0850 and 1650 e.s.t. schedules).

WNY, New York, N.Y. On 482, 2051, 6519.5, and 13060.5 kc. at 0510, 0900, 1110, and 1700 e.s.t. Warnings on receipt (same frequencies).

WSF, New York, N.Y. On 442 kc. at 0905 and 1705 e.s.t.

WSC, Tuckerton, N.J. On 460 kc. at 0818 and 1818 e.s.t. Warnings on receipt.

Commercial radio station weather broadcasts.—Taped or direct broadcasts of forecasts and storm warnings are made by commercial radio stations in the areas covered by this Coast Pilot. These usually are made several times daily; broadcast times are published in local newspaper

radio program schedules, and in the Costal Warning Facilities Charts issued annually by the U.S. Weather Bureau. The charts are on sale, 10 cents each, by Superintendent of Documents, Washington, D.C. 20402.

STORM WARNING STATIONS.—Weather Bureau listings of display stations in the area covered by this Coast Pilot follow: **DN** indicates day and night display; **D**, day display only; **S**, seasonal display.

Massachusetts:

DN Provincetown; 42°03.1′, 70°11.3′.
DN Chatham Light Station; 41°40.3′, 69°57.0′.
D Pollock Rip Lightship; 41°36.1′, 69°51.0′.
D Nantucket Lightship; 40°33.0′, 69°28.0′.
DN Brant Point CG Station; 41°17.4′, 70°05.5′.
D Harwich Port; 41°39.8′, 70°04.0′ (S).
D Hyannis Port; 41°37.9′, 70°18.0′ (S).
DN Falmouth; 41°32.6′, 70°36.5′.
D Edgartown Yacht Club; 41°23.3′, 70°30.7′ (S).
DN Vineyard Haven Machine and Marine Services, Inc.; 41°27.2′, 70°36.0′.
DN Nobska Point Light Station; 41°31.0′, 70°39.3′.
D Gay Head CG Station; 41°21.0′, 70°45.9′.
DN South Dartmouth (New Bedford Yacht Club); 41°35.1′, 70°56.7′ (S).
DN Red Brook Harbor; 41°40.6′, 70°37.0′ (S).
D West Falmouth; 41°36.0′, 70°38.2′.
DN Wings Neck Light (Pocasset); 41°40.8′, 70°39.7′.
D Bourne Neck, Training Ship Bay State; 41°44.5′, 70°37.1′ (S).
D Marion; 41°42.3′, 70°45.7′.
DN Fairhaven; 41°38.2′, 70°54.4′.

Rhode Island:

D Castle Hill CG Station; 41°27.8′, 71°21.7′.
D Jamestown; 41°30.0′, 71°22.0′ (S).
D Bristol, Coast Guard Depot; 41°40.0′, 71°16.7′.
D Edgewood Yacht Club; 41°46.6′, 71°23.5′.
D Newport, Ida Lewis Yacht Club; 41°28.7′, 71°19.6′ (S).
DN Providence, Providence Journal Co.; 41°49.5′, 71°25.0′.
DN Point Judith CG Station; 41°21.7′, 71°28.9′.
D South Kingston, Snug Harbor Marina; 41°23.2′, 71°31.1′ (S).
DN Black Island CG Station; 41°11.7′, 71°35.4′.
D Watch Hill Light Station; 41°18.2′, 71°51.5′.
D Westerly Yacht Club; 41°20.9′, 71°49.7′ (S).

Connecticut:

D Stonington; 41°20.0′, 71°54.5′ (S).
D Mystic; 41°20.5′, 71°58.4′ (S).
D Fishers Island CG Station; 41°15.3′, 72°01.9′.
DN New London, CG Moorings; 41°20.6′, 72°05.6′.
D Saybrook, Terra Mar Yacht Basin; 41°17.0′, 72°21.0′ (S).
D Saybrook, Baldwin Bridge Yacht Club; 41°19.1′, 72°21.0′ (S).
D Clinton; 41°16.2′, 72°31.7′.
D Guilford; 41°16.3′, 72°39.9′.
DN New Haven, abandoned lighthouse; 41°14.9′, 72°54.3′.
D Prospect Beach Fish and Game Club; 41°15.0′, 72°58.0′ (S).
DN Bridgeport; 41°09.6′, 73°11.2′.
D Stratford Shoal Light Station; 41°03.5′, 73°06.0′.

New York:

DN Troy Lock and Dam; 42°45.1′, 73°41.2′.
D Croton Point Park; 41°11.2′, 73°54.1′ (S).
D Mamaroneck Harbor; 40°56.2′, 73°43.4′ (S).
D Mamaroneck Harbor Island Beach; 40°56.6′, 73°43.9′ (S).
DN New Rochelle; 40°54.5′, 73°46.2′ (S).
D Centerport Yacht Club; 40°54.1′, 73°21.7′ (S).
DN Fort Schuyler; 40°48.3′, 73°47.5′.
DN Port Washington Knickerbocker Yacht Club; 40°49.7′, 73°42.2′ (S).
D Port Washington Yacht Club; 40°49.3′, 73°42.2′ (S).
D North Hempstead Town Dock; 40°49.9′, 73°42.2′ (S).
D Manhassett Bay Yacht Club; 40°49.4′, 73°42.3′ (S).
D Huntington Yacht Club; 40°53.8′, 73°25.3′ (S).
D Hempstead Harbor; 40°51.4′, 73°39.1′ (S).
DN Eatons Neck CG Station; 40°57.3′, 73°23.9′.
D Northport Yacht Club; 40°54.5′, 73°21.5′ (S).
D East Hampton, Three Mile Harbor; 41°01.2′, 72°10.9′ (S).
D Montauk CG Station; 41°04.3′, 71°56.1′.
D Montauk Point Light Station; 41°04.3′, 71°51.5′.
D Shinnecock CG Station; 40°51.0′, 72°30.2′.
D Moriches CG Station; 40°47.2′, 72°45.0′.
DN Patchogue, Long Island; 40°45.1′, 73°01.2′.
D Bay Shore Marine Basin; 40°42.9′, 73°14.4′.
D Fire Island CG Station; 40°37.5′, 73°15.6′.
DN Hempstead Town Marina; 40°35.6′, 73°35.2′.
D Short Beach CG Station; 40°35.4′, 73°33.4′.
DN Freeport Yacht Club; 40°38.3′, 73°34.7′.
D Nassau, Marine Bureau; 40°37.7′, 73°40.1′.
D Atlantic Beach CG Station; 40°35.5′, 73°44.4′.
D Ambrose Lightship; 40°27.6′, 73°50.2′.
D Rockaway Point CG Station; 40°34.0′, 73°53.1′.
D Rockaway Point Lookout Tower; 40°33.2′, 73°56.2′.
D New York City, Battery Place, CG Base; 40°42.0′, 74°00.9′.
DN Staten Island, Princess Bay; 40°30.6′, 74°11.7′.
D Staten Island, Great Kills Harbor; 40°32.3′, 74°08.5′ (S).

New Jersey:

DN Sandy Hook CG Station; 40°28.3′, 74°00.8′.

CLIMATOLOGICAL TABLES

These tables were compiled from Weather Bureau 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 ¼ 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. WB-1965

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)	18	18	(b)	19	19	18	18	18	14	19	19	19	19	19	19	19	19	19	19
Jan.	39.2	26.8	33.0	57	5	4.22	2.82	9.7	80	72	12.8	NW	51NW	41	7.1	7	6	18	14	2	*	6
Feb.	38.1	24.6	31.4	56	0	3.76	2.32	10.2	79	69	13.4	WNW	57NW	48	6.8	6	6	16	12	2	1	6
Mar.	42.5	29.6	36.1	62	7	4.54	2.54	7.3	78	67	13.6	NW	63N	56	6.4	8	8	15	12	2	1	6
Apr.	50.6	38.0	44.3	73	20	3.76	4.48	1.0	79	68	12.8	WSW	49N	55	6.6	7	8	15	12	*	2	8
May	59.9	45.3	52.6	77	30	2.88	3.07	0.0	80	70	11.4	SW	43SE	59	6.6	7	8	16	10	0	3	10
June	67.8	54.8	61.3	88	39	2.92	3.00	0.0	84	73	10.5	SW	34NE	63	6.5	7	8	15	8	0	3	12
July	74.3	61.7	68.0	92	47	2.71	2.65	0.0	86	74	9.8	SW	36S	62	6.7	6	9	16	8	0	4	14
Aug.	74.4	61.7	68.1	95	49	3.68	3.67	0.0	86	74	9.6	SW	63SE	61	6.2	8	9	14	9	0	4	12
Sept.	69.3	56.4	62.9	84	35	3.51	4.42	0.0	84	71	10.3	SW	63SE	60	6.1	9	7	14	8	0	2	8
Oct.	60.8	47.8	54.3	80	29	3.70	3.21	T	83	70	11.3	SW	60E	58	5.8	10	8	13	9	0	1	7
Nov.	52.3	39.5	45.9	69	20	4.05	3.38	0.2	81	70	11.6	NW	61NW	44	7.0	6	8	16	12	*	1	5
Dec.	42.5	29.6	36.1	59	-3	3.93	2.48	7.2	79	69	12.3	WNW	50W	43	6.9	6	8	17	12	2	*	4
Year	56.0	43.0	49.5	95	-3	43.66	4.48	35.6	82	70	11.6	SW	63N	55	6.6	87	93	185	125	8	21	98

PROVIDENCE, R. I. (T. F. Green Airport) 41°44'N., 71°26'W. Elevation (ground) 51 feet. WB-1965

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)	2	2	(b)	12	12	2	2	11	10		12	12	12	12	12	12	12	12	12
Jan.	37.3	21.0	29.2	58	-3	3.81	3.34	10.9	69	57	10.3	NW		56	6.5	11	7	13	11	3	*	2
Feb.	38.3	21.1	29.7	55	0	3.10	2.50	9.0	71	53	10.3	NNW		56	6.8	8	7	13	11	2	*	3
Mar.	45.3	28.6	37.0	73	17	4.14	2.12	10.4	69	54	11.0	WNW		58	6.7	10	8	13	11	3	1	2
Apr.	56.6	37.7	47.2	84	20	3.75	2.67	0.7	68	50	11.4	SW		55	6.8	8	8	14	12	*	2	3
May	67.7	47.2	57.5	94	33	3.35	3.10	0.0	69	44	10.1	S		61	6.5	8	11	12	11	0	3	2
June	76.1	56.3	66.2	94	43	2.76	1.99	0.0	71	49	9.2	SW		61	6.2	8	10	12	11	0	4	3
July	81.4	62.7	72.1	97	49	2.91	2.80	0.0	77	56	8.7	SW		61	6.3	8	11	12	10	0	5	2
Aug.	80.0	60.9	70.5	90	40	3.96	5.47	0.0	79	54	8.6	SSW		58	6.2	9	11	11	10	0	3	2
Sept.	73.1	53.3	63.2	88	35	3.52	4.89	0.0	80	56	8.9	SW		58	5.8	10	8	12	9	0	2	2
Oct.	63.4	42.9	53.2	78	29	3.10	6.63	0.1	75	49	9.0	NW		59	5.3	12	7	12	8	*	1	3
Nov.	52.2	33.8	43.0	71	18	4.11	3.04	0.6	72	51	9.6	SW		53	6.0	9	8	13	11	*	1	3
Dec.	40.4	23.5	32.0	69	-1	3.62	2.07	7.4	77	64	9.6	WNW		54	5.9	9	8	14	11	2	*	2
Year	59.3	40.8	50.1	97	-3	42.13	6.63	39.1	73	53	9.7	SW		58	6.2	110	104	151	124	10	22	28

BLOCK ISLAND, R. I. (State Airport) 41°10'N., 71°35'W. Elevation (ground) 110 feet. WB-1965

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	(c) Thunderstorms	(c) Heavy fog
(a)	(b)	(b)	(b)	15	15	(b)	15	15	14	14					15	15	15	15	15	15	14	14
Jan.	37.9	26.3	32.1	57	-1	3.84	4.06	5.8	73	65					6.6	8	9	14	11	2	*	4
Feb.	36.7	25.1	30.9	55	-2	3.29	2.01	6.6	73	65					6.1	8	7	13	10	2	*	4
Mar.	42.2	31.2	36.7	60	9	4.07	2.15	6.2	75	65					5.7	9	9	13	10	2	*	5
Apr.	50.8	38.4	44.6	73	21	3.61	2.50	0.4	79	65					6.4	8	8	14	11	*	2	9
May	60.1	47.6	53.9	81	34	3.01	2.35	0.0	80	67					6.1	8	10	13	9	0	2	11
June	69.6	56.2	62.9	90	44	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					6.9	7	11	13	7	0	4	12
Aug.	75.6	63.6	69.6	88	51	3.86	4.86	0.0	86	71					6.5	8	11	12	8	0	4	11
Sept.	70.2	57.8	64.0	87	43	3.20	8.52	0.0	84	70					6.0	10	9	11	8	0	1	5
Oct.	61.1	49.2	55.2	75	30	3.02	6.63	T	80	66					5.4	12	7	12	8	0	1	4
Nov.	51.7	38.6	45.2	70	20	3.71	3.14	0.3	76	65					6.5	7	10	13	10	*	*	3
Dec.	42.1	29.6	35.9	64	-4	3.59	2.65	3.8	72	65					6.1	7	10	14	11	2	*	3
Year	56.2	43.9	50.1	91	-4	40.45	8.52	23.1	79	67					6.2	101	111	153	111	7	17	82

(c) Thunderstorms and heavy fog data may be incomplete because station did not operate 24 hours daily.

HARTFORD, CONN. (Bradley Field) 41°56'N., 72°41'W. Elevation (ground) 169 feet. WB-1965

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)	6	6	(b)	11	11	6	6	10	9	11	11	11	11	11	11	11	11	11	11
Jan.	34.7	17.3	26.0	54	-26	3.58	2.44	12.9	75	59	8.9	NW	43NW	55	6.2	8	9	14	10	3	0	2
Feb.	36.0	18.2	27.1	59	-21	2.94	2.16	12.0	75	57	8.9	NW	43W	53	6.6	6	8	14	11	3	*	4
Mar.	45.3	26.7	36.0	76	4	3.80	1.61	13.9	74	54	9.4	NW	43NE	56	6.4	7	9	15	11	3	1	2
Apr.	59.6	37.3	48.5	94	19	3.73	1.62	2.1	71	45	9.6	S	41NE	53	6.9	6	8	16	12	1	1	2
May	72.0	47.7	59.9	96	30	3.41	1.30	0.0	74	45	8.6	S	36NW	60	6.5	6	11	14	11	0	3	2
June	80.5	56.9	68.7	100	37	3.70	3.72	0.0	78	50	7.6	S	39W	60	6.5	6	10	14	11	0	4	3
July	85.0	61.8	73.4	101	44	3.61	3.48	0.0	81	51	6.8	S	29W	60	6.4	6	12	13	10	0	5	3
Aug.	82.7	59.7	71.2	94	36	4.01	12.12	0.0	86	55	6.8	S	38NW	61	6.4	6	12	13	10	0	4	3
Sept.	74.7	51.8	63.3	96	30	3.65	5.28	0.0	87	55	7.0	S	37NE	59	6.0	9	9	12	10	0	2	3
Oct.	64.8	41.2	53.0	91	24	3.18	4.45	T	86	50	7.4	N	35W	59	5.8	10	8	13	8	0	1	4
Nov.	50.9	31.6	41.3	74	14	3.84	2.39	1.2	80	56	8.0	S	44W	48	6.7	6	9	15	11	*	1	2
Dec.	37.6	20.2	28.9	65	-9	3.47	1.70	10.2	80	63	7.9	N	43NW	49	6.5	8	8	15	11	3	*	3
Year	60.3	39.2	49.8	101	-26	42.92	12.12	52.3	79	53	8.1	S	44W	57	6.4	84	113	168	125	14	23	33

NEW HAVEN, CONN. (Municipal Airport) 41°16'N., 72°53'W. Elevation (ground) 6 feet. WB-1965

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	(c) Thunderstorms	(c) Heavy fog
(a)	(b)	(b)	(b)	22	22	(b)	22	22	22	22	21		22	22	22	22	22	22	22	22	21	21
Jan.	37.1	22.0	29.6	60	-8	3.96	2.85	9.7	76	63	7.2		35W	54	6.4	9	7	15	12	3	*	3
Feb.	38.0	21.1	29.6	60	-5	3.19	1.73	10.0	76	62	7.4		33SE	60	6.3	8	6	14	11	3	*	2
Mar.	44.9	28.9	36.9	74	1	4.62	3.11	6.7	75	61	7.6		36E	60	6.1	9	8	14	12	2	1	3
Apr.	56.9	37.9	46.9	83	17	3.89	2.81	0.8	75	62	7.3		41NW	56	6.5	7	8	15	13	*	2	3
May	66.8	47.5	57.2	86	32	3.71	3.09	T	77	63	6.4		30SW	60	6.4	7	10	14	12	0	4	4
June	75.2	57.1	66.2	96	40	3.53	2.69	0.0	79	65	5.7		28SW	65	6.0	7	11	12	11	0	5	3
July	80.5	63.2	71.9	100	47	3.43	4.29	0.0	81	66	5.5		30SW	67	5.9	8	12	11	10	0	6	2
Aug.	79.4	61.8	70.6	100	45	4.24	3.90	0.0	83	67	5.6		33NE	66	5.7	9	11	11	9	0	4	2
Sept.	73.3	54.5	63.9	91	33	3.93	5.55	0.0	84	66	6.1		36N	65	5.6	10	9	11	9	0	3	2
Oct.	63.7	44.2	54.0	84	25	3.45	3.81	0.1	82	64	6.4		38E	65	5.2	12	8	11	8	*	1	2
Nov.	51.9	34.9	43.4	74	14	4.05	4.68	1.0	81	64	7.0		50E	53	6.2	8	8	14	10	*	1	2
Dec.	40.4	24.4	32.4	63	-3	4.02	4.25	8.5	78	64	7.2		39SW	55	6.2	9	8	14	11	3	*	1
Year	58.9	41.5	50.2	100	-8	46.02	5.55	36.8	79	64	6.6		50E	61	6.0	103	106	156	129	11	27	28

(c) Thunderstorms and heavy fog data may be incomplete because station did not operate 24 hours daily.

BRIDGEPORT, CONN. (Municipal Airport) 41°10'N., 73°08'W. Elevation (ground) 7 feet. WB-1965

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)	3	3	(b)	17	17	3	3	8	7			17	17	17	17	17	17	17	17
Jan.	37.4	22.9	30.2	51	3	3.69	2.42	7.7	74	62	10.3	NW			6.3	9	7	15	11	2	*	3
Feb.	38.2	22.7	30.5	50	-5	2.96	1.80	7.3	74	62	10.8	NW			6.2	8	7	13	10	2	*	3
Mar.	45.2	29.7	37.5	66	8	4.25	2.74	5.2	76	60	11.1	NW			6.2	8	9	14	11	1	1	3
Apr.	56.7	39.3	48.0	83	24	3.80	2.00	0.6	76	57	10.7	N			6.5	7	8	15	12	*	2	3
May	67.9	49.5	58.7	87	37	3.71	2.14	T	75	53	9.6	E			6.3	7	11	13	10	0	3	4
June	77.1	58.8	68.0	93	45	3.40	2.02	0.0	80	60	8.3	SW			5.8	9	10	11	8	0	3	3
July	82.6	64.8	73.7	97	51	3.77	3.57	0.0	82	61	8.1	SW			5.9	8	12	11	9	0	6	2
Aug.	81.1	63.4	72.3	87	50	4.45	3.97	0.0	84	60	8.0	SW			5.7	9	11	11	9	0	4	1
Sept.	74.6	56.4	65.5	86	36	3.95	4.67	0.0	82	58	9.3	NE			5.5	10	9	11	9	0	2	1
Oct.	64.7	46.0	55.4	81	30	3.38	0.76	T	80	55	9.7	NE			5.1	12	8	11	7	0	1	1
Nov.	52.7	36.3	44.5	67	21	4.02	4.07	0.5	78	61	10.5	NW			6.0	9	7	14	9	*	*	2
Dec.	40.8	25.6	33.2	62	-1	3.51	2.05	4.9	78	68	10.4	NW			6.0	9	9	13	11	2	*	2
Year	59.9	43.0	51.5	97	-5	44.89	4.67	26.2	78	60	9.7	SW			6.0	105	108	152	115	7	22	28

NEW YORK, N. Y. (Meteorological Observatory, Central Park) 40°47'N., 73°58'W. Elevation (ground) 132 feet. WB-1965

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)	97	97	(b)	54	97	46	46	45	45	19	89	41	41	41	41	97	95	5	
Jan.	39.5	26.9	33.2	72	-6	3.31	3.33	7.8	68	60	9.6	NW	41NW	50	6.1	8	9	14	11	2	0	
Feb.	40.3	26.4	33.4	75	-15	2.84	2.96	8.5	68	59	9.6	NW	41NE	55	5.8	8	9	11	10	2	0	
Mar.	47.8	33.2	40.5	86	3	4.01	4.25	5.3	67	55	9.8	NW	52NW	57	5.7	9	10	12	12	2	*	
Apr.	59.6	43.1	51.4	92	12	3.43	2.67	1.0	68	53	9.3	NW	39NE	59	5.9	8	10	12	11	*	1	
May	71.4	53.4	62.4	99	32	3.67	3.82	T	71	53	7.8	SW	33W	62	5.7	8	12	11	11	0	3	
June	80.2	62.5	71.4	101	44	3.31	4.74	0.0	74	55	7.2	SW	43SW	65	5.6	8	12	10	10	0	4	
July	85.3	68.2	76.8	106	52	3.70	3.56	0.0	76	56	6.8	SW	37NW	66	5.5	8	13	10	11	0	3	
Aug.	83.3	66.8	75.1	104	50	4.44	4.80	0.0	79	58	6.8	SW	31NE	64	5.5	9	12	10	10	0	3	
Sept.	76.8	60.1	68.5	102	39	3.87	8.30	0.0	80	58	7.2	SW	38NE	63	5.2	11	10	9	8	0	1	
Oct.	66.3	50.3	58.3	94	28	3.14	11.17	T	76	55	8.0	SW	35NE	61	4.9	12	9	10	8	0	1	
Nov.	53.7	40.3	47.0	84	5	3.39	3.81	1.0	73	59	8.9	NW	61NE	53	5.8	9	9	12	9	*	0	
Dec.	42.1	29.7	35.9	70	-13	3.26	3.21	6.1	69	60	9.1	NW	37NW	50	5.9	9	9	13	10	2	0	
Year	62.2	46.7	54.5	106	-15	42.37	11.17	29.7	72	57	8.3	NW	61NE	60	5.6	107	124	134	121	8	16	

ALBANY, N. Y. (Albany County Airport) 42°45'N., 73°48'W. Elevation (ground) 275 feet. WB-1965

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)	18	18	(b)	19	19	18	18	26	15	27	27	27	27	27	27	19	19	27	27
Jan.	31.0	14.4	22.7	64	-26	2.47	1.68	16.4	78	65	8.4	WNW	50W	45	7.0	6	8	17	13	4	*	1
Feb.	32.5	14.8	23.7	62	-21	2.20	1.42	15.4	78	62	9.0	WNW	62NW	51	6.8	6	7	15	11	4	*	1
Mar.	41.9	24.0	33.0	79	-21	2.72	1.53	12.1	77	57	9.1	WNW	48W	53	6.8	7	8	16	12	3	1	1
Apr.	56.7	35.7	46.2	91	14	2.77	1.30	2.6	73	50	9.1	WNW	43W	52	7.0	5	8	17	13	1	1	1
May	69.5	46.3	57.9	94	27	3.47	1.92	T	73	50	7.8	S	43W	56	6.8	5	10	16	13	0	4	2
June	78.7	55.8	67.3	99	36	3.25	3.48	0.0	76	51	7.0	S	39W	61	6.4	6	11	13	10	0	6	1
July	83.7	60.5	72.1	100	41	3.49	2.70	0.0	77	50	6.3	S	37NW	64	6.2	6	13	12	11	0	7	2
Aug.	81.4	58.5	70.0	99	42	3.07	4.08	0.0	84	53	6.0	S	33S	61	6.0	8	11	12	10	0	5	3
Sept.	72.9	50.3	61.6	100	24	3.58	3.66	0.0	87	54	6.3	S	42S	58	5.8	9	10	11	9	0	2	3
Oct.	61.8	39.8	50.8	89	20	2.77	2.46	0.1	86	54	6.9	S	39NW	55	5.9	9	9	13	8	*	1	4
Nov.	47.5	30.6	39.1	82	6	2.70	2.01	2.4	81	62	7.8	S	61E	39	7.3	4	9	17	11	1	*	2
Dec.	34.5	18.5	26.5	62	-19	2.59	4.02	12.0	80	66	7.7	S	47W	39	7.1	5	8	18	11	3	*	2
Year	57.7	37.4	47.6	100	-26	35.08	4.08	61.0	79	56	7.6	S	62NW	54	6.6	76	112	177	131	15	28	23

MEAN SURFACE WATER TEMPERATURES (T) AND SALINITIES (S)--ATLANTIC COAST

Stations	Years	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Mean	
		(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo	(T) °F	(S) °/oo
Cape Cod Canal (E. ent.), Mass. (41°46'N., 70°30'W.)	11	34.4	31.6	33.0	31.6	35.5	31.6	41.3	31.4	49.1	31.1	55.0	31.2	58.9	31.6	61.1	31.5	60.3	31.5	55.5	31.6	48.8	31.5	40.2	31.6	47.8	31.5
Cape Cod Canal (W. ent.), Mass. (41°44'N., 70°37'W.)	11	34.1	31.2	33.0	31.2	36.0	31.1	42.8	31.0	50.9	30.8	59.1	31.1	63.7	31.4	65.4	31.5	62.9	31.4	56.3	31.4	48.9	31.4	39.5	31.4	49.4	31.2
Woods Hole, Mass. 41°31'N., 70°40'W.	22	34.6	31.4	33.1	31.4	36.5	31.4	44.3	31.4	53.4	31.6	62.6	31.8	69.8	31.9	70.8	31.8	67.5	31.9	59.8	31.9	51.0	31.8	41.0	31.5	52.0	31.6
Newport, R. I. 41°30'N., 71°20'W.	11	36.1	30.6	34.8	30.3	37.3	30.3	43.0	29.9	52.1	30.6	61.6	31.2	67.7	31.6	69.1	31.6	65.6	31.6	59.2	31.4	53.2	30.8	42.0	30.8	51.8	30.9
New London, Conn. 41°22'N., 72°06'W.	19	37.4	18.2	36.7	16.6	40.1	14.2	49.1	12.8	58.1	14.9	66.5	20.0	71.8	24.3	72.2	25.9	68.6	26.1	61.1	25.8	51.8	22.4	41.9	19.6	54.6	20.0
Plum Island (L. I. Sound) N. Y. (41°10'N., 72°12'W.)	8	36.9	29.1	34.3	29.1	36.3	29.0	42.0	28.2	49.8	28.1	58.7	28.9	65.6	29.5	68.4	30.2	66.8	30.3	60.4	30.3	52.7	29.8	43.2	29.4	51.3	29.3
Montauk (Fort Pond Bay), N. Y. (41°03'N., 71°58'W.)	19	36.3	30.2	34.9	30.1	37.7	29.8	43.8	29.3	51.7	29.4	61.0	29.8	68.1	30.3	69.9	30.6	67.3	30.8	60.6	31.0	51.9	30.7	42.4	30.3	52.1	30.2
Willets Point (E. River), N. Y. (40°48'N., 73°47'W.)	34	35.5	25.5	33.8	25.1	36.9	24.8	44.5	24.1	54.1	24.1	62.7	24.7	68.2	25.4	71.7	26.0	70.0	26.1	62.1	25.9	51.8	25.8	40.9	25.5	52.7	25.2
New York, (The Battery), N. Y. 40°42'N., 74°01'W.	39	37.3	21.2	35.8	21.2	38.7	18.6	45.8	16.6	55.5	19.0	65.0	21.6	71.4	23.3	73.2	23.9	70.4	23.9	62.1	23.5	52.5	22.2	42.7	21.0	54.2	21.3
Bear Mountain (Hudson R.), N.Y. 41°19'N., 73°59'W.	5	33.2	0.3	32.7	0.1	35.3	0.2	45.7	0.1	57.4	0.0	69.0	0.1	75.5	0.6	77.3	0.8	74.8	1.4	64.0	1.1	51.4	0.4	38.8	0.4	54.6	0.5
New York (Fort Hamilton), N.Y. 40°37'N. 74°02'W.	12	35.8	22.7	34.2	23.7	36.4	20.4	43.7	17.4	53.3	20.9	62.6	23.3	69.4	24.7	71.3	25.9	67.7	25.5	59.6	24.4	49.6	23.0	40.8	22.6	52.0	22.9
Sandy Hook, N. J. 40°28'N., 74°01'W.	28	34.9	23.0	34.9	23.0	39.5	21.7	48.5	20.4	58.6	22.0	68.4	24.2	74.3	25.9	74.3	25.9	69.5	26.1	59.0	25.9	48.9	25.0	38.8	24.1	54.1	23.9

°/oo--This symbol denotes the salinity of sea water, and is defined as the number of grams of salts in 1,000 grams of sea water. For sea temperature and salinity in greater detail, see Coast and Geodetic Survey Publication 31-1, Surface Water Temperature and salinity, Atlantic Coast, North and South America.

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HOURS OF OPERATION OF FOG SIGNALS
(U.S. Coast Guard)

Light station	15 Calendar Years - 1950 thru 1964														Pre - 1950		
	Average													Max. 1 yr.	Ave.	For yrs.	Max. 1 yr.
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year				
Canal Breakwater, Mass. 41°46.8'N., 70°29.4'W.	139	122	148	138	141	171	175	166	127	127	136	122	1712	2920	1135	20	1692
Race Point, Mass. 42°03.7'N., 70°14.6'W.	71	70	61	70	81	106	87	76	58	55	36	48	819	1628	697	65	1519
Cape Cod, Mass. 42°02.4'N., 70°03.7'W.	97	97	103	110	128	101	118	111	95	79	72	71	1182	1489	883	65	1231
Pollock Rip Lightship, Mass. 41°36.1'N., 69°51.1'W.	42	44	50	69	121	139	220	166	104	45	31	35	1066	1741	1158	61	1760
Nantucket Shoals Lightship, Mass. 40°33.0'N., 69°28.0'W.	38	53	56	100	154	163	213	142	76	47	38	28	1108	1482	1096	53	1581
West Chop, Mass. 41°28.8'N., 70°36.0'W.	81	76	73	55	87	79	85	69	42	36	37	48	768	1060	661	65	1158
Nobska Point, Mass. 41°30.9'N., 70°39.4'W.	62	65	58	61	78	84	90	73	39	31	29	42	712	958	620	44	960
Buzzards Bay, Mass. * 41°23.8'N., 71°02.0'W.	79	94	95	121	149	175	205	170	92	75	61	78	1394	1769	---	--	----
Butler Flats, Mass. 41°36.2'N., 70°53.7'W.	64	59	56	67	71	77	82	60	38	40	33	41	688	1381	516	44	852
Cleveland Ledge, Mass. 41°37.9'N., 70°41.7'W.	75	63	54	52	70	68	68	54	30	32	33	47	646	1111	539	7	900
Point Judith, R. I. 41°21.7'N., 71°28.9'W.	56	72	66	86	119	123	141	114	59	45	37	47	965	1489	786	65	1138
Rose Island, R. I. 41°29.7'N., 71°20.6'W.	43	45	39	50	68	68	80	54	40	29	21	32	569	1241	548	44	660
Hog Island Shoal, R. I. ** 41°38.0'N., 71°16.4'W.	32	30	26	31	46	31	33	26	18	21	25	17	336	500	477	47	954
Borden Flats, Mass. ** 41°42.3'N., 71°10.5'W.	29	30	29	23	21	23	28	21	18	27	19	25	293	819	183	14	257
Pomham Rocks, R. I. 41°46.6'N., 71°22.2'W.	34	28	26	19	23	15	20	21	22	21	20	29	278	466	174	46	282
Warwick, R. I. 41°40.0'N., 71°22.8'W.	44	45	35	27	39	34	29	25	29	26	26	39	398	627	440	49	756
Block Island Southeast, R. I. 41°09.2'N., 71°33.1'W.	93	94	101	108	154	155	198	160	98	75	68	76	1380	2076	935	65	1347
Watch Hill, R. I. 41°18.2'N., 71°51.5'W.	89	79	100	109	141	175	216	169	93	74	56	80	1381	2272	806	40	1430
Little Gull Island, N. Y. 41°12.4'N., 72°06.4'W.	57	59	57	79	105	113	123	101	71	30	33	41	869	1486	824	65	2041

*10 Calendar Years - 1955 thru 1964
**13 Calendar Years - 1950 thru 1962

HOURS OF OPERATION OF FOG SIGNALS
(U.S. Coast Guard)

Light station	15 Calendar Years - 1950 thru 1964														Pre - 1950		
	Average													Max. 1 yr.	Ave.	For yrs.	Max. 1 yr.
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year				
North Dumpling, N. Y. 41°17.3'N., 72°01.2'W.	55	58	51	72	97	129	124	94	56	41	42	50	869	1709	672	44	1791
New London Ledge, Conn. 41°18.3'N., 72°04.6'W.	46	40	42	59	79	102	91	63	42	34	30	39	667	900	816	39	1042
Plum Island, N. Y. 41°10.4'N., 72°12.7'W.	43	53	51	61	73	74	67	49	38	24	32	38	603	1492	429	44	534
Falkner Island, Conn. 41°12.7'N., 72°39.2'W.	81	80	69	80	95	96	93	62	46	43	51	61	857	1380	672	65	1209
Southwest Ledge, Conn. 41°14.1'N., 72°54.7'W.	68	74	67	57	63	66	53	34	31	51	54	74	692	994	526	50	769
Stratford Shoal, N. Y. 41°03.6'N., 73°06.1'W.	53	52	52	53	67	60	43	31	18	23	29	43	524	936	563	65	736
Stratford Point, Conn. 41°09.1'N., 73°06.2'W.	96	91	79	79	94	97	85	64	42	45	59	76	907	1191	582	44	1220
Penfield Reef, Conn. 41°07.0'N., 73°13.3'W.	72	70	58	57	76	62	49	33	26	25	41	43	612	1098	600	56	960
Eatons Neck, N. Y. 40°57.2'N., 73°23.7'W.	99	95	82	76	84	76	81	68	60	59	66	82	928	1387	513	65	1038
Execution Rocks, N. Y. 40°52.7'N., 73°44.3'W.	76	66	55	44	66	52	46	36	27	34	41	56	599	841	544	65	882
Stepping Stones, N. Y. 40°49.5'N., 73°46.5'W.	40	29	29	24	26	20	17	11	8	12	26	26	268	388	378	44	727
North Brother Island, N. Y. 40°48.0'N., 73°54.0'W.	31	24	20	15	16	9	6	2	5	9	20	25	182	384	199	44	325
Montauk Point, N. Y. 41°04.3'N., 71°51.4'W.	64	68	75	90	138	151	172	121	77	46	35	52	1089	1748	862	65	1341
Ambrose Channel Lightship, N. Y. 40°27.5'N., 73°50.2'W.	76	77	77	83	103	82	75	57	48	41	47	59	825	1169	1137	56	2051
West Bank, N. Y. 40°32.3'N., 74°02.6'W.	40	34	29	40	45	43	29	18	17	22	29	34	380	578	520	48	680
Robbins Reef, N. Y. 40°39.4'N., 74°04.0'W.	46	41	35	32	28	26	20	13	15	22	26	38	342	594	412	57	1097
Governors Island, N. Y. 40°41.6'N., 74°01.2'W.	41	25	24	18	19	13	12	14	10	17	22	39	254	464	249	48	514
Stony Point, N. Y. 41°14.5'N., 73°58.3'W.	80	64	57	44	43	43	25	33	38	45	56	65	593	994	400	44	790
Esopus Meadows, N. Y. 41°52.1'N., 73°56.5'W.	48	39	34	15	19	9	6	11	20	32	29	35	297	471	246	44	399

ATLANTIC OCEAN DISTANCES FOR DEEP-DRAFT VESSELS
QUEBEC, CANADA, TO PANAMA CANAL ZONE

March 21, 1964

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.

	Quebec, Canada 46°49.5'N., 71°11.5'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°55.4'N., 82°26.9'W.	Pensacola, Fla. 30°24.0'N., 87°13.0'W.	Mobile, Ala. 30°41.5'N., 88°02.2'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°18.5'N., 94°48.1'W.	Corpus Christi, Tex. 27°48.8'N., 97°24.0'W.	San Juan, P. R. 18°27.8'N., 66°06.7'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.
542																													
578	120																												
1137	595	484																											
1179	637	526	100																										
1172	630	519	203	163																									
1395	853	742	426	386	223																								
1543	1001	890	575	535	372	240																							
1699	1157	1046	734	694	531	417	392																						
1550	1008	896	584	544	381	267	242	150																					
1577	1035	923	611	571	408	294	269	173	27																				
1590	1048	936	628	588	425	345	322	267	117	144																			
1809	1267	1155	847	807	644	564	541	486	336	363	219																		
1875	1333	1221	913	873	710	630	607	552	402	429	285	151																	
1949	1407	1295	987	947	784	704	681	626	476	503	359	227	102																
2033	1491	1379	1071	1031	868	788	765	710	560	587	443	315	197	145															
2340	1798	1690	1387	1347	1184	1109	1086	1031	881	908	764	667	572	543	462														
2401	1859	1751	1448	1408	1245	1170	1147	1092	942	969	825	728	633	604	523	73													
2633	2091	1983	1680	1640	1477	1402	1379	1324	1174	1201	1057	960	865	836	755	305	232												
2832	2290	2182	1879	1839	1676	1601	1578	1523	1373	1400	1256	1159	1064	1035	954	504	431	331											
2872	2330	2222	1919	1879	1716	1641	1618	1563	1413	1440	1296	1199	1104	1075	994	544	471	383	86										
2941	2399	2291	1988	1948	1785	1710	1687	1632	1482	1509	1365	1268	1173	1144	1063	613	540	495	255	244									
3077	2535	2427	2124	2084	1921	1846	1823	1768	1618	1645	1501	1404	1309	1280	1199	749	676	649	414	403	362								
3103	2561	2453	2150	2110	1947	1872	1849	1794	1644	1671	1527	1430	1335	1306	1225	775	702	682	446	436	395	76							
3208	2666	2558	2255	2215	2052	1977	1954	1899	1749	1776	1632	1535	1440	1411	1330	880	807	809	583	572	531	240	188						
2306	1764	1669	1531	1486	1334	1399	1395	1375	1225	1252	1114	1153	1138	1156	1121	966	1017	1249	1448	1488	1557	1693	1719	1824					
3064	2522	2419	2189	2149	1986	1972	1955	1904	1754	1781	1637	1609	1563	1564	1513	1060	1005	1215	1342	1368	1398	1482	1493	1549	992				
3110	2568	2465	2235	2195	2032	2018	2001	1950	1800	1827	1683	1655	1609	1610	1559	1106	1051	1261	1388	1414	1442	1528	1539	1595	1038	46			

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.

COASTWISE DISTANCES

CAPE COD, MASS., TO NEW YORK, N. Y.

September 10, 1960

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.																											
NANTUCKET SHOALS	144																										
Nantucket, Mass.	69	85																									
Vineyard Haven, Mass.	43	88	29																								
Woods Hole, Mass.	22	92	33	7																							
New Bedford, Mass.	31	111	53	28	15																						
Newport, R. I.	54	111	71	45	38	38																					
Fall River, Mass.	69	126	77	51	44	54	16																				
Providence, R. I.	74	131	91	65	57	58	21	21																			
Great Salt Pond, R. I.	66	114	80	54	50	48	23	38	43																		
Stonington, Conn.	77	126	92	67	61	58	34	49	55	19																	
New London, Conn.	89	136	103	77	72	74	48	63	68	29	12																
Hartford, Conn.	140	187	155	129	125	124	98	113	118	80	66	62															
New Haven, Conn.	127	171	140	114	109	111	84	100	105	65	52	49	74														
Stratford, Conn.	132	176	147	121	117	113	90	105	110	72	59	54	81	15													
Bridgeport, Conn.	138	182	153	127	123	122	95	110	115	78	64	60	86	25	10												
South Norwalk, Conn.	151	195	166	140	135	135	108	124	129	91	77	73	101	36	26	21											
Stamford, Conn.	152	196	167	141	136	136	109	125	130	92	79	74	102	37	27	22	11										
Montauk, N. Y.	85	127	99	74	69	66	42	58	63	23	18	20	66	51	56	62	75	76									
Sag Harbor, N. Y.	100	143	114	88	83	81	57	72	77	39	29	27	64	49	54	60	73	74	21								
Greenport, N. Y.	99	142	113	87	82	80	56	71	76	37	28	25	62	47	52	58	71	72	22	11							
Port Jefferson, N. Y.	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.	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.	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.	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.	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.	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	

Each distance is by shortest route that safe navigation permits between the two ports concerned.

INSIDE-ROUTE DISTANCES

SOUTH SIDE OF LONG ISLAND
GREENPORT, N. Y., TO EAST ROCKAWAY INLET, N. Y.

July 1, 1961

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.

July 1, 1961

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	6																		
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		

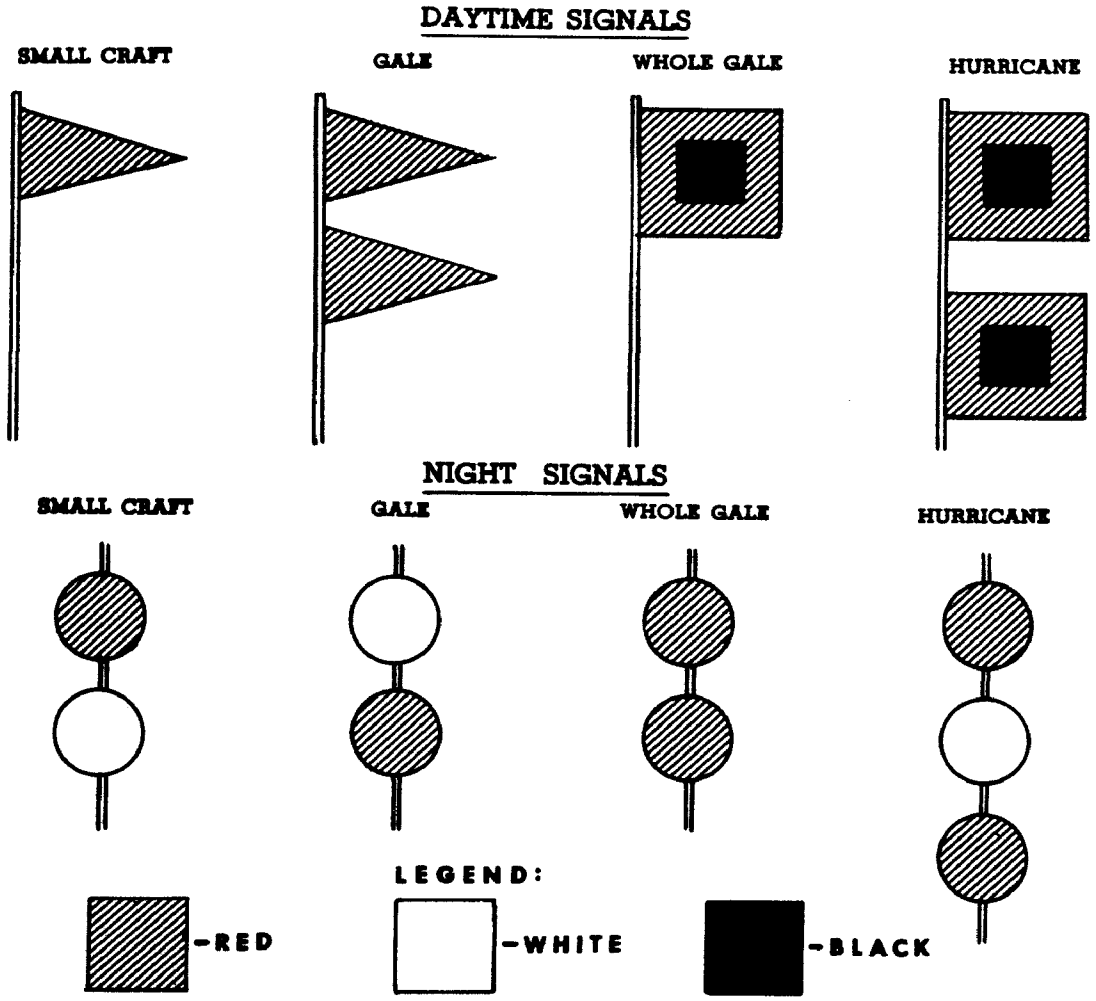
Conversion Table, Degrees to Points and Vice Versa

° ′	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	

BEAUFORT SCALE OF WIND FORCE

Beaufort Number	Miles per Hour	Knots	Wind Effects Observed at Sea	Terms Used In U.S.W.B. Forecasts
0	Less than 1	Less than 1	Sea like a mirror	
1	1- 3	1- 3	Ripples with the appearance of scales formed, but without foam crests	Light
2	4- 7	4- 6	Small wavelets, short but pronounced; crests appear glassy, do not break	
3	8-12	7-10	Large wavelets with crests beginning to break; foam appears glassy. Perhaps scattered white horses (white foam crests).	Gentle
4	13-18	11-16	Small waves, becoming longer; fairly frequent white horses	Moderate
5	19-24	17-21	Moderate waves of a pronounced long form; many white horses, possibly some spray.	Fresh
6	25-31	22-27	Large waves begin to form; white foam crests more extensive everywhere; probably some spray.	Strong
7	32-38	28-33	Sea heaps up; some white foam from breaking waves blows in streaks along the direction of the wind.	
8	39-46	34-40	Moderately high waves. Edges of crests begin to break into spindrift. Well-marked streaks of foam blow along direction of wind.	Gale
9	47-54	41-47	High waves. Dense streaks of foam along direction of wind. Spray may affect visibility.	
10	55-63	48-55	Very high waves with long overhanging crests; great patches of foam blown in dense white streaks along direction of wind. Sea surface takes on a white appearance. Visibility affected.	Whole gale
11	64-72	56-63	Exceptionally high waves; sea completely covered with long white patches of foam lying along direction of wind; edges of wave crests everywhere blown into froth. Visibility affected.	
12 or more	73 or more	64 or more	Air filled with foam and spray; sea completely white with driving spray. Visibility very seriously affected.	Hurricane

SMALL CRAFT, GALE, WHOLE GALE 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 winds up to 33 knots and/or sea conditions dangerous to small craft operations are forecast for the area.

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

WHOLE GALE WARNING: A single square red flag with a black center displayed during daytime and two red lights at night to indicate winds ranging from 48 to 63 knots are forecast for the area.

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

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.10 feet or 1,852 meters 1 statute mile = 5,280 feet or 1,609.35 meters

Nautical miles	0	1	2	3	4	5	6	7	8	9
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.769	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.126	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.483	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.840	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.197	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.554	81.705	82.856	84.007	85.158	86.308	87.459	88.610	89.761	90.911
80	92.062	93.213	94.364	95.515	96.665	97.816	98.967	100.118	101.268	102.419
90	103.570	104.721	105.871	107.022	108.173	109.324	110.475	111.625	112.776	113.927

STATUTE MILES TO INTERNATIONAL NAUTICAL MILES

Statute miles	0	1	2	3	4	5	6	7	8	9
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.249	19.118	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.746	55.615	56.484	57.353	58.222	59.091	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029

FEET TO METERS

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

METERS TO FEET

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

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