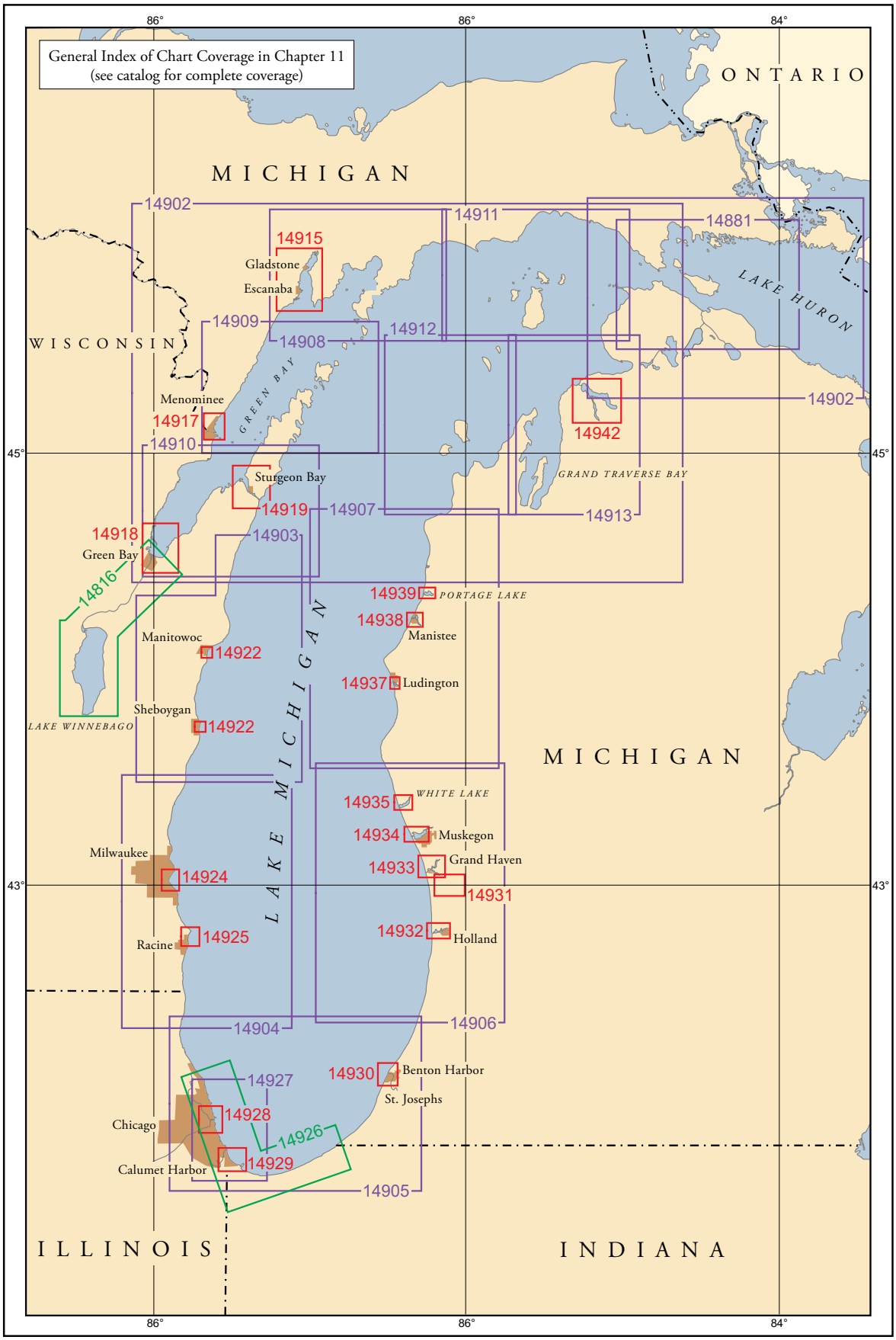
General Index of Chart Coverage in Chapter 11
(see catalog for complete coverage)
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86°
84°
45°
43°
ONTARIO
MICHIGAN
WISCONSIN
ILLINOIS
INDIANA
LAKE HURON
GREEN BAY
GRAND TRAVERSE BAY
PORTAGE LAKE
WHITE LAKE
LAKE WINNEBAGO
LAKE MICHIGAN
Gladstone
Escanaba
Menominee
Sturgeon Bay
Green Bay
Manitowoc
Sheboygan
Milwaukee
Racine
Chicago
Calumet Harbor
Manistee
Ludington
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Lake Michigan

Chart Datum, Lake Michigan

(1) Depths and vertical clearances under overhead cables and bridges given in this chapter are referred to Low Water Datum, which for Lake Michigan is an elevation 577.5 feet (176.0 meters) above mean water level at Rimouski, QC, on International Great Lakes Datum 1985 (IGLD 1985). (See Chart Datum, Great Lakes System, indexed as such, chapter 1.)

Dimensions, etc.

(2) Length, steamer track, Chicago to Straits of Mackinac; 321 miles.

(3) Length (right line), from about longitude 87°30'W. at the south end to 85°45'W. at the north end; 307 miles.

(4) Breadth (right line), on about latitude 45°25'N.; 118 miles.

(5) Depth, maximum recorded by NOS; 923 feet.

(6) Water surface of lake (including Green Bay); 22,300 square miles.

(7) Entire drainage basin (including Green Bay); 67,900 square miles.

General description

(8) **Lake Michigan** is the third largest of the Great Lakes and is the only one entirely within the United States. The only natural outlet of the lake is at the north end through the Straits of Mackinac. At the south end of the lake, the Illinois Waterway provides a connection to the Mississippi River and the Gulf of Mexico. The north part of the lake has many islands and is indented by several bays; Green Bay and Grand Traverse Bay are the largest. The shores in the south part of the lake are regular, and it has been necessary to construct artificial harbors. The forested shores in the north part of the lake are sparsely populated, while those in the south part are near the heart of the great urban industrial area of the U.S. Midwest.

Fluctuations of water level

(9) The normal elevation of the lake surface varies irregularly from year to year. During the course of each year, the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter and the highest during the summer.

(10) In addition to the normal seasonal fluctuations, oscillations of irregular amount and duration are also produced by storms. Winds and barometric pressure changes that accompany squalls can produce fluctuations that last from a few minutes to a few hours. At other times, strong winds of sustained speed and direction can produce fluctuations that last a few hours or a day. These winds drive forward a greater volume of surface water than can be carried off by the lower return currents, thus raising the water level on the lee shore and lowering it on the windward shore. This effect is more pronounced in bays and at the extremities of the lake, where the impelled water is concentrated in a small space by converging shores, especially if coupled with a gradually sloping inshore bottom which even further reduces the flow of the lower return currents. This condition is very pronounced at Green Bay Harbor.

Weather, Lake Michigan

(11) Rough water is created when strong winds blow over a long fetch of water. Northerly winds cause this on the south part of the lake and southerly winds have the same effect on the north part of the lake. They raise dangerous seas and generate hazardous currents at harbor entrances. Winds with southerly components are prevalent during the entire navigation season. Northerlies are a little less frequent, but are common, particularly in spring. The sea conditions are worst in October and November, when, lakewide, wave heights of 5 to 10 feet (2 to 3 m) are encountered about 35 percent of the time. In October, south through southwest winds are most often responsible, while by November west through north winds often generate rough seas. Seas of 10 feet (3 m) or more are encountered 3 to 5 percent of the time from November through March. Extreme waves of 20 to 22 feet (6 to 7 m) have been encountered. During the spring, high seas are infrequent, but 5- to 10-foot (2 to 3 m) seas develop 15 to 30 percent of the time in the south and 20 to 40 percent in the north. Summer seas climb above 10 feet (3 m) less than 1 percent of the time, while those in the 5- to 10-foot (2 to 3 m) category drop to less than 20 percent in June and July. By August, the fall buildup begins.

(12) Gales are most likely from September through April, particularly in the fall. During this season gales blow 3 to 7 percent of the time; speeds of 28 knots or more occur from 12 to 20 percent of the time. Strong winds often blow out of the west and northwest, making east shore harbor entrances dangerous. The strongest measured over-the-lake wind was out of the west-southwest at 58 knots. However, since Green Bay recorded a 70-knot southwesterly gust in May 1989, it is not unrealistic to expect a wind extreme of 70 knots or more

over open waters. Spring winds can still blow strong, with winds of 28 knots or more encountered about 4 to 8 percent of the time. They do slacken from their winter fierceness, with southerlies and southwesterlies becoming more frequent and northerlies less so as summer approaches. Strong winds are infrequent in summer and mostly associated with thunderstorms. South and southwest winds prevail particularly in the north; southeasterlies are also common in the south. Northerlies are a secondary wind.

(13) Coastal winds are more localized and variable. Along the Michigan shore, spring winds are variable, particularly in the morning, when northerlies, easterlies, and southerlies are among the most common. By afternoon, aided by a lake-breeze effect, there are a preponderance of winds out of the south, particularly with the approach of summer. Summer also brings a slackening of windspeeds. The likelihood of encountering winds of 28 knots or more falls from a 4- to 10-percent chance in March to less than 3 percent by May. The most likely cause of strong winds in spring and summer are thunderstorm gusts. By summer, windspeeds of 28 knots or more occur less than 4 percent of the time and less than 2 percent most of the time. Summer winds along the shore are usually out of the east through south during the morning hours, swinging to the south and northwest by afternoon, with an increase in speed. By October, there is a noticeable increase in windspeeds. Speeds of 28 knots or more increase to 4 to 6 percent. By December, these speeds can be encountered up to 11 percent of the time. Morning directions are variable, with east, south, and west winds among the most common. Afternoon winds are most often out of the south through west. The strong winds continue throughout the winter and are associated with winter storms, which bring a variety of winds from southwest through northeast.

(14) Along the west shore of the lake, spring winds are variable, but the influence of the land-lake breeze is already noticeable. Morning winds often have a westerly component, while an easterly influence is evident during the afternoon. Wind strength gradually abates during spring; by May, winds of 28 knots or more are encountered less than 1 percent of the time. Except for occasional thunderstorm gusts, summer winds rarely exceed 28 knots through September. Morning breezes are generally out of the south through west. During the day, they strengthen slightly and blow out of the northeast through southeast; southwest and west winds are also common during the afternoon, when the prevailing circulation interferes with the lake-breeze effect. With autumn comes an increase in strength and less diurnal variability. By November, winds of 28 knots or more are encountered about 1 percent of the time. Fall winds blow mainly out of the south through northwest, with southwest and west winds the most frequent. During winter, westerlies and northwesterlies are common, but unseemingly, winds of 28 knots or more are no more frequent than in fall.

(15) While thunderstorms can occur at any time, they are most likely from May through September. During this period, thunder is heard on an average of 4 to 8 days per month at locations along the shore and 1 to 3 percent of the time over open water. Activity is a little more numerous in the south than the north. Over open water, July and August are the peak months, while June and July are more active along the shore. During the summer, a cool dome of air, the result of the lake breeze, often blocks thunderstorms and squall lines during the day. This results in a nighttime peak in activity. However, a severe squall line may break through this block, or due to a strong prevailing circulation, the block may not exist.

(16) In spring, when there is often a clash between cold and warm air, thunderstorms and squall lines can be violent. On occasion they may trigger tornadoes or even waterspouts. This area lies at the northeast edge of the nation's maximum frequency belt for tornadoes. Although rare, tornadoes are most likely from April through June.

(17) Poor visibilities, caused by fog, rain, snow, and pollution, may occur in any season. Fog is the principal cause of visibilities less than 0.5 statute mile (0.4 nm). It is most likely in the spring and early summer over open water (advection fog) and from late fall through spring along the shore (radiation fog).

(18) In open waters, from March in the south and April in the north through June, warm moist air riding winds with a southerly component blowing at 5 to 20 knots reduces visibilities to less than 0.5 statute mile (0.4 nm) from 5 to 10 percent of the time. These fogs are most likely during the morning and early afternoon and when the air is 5° to 15°F (3° to 8°C) warmer than the water. May and June are the most likely months.

(19) The shores of Lake Michigan are subject to varying amounts of fog. Upwelling along the northwest shores increases the possibility of advection fog in spring and summer; in fact, the west shore waters in general are 5 to 10°F (3° to 6°C) cooler than the east shore waters. north of Chicago, visibilities drop to less than 0.5 statute mile (0.4 nm) on about 25 to 35 days annually. In the Chicago area, smoke and haze frequently reduce visibility to the 3- to 6-mile (2.6 to 5.2 nm) range, but dense fog is less common than it is to the north. It is most likely from fall through late spring with a minimum in July. Along the Michigan shore, the indication from the few locations with fog observations is that frequencies are similar to those along the Wisconsin shore. In comparing Muskegon to Milwaukee, both exhibit a morning maximum from April through October, early morning in the summer and around sunrise in other seasons. The most fog-free times occur during the afternoon in spring and late morning through evening in summer. Milwaukee is more fog prone in spring, but less in summer and fall. Overall, Muskegon averages 5 fewer days

annually with visibilities less than 0.5 statute mile (0.4 nm).

Ice

(20) The first waters to form an extensive ice cover are Green Bay and the Bays de Noc. The Straits of Mackinac and the shallow areas north of Beaver Island usually follow. The Straits are usually closed by mid-December. (See the discussion of ice in the Straits of Mackinac in chapter 10.) These buildups are aided by windrows resulting from prevailing winds and currents. In a normal winter, an early ice cover is established by the end of January and includes the above-mentioned waters plus the extreme south part of the lake. In general, ice accumulates in a southerly direction with a rapid buildup in the shallows east of Manitou and Fox Islands. In this area, the prevailing northwest wind traps ice between the land masses and, with the exception of Grand and Little Traverse Bays which are solid, vessels can expect to encounter drifting ice. The surface features and location of the ice fields change as a direct function of the wind. Shores exposed to the full force of the wind often have large ice fields of very heavy brash extending 1 to 2 miles offshore. In addition, a circular current pattern in the south part of the lake distributes drifting floes along the shore. Even during a mild winter, these floes can build out 10 to 15 miles into the lake. A mild winter on Lake Michigan means about 10-percent coverage compared to an average 40-percent coverage and an 80-percent coverage during a severe winter. Maximum ice coverage occurs by mid-March, on the average, while decay begins a week or two later. By mid-April, ships are once again transiting the Straits of Mackinac.

Routes

(21) The Lake Carriers' Association and the Canadian Shipowners Association have recommended, for vessels enrolled in the associations, the following separation of routes for upbound and downbound traffic in Lake Michigan:

(22) Southbound vessels, bound for Milwaukee and west shore points north thereof shall run out on a course of **241°** for 30 miles from a point of departure abreast of Lansing Shoals on course to Rock Island Passage then steer **205°** for 202.5 miles to Milwaukee, or other courses to destination.

(23) Southbound vessels, bound for west shore points south of Milwaukee shall run out on a course of **241°** for 30 miles from a point of departure abreast of Lansing Shoals on course to Rock Island Passage; then steer **196°** for 208 miles to a point east of Wind Point to intersect the regular southbound track; vessels bound for Calumet or Indiana Harbor steer **188°** for 69.5 miles; vessels bound for Buffington or Gary steer **183°** for 73.6 miles; vessels bound for Burns Harbor change course 19.7 miles prior to reaching the point east of Wind Point and steer **180°** for 96.75 miles.

(24) Southbound vessels from Sturgeon Bay bound for ports near the south end of Lake Michigan shall lay a course of **172°** for 47.5 miles to a point 19 miles **114.75°** from Rawley Point Light.

(25) Southbound vessels from Porte Des Morts Passage bound for the south end of Lake Michigan shall lay a course of **189°** for 79.5 miles to a point 19 miles **114.75°** from **Rawley Point Light**.

(26) From the point 19 miles east of Rawley Point Light vessels shall steer **183°** for 165.25 miles to Buffington or Gary, or when **090°** from **Wind Point Light** vessels can change course to **188°** for 69.5 miles to Calumet or Indiana Harbor.

(27) Southbound vessels from the Straits of Mackinac bound for east shore points may use the Grays Reef Passage or the northbound course by Lansing Shoals. If they choose to use the Grays Reef Passage they shall lay a course from the Mackinac Bridge, steering **275°** until abeam of **New Shoal Lighted Buoy 1** when change is made to **260°**. Steer **260°** until turning to the **186°** course through Grays Reef with White Shoal bearing **006°**.

(28) From Grays Reef, take departure from Grays Reef Passage steering **237°** and haul to **217°** when abeam **Ile Aux Galets Light**. Then when abeam Leland Light, change course to **197°** until abeam **North Manitou Shoals Light** when haul is made to **242°** for about 13.25 miles for Sleeping Bear.

(29) When abeam **Sleeping Bear Lighted Bell Buoy 7**, steer **205°** for 17.5 miles to a point 3.75 miles west of Point Betsie Light; then steer **195°** for 45.25 miles to a point 3 miles west of **Big Sable Light**; then steer **183°** for 28 miles to a point 3 miles west of Little Sable Light; thence to destination.

(30) Northbound vessels for the Straits of Mackinac will navigate via Manitou Passage. This rule does not apply to vessels coming out of Green Bay. Vessels from Southern Lake Michigan set a course for a point 4.75 miles abreast of Big Sable. These courses and distances are: from Burns Harbor **009°** for 169.5 miles; from Gary and Buffington **012°** for 168 miles; from Calumet and Indiana Harbor **015°** for 163.75 miles, and from Chicago **017°** for 158 miles; then, from abreast Big Sable, steer **015°** for 44 miles until 5.75 miles from **Point Betsie Light**; then steer **029°** for 17.5 miles until abreast of Sleeping Bear Lighted Bell Buoy 7; then steer **062°** for 14.5 miles until abreast of **North Manitou Shoal Light**; then **037°** for 64.75 miles to Grays Reef.

(31) Vessels eastbound out of St. Martin and Rock Island Passages shall set a course to pass not more than 6 miles off Seul Choix Point. Taking departure from **Rock Island Passage Lighted Gong Buoy RI** the course is **056°** for 58 miles.

(32) Vessels northbound from ports near the south end of Lake Michigan to Escanaba shall set course for not more than 8 miles off Wind Point. Vessels from Gary and Buffington steer **350°** for 75.7 miles; vessels from Calumet and Indiana Harbor steer **354°** for 69 miles.

Mackinac Bridge
Image courtesy of Photography Plus/Marge Beaver (1995)

Then steer **006°** for 98.75 miles to a point not more than 5 miles off Rawley Point; then steer **020°** for 75.25 miles to Porte Des Morts Entrance Lighted Bell Buoy. Northbound vessels to Port Inland from near the south end of Lake Michigan shall follow the northbound Manitou course to a point 5.75 miles abreast Point Betsie; then steer **013°** for 63.5 miles to a point 4 miles west of Boulder Reef; then steer **022°** for 23.75 miles to **Port Inland Lighted Bell Buoy 2**; then steer **000°** 4 miles to destination.

(33) It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it. The recommended courses are shown on charts 14900 and 14901, Lake Michigan.

Pilotage

(34) The waters of Lake Michigan are Great Lakes undesignated waters; registered vessels of the United States and foreign vessels are required to have in their service a United States or Canadian registered pilot or other officer qualified for Great Lakes undesignated waters. Registered pilots for Lake Michigan are supplied by Western Great Lakes Pilots Association (See Appendix A for addresses.) Pilot exchange points are off Port Huron at the head of St. Clair River in about 43°05'30"N., 82°24'42"W. and at De Tour, MI, at the entrance to St. Marys River. Three pilot boats are at Port Huron; HURON BELLE has an international orange hull with an aluminum cabin, and HURON MAID and HURON LADY each have an international orange hull with a white cabin. The pilot boat at De Tour, LINDA JEAN, has a green hull and a white cabin. (See Pilotage, chapter 3, and **46 CFR 401,** chapter 2.)

Principal ports

(35) Most of the harbors on the east side of Lake Michigan are within the mouths of small rivers or in small lakes connected to Lake Michigan by an entrance channel. Parallel piers have been constructed at the mouths of these harbors to aid in carrying the bar into deeper water and to lessen the need for dredging in the harbor entrance. In addition, several harbors along this shore have been provided with stilling basins formed by breakwaters that converge to an entrance opening in deep water beyond the parallel piers. These basins dissipate the force of storm generated waves to prevent them from being conducted through the confined channels between the piers and into the harbors.

(36) The harbors on the west side of the lake are generally at the mouths of small rivers, the only large streams being the Fox and Menominee Rivers which empty into Green Bay. The entrances to the harbors are generally protected by parallel piers, and some have been provided with stilling basins. Some harbor entrances are protected by detached breakwaters. Outer harbors enclosed by breakwaters have been constructed at Calumet Harbor

and Milwaukee. Entirely artificial harbors, with basins enclosed by piers and breakwaters, are at Burns International Harbor, Gary, Buffington, Indiana Harbor, Great Lakes, Waukegan, Port Washington, and Port Inland.

(37) The most important harbors in Lake Michigan are Muskegon, Calumet, Chicago, Milwaukee, Kenosha, and Green Bay. Drydocking facilities for deep-draft vessels are at Sturgeon Bay.

Charts 14880, 14881, 14902

(38) **Old Mackinac Point** (45°47'16"N., 84°43'45"W.), the northeasternmost point of the lower peninsula of the State of Michigan, is on the south side of the narrowest part of the Straits of Mackinac at the entrance to Lake Michigan. The point is marked by an abandoned lighthouse.

(39) **Mackinac Bridge** crosses the Straits of Mackinac between Mackinaw City and St. Ignace to connect the upper and lower Michigan peninsulas. The center span of the suspension bridge is 3,000 feet wide with a vertical clearance of 148 feet at the center decreasing to 135 feet at each end. The north and south suspension spans are each 1,720 feet wide with clearances of 129 feet decreasing to 86 feet at the shoreward ends. Between each of these spans and the adjacent cable anchor piers, fixed spans have clearances of 86 feet decreasing to 52 feet at the anchors. The south bridge approach has 16 fixed spans with clearances of 75 to 20 feet. The north bridge approach has 12 fixed spans with clearances of 75 to 20 feet.

(40) The lake approaches to the center suspension span are marked by lighted buoys. A private sound signal is under the center span on the channel line. Obstructions covered 32 and 27 feet are south of the buoyed channel on the east and west sides of the bridge, respectively. The least depth north of the buoyed channel is 23 feet.

(41) Between Old Mackinac Point and **McGulpin Point,** the northernmost point of the lower peninsula of the State of Michigan, 1.8 miles west, a small bight has shallow water extending about 0.8 mile offshore. McGulpin Point is deep-to. Between McGulpin Point and Waugoshance Point, 11.5 miles west, the shore is indented by three shallow bays. The wide unnamed bay just southwest of McGulpin Point has depths less than 15 feet extending 1.5 miles from its head. It affords protection in northeast to southwest winds. **Cecil Bay,** just west, has shallows extending 0.5 mile from shore. From the east point of the bay a very shallow bank extends 0.4 mile northwest. A detached 19-foot spot is 1.1 miles north of this point. **Big Stone Bay,** just west of Cecil Bay, has deep water within 0.3 mile of its head. West from Big Stone Bay the shoal border increases to a width of about 2 miles abreast the outer end of Waugoshance Point.

Charts 14880, 14902, 14911

(42) **Waugoshance Point** (45°45'30"N., 85°00'36"W.) is a narrow strip of land jutting 2 miles west from the shoreline. Very shallow waters, rocks awash, and a group of small islands extend 3.5 miles west from the extremity of the point to just beyond **Waugoshance Island.** This area is the outcropping of an extensive bank that reaches 1.2 miles west and about 2 miles northwest from Waugoshance Island. The bank, with depths of 3 to 8 feet at the outer end, is marked near the northwest extent by an abandoned lighthouse. Protective riprap extends 25 feet from the base of the structure. The shoals north and west of the lighthouse, Grays Reef Passage, and the islands and shoals of the Beaver Island group will be described later.

(43) **Sturgeon Bay** is a broad bay open to the west between Waugoshance Point on the north and **Sturgeon Bay Point** on the south. The north part of the bay is filled with a shallow flat over rock bottom. A shoal with depths less than 6 feet extends 0.5 mile northwest from Sturgeon Bay Point.

Chart 14880

(44) From Sturgeon Bay Point, the shore extends south and then rounds southwest for about 16 miles to **Sevenmile Point** (45°28'42"N., 85°05'30"W.). The shoal border in this stretch is generally less than 0.7 mile wide, except in the vicinity of Cross Village where the 24-foot contour is 1.2 miles offshore.

(45) **Cross Village, MI,** is about 8 miles south of Waugoshance Point and 2 miles south of Sturgeon Bay Point. In 1978, the former small-craft basin had partially filled with sand and gravel, and the breakwater was in ruins. No shelter is available at Cross Village.

Charts 14880, 14902, 14913

(46) **Little Traverse Bay** indents the east shore of Lake Michigan between Sevenmile Point and **Big Rock Point** (45°21'42"N., 85°12'06"W.). The bay is about 10 miles wide at the entrance, narrowing to 2 miles wide at its head, 11.5 miles east. The bay, with deep water and good holding ground, provides protection in all but west winds. Shoals extend about 0.5 mile off the northwest shore and the head of the bay, but otherwise the shores are generally deep-to.

(47) **Harbor Point** is a narrow spit that extends southeast from the north shore of Little Traverse Bay to protect the harbor at Harbor Springs. **Little Traverse Light** (45°25'10"N., 84°58'39"W.), 72 feet above the water, is shown from a white skeleton tower on the end of the point.

(48) **Harbor Springs, MI,** on the north shore of Little Traverse Bay, is a fine small-craft harbor of refuge affording security in any weather. On the north shore of

the harbor, docks extend to 10 to 12 feet of water, with 16 feet at the end of the city dock.

Harbor regulations

(49) **Local harbor regulations** are established by the Harbor Springs City Council and are enforced by the **harbormaster.** A **slow-no wake speed** is enforced within the limits of the harbor. Copies of the regulations may be obtained from the Harbormaster, City of Harbor Springs, 250 East Bay Street, Harbor Springs, MI 49740.

(50) A **special anchorage** area, marked by lighted buoys, is on the north side of the harbor. (See **110.1 and 110.82a,** chapter 2, for limits and regulations.)

Small-craft facilities

(51) A municipal marina constructed by the Michigan State Waterways Commission and the city, and private marinas provide transient berths, gasoline, diesel fuel, water, ice, electricity, marine supplies, sewage pump-out, launch ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 50 tons are available for all types of marine repairs.

(52) The west terminus of the Inland Route, which connects Crooked Lake, Crooked River, Burt Lake, Indian River, and Mullett Lake to the Cheboygan River and Lake Huron, is about 2.5 miles east of the head of Little Traverse Bay. There is no navigable connection from Lake Michigan to the Inland Route, but an overland portage service is available for trailerable craft to 25 feet and 5,000 pounds. (For complete information see Inland Route, chapter 10.)

(53) **Petoskey, MI,** is on the south side near the head of Little Traverse Bay. A small-craft harbor at Petoskey is protected on the west by a breakwater extending north from shore and marked on the outer end by a light. The breakwater should not be passed close aboard due to large riprap stones along the sides, and end. In 2002, reported depths in the harbor were 9 feet along the outer ends of the municipal piers, thence 7.5 feet in the northeast basin and 6.4 feet in the southwest basin.

(54) Anchorage ground in the harbor is poor, being stony bottom.

(55) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(56) The municipal marina constructed by the city and the Michigan State Waterways Commission on the southeast side of the harbor provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

(57) From Big Rock Point, the shore trends southwest for about 4 miles to Charlevoix. Deep water is about 0.4 mile offshore in this stretch.

Charts 14913, 14942

(58) **Charlevoix, MI**, is a city and harbor at the mouth of **Pine River,** about midway of the rounding shore between Little Traverse Bay and Grand Traverse Bay.

Channels

(59) A dredged entrance channel leads southeast from Lake Michigan between parallel piers through the lower portion of Pine River to Round Lake, the harbor proper of Charlevoix. The outer ends of the piers are marked by lights. The light on the south pier has a mariner activated sound signal initiated by keying the microphone five times on VHF-FM channel 83A. From the east end of Round Lake, a dredged channel leads southeast through the upper portion of Pine River to Lake Charlevoix, entered about 1 mile distant from the Lake Michigan shoreline. Mooring to the Government piers or revetments is prohibited.

(60) In 2011, the controlling depths were 15 feet in the entrance to Round Lake, thence 16 feet in the dredged channel from Round Lake to Lake Charlevoix.

(61) **Round Lake,** about 0.4 mile in diameter, has depths to 60 feet, with deep water generally close to shore. The lake has good anchorage.

Anchorages

(62) A special anchorage, marked by buoys in the north part of Round Lake, has good holding ground, sand and gravel bottom. (See **33 CFR 110.1 and 110.82,** chapter 2, for limits and regulations.)

Bridges

(63) Bridge Street (U.S. Route 31) bridge crosses Pine River just below Round Lake. The bridge has a bascule span with a clearance of 16 feet. (See **33 CFR 117.1 through 117.59 and 117.641,** chapter 2, for drawbridge regulations.)

Currents

(64) Currents in Pine River are reported to reverse twice daily with a velocity up to 3 mph. At times they may reach a velocity up to 5 mph.

Coast Guard

(65) **Charlevoix Coast Guard Station** is on the north side of the Pine River entrance to Lake Charlevoix.

Harbor regulations

(66) Federal regulations specify a **speed limit** of 8 mph (7 knots) in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations have been established by the city of Charlevoix and are enforced

by the **harbormaster.** A **slow-no wake speed** is enforced. Copies of regulations may be obtained from the Chief of Police, City Hall, 210 State Street, Charlevoix, MI 49720.

Small-craft facilities

(67) A marina, developed by the Michigan State Waterways Commission and operated by the city, is on the west side of Round Lake. Transient berths, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channel 9. Repair facilities are close by and gasoline and diesel fuel are available at a fuel dock in the southwest corner of the lake, adjacent to the municipal marina.

Ferry

(68) Ferry service is available between Charlevoix and St. James Harbor on Beaver Island from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is on the west shore of Round Lake about 300 feet southeast of the U.S. Highway 31 bridge.

(69) **Lake Charlevoix** extends about 14 miles southeast from the head of Pine River and is from 1 to 2 miles wide, with depths to over 100 feet and deep water generally close to shore. **Boyne City, MI,** is at the southeast end of the lake. A municipal marina at Boyne City provides transient berths, water, ice, electricity, sewage pump-out, and a launching ramp.

(70) About 5 miles from the northwest end of Lake Charlevoix, **South Arm** extends 9 miles south from **Ironton** at the north end to **East Jordan** at the south end. A marina developed by the Michigan State Waterways Commission at East Jordan provides transient berths, gasoline, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

(71) A **slow-no wake speed** is enforced in the narrows of South Arm opposite Ironton. (See Small-craft Regulations, State of Michigan, chapter 3.)

Cable Ferry

(72) A cable ferry crosses South Arm at Ironton. The self-propelled ferry is guided across the 600-foot-wide channel by two cables which are anchored ashore and pass along each side of the ferry at deck level. The cables are at a depth of about 20 feet at midchannel when the ferry is docked on either shore. When the ferry is at midchannel, the cables are at their least depths. The ferry should not be passed within about 200 feet when docked at either shore. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

(73) From Charlevoix west for 1.8 miles to **South Point** (45°19'18N., 85°17'54"W.), shoals extend about 0.25 mile offshore. A lighted bell buoy marks the north extent of the shoals off South Point.

(74) The Medusa Cement Co. has a facility for shipping cement and receiving coal on the east side of South Point about 1.5 miles west of Charlevoix. Lighted loading silos and the tallest stack (45°19'01"N., 85°18'01"W.) at the facility are prominent. A breakwater formed by two sunken barges extends about 1,600 feet lakeward from the shore and affords protection for the privately dredged channel along its south side and for the loading slip at its inner end. A private light marks the outer end of the breakwater. The entrance channel and slip are reported to be dredged to 24 feet annually. The slip is about 100 feet wide. The north side, 645 feet long, is used to ship cement. The south side, 556 feet long, is used to receive coal for plant consumption. The docks have a deck height of 10 feet, and there is silo storage for 120,000 tons of cement. Six spouts can load vessels at 3,000 tons per hour.

Chart 14913

(75) **Fisherman Island**, about 4 miles southwest of South Point, is on the northeast side of the entrance to Grand Traverse Bay. The island is on a stony bank that extends about 1 mile northwest from shore with depths of 6 to 9 feet at the outer edge. A buoy marks the extent of the bank.

(76) **Grand Traverse Bay,** separated from Lake Michigan by the **Leelanau Peninsula,** extends south from the lake for about 32 miles and is about 10 miles wide. The upper 17 miles of the bay are divided into **East Arm** and **West Arm** by a narrow peninsula that extends north and terminates in Old Mission Point. The shores of Grand Traverse Bay are generally hilly and wooded.

(77) The east shore of Grand Traverse Bay, from Fisherman Island to the south end of East Arm, is bordered by shoals, rocky spots, and ledges, and should not be approached closer than 1 mile. A shoal with a least depth of 15 feet is 2.8 miles off the east shore of the bay 11.5 miles south of Fisherman Island. A lighted bell buoy marks the west side of the shoal.

(78) **Elk Rapids, MI,** is a village and small-craft harbor on the east shore of the bay about 12 miles from the head of East Arm at the mouth of **Elk River.** The harbor is entered through an entrance channel that leads south from the bay between two breakwaters to a basin at the river mouth. The entrance is marked by two lighted buoys and a **159.5°** lighted range. Lights are on the outer ends of the breakwaters and the channel inside the breakwaters is marked by buoys; all of the aids are privately maintained. The entrance channel has been privately dredged to a reported depth of 11 feet in 2010.

(79) A marina developed by the Michigan State Waterways Commission in the harbor can provide transient berths, gasoline, diesel fuel, water, electricity, pump-out facility, launching ramp, and hull/engine repairs can be made. The harbormaster monitors VHF-FM channel 16.

(80) At **Deepwater Point,** on the east shore about 3 miles from the head of the East Arm, there are piles formerly used for mooring self-unloading coal vessels. A marina, 1.2 miles south of Deepwater Point at the town of Acne, can provide transient berths, gasoline, diesel fuel, water, electricity, and sewage pump-out. The outer ends of the breakwaters are marked by private lights. A shallow flat, with depths less than 18 feet, extends 1.3 miles from the head of East Arm.

(81) A **slow-no wake speed** is enforced on Torch River and the adjacent waters of Torch Lake for 300 feet, on Clam River from Torch Lake to Clam Lake, on Grass River from Clam Lake to Lake Bellaire, and on Intermediate River from Lake Bellaire to Intermediate Lake.

(82) The west shore of East Arm may be approached within 0.3 mile except in the upper 2.5 miles where shoals extend 0.5 mile offshore. **Old Mission Harbor**, 2.5 miles south of Old Mission Point, affords good shelter in winds from southwest through north to east. Deep water is within 0.1 mile of the head of the bay and the northeast shore. In 1983, a submerged obstruction was reported to be southeast of Old Mission Harbor in about 44°57'30"N., 85°28'24"W. At **Old Mission Point** (44°59'30"N., 85°28'48"W.), marked by an abandoned lighthouse, a shoal bank, with depths less than 12 feet near the outer edge, extends 1.5 miles north and west. The bank should not be navigated, even by small craft.

(83) **Mission Point Light,** on a detached shoal 2 miles northwest of Old Mission Point, is a guide into the East and West Arms of Grand Traverse Bay. A small rocky ledge, covered 22 feet, is 1.7 miles northeast of the light.

(84) From Old Mission Point, the east shore of West Arm extends 2 miles southwest to **Merril Point,** thence 6 miles south to **Tucker Point** (44°53'24"N., 85°33'30"W.). Along this stretch, the shoal border gradually widens from 0.2 mile to 0.75 mile, just north of Tucker Point. A shoal, with several bare spots, extends 0.4 mile south from Tucker Point; the south extent of the shoal is marked by a buoy.

(85) **Bowers Harbor,** enclosed on the west by Tucker Point, provides secure anchorage with shelter from all but southwest winds. A marina on the northeast side provides transient berths, water, electricity and launching ramp. **Marion Island** is off the mouth of Bowers Harbor, 1.3 miles southwest of Tucker Point. Shoals extend 0.4 mile north and 0.9 mile southwest from the island. Buoys mark the northeast and southwest extent of the shoals. A wreck, covered 32 feet, is just north of the buoy marking the southwest shoal.

(86) The east shore of West Arm, from Bowers Harbor to the head at Traverse City, is clear to within 0.25 mile.

(87) **Traverse City, MI,** at the head of West Arm, is the principal harbor on Grand Traverse Bay. The Park Place cupola (44°45'45"N., 85°37'04"W.) is prominent.

(88) The **Great Lakes Maritime Academy** of Northwestern Michigan College is in Traverse City, MI Maritime oriented courses, including seamanship, navigation, communication, and maritime law, prepare cadets for positions aboard Great Lakes ships. Further information may be obtained from The Dean of Admissions, Northwestern Michigan College, 1701 East Front Street, Traverse City, MI 49684.

Channels

(89) A dredged basin is on the west side of West Arm about 1.5 miles north of the city. The basin is formed by a breakwater extending south from shore on the east side and a detached breakwater on the south side. The outer ends of the breakwaters are marked by lights. In 1982, the controlling depths were 12 feet in the south part of the basin and 10 feet in the north part except for shoaling to 5 feet along the east edge and 8 feet in the northeast corner.

(90) **Boardman River** flows from **Boardman Lake** through Traverse City and empties into the head of West Arm. The mouth of the river is protected by parallel piers; the outer end of the west pier is marked by a private light. The river has depths of about 2 feet for 0.3 mile, thence 1 foot to a dam 1.2 miles above the mouth. Currents in the river are swift. Below the dam, the river is crossed by six fixed highway bridges with a minimum clear width of 10 feet and a minimum clearance of 5 feet.

Coast Guard

(91) **Traverse City Coast Guard Air Station**, is about 2 miles southeast of the mouth of Boardman River. The air station supports Coast Guard surface operations, carries out search and rescue missions, and renders airborne assistance. The air station can be contacted on VHF-FM channel 16 or through the nearest Coast Guard station.

Harbor regulations

(92) Local harbor regulations are established and enforced by the **harbormaster** who can be reached at the Traverse City Police Department, 520 W. Front Street, Traverse City, MI 49684. Copies of the regulations can be obtained from the harbormaster.

Small-craft facilities

(93) A public small-craft basin constructed by Traverse City and the Michigan State Waterways Commission is protected by breakwaters, about 2,800 feet west of the mouth of Boardman River. The basin is entered from the east between two breakwaters that are marked on the ends by private lights. Transient berths, gasoline, water, electricity, sewage pump-out, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9.

(94) A small-craft basin protected by breakwaters is at **Greilickville**, about 2 miles northwest of the Traverse City docks. The outer ends of the breakwaters are marked by lights. A dredged channel leads north from deepwater in Grand Traverse Bay through the breakwaters to a mooring basin. In 2008, the controlling depths were 9 feet in the entrance channel to the basin, thence

10 feet in the basin (except for shoaling to 5 feet along the east edge.)

(95) A seasonal facility constructed by the city and the Michigan State Waterways Commission is on the west side of the basin and two private marinas are at the north end of the basin. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, marine supplies, launch ramp, and harbormaster services are available. The harbormaster may be contacted during the boating season by calling 231–946–5463. One of the private marinas has 30-ton mobile hoist available for hull and engine repairs. In 1978, depths of 7 to 15 feet were reported alongside the docks, with 10 feet at the fuel pumps.

(96) North from Traverse City for 11 miles to **Lee Point** (44°55'30"N., 85°36'06"W.), shoals extend about 0.3 mile offshore, except at a point 2 miles north of Traverse City where a shoal with a least depth of 6 feet extends 0.5 mile offshore. The outer edge of the shoal is marked by a lighted buoy. The buoy is sometimes difficult to distinguish at night because of vehicle taillights on the shore highway. A shoal with depths of 7 to 18 feet extends 2.5 miles south from Lee Point. The south end is marked by a buoy. From Lee Point north for 5.5 miles to **Stony Point (Suttons Point),** shoals extend no more than 0.6 mile offshore. A lighted bell buoy 0.7 mile northeast of Lee Point marks the outer edge of the shoal bank. A buoy marks the outer edge of the shoal that extends 0.3 mile north from Stony Point.

(97) The shore from Stony Point north to **Omena Point** has generally deep water within 0.4 mile. **Omena Bay,** behind Omena Point, has good water with secure anchorage and shelter from all winds from southwest through north to east.

(98) **Suttons Bay** extends 2.5 miles southwest from Grand Traverse Bay on the west side of Stony Point. The bay affords good anchorage with protection from all but northeast winds. Shoals extend 0.2 mile from the east shore and head, and 0.4 mile from the west shore. **Suttons Bay, MI,** is a village on the west side of the head of the bay. A public small-craft facility constructed by the Michigan State Waterways Commission at the village provides transient berths, gasoline, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Limited repairs are available.

(99) **Northport Bay** is an indentation on the west side of Grand Traverse Bay between Omena Point and **Northport Point,** Shelter is available in the bay from all but southeast winds, but the holding ground is poor, being either mud or rock. A shoal marked at the outer edge by a lighted bell buoy extends 0.5 mile southeast from Northport Point. Shoals extend no more than 0.5 mile offshore in the bay, but there are several dangerous detached shoals in the bay. About 0.5 mile west of Northport Point, a shoal with rocks awash is about 1.2 miles long north and south. A buoy marks the south end of the shoal. A 3-foot shoal, marked on the south side by a buoy, is 1 mile west of Northport Point. **Bellow Island** is in the entrance to the bay, 2.4 miles south of Northport Point. Shoals extend about 0.3 mile off around the island. Two 14-foot spots are 1 mile north and a 17-foot spot is 0.6 mile northwest of Bellow Island.

(100) **Northport, MI,** is a village and small-craft harbor on the west side of Northport Bay. A breakwater marked at the outer end by a private light protects a small-craft basin constructed by the village and the Michigan State Waterways Commission. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A boatyard about 1 mile north of the village has a 60-ton mobile hoist which can handle all types of vessels to 75 feet in length for hull and engine repairs.

(101) From Northport Point north to Lighthouse Point, deep water is generally within 0.5 mile of shore. An 18-foot spot is 1 mile offshore 4.3 miles northeast of Northport Point. **Lighthouse Point** is the north end of the Leelanau Peninsula, which separates Grand Traverse Bay from Lake Michigan. Shoals extend 0.7 mile north from the point. **Grand Traverse Light** (45°12'38"N., 85°33'01"W.), 50 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on Lighthouse Point; the light is obscured from the south.

Charts 14902, 14911

(102) An extensive area of off-lying islands and shoals is in Lake Michigan from the vicinity of Waugoshance Point southwest to Lighthouse Point.

(103) A group of shoals about 4 miles long east and west has its north limit about 3.5 miles north of Waugoshance Island along the south side of the vessel route between the Straits of Mackinac and Grays Reef Passage. **Rose Shoal,** the southernmost of the group, has a least depth of 11 feet 2.6 miles north-northwest of Waugoshance Island. Bordering the south side of the vessel route, **New Shoal No. 1,** the easternmost of the group, has a depth of 14 feet over boulders. **New Shoal No. 3,** the westernmost of the group, has a least depth of 16 feet. A lighted bell buoy at the northwest end of the shoal marks the east side of the route through Grays Reef Passage. **New Shoal No. 2,** midway between the other two, has a least depth of 17 feet and is marked on the north side by a lighted buoy.

(104) **White Shoal,** 6.2 miles northwest of Waugoshance Island, is about 2 miles long east and west. The west end of the shoal is awash. **White Shoal Light** (45°50'30"N., 85°08'08"W.), 125 feet above the water, is shown from a conical crib with red and white spiral bands on the east end of the shoal; a sound signal and a radar beacon (Racon) are at the light. Riprap extends 25 feet from the

base of the light and it should not be passed close aboard even by shallow-draft vessels. A buoy marks the west end of White Shoal. An 18-foot shoal is 0.8 mile northwest of the buoy, and several shoal spots with depths of 20 to 30 feet are close around White Shoal.

(105) **Simmons Reef,** about 5 miles northwest of White Shoal, is about 2.8 miles long east and west and 1.6 miles wide. The reef has a rock awash near its center and depths of 3 to 6 feet scattered over a large area. The reef is dangerous in that it is composed of boulders that make up quickly from deep water. A lighted bell buoy marks the south side of the reef.

(106) **Fagan Reef,** 3 miles northwest of Simmons Reef, is about 4 miles long and 2 miles wide. It has numerous shoal spots with depths less than 24 feet and a least depth of 10 feet at its west end.

(107) St. Helena Island and Shoal, Manitou Paymen Shoal, and other shoals along the north shore are discussed with the north shore of Lake Michigan.

(108) **Vienna Shoal,** with a least depth of 12 feet, is 2.4 miles west-northwest of Waugoshance Island on the east side of Grays Reef Passage. **East Shoal,** 1.4 miles south-southwest of Vienna Shoal, has a least depth of 17 feet. A lighted buoy on the west end of the shoal marks the east side of the dredged channel through Grays Reef Passage.

(109) **Grays Reef** is an extensive area of shallow water over rocks that extends from Grays Reef Passage west for 8.5 miles to Hog Island. The reef has depths ranging from rocks awash to 18 feet.

(110) **Grays Reef Passage,** between Vienna Shoal and East Shoal on the east and Grays Reef on the west, is the main route for vessels drawing less than 25 feet between the Straits of Mackinac and harbors south in Lake Michigan. The passage is obstructed at the center by **Middle Shoal,** with a depth of 17 feet, and by a bank with depths of 21 to 25 feet and a dumping ground close north of Middle Shoal. The main vessel route through the passage is a dredged channel, marked by a light and lighted buoys, on the east side of Middle Shoal. **Grays Reef Light** (45°45'57"N., 85°09'14"W.), 82 feet above the water, is shown from a square tower on the west side of the dredged channel, just southeast of Middle Shoal. sound signal and a racon are at the light. The light should not be passed close aboard due to protective riprap. From the north end, the course through the channel is **186°** to Grays Reef Light and thence **216½°** toward North Manitou Shoal Light. In 2008, the controlling depth was 24½ feet in the dredged channel. The channel through Grays Reef Passage on the west side of Middle Shoal is unmarked and no longer used by large vessels.

(111) Grays Reef Passage is a **regulated navigation area.** (See **33 CFR 165.1 through 165.13, and 165.901 (b) and (c),** chapter 2, for limits and regulations.)

(112) **Ile aux Galets** (locally pronounced skill-a-gal-lee) is a small island 7.7 miles southwest of Waugoshance Island on the east side of the approach to Grays Reef Passage from the south. Shoals that extend 1.8 miles east from the island are marked at the outer end by a buoy, and shoals that extend 0.5 mile northwest from the island are marked by a buoy. **Ile aux Galets Light** (45°40'35"N., 85°10'20"W.), 58 feet above the water, is shown from a white octagonal tower on the island.

(113) **Dahlia Shoal,** 3.7 miles south-southwest of Ile aux Galets, has a least depth of 14 feet and is marked on the west side by a buoy. A 21-foot spot is 1 mile northeast of the buoy.

(114) **Hat Island,** the easternmost of the island group lying west of Grays Reef Passage, is on the north edge of Grays Reef, 11.5 miles west-northwest of Waugoshance Island and 10.5 miles northeast of Beaver Island. Shoals extend 0.5 mile north from the island.

(115) **Hog Island,** 5.5 miles northeast of Beaver Island, is low and wooded and completely surrounded by very shallow flats. Grays Reef extends east from the island, and shoals extend about 1.5 miles north and 2.5 miles south from the island. A very shallow bank, with numerous rocks awash, connects the island to Garden Island, 3 miles west. There is no vessel passage across the bank, which extends about 2 miles south from a line connecting the south ends of the islands. **Hog Island Reef,** a detached shoal 3.2 miles south-southeast of the island, has a least depth of 5 feet and is marked on the east side by a buoy.

(116) **Garden Island,** 1.5 miles north of Beaver Island, is generally high and wooded and is surrounded by shoal water. **Garden Island Shoal,** 2.5 miles north of Garden Island, has a least depth of 15 feet and is marked at the northeast end by a lighted bell buoy. A shoal with a least depth of 16 feet is 1.2 miles north of Garden Island.

(117) **Squaw Island,** 3 miles west-northwest of Garden Island, is the northwesternmost of the island group west of Grays Reef Passage. An abandoned lighthouse is on the north end of the island. A shoal bank extends about 0.7 mile from the east, south, west shores of the island; a buoy marks the outer edge of the bank on the east side. A shoal with depths of 6 to 16 feet that extends about 2 miles north-northeast from the island is marked at the outer end by a buoy. A detached 14-foot shoal is 1.8 miles northeast of the island, and rocky spots covered 12 to 17 feet are 1 mile northwest of the island.

(118) **Whiskey Island** is about 3.5 miles west of Garden Island and 1.7 miles southwest of Squaw Island. Shoals extend about 0.5 mile offshore around the island, except about 1 mile east and southeast. A buoy is 1 mile east-southeast of the island. A large detached bank, with several spots awash, is 1.2 miles southwest of the island. The south side of the bank is marked by a buoy.

(119) In the passage between Garden Island on the east and Squaw and Whiskey Islands on the west, numerous detached ledges and spots have depths of 1 to 14 feet. Passage without local knowledge, by even shallow-draft vessels, is not recommended.

(120) **Lansing Shoals,** an extensive area of boulders with depths less than 24 feet, is from 4.4 to 6.2 miles north

of Squaw Island. The shoalest spot, covered 13 feet, is at the southeast end of the ledge. **Lansing Shoals Light** (45°54'13"N., 85°33'42"W.), 69 feet above the water, is shown from a square gray tower on the south side of the 13-foot spot; a seasonal sound signal and racon are at the light. Rip-rap extends 50 feet from the base of the light, and it should not be passed close aboard even by shallow-draft vessels. The light marks the north side of the vessel route from the Straits of Mackinac for vessels drawing over 25 feet.

(121) **Beaver Island,** the principal island in the group west of Grays Reef Passage, is 13 miles long north and south with a maximum width of 6.5 miles. The wooded island is bluff on the west side and lower on the east side. Shoals extend about 0.5 to 1 mile offshore around the island, except in Sandy Bay, about midlength of the east side, where deep water is within 0.2 mile of shore.

(122) The shoal bank that extends 0.7 mile northeast from Beaver Island is marked at the outer edge by a lighted buoy. A 3-foot depth is just inside the buoy.

(123) Several reefs with depths of 8 to 12 feet are 1.5 miles east and 0.8 mile northeast from the northeast end of Beaver Island. These limit the draft for vessels navigating the channel between the shoal banks that extend off the north side of Beaver Island and the south side of Garden Island.

(124) **St. James Harbor** is a bight near the northeast end of Beaver Island and is the harbor for the village of **St. James, MI,** on the northwest side of the harbor. The harbor is protected on the east by **Sucker Point** and provides protection from all but southeast winds. Sucker Point is marked on the southwest side by **St. James Light** (45°44'36"N., 85°30'30"W.), 38 feet above the water and shown from a white cylindrical tower. Deep water extends from the lake across the center of the harbor, with the south end of the harbor shoal. Another shoal extends west across the harbor from Sucker Point to St. James, with deep water on the north side of the shoal near the head of the harbor. In 1998, the dredged channel across the shoal had a controlling depth of 13 feet.

(125) Vessels approaching St. James Harbor must take care to avoid the shoal bank that extends south and east from Sucker Point. A lighted buoy and a buoy mark the south and southeast limits of the bank, respectively. On the south side of the harbor entrance, shoals extend about 0.4 mile northeast and 1 mile southeast from **Luney Point**. The shoal area is marked on the northeast side by a buoy and on the east side by a lighted bell buoy. A detached gravel and boulder bank, covered 14 feet is about 2 miles east of Luney Point.

Small-craft facilities

(126) A public dock developed by the township and the Michigan State Waterways Commission is on the northwest side of the harbor at St. James. The harbormaster at St. James monitors VHF-FM channels 16 and 9. A marina, with a reported approach depth of 6 feet, is at the north end of the harbor and can provide transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, a 30-ton hoist, and marine supplies; full repairs are also available.

Ferry

(127) Ferry service is available between St. James Harbor and Charlevoix, MI, from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is 0.5 mile northwest of St. James Light.

(128) **High Island,** about 3.8 miles west of the north end of Beaver Island, is a wooded island with a high sand ridge along the length of the west side. Shoals extend to 1 mile off the west shore and 0.5 to 0.8 mile off the south and east shores, except at the northeast end of the island where a narrow point extends 0.5 mile east. Under this point, deep water is close-to, and good anchorage is available with protection from all but east and southeast winds. Shoals extend 1.2 miles north and northeast from this point. A shoal bank with depths of 12 to 15 feet extends about 2 miles northwest from High Island and connects with the shoals surrounding Trout Island.

(129) **Trout Island,** 1.6 miles north of High Island, is connected to it by a shoal bank. Passage between the islands is unsafe for vessels drawing over 6 feet. A 4-foot spot 0.6 mile south of Trout Island must be avoided. Shoals extend about 0.2 to 0.5 mile offshore around Trout Island. **Trout Island Shoal,** 1.9 miles west of Trout Island, has a least depth of 11 feet and is marked on the northwest side by a buoy.

(130) **Gull Island,** 6.7 miles west of High Island, is low, flat, and somewhat wooded. Shoals extend generally 0.5 mile offshore, except for banks that reach 1 mile south-southeast and 1.7 miles northeast. Detached 21- and 23-foot spots are 1 mile north-northwest and 1.6 miles southeast of the island, respectively. **Gull Island Light** (45°42'42"N., 85°50'33"W.), 77 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on a bare spot close northwest of the island. **Gull Island Reef,** about 4 miles southeast of the island, has a least depth of 3 feet and depths of 9 to 15 feet over a large area.

(131) **Richards Reef,** about 8 miles west of Beaver Island Light, is covered 22 feet.

(132) **Boulder Reef,** 9.5 miles southwest of Gull Island, has a least depth of 15 feet and is marked on the south side by a lighted bell buoy.

Charts 14902, 14912

(133) **North Fox Island**, 10 miles southwest of Beaver Island, is wooded. Shoals extend no more than 0.3 mile offshore except on the south and west sides where depths of 5 to 13 feet reach 1 mile from shore.

(134) **South Fox Island,** 4 miles southwest of North Fox Island, is hilly on the west side and lower and wooded on the east side. An abandoned lighthouse is on the south end of the island. The east and west sides of the island are fairly deep-to, except for a 13-foot spot that reaches 0.8 mile off the west shore. A shoal bank and detached 18- to 21-foot spots reach 2.4 miles north from the island. A detached 21-foot spot is 3.3 miles north of the island. Shoals extend 0.8 mile around the south point of the island.

(135) **Caution**.—Currents with velocities up to 2 mph are of frequent occurrence around North and South Fox Islands. Mariners should exercise caution while navigating in the area.

(136) **South Fox Island Shoals** is an extensive bank reaching 9 miles south from South Fox Island. A buoy marks the south end of the bank. The bank has general depths of 15 to 30 feet with some shoaler spots. Two 9-foot spots are 4.2 and 7 miles south of South Fox Island, and an 11-foot spot is 6.4 miles south of the island. Buoys 4.2 and 6.2 miles south of the island mark a deepwater passage through the shoals. The bottom in the vicinity of the shoals is rocky, and deep-draft vessels should exercise caution in thick weather.

Charts 14902, 14913, 14912

(137) **Lighthouse Point** (45°12'36"N., 85°33'00"W.), the north point of the Leelanau Peninsula, is marked by Grand Traverse Light. Between Lighthouse Point and **Cathead Point,** 3.6 miles southwest, **Cathead Bay** affords shelter in south winds. The bay is shoal however, with two rocky ledges that extend 0.9 mile from shore. Approaching Cathead Point from west, a clump of trees on the point gives it the appearance of an island.

(138) From Cathead Point southwest for 14.5 miles to **Carp River Point,** the shore is generally bluff and hilly. Shoals extend generally less than 0.8 mile from shore, except for detached 7- and 8-foot spots 1.2 miles offshore 5 miles northeast of Carp River Point. Leland, MI, is 1.2 miles northeast of Carp River Point.

Charts 14902, 14912

(139) **Leland, MI**, is a village and small-craft harbor at the mouth of Leland River about 32 miles southwest of Charlevoix. Local fish tugs and recreational craft are the principal users of the harbor.

Channels

(140) The harbor is protected on the north and northwest by a detached breakwater and on the southwest by a pier extending lakeward from the south side of the mouth of Leland River. The outer end of the pier and the southwest end of the breakwater are marked by lights. An anchorage area inside the breakwater is approached from the southwest through a dredged channel between the breakwater and pier. A dredged channel leads from the south end of the anchorage to the mouth of the river, and a marina basin, maintained by private interests, is on the east side of the anchorage. (See Notice to Mariners and the latest edition of the chart for controlling depths.)

(141) **Leland River** is a narrow crooked stream about 0.8 mile long which connects Lake Leelanau to Lake Michigan. A dam crosses the river about 400 feet above the mouth. The Main Street bridge 250 feet above the dam has a vertical clearance of about 4 feet. From this bridge to Lake Leelanau, the river is navigable by shallow-draft vessels.

(142) **Lake Leelanau** is 16 miles long and as much as 1.8 miles wide. The upper and lower ends of the lake have good depths, but in the constriction near the middle of the lake at the village of Lake Leelanau, available depths are only 3 feet. A fixed highway bridge with a clearance of about 15 feet crosses the lake at the village.

Small-craft facilities

(143) A public dock constructed by the Michigan State Waterways Commission in Leland harbor provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

Ferry

(144) Mail and ferry service is available between Leland and North and South Manitou Islands from April through December with regular service. Irregular service is available from January through March depending on ice conditions. The terminal is on the east side of the Leland River mouth.

(145) **Good Harbor Bay,** between Carp River Point and **Pyramid Point** 7.7 miles west-southwest, has deep water close to shore and affords protection in all but north to northeast winds. However, in the northeast part of the bay, an extensive rocky ledge with depths of 2 to 18 feet is 1 to 3 miles offshore.

(146) **Pyramid Point Shoal,** with a least depth of 7 feet, extends 2 miles north from Pyramid Point. A lighted buoy marks the north end of the shoal.

(147) **Sleeping Bear Bay** lies between Pyramid Point and **Sleeping Bear Point** (44°54'30"N., 86°03'00"W.), 6.8 miles southwest. The shores of the bay are generally deep-to, except for a rocky ledge with depths of 4 feet that extends 0.8 mile from shore 3 miles southwest of Pyramid Point, which is bluff. The bay affords good shelter from northeast through south to west winds. Very good holding ground is found under Pyramid Point. At **Glen Haven, MI,** a village on the southwest side of the bay, the waterfront is in ruins and no services are available.

(148) **Sleeping Bear Shoal,** with boulders covered 17 to 24 feet, extends 1.2 miles west from Sleeping Bear Point. Detached spots less than 30 feet extend 4 miles farther west from the point and are marked near the outer limit by a lighted bell buoy. Vessels using Manitou Passage should keep north and west of the buoy.

(149) **Manitou Passage,** between North and South Manitou Islands and the mainland, is used by deep-draft vessels bound between Grays Reef Passage and the south end of Lake Michigan. The passage has good deep water and a least width of about 1.8 miles between Pyramid Point Shoal and North Manitou Shoals.

(150) **North Manitou Island,** 6.5 miles north of Pyramid Point, is a hilly and wooded island 7 miles long north and south and 4.2 miles wide. A lee can be found under the island with generally good holding ground. The bight on the east side affords good shelter from west winds. The north shore is deep-to with several detached spots of 24 to 29 feet. The east shore is clear to within 0.4 mile and the west shore to within 0.6 mile. A shoal bank with depths of 4 to 15 feet extends 1.5 miles south from **Donner Point** at the southwest end of the island and extends east to a point 2 miles south of **Dimmicks Point.** In 1981, numerous boulders were reported to exist from close inshore to about 0.4 mile offshore between Donner and Dimmicks Points. **North Manitou Shoals,** an area of foul ground with depths of 15 to 30 feet, extend 3 miles south of Dimmicks Point and 3.5 miles south of Donner Point. A buoy marks the extent south of Donner Point. **North Manitou Shoals Light** (45°01'16"N., 85°57'26"W.), 79 feet above the water is about 2.8 miles south of Dimmicks Point; a sound signal and racon are at the light.

(151) **South Manitou Island** is 6.8 miles north of Sleeping Bear Point and 3.9 miles southwest of North Manitou Island with a deep channel between. The island is hilly and bluff on the west side and lower and wooded on the east side. A 54-foot high private lighthouse is on the southeast point of the island. The shores of the island are relatively deep-to, except the south side where shoals with depths of 10 to 19 feet extend 1 mile offshore. Detached 18- and 19-foot spots are 1.5 miles south and 2.8 miles southwest of the island, respectively. A lighted gong buoy is on the southwest side of the 19-foot spot. **South Manitou Harbor**, on the east side of the island, affords anchorage with good holding ground and protection from southwest through north to northeast winds.

Ferry

(152) Mail and ferry service is available between North and South Manitou Islands and Leland during most of the year, depending on ice conditions.

(153) From Sleeping Bear Point, the shoreline trends south for 8 miles to a high rounding point known as **Empire Bluffs.** Shoals extend 0.7 mile offshore at the bluffs, and a detached 23-foot spot is 2 miles offshore. At **Empire, MI,** just north of the bluffs, two piers in ruins extend into the lake. In 2011, they were almost completely covered with sand. A boat launch is just north of the ruins.

(154) From Empire Bluffs, the shoreline continues south and then bends west to **Platte River Point** at the mouth of the **Platte River. Platte Bay** is the bight between Empire Bluffs and Platte River Point. The shore of the bay is bluff with deep water close-to. A shoal, with rocks awash and a depth of 10 feet at the outer end, extends 1.5 miles north from Platte River Point.

Charts 14902, 14907

(155) From Platte River Point southwest for 5.7 miles to Point Betsie, the shore is bold and hilly, and there are no outlying obstructions. **Point Betsie** is a rounding sandy point. **Point Betsie Light** (44°41'28"N., 86°15'19"W.), 52 feet above the water, is shown from a white cylindrical tower with a red roof and attached dwelling on the point. The light marks the turning point for vessels bound between Manitou Passage and the south end of Lake Michigan.

(156) From Point Betsie, the shore continues sandy and hilly for 4.3 miles south to Frankfort Harbor.

(157) **Frankfort Harbor,** 4.3 miles south of Point Betsie, is in Betsie Lake, connected to Lake Michigan by an entrance channel. The shore south of the entrance channel is bluff, reaching over 300 feet above the lake. The city of **Frankfort, MI,** is on the north side of Betsie Lake. A tank on a hill 0.75 mile northeast of the harbor entrance is prominent from Lake Michigan.

(158) **Frankfort North Breakwater Light** (44°37'51"N., 86°15'08"W.), 72 feet above the water, is shown from a white square pyramidal tower on the north side of the harbor entrance. A mariner radio activated sound signal is at the light, initiated by keying the microphone five times on VHF-FM channel 83A. An aerolight is 2.1 miles northeast of the light.

Channels

(159) The harbor is entered from Lake Michigan through a dredged entrance channel between converging breakwaters to an outer harbor basin which is not adapted for anchorage but reduces wave action in the inner harbor. From the outer basin, the channel continues east between parallel piers to an inner basin and anchorage area in Betsie Lake. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the breakwaters and piers and marked by lights.

(160) **Betsie Lake,** extends about 1.5 miles southeast from the inner end of the entrance channel. Outside the dredged areas, the lake is generally shoal, with depths of 8 feet and less. The southeast end of the lake is filled with submerged pilings, and at the extreme end, off the mouth of **Betsie River,** the lake is swampy. Anchorage

in the lake is poor. A private channel extends from the inner harbor basin east through Betsie Lake to a private dock. In 1975, the controlling depth in the channel was 7 feet.

Bridges

(161) Betsie River is crossed near its mouth by a fixed highway bridge with a clearance of 4 feet and by a fixed railroad bridge with a 14-foot span and a clearance of 7 feet.

Currents

(162) Currents in the Frankfort Harbor entrance channel attain velocities up to 3 mph in either direction.

(163) **Frankfort Coast Guard Station** is on the north side of the harbor entrance channel.

Harbor regulations

(164) A **speed limit** of 8 mph is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Mooring to the breakwaters, piers, or revetments is prohibited.

(165) A **special anchorage** area, marked by private buoys, is in Betsie Lake. (See **33 CFR 110.1 and 110.81a,** chapter 2, for limits and regulations.)

Wharves

(166) Koch Fuels, Inc. receives petroleum products at a 425-foot wharf on the south side of the inner basin. The wharf has a deck height of 8 feet with reported depths of 18 to 20 feet alongside. There is tank storage for 310,000 barrels of petroleum.

Small-craft facilities

(167) A public dock constructed by the Michigan State Waterways Commission on the north side of the inner basin provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. A marine railway for small craft is available in the harbor.

(168) From Frankfort south for about 19 miles to Portage Lake, the shore is bold and wooded with many hills from 300 to 400 feet high. The shore is deep-to except just south of the entrance to Arcadia Lake where depths under 24 feet extend 0.8 mile offshore. A submerged wreck is 0.5 mile offshore 6.6 miles south of Frankfort.

(169) **Arcadia Lake,** 10 miles south of Frankfort, is an L-shaped lake separated from Lake Michigan by a narrow strip of land. The lake is entered from deep water in Lake Michigan through a dredged entrance channel between parallel piers and revetments to deep water inside the lake; the pierheads are marked by lights. In 2012, the controlling depth was 7 feet in the entrance channel to the lake. The entrance channel is subject to extensive shoaling. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap. The south part of the Arcadia Lake shoals off into heavy weeds and marsh at the east end. The village of **Arcadia, MI** is at the north end of the lake.

Small-craft facilities

(170) A marina developed by the Michigan State Waterways Commission and a private marina are located in the north arm of the lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. At the private marina, a 10-ton hoist is available for hull and engine repairs.

Charts 14907, 14939

(171) **Portage Lake,** 23 miles south of Point Betsie, is separated from Lake Michigan by a narrow strip of land. The lake, 3.3 miles long and 0.6 to 1.5 miles wide, has central depths of 14 to 60 feet with gradual shoaling toward shore. A shoal, marked by a lighted buoy, has depths of 7 to 12 feet near its outer end and extends 0.4 mile south from North Point, about 0.9 mileeast of the entrance channel. **Onekama, MI,** is a village on the north side of the lake at the east end.

Channels

(172) The dredged entrance channel leads from Lake Michigan between parallel piers and revetments to the deep water inside Portage Lake. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The channel is subject to shoaling from sand swept in by shore currents. The currents in the entrance channel attain velocities up to 3 mph in either direction. The outer ends of the piers and the Portage Lake end of the south pier are marked by lights. A mariner radio activated sound signal, is at the north outer end light, initiated by keying the microphone five times on VHF-FM channel 83A.

(173) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(174) Good anchorage is available in Portage Lake.

(175) A **speed limit** of 8 mph (7 knots) is enforced in Portage Lake. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(176) A marina on the south side of Portage Lake just east of Eagle Point provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and marine supplies. A 14-ton mobile hoist and a 50-ton marine railway are available for hull and engine repairs. In 1978,

there were reported depths of 5 to 12 feet alongside the docks and 10 feet alongside the fuel pumps.

Chart 14907

(177) From Portage Lake south-southwest for 8.3 miles to Manistee, the shore continues somewhat bluff, generally 60 feet high, with several hills 115 to 180 feet high. The 18-foot contour is no more than 0.4 mile offshore.

Charts 14907, 14938

(178) **Manistee Harbor**, 31 miles south of Point Betsie, is on the **Manistee River,** which flows from the north end of Manistee Lake for 1.5 miles to Lake Michigan. There are extensive facilities along both sides of the river and on the west side of Manistee Lake. The principal cargo handled is coal, with occasional shipments of salt and machinery. The harbor is also a base for fish tugs. A radio mast at the north end of Manistee Lake is prominent.

(179) **Manistee North Pierhead Light** (44°15'07"N., 86°20'49"W.) 55 feet above the water, is shown from a white cylindrical tower on the outer end of the north pier. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(180) The entrance to Manistee River is protected on the southwest by a breakwater. A dredged entrance channel leads from deep water in Lake Michigan through the north part of the outer harbor basin to the river entrance between two piers and through the river channel to Manistee Lake. (See Notice to Mariners and the latest edition of the chart for controlling depths.)

(181) Currents in the river attain velocities up to 3 mph in either direction.

(182) Numerous submerged pile clusters extend along the north channel limit from the outer end of the north pier to its inner end. Large pile clusters protect each end of the revetment upstream of the north pier.

(183) The outer basin, enclosed by the south breakwater and north pier, is not adapted for anchorage, but reduces wave action in the inner harbor. Mooring to the breakwater, piers, or revetments is prohibited. Large riprap stones are along both sides and across the ends of the breakwater and pier, and navigation should not be attempted close to these structures.

(184) **Manistee Lake,** about 4 miles long and up to 0.5 mile wide, has depths to 50 feet, with the shores generally deep-to. Buoys mark the outer ends of shoals and submerged dock ruins from the inner end of Manistee River south in the lake. Good anchorage is in the north part of the lake in depths of 20 to 25 feet.

(185) **Big Manistee River** entering Manistee Lake at its north end, flows through a flat valley with numerous cutoffs and sloughs, and is crossed by a number of fixed bridges. The channel is tortuous, with depths varying from 1½ to 11 feet to a dam which crosses the river about 30 miles above the mouth.

Bridges

(186) Maple Street bridge, about 1.1 miles above the mouth of Manistee River, has a bascule span with a clearance of 23 feet. U.S. Route 31 bridge, 1.4 miles above the mouth, has a bascule span with a clearance of 32 feet. The CSX railroad bridge, 1.5 miles above the mouth, has a swing span with a clearance of 13 feet. (See **33 CFR 117.1 through 117.59 and 117.637,** chapter 2, for drawbridge regulations.) An overhead power cable at the head of the river has a clearance of 145 feet.

Coast Guard

(187) **Manistee Coast Guard Station** is on the north side of the entrance to Manistee Harbor.

Harbor regulations

(188) Harbor regulations have been established by the city of Manistee and are enforced by the **harbormaster.** Copies of regulations may be obtained from the Chief of Police at City Hall. A **slow-no wake speed** is enforced in the Manistee River. Federal regulations specify an 8 mph (7 knots) **speed limit** for vessels over 40 feet in length. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(189) Manistee has several deep-draft facilities. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(190) **Morton Salt Co. Coal Dock:** (44°14'36"N., 86°18'29"W.); 400-foot face; deck height, 4 feet; open storage for 45,000 tons of coal; receipt of coal; owned and operated by Morton Salt Division of Morton International, Inc.

(191) **Morton Specialty Chemical Products, Manistee Stone Dock:** across slip south of Coal Dock; 600-foot face; covered storage for 10,000 tons of limestone; receipt of limestone; owned and operated by Morton Specialty Chemical Products, Division Morton International Inc.

(192) **Rieth-Riley Construction Co., Great Lakes Materials Division** (44°13'44"N., 86°18'08"W.); 1,600-foot face; 21 to 22 feet alongside; deck height, 3 to 4 feet; open storage for 200,000 tons of materials; receipt of coal, limestone, slag, coke and liquid asphalt; owned and operated by Reith-Riley Construction Co., Inc.

(193) **Packaging Corp. of America Dock:** (44°13'10"N., 86°17'22"W.); 767-foot face, 24 feet alongside; receipt of coal; owned by Packaging Corp. of America and operated by TES Filer City Station Ltd.

Small-craft facilities

(194) A public dock constructed by the Michigan State Waterways Commission is on the south side of the Manistee River just inside the mouth. There are private marinas on the north side of the river 0.7 mile above the mouth and at the north end of Manistee Lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. The marina at the north end of Manistee Lake has a 20-ton marine railway for hull and engine repairs.

Chart 14907

(195) From Manistee south-southwest for 16 miles to Big Sable Point, the shore is bluff, with a few hills. The 18-foot contour is about 0.4 mile offshore. **Big Sable Point,** 45 miles south of Point Betsie, has a low shoreline with hills rising inland. **Big Sable Light** (44°03'28"N., 86°30'51"W.), 106 feet above the water, is shown from a conical tower, white with middle third and top black, with an attached dwelling on the point.

(196) From Big Sable Point south-southeast for 7.5 miles to Ludington, the shore is clear to within 0.5 mile. The land in this stretch is generally low, except in the vicinity of Lincoln Lake where the bluffs reach 120 to 180 feet in height. **Big Sable River,** the outlet of Hamlin Lake, flows into Lake Michigan 2 miles south of Big Sable Point. A dam crosses the river about 0.8 mile above the mouth.

Charts 14907, 14937

(197) **Ludington Harbor** is in Pere Marquette Lake, 7.5 miles south of Big Sable Point. The city of **Ludington, MI,** is on the north side of the lake.

(198) **Ludington North Breakwater Light** (43°57'13"N., 86°28'10"W.), 55 feet above the water, is shown from a white square pyramidal tower on the outer end of the north breakwater. A mariner radio activated sound signal is at the light, initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(199) A dredged entrance channel leads east from deep water in Lake Michigan between converging breakwaters to an outer harbor basin. The outer ends of the breakwaters are marked by lights. From the basin, the channel leads to the north end of Pere Marquette Lake. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The channel is protected by piers and revetments on the north and south sides. The piers are marked at their outer ends by lights.

(200) The outer basin is not adapted for anchorage of vessels, but reduces wave action in the inner harbor. Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(201) **Pere Marquette Lake** is about 2 miles long, including a marsh at the south end, has an average width of 0.5 mile, and is up to 43 feet deep. The anchorage is good. **Pere Marquette River,** which flows into the south end of Pere Marquette Lake, is not navigable above the lake except for rowboats and small launches.

(202) A buoy marks the outer end of submerged dock ruins on the west side of Pere Marquette Lake. Buoys mark the north side of the channel leading to the small-craft facilities in the inlet on the northeast side of the lake.

(203) **Caution.**—Northwest and southwest winds make entry between the breakwaters hazardous. Vessels usually increase their speed until just inside the breakwaters to compensate. Small-craft operators transiting from south to north have reported that South Breakwater Light is sometimes difficult to see because of the brilliance of North Breakwater Light.

Bridges

(204) A fixed highway bridge with a clearance of 12 feet crosses the inlet on the northeast side of Pere Marquette Lake.

Coast Guard

(205) Ludington Coast Guard Station is on the north side of the harbor entrance.

Harbor regulations

(206) A **speed limit** of 8 mph (7 knots) is enforced when entering or leaving Ludington Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(207) Ludington has one major deep-draft facility. (For complete information on the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(208) Occidental Chemical Corporation, Ludington Plant West Wharf: (43°56'28"N., 86°26'31"W.); 1,367-foot face; 23 to 27 feet alongside; deck height, 4½ feet; open storage for 500,000 tons of limestone; receipt of limestone; owned and operated by Occidental Chemical Corporation.

(209) Occidental Chemical Corporation, Ludington Plant East Wharf: (43°56'20"N., 86°26'23"W.); 550-foot face; 28 feet alongside; deck height, 4½ feet; shipment of liquid calcium chloride; owned and operated by Occidental Chemical Corporation.

Small-craft facilities

(210) A municipal marina is on the north side of Pere Marquette Lake just inside the entrance. The marina has several transient berths and provides gasoline,

diesel fuel, electricity, water, ice and a pump-out facility. A public launching ramp, protected by a rubble mound breakwater, is in the outer harbor basin just north of the north pier. A large marina is just southeast of the municipal marina with about 60 transient berths and provides gasoline, diesel fuel, electricity, water, ice and pump-out facility. Additional private marinas are along the west side of Pere Marquette Lake and in the northeast arm of the lake. All marinas monitor VHF-FM channel 9.

Ferries

(211) Ferry service is available from Ludington to Manitowoc, WI from about mid May to the end of October for autos, and passengers. The terminal is about 1 mile southeast of the harbor entrance.

Chart 14907

(212) From Ludington south for 12 miles to Pentwater, the shore is bluff, with hills reaching 150 to 250 feet high. The shoal border is regular, and there are no outlying dangers. At the Ludington Pumped Storage Hydroelectric Plant, 4 miles south of Ludington, two jetties extend from shore and are attached by log booms to a detached breakwater. These structures are marked by private lighted buoys, and navigation should not be attempted close to them. The outlet of **Bass Lake,** 8.5 miles south of Ludington, is blocked by a dam at the Lake Michigan shoreline, and its water level is about 3 feet above Low Water Datum.

(213) **Pentwater Harbor,** serving the town of **Pentwater, MI,** is in Pentwater Lake, 20 miles south of Big Sable Point. Pentwater Lake is connected to Lake Michigan by a dredged entrance channel.

Channels

(214) The dredged channel leads from deep water in Lake Michigan southeast between piers and revetments to the north end of Pentwater Lake. (See Notice to Mariners and the latest edition of the chart for controlling depths.) Currents in the channel attain velocities up to 3 mph in either direction. The outer ends of the piers are marked by lights. The north pier light has a mariner radio activated sound signal, initiated by keying the microphone five times on VHF-FM channel 83A.

(215) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(216) **Pentwater Lake,** about 2 miles long and 0.5 mile wide with depths of 25 to 50 feet, provides good anchorage. **Pentwater River,** at the head of the lake, has depths of 1 foot and is crossed by a highway bridge at the mouth.

(217) A **slow-no wake speed** is enforced in Pentwater Lake and in the entrance channel. Federal regulations specify an 8 mph (7 knots) **speed limit** for vessels over 40 feet in length. (See **33 CFR162.120,** chapter 2, for regulations.)

Small-craft facilities

(218) A municipal marina is just southeast of the entrance at about 43°46'36"N., 86°26'00"W. The marina can provide transient berths, gasoline, diesel fuel, electricity, water, ice, winter storage and a pump-out facility. A harbormaster is on duty seasonally (May-October) and monitors VHF-FM channel 9. Private marinas are in the small arm just southeast of the municipal marina. These facilities can provide transient berths, gasoline, diesel fuel, water, ice, electricity, winter storage, launching ramp and pump-out. A 35-ton marine lift is available and full repairs (hull, engine, electrical) can be made.

(219) From Pentwater Harbor, the shore trends southwest for 10 miles to Little Sable Point. This stretch is a continuous line of bluffs with a regular shoal border and several off-lying wrecks. A wreck, covered 18 feet, is 0.5 mile offshore 2 miles southwest of Pentwater Harbor, and a wreck, covered 1 foot, is close to shore 7 miles southwest of the harbor. **Little Sable Point** is a broad rounding point 28 miles south of Big Sable Point. **Little Sable Light** (43°39'09"N., 86°32'24"W.), 108 feet above the water, is shown from a conical red brick tower on the point.

Charts 14907, 14906

(220) From Little Sable Point, the shore trends south-southeast for 20 miles to White Lake. This stretch is quite rugged, with no shoals beyond 0.5 mile from shore. A wreck, covered ½ foot, is close to shore 0.8 mile south of Little Sable Light.

(221) **Stony Lake,** 6.5 miles south of Little Sable Point has its outlet into Lake Michigan through **Stony Creek.** Rows of old piles at the mouth of the creek are the only remainder of former lumber loading facilities. The creek is not navigable.

Chart 14906

(222) About 4 miles south of Stony Lake, several hills from 125 to 245 feet high are along the shore.

Charts 14906, 14935

(223) **White Lake**, about 20 miles south-southeast of Little Sable Point, is separated from Lake Michigan by a narrow strip of sandy bluffs. A dredged cut affords access between the lakes. The towns of **Montague, MI**, and **Whitehall, MI**, are at the northeast end of White Lake about 4 miles above the cut.

Channels

(224) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments to the west end of White Lake. The outer ends of the piers and the inner end of the south pier are marked by lights. The outer end of the channel between the piers is subject to extensive shoaling. (See Notice to Mariners and the latest edition of the chart for controlling depths.) Currents in the channel attain velocities up to 3 mph in either direction.

(225) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(226) In White Lake, at the inner end of the dredged channel, the channel bends southeast around the shoal off **Indian Point.** The south edge of the shoal is marked by lighted buoys. The lake has central depths of 25 to 70 feet with shoals extending as much as 0.6 mile from shore. Lighted buoys and lights at the outer edges of the shoals mark the deep water through the lake to its head. **White River** flows into the head of the lake between Montague and Whitehall. The bar at the mouth of the river has depths of 2 feet.

Anchorages

(227) The preferred anchorages in White Lake are in the northwest end of the bay in the upper part of Indian Bay in depths of 25 to 30 feet, mud bottom; in the southwest part of the lake west of the yacht club in 10 to 25 feet, sand bottom; and in the northeast end of the lake south and west of the city dock in 8 to 10 feet, mud bottom.

Bridges

(228) A fixed highway bridge and a fixed pedestrian bridge, with a reported least clearance of 4 feet, cross White River just above the mouth.

(229) A **speed limit** of 8 mph (7 knots) is enforced in White Lake. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(230) A marina developed by the Michigan State Waterways Commission is at Whitehall. Marinas here and at Montague provide transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 30 tons and a 15-ton marine railway for boats to 38 feet are available for hull, engine, and electronic repairs.

Chart 14906

(231) From White Lake, the shoreline continues south-southeast for 11 miles to Muskegon Lake. The shore consists of low sand bluffs and wooded hills, and is clear of shoals to within 0.6 mile.

Charts 14906, 14934

(232) **Muskegon Harbor**, 31 miles south-southeast of Little Sable Point, consists of Muskegon Lake and a dredged entrance channel which connects it with Lake Michigan. Facilities for a wide range of commerce are on the south shore of the harbor at the city of **Muskegon, MI**, and at its east end.

Prominent features

(233) A lighted stack of the Consumers Energy Co. at the mouth of the Muskegon River in 43°15'16"N., 86°14'23"W. is prominent from Lake Michigan. Sand-hills north and south of the harbor entrance may obstruct the stack from some directions.

(234) **Muskegon South Breakwater Light** (43°13'27"N., 86°20'49"W.) 70 feet above the water, is shown from a pyramidal tower on the outer end of the south breakwater. A mariner radio activated sound signal is at the light, initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(235) The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters to an outer basin, thence between piers and revetments to Muskegon Lake. (See Notices to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the breakwaters and piers, and the inner ends of piers, are marked by lights. A mariner radio activated sound signal is at the light on the south pier, initiated by keying the microphone five times on VHF-FM channel 83A.

(236) Currents in the channel attain velocities up to 3 mph in either direction.

(237) The outer basin is not adapted for anchorage of vessels, but reduces wave action in the entrance channel.

(238) Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap. In 2001, a rock bed was reported 30 feet north of the South Breakwater Light.

(239) **Muskegon Lake** is about 4 miles long and varies from 2 miles wide at the west end to as little as 0.6 mile in the east part. The lake has central depths of 25 to 79 feet. Near midlength of the lake, shoals marked at the outer edges by lights extend from the north and south shores and restrict the available width of deep water to 1,600 feet. There are many obstructions in the shallow parts of the lake, including cribs, pipelines, and submerged pilings and dock ruins.

(240) The North Channel of the **Muskegon River** flows into the northeast end of Muskegon Lake. The channel, at a river stage of about 2 feet above extreme low water, has depths of 2½ to 9 feet for 33 miles above the mouth to the former dam at **Newaygo, MI** Two fixed bridges, with a reported least clearance of 8 feet, cross the river about 0.3 mile and 0.4 mile above the mouth.

(241) **Bear Lake** parallels the northwest side of the northeast end of Muskegon Lake and has its outflow through a narrow channel into its north side. **North Muskegon, MI,** is the community on the peninsula between the two lakes.

Anchorage

(242) Muskegon Lake affords good anchorage, generally sand or mud bottom. Special anchorages are in the southwest part of the lake and on the south side at Muskegon. (See **33 CFR 110.1 and 110.81,** chapter 2, for limits and regulations.)

Weather, Muskegon and vicinity

(243) Muskegon, MI, is located on the east shore of Lake Michigan and in the west-central portion of the state. The location averages about three days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 81°F (27.2°C) and an average minimum of 60°F (15.6°C). January is the coolest month with an average high of 30°F (-1°C) and an average minimum of 18°F (-7.8°C). The highest temperature on record for Muskegon is 99°F (37.2°C) recorded in August 1964 and the lowest temperature on record is -15°F (-26.1°C) recorded in December 1976. About 141 days each year experience temperatures below 32°F (0°C) and an average ten days each year records temperatures below 5°F (-15°C). Every month has seen temperatures below 40°F (4.4°C) except July (extreme minimum is 41°F (5°C)) and every month except July and August has recorded temperatures below freezing (0°C).

(244) The average annual precipitation for Muskegon is 32.56 inches (827 mm) which is fairly evenly distributed throughout the year. Precipitation falls on about 208 days each year. The wettest month is September with 3.32 inches (84 mm) and the driest, February, averages only 1.65 inches (42 mm). An average of 35 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 93 days each year and averages about 104 inches (2642 mm) each year. January averages nearly 34 inches (864 mm) per year while December averages nearly 27 inches (686 mm) each year. One-foot (305 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About 24 days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June, July, and August. Fog is present on average 140 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer and early autumn.

(245) The prevailing wind direction in Muskegon is the west-northwest. Late winter through spring is the windiest period but a maximum gust of 58 knots occurred in February 1987.

(246) (See Appendix B for **Muskegon climatological table.**)

Quarantine, customs, immigration, and agricultural quarantine.

(247) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(248) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(249) Muskegon is a **customs port of entry**.

Coast Guard

(250) **Muskegon Coast Guard Station** is on the south side of the entrance channel, about 0.2 mile inside the south pier.

Harbor regulations

(251) A **speed limit** of 8 mph is enforced in Muskegon Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) A **slow-no wake speed** is enforced in the Bear Lake entrance channel.

Wharves

(252) Muskegon has numerous deep-draft facilities along the south shore of Muskegon Lake. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(253) **Stoneco, a division of Great Lakes Dock and Materials Co. Pier:** (43°13'17"N., 86°17'24"W.); 400-foot north side, 900-foot east side; 45 feet alongside north side and 28 feet alongside east side; deck height, 9 feet; open storage for 250,000 tons of bulk materials; receipt of dry bulk commodities, including limestone, slag, salt, coal, and coke; operated by Great Lakes Dock and Materials Co.

(254) **Lafarge Corp., Muskegon Terminal Pier:** (43°14'04"N., 86°15'43"W.); 529-foot face, 900 feet with dolphins; 19 to 22 feet alongside: deck height, 6 feet; pneumatic pipelines extend to storage silos, nominal rate of delivery, 400-600 tons per hours; storage silos for 13,800 tons of cement; receipt of bulk cement; owned and operated by Lafarge Corp.

(255) **West Michigan Dock & Market Corp., Outer Dock, Berths Nos. 3, 4 and 5:** (43°14'16"N., 86°15'39"W.); 1,350 feet of berthing space; 21 to 25 feet alongside; deck heights, 6 and 5 feet; 40,000 square feet covered storage; 5.3 acres open storage; 15-ton gantry crane; receipt of limestone, pig iron, and other dry bulk commodities;

shipment of scrap metal; owned and operated by West Michigan Dock & Market Corp.

(256) **West Michigan Dock & Market Corp., Upper Dock, Berths Nos. 6 and 7:** (43°14'19"N., 86°15'31"W.); 784-foot face; 25 feet alongside; deck height, 6 feet; 72,000 square feet covered storage; receipt of limestone, pig iron, and miscellaneous dry bulk materials; owned and operated by West Michigan Dock & Market Corp.

(257) **Verplank Dock Co., Salt Dock:** (43°14'36"N., 86°14'55"W.); 1,200 feet of natural and improved bank; 18-21 feet alongside; deck height, 8 feet; open storage for 250,000 tons of salt; owned and operated by Verplank Coal and Dock Co.

(258) **Verplank Dock Co.:** (43°15'09"N., 86°14'38"W.); 1,200 feet of natural bank; 28 feet alongside; bank height, 4 feet; open storage for 200,000 tons of material; receipt of limestone and slag; owned by Consumers Energy and operated by Verplank Coal and Dock Co.

(259) **Consumers Energy Co., B.C. Cobb Plant Wharf:** (43°15'08"N., 86°14'47"W.); 1,800 feet of berthing space along dolphins; 30 feet alongside; deck height, 8½ feet; receiving hopper served by electric belt conveyor extending to stacker, rate 4,000 tons per hour; 22 acres open storage; receipt of coal for plant consumption; owned and operated by Consumers Energy Co.

Small-craft facilities

(260) A public docking facility is available mid-length of the south lakeshore at the Hartshorn Marina (43°13'48"N., 86°15'54"W.), jointly constructed by the city and the Michigan State Waterways Commission. Several private marinas are along the south shore of Muskegon Lake and can provide: transient berths, gasoline, diesel fuel, marine supplies, sewage pump-out, complete vessel repair, and hoists to 110 tons. A private marina is on the north shore at the outlet of Bear Lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A 30-ton mobile hoist is available for engine repairs, and limited hull and electronic repairs.

Ferries

(261) A ferry which carries passengers and/or vehicles operates between Muskegon and Milwaukee, WI from a terminal on the south side of Muskegon Lake, just north of a marina, in about 43°13'10"N., 86°17'30"W.

Communications

(262) Muskegon has good highway and rail connections. The city is served by Muskegon County Airport south of the city.

Chart 14906

(263) From Muskegon, the shore extends south-southeast for 12.5 miles to Grand Haven. The north 5 miles of this reach has hills to 205 feet high; the remainder of the stretch is lower. Deep water is about 0.5 mile offshore. Two unmarked fish havens are about 0.5 mile south of the Muskegon Harbor entrance.

(264) **Mona Lake,** a small body of water 4.8 miles south of Muskegon, has several summer resorts and is used by small recreational craft. This narrow lake is about 3.5 miles long with general depths of 18 to 40 feet. It empties into Lake Michigan through a slightly winding channel at the west end. In 1971, the controlling depth in the channel was 3 feet, but it is at times entirely closed by sandbars. The ruins of two piers protect the entrance. The north pier is almost entirely washed away, and the south pier is gone except for a double row of piles extending from a point 50 feet out in the lake to a point about 450 feet inside. The banks rise steeply from each shore.

(265) A highway bridge with a 29-foot draw span and a clearance of 12 feet crosses the inner end of the entrance channel. In 1978, it was reported that the bridge was being maintained in the closed position. A fixed highway bridge with a clearance of 18 feet crosses the lake 1.5 miles farther east.

(266) A **slow-no wake speed** is enforced in Mona Lake. A restricted navigation area for motorboats is within 100 feet of shore for 1,025 feet east of the west bridge.

Charts 14906, 14933

(267) **Grand Haven, MI**, is a city and harbor on the **Grand River,** 43 miles south of Little Sable Point. The towns of **Ferrysburg, MI,** and **Spring Lake, MI,** front the north side of the river. These communities are not visible from Lake Michigan because of sand dunes and hills immediately north and south of the harbor entrance. The principal commodities handled in the port are coal and sand.

(268) **Grand Haven South Pierhead Entrance Light** (43°03'25"N., 86°15'21"W.) 42 feet above the water, is shown from a red building on the outer end of the south pier. A mariner radio activated sound signal is at the light, initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(269) The dredged entrance channel leads east from deep water in Lake Michigan between parallel piers at the mouth of Grand River and upstream for about 16 miles. The outer ends of the piers are marked by lights. South Pierhead Entrance Light and an inner light on the south pier form a range useful for approaching the harbor. There is a turning basin on the south side of the channel 2.3 miles above the mouth.

Grand Haven, Michigan
Image courtesy of Photography Plus/Marge Beaver (1993)

(270) A Federal project provides for a depth of 23 feet in the entrance channel and between the piers to about 1,000 feet inside the pier ends, thence 21 feet in the river channel to the railroad bridge at Ferrysburg, thence 18 feet in the channel to Spring Lake and 8 feet in the river channel from the entrance of Spring Lake, 14½ miles upstream to the head of the project. The turning basin, 2.3 miles above the mouth, has a project depth of 18 feet. (See Notice to Mariners and latest edition of the chart for controlling depths.)

(271) Large riprap stones have been placed along the lakesides and ends of the piers, and navigation should not be attempted close to these structures. Mooring to the piers or revetments is prohibited.

(272) The Grand River is not maintained above the junction with Bass River. Conditions are unknown, but depths probably do not exceed 2 to 3 feet at extreme low water for 23.5 miles upstream to Grand Rapids. Only small recreational craft navigate this section of the river.

(273) The lower part of Grand River has connecting shallow side channels separated from the main river by low marshy islands. Several connected bayous, or bays, have very shallow entrances with deep water inside. **South Channel,** the farthest downstream of the side channels, cuts across a bend in the river between points about 1.2 and 3.3 miles above the mouth and has a controlling depth of 3 feet.

(274) **Spring Lake,** extending north and connected to the Grand River at Ferrysburg, has depths of 19 to 42 feet except for shoaler depths at its head.

(275) **Danger**.—The J.B. Sims Power Plant is on Harbor Island. Intake pipes on the west side of the island in the intake mode pose no threat to watercraft. The intakes have a compressed air blowback system to clear the screens. This blowback is capable of capsizing a small recreational vessel. The area is surrounded by rope barriers and is marked by signs.

Currents

(276) High-water periods on the Grand River are usually for two months during the spring. During these periods, currents may reach 3 to 5 mph. Currents up to 5 mph should be expected after periods of heavy precipitation, regardless of season.

Quarantine, customs, immigration, and agricultural quarantine

(277) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(278) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(279) Grand Haven is a **customs station.**

Structures across Grand River to Bass River						
	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
	Main Channel					
1	CSX Railroad Bridge (swing)	43°04'33"N., 86°13'11"W.	1.38	60 (right) 61 (left)	9	Note 1
2	U.S. Route 31 Bridge (bascule)	43°04'31"N., 86°13'04"W.	2.89	155	25	Note 1
3	Overhead power cable	43°04'31"N., 86°13'02"W.	2.94		134	
4	Overhead power cable	43°02'57"N., 86°09'38"W.	6.45		90	
5	Overhead power cable	43°02'26"N., 86°04'55"W.	12.60		80	
	South Channel					
6	Overhead cable	43°04'12"N., 86°13'37"W.	1.83	N/A	N/A	Clearance data not available
7	Third Street Bridge (fixed)	43°04'12"N., 86°13'36"W.	1.84	23	9	
8	Overhead cable	43°04'12"N., 86°13'35"W.	1.85	N/A	N/A	Clearance data not available
9	Overhead cable	43°04'13"N., 86°13'33"W.	1.92	N/A	N/A	Clearance data not available
10	Overhead cable	43°04'14"N., 86°13'27"W.	2.00	N/A	N/A	Clearance data not available
11	CSX Railroad Bridge (fixed)	43°04'14"N., 86°13'26"W.	2.01	N/A	9	
12	Overhead cables	43°04'12"N., 86°13'17"W.	2.16	N/A	N/A	Clearance data not available
13	U.S. Route 31 Bridge (fixed)	43°04'12"N., 86°13'10"W.	2.25	N/A	17	
14	Overhead power cable	43°04'12"N., 86°13'09"W.	2.26		49	
15	Overhead cable	43°04'12"N., 86°13'05"W.	2.32	N/A	N/A	Clearance data not available
	Spring Lake Channel					
16	Route 104 Bridge (fixed)	43°04'35"N., 86°12'51"W.	3.15	111	35	
17	Overhead power cable	43°04'38"N., 86°12'50"W.	3.21		113	

* Miles above South Pierhead Entrance Light
**Clear width proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.59 and 117.633, chapter 2, for drawbridge regulations.

Coast Guard

(280) **Grand Haven Coast Guard Station** and a **Sector Field Office** are on the south side of the harbor entrance. (See Appendix A for address of the Detachment.)

Harbor regulations

(281) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Grand Haven harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(282) State regulations specify a **slow-no wake speed** on the following waters:

Grand River:

(283) – from the mouth to the junction with South Channel,

(284) – from 3,200 feet below to 1,000 feet above the CSX railroad bridge,

(285) – within 200 feet of the north shore from the junction with Spring Lake east for 4,000 feet,

(286) – within 300 feet of the south shore from the junction with Spring Lake to the upper junction with South Channel,

(287) – from the confluence with Indian Channel upstream for 3,500 feet,

(288) – in the river bend in the vicinity of Millhouse Bayou, and

(289) – for a stretch of 4,000 feet in the vicinity of Grand Valley Marina about 12 miles above the river mouth in South Channel

(290) **Pottawattomie Bayou**

(291) **Millhouse Bayou**

(292) **Spring Lake (entrance)**

(293) **Spring Lake**

(294) – adjacent to the towns of Ferrysburg and Spring Lake for vessels 26 feet in length or more, and within 200 feet of shore of these towns for vessels less than 26 feet in length

(295) **Smith Bayou**

(296) **Pettys Bayou**

(297) **Cornelius Bayou**

(298) **Stahl Bayou**

(299) Local harbor regulations are under the control of the city manager and enforced by the **harbormaster.** Copies of the regulations can be obtained from the City Manager, City Hall, 519 Washington Street, Grand Haven, MI 49417.

Wharves

(300) Grand Haven has several deep-draft facilities in the lower 2 miles of Grand River. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(301) **J.B. Sims Power Plant Dock:** east side of river just above junction with South Channel; 437-foot face; 17 feet alongside; deck height, 6 feet; open storage for 70,000 tons of coal; receipt of coal; owned and operated by City of Grand Haven, Board of Light and Power.

(302) **Construction Aggregates Corp. Wharf:** west side of river 0.5 mile above South Channel; 350 feet of berthing space along dolphins; 20 feet alongside; deck height, 7 feet; vessel loading conveyor, rate 3,200 tons per hour; shipment of sand; owned and operated by Construction Aggregates Corp.

(303) **Verplanks Coal and Dock Co. Wharf:** north side of river 0.5 mile above Construction Aggregates Corp. Wharf; 2,200 feet of natural and improved bank; 21 feet alongside; deck height, 4 feet; open storage for 200,000 tons of material; receipt of coal and bulk aggregates; owned by Verplanks Coal and Dock Co. and operated by Verplanks Coal and Dock Co. and Grand Haven Materials Terminal.

Small-craft facilities

(304) Grand Haven has numerous small-craft facilities along both sides of Grand River, in South Channel, and in Spring Lake. The public docking facility, constructed by the city and the Michigan State Waterways Commission, is on the east side of the river just below the junction with South Channel. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, launching ramps, and harbormaster services are available in the harbor. The harbormaster monitors VHF-FM channels 16 and 9. Lifts to 50 tons are available for hull and engine repairs.

Chart 14906

(305) From Grand Haven, the shore trends south for 11 miles to Port Sheldon. This stretch is partially wooded with rolling terrain and several hills in the north part 140 to 200 feet high. There is deep water within 0.5 mile of the shore.

(306) **Port Sheldon** is a small harbor in **Pigeon Lake** 55 miles south of Little Sable Point. Pigeon Lake is connected to Lake Michigan by a entrance channel constructed by Consumers Energy Co. The channel is protected by two piers, each marked at the outer end by a private light. The primary purpose of the channel is to provide cooling water for the powerplant on the north side of the lake. Mariners entering the harbor do so at their own risk and are requested not to dispose of waste in Pigeon Lake. A **slow-no wake speed** is enforced in the lake. A 650-foot white stack and a lighted 400-foot red and white banded stack at the Consumers Energy Co. on the north side of Pigeon Lake are prominent.

(307) From Port Sheldon, the shore trends south for 8.8 miles to the Holland Harbor entrance. Sand bluffs are close to shore, and deep water is within 0.5 mile of shore.

Charts 14906, 14932

(308) **Holland Harbor**, 63 miles south of Little Sable Point, is formed by **Lake Macatawa,** which is connected to Lake Michigan at its west end by an improved channel. The lake extends 5 miles east to its head at the mouth of **Macatawa River** and has a least width of 1,000 feet near its midlength. The width increases to over 1 mile in the vicinity of **Big Bay** and **Pine Creek Bay,** two large indentations in the north shore of the lake. The city of **Holland, MI,** fronts the east shore and much of the south shore of the lake. **Macatawa, MI,** is a small resort community on the southwest side of the lake. The principal commodities handled in the port are coal, salt, cement, stone, and agricultural chemicals.

(309) **Holland Harbor South Pierhead Light** (42°46'22"N., 86°12'45"W.), 52 feet above the water, is shown from a square tower on a building on the outer end of the south pier.

Channels

(310) The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters and through an outer basin and revetted channel to Lake Macatawa. The outer and inner ends of the breakwaters are marked by lights. The channel, well marked by buoys, continues across the lake to a turning basin off Holland at the east end of the lake. From the northeast side of the basin, the channel leads into the mouth of Macatawa River. (See Notice to Mariners and the latest edition of the chart for controlling depths.) Lights mark the outer edges of shoals that extend from shore into the lake.

(311) The currents in the entrance channel attain velocities up to 3 mph in either direction. Mooring to the breakwaters and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(312) Outside the dredged channel, the west end of Lake Macatawa has central depths of 15 to 36 feet with much shoaler water extending from shore. In the east end of the lake, depths are 7 to 16 feet with shoals along the shore. Shoals with depths of 1 to 3 feet extend from shore on either side of the entrance to Big Bay. The south limit of the east shoal is marked by a light. Lighted and unlighted seasonal buoys mark the channel into Big Bay between the shoals. A light marks the extent of a

shoal off the south shore opposite Big Bay, and a light marks a shoal off Superior Point, on the north shore at the constriction of the lake.

Anchorage

(313) Pine Creek Bay affords good anchorage for small craft in mud bottom. A special anchorage is in the southwest part of Lake Macatawa. (See **33 CFR 110.1 and 110.80a,** chapter 2, for limits and regulations.)

Coast Guard

(314) **Holland Coast Guard Station** is on the north side of Lake Macatawa near the harbor entrance.

Harbor regulations

(315) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Lake Macatawa. (See **33 CFR 162.120,** chapter 2, for regulations.) State regulations specify a **slow-no wake speed** off Central Park near midpoint of the lake, off Kollen Park at the east end of the lake, and from the mouth of Macatawa River upstream to a point 1,500 feet above the River Avenue bridge.

Towage

(316) Tugs for Holland are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(317) Holland has several deep-draft facilities. The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(318) **Verplank Dock Co., Holland Dock:** (42°47'27"N., 86°07'08"W.); 760-foot face with slip; 21 feet alongside; deck height, 4 to 5 feet; open storage for 75,000 tons of limestone; water and electrical connections; receipt of limestone; owned and operated by Verplank Dock Co.

(319) **Macatawa Bay Dock and Terminal Co. Wharf:** immediately northeast of Verplank Dock Co., Holland Dock; 855-foot face; 22 feet alongside; deck height, 6 feet; two 50-ton crawler cranes and four 15-ton cranes; open storage for 200,000 tons of scrap metal; water connections; receipt of pig iron, shipment of scrap metal; owned by Bay Side Land Co., and operated by Macatawa Bay Dock and Terminal Co.

(320) **James DeYoung Generating Plant Dock:** northeast of Macatawa Bay Dock and Terminal Co. Wharf; 1,000-foot face; 21 to 22 feet alongside; deck height, 5 feet; open storage for 160,000 tons of coal; receipt of coal; owned and operated by City of Holland, Board of Public Works.

(321) **Brewers City Dock:** northeast of James DeYoung Generating Plant Dock; 850-foot face; 22 feet alongside; 120,000 tons of open storage; receipt of limestone aggregate and occasionally salt; owned and operated by Brewers City Dock, Inc.

Small-craft facilities

(322) There are numerous marinas throughout Lake Macatawa. Gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, and launching ramps are available. Several lifts to 60 tons are available for hull, engine, and electronic repairs.

Chart 14906

(323) From Holland Harbor south for 7 miles to the mouth of the Kalamazoo River, the shore is low bluffs and occasional hills 100 to 250 feet high. Deep water is within 0.5 mile of shore. A sunken barge and crane is in 35 feet of water 0.6 mile offshore 3.8 miles south of Holland. Depth over the wreck is unknown.

(324) **Saugatuck Harbor**, 70 miles south of Little Sable Point, is formed by a dredged entrance channel and the lower part of the **Kalamazoo River**. The dredged entrance is 0.75 mile north of the original natural river mouth. A radar dome on Mount Baldhead, about 1 mile south of the entrance, is prominent.

Channels

(325) In its lower 2 miles, the Kalamazoo River is from 200 to 500 feet wide. For the next 0.75 mile, the river widens to 2,000 feet and is known as **Kalamazoo Lake**. At the upper end of the lake, the river narrows again to 500 feet. The village of **Saugatuck, MI**, is on the north side of Kalamazoo Lake and the east side of the river below the lake. **Douglas, MI**, is a village on the south side of the lake.

(326) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments through the mouth of Kalamazoo River and thence upstream for about 2.1 miles to Saugatuck at the north end of Kalamazoo Lake. (See Notice to Mariners and latest edition of the chart for controlling depths.) The outer ends of the piers are marked by lights, and the channel is marked by buoys. A mariner radio activated sound signal is at the outer end of the south pier, initiated by keying the microphone five times on VHF-FM channel 83A. Mooring to the piers and revetments is prohibited.

(327) From Saugatuck to Calkins, about 24 miles upstream, the river is from 100 to 150 feet wide and affords, at low water, a narrow and crooked channel for boats drawing not more than 2½ feet. The Allegan Dam at Calkins, does not have a lock, and boats must be portaged around it. The pool above the dam extends to Allegan and has a controlling depth of about 5 feet.

(328) **Caution**.—Submerged pilings of the old piers at the former entrance of the river extend into the lake about 200 feet. Navigation should not be attempted close to these structures.

Bridges

(329) The Saugatuck-Douglas Bridge crosses the Kalamazoo River at the southeast end of Kalamazoo Lake. The bridge has a fixed span with a vertical clearance of 17 feet and a horizontal clearance of 58 feet in both the right and left channel openings. Overhead power cables just northwest of the bridge have a least clearance of 25 feet.

Harbor regulations

(330) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Saugatuck Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) State regulations specify a **slow-no wake speed** from the river mouth upstream to Kalamazoo Lake.

Small-craft facilities

(331) There are several marinas at Saugatuck and at Douglas. Gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, and launching ramps are available. Hoists to 30 tons can handle 60-foot craft for hull and engine repairs.

Cable ferry

(332) A cable ferry crossing the Kalamazoo River 2 miles above the mouth is propelled by hauling a submerged chain which is worked around a hand capstan on the ferry. Vessels should avoid passing within 30 feet of the bow or stern of the ferry. Passage on its stern is preferred.

(333) From Saugatuck Harbor for 19 miles south to South Haven, the shore is generally bluff with some steep clay banks. A boulder ledge with depths of 24 to 28 feet at the outer edge extends 1 mile offshore from 1.5 to 3.5 miles south of Saugatuck Harbor entrance. south of this area, deep water is within 0.6 mile of shore, but scattered boulders are throughout the stretch, and small craft should keep well clear of the shore.

(334) **South Haven, MI,** is a city and harbor at the mouth of the **Black River,** 88 miles south of Little Sable Point. The harbor is a base for recreational craft and local fish tugs. Two lighted radio masts 1 mile northeast of the river mouth are prominent.

(335) **South Haven South Pierhead Light** (42°24'05"N., 86°17'17"W.) 37 feet above the water, is shown from a red conical tower on the outer end of the south pier. A mariner radio activatied sound signal is at the light, initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(336) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of the Black River. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the piers are marked by lights. Mooring to the piers and revetments is prohibited. Above the dredged channel, the Black River is navigable by small craft to the vicinity of the fixed highway bridge about 2.6 miles above the entrance.

Currents

(337) Currents in the river attain velocities up to 3 mph.

Bridges

(338) A bascule highway bridge with a clearance of 10 feet crosses Black River just above the head of the dredged channel. (See **117.1 through 117.59 and 117.624**, chapter 2, for drawbridge regulations.) An overhead cable with unknown clearance crosses the river 1.9 miles above the entrance. Fixed highway bridges about 2.2 and 2.6 miles above the entrance have clearances of 14 and 36 feet, respectively.

Coast Guard

(339) **South Haven Coast Guard Station,** operated on weekends during the boating season only, is on the north side about 1,100 yards east of the entrance to Black River. A radio guard is usually maintained during daylight hours on holidays and weekends.

Harbor regulations

(340) Federal regulations specify a **speed limit** of 8 mph (7 knots) in South Haven harbor. (See **33 CFR** 162.120, chapter 2, for regulations.) A **slow-no wake speed** is enforced in the harbor.

Small-craft facilities

(341) A public docking facility constructed by the city and the Michigan State Waterways Commission is on the north side of the river 0.5 mile above the mouth. A private marina is adjacent to the public dock and several marinas are above the Dyckman Avenue bridge. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A 25-ton hoist is available for engine repairs and hull and electronic repairs are available from local firms.

Chart 14905

(342) From South Haven south-southwest for 22 miles to St. Joseph and Benton Harbor, the shore is skirted by low bluffs for the first 5 miles and higher bluffs in the remainder of the stretch. Deep water is within 0.5 mile of shore. The Palisades Nuclear Power Plant, 6 miles south-southwest of South Haven, is prominent. A **security zone** has been established in the waters of Lake Michigan off the Palisades Nuclear Power Plant. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.)

Structures across St. Joseph River to Paw Paw River						
	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
	Main Channel					
1	CSX Railroad Bridge (swing)	42°06'44"N., 86°28'58"W.	0.67	91 (right) 100 (left)	12	Note 1
2	Blossomland/M-63 Bridge (bascule)	42°06'44"N., 86°28'41"W.	0.92	100	36	Note 2
3	Overhead cable	42°06'43"N., 86°28'17"W.	1.27		67	
4	Twin Cities Bicentennial Bridge (bascule)	42°06'42"N., 86°28'16"W.	1.30	100	19	Note 2
5	Overhead power cable	42°06'35"N., 86°28'03"W.	1.52		76	
6	Napier Avenue Bridge (fixed)	42°05'19"N., 86°28'30"W.	3.11	166	28	
	Morrison Channel					
7	Overhead power cable	42°06'34"N., 86°28'29"W.	1.17		57	
8	Wayne Street Bridge (fixed)	42°06'34"N., 86°28'29"W.	1.19	90	36	
9	Overhead power cable	42°06'19"N., 86°28'26"W.	1.46		56	
10	Overhead power cable	42°06'05"N., 86°28'19"W.	1.76		57	
11	Overhead power cable	42°05'57"N., 86°28'18"W.	1.92		63	
	Paw Paw River					
12	Edgewater Drive Bridge (fixed)	42°06'58"N., 86°28'07"W.	1.49	136	9	Clearances are reported
13	Overhead power cable	42°06'58"N., 86°28'07"W.	1.49		31	
14	Overhead cable	42°06'59"N., 86°28'07"W.	1.50		N/A	Clearance data not available
15	CSX Railroad Bridge (fixed)	42°07'00"N., 86°28'08"W.	1.51	45	6	
16	Overhead power cables	42°07'00"N., 86°28'07"W.	1.52		38	
17	Overhead power/telephone cables	42°07'22"N., 86°27'52"W.	2.02		27	
18	Klock Road Bridge (fixed)	42°07'24"N., 86°27'51"W.	2.05	53	9	
19	North Shore Road Bridge (fixed)	42°07'31"N., 86°27'19"W.	2.57	174	8	
20	Overhead cable	42°07'32"N., 86°27'18"W.	2.58		N/A	Clearance data not available
21	Paw Paw Avenue Bridge (fixed)	42°07'31"N., 86°26'54"W.	3.15	45	11	
22	Overhead cable	42°07'31"N., 86°26'54"W.	3.15		N/A	Clearance data not available
23	Overhead cable	42°07'30"N., 86°26'53"W.	3.17		N/A	Clearance data not available
24	CSX Railroad Bridge (fixed)	42°07'30"N., 86°26'52"W.	3.18		8	
25	Overhead cable	42°07'31"N., 86°26'51"W.	3.19		N/A	Clearance data not available

* Miles above North Pierhead Light
** Clear width proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 2 – See 33 CFR 117.1 through 117.59 and 117.651, chapter 2, for drawbridge regulations.

Charts 14905, 14930

(343) The **St. Joseph River** flows into Lake Michigan 22 miles south-southwest of South Haven and 107 miles south of Little Sable Point. The port cities of **St. Joseph, MI,** and **Benton Harbor, MI,** are on the west and east sides of the river, respectively. The principal commodities handled in the harbor are gravel and cement.

Prominent features

(344) A blue cupola about 0.8 mile east-southeast of St. Joseph North Pierhead Light and a lighted white tank with St. Joseph written on it, 1,100 feet north-northeast of the cupola, are prominent.

(345) **St. Joseph North Pierhead Light** (42°06'55"N., 86°29'44"W.) 31 feet above the water, is shown from a white cylindrical tower on the outer end of the south pier. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(346) A dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of St. Joseph River upstream for about 1 mile to the junction with **Paw Paw River.** The outer ends of the piers are marked by lights and the north pier has an inner light. The Federal project depths for the dredged channels in the harbor are 21 feet in the entrance and through the harbor to the junction with the Paw Paw River, thence 18 feet in the remainder of the channel to the head of the project at Riverview Drive. Turning

basins on the north side of the channel just below the junction with the Paw Paw River and on the southeast side of the channel below the Twin Cities Bicentennial Bridge have project depths of 18 feet. (See Notice to Mariners and latest edition of charts for controlling depths.)

(347) Currents in the river attain velocities up to 3 mph.

(348) Navigation should not be attempted close to the piers due to stone riprap. Mooring to the piers and revetments is prohibited.

(349) Above the dredged channel, the St. Joseph River turns south and flows between St. Joseph on the west bank and the city of Benton Harbor on the east bank. In 1980, this reach had depths of 6 to 20 feet in the best channel, generally near the east bank. Small islands near midstream in this reach are sometimes submerged during high water conditions. Depths of 2 to 3 feet can be carried for about 7 miles above St. Joseph. The river is obstructed by dams at Berrien Springs, about 22 miles above St. Joseph.

(350) **Morrison Channel** cuts across the south turn in the St. Joseph River leaving the river about 1 mile above the pierheads and rejoining it about 2.5 miles above the pierheads. The channel is separated from the river channel by **Marina Island.** In 1971, Morrison Channel had a centerline controlling depth of 6 feet.

(351) Above the dredged channel in the Paw Paw River, the crooked channel is navigable by small craft for about 2 miles to the Paw Paw Avenue bridge. In 1968, the centerline controlling depth was 1 foot.

Coast Guard

(352) **St. Joseph Coast Guard Station**, marked by a light, is near the inner end of the north pier.

Towage

(353) Tugs are available from Sault Ste. Marie, Chicago, and Milwaukee. (See Towage under these sections.)

Harbor regulations

(354) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(355) Harbor regulations for the city of St. Joseph are enforced by the **harbormaster** and copies may be obtained from City Manager, City Hall, City of St. Joseph, St. Joseph, MI 49085.

(356) Harbor regulations for the city of Benton Harbor are enforced by the **harbormaster,** who is the chief of police. Copies of the regulations may be obtained from the Chief of Police, 200 Wall Street, Benton Harbor, MI 49022.

Wharves

(357) St. Joseph and Benton Harbor have several deep-draft facilities along the dredged section of the St. Joseph River. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(358) **Lafarge Corp. Dock:** north side of river just above CSX railroad bridge; 560-foot face; 10 to 25 feet alongside; deck height, 5 feet; vessels unload through a 10-inch pipeline; water connections; receipt of cement; owned and operated by Lafarge Corp.

(359) **McCoy Concrete Dock:** south side of river 300 feet below Main Street/Interstate 94 bridge; 800-foot face; 19 feet alongside; deck height, 4 feet; open storage for 140,000 tons of stone and 40,000 tons of salt; receipt of limestone and salt; owned and operated by McCoy Concrete, Inc.

(360) **Consumers Asphalt Co. Dock:** (42°06'47"N., 86°28'16"W.); 700-foot face; 21 feet alongside; deck height, 5 feet; open storage for 6,000 tons of stone; receipt of limestone and salt; owned and operated by Consumers Asphalt Co.

Small-craft facilities

(361) A public docking facility developed by the Michigan State Waterways Commission is just east of the Coast Guard Station. Transient berths, water, electricity, sewage pump-out, and harbormaster services are available. Several privately operated marinas are in the river and in Morrison Canal.

Chart 14905

(362) From the mouth of St. Joseph River, the shoreline trends south-southwest, thence southwest, for about 35 miles to Michigan City. The shore in this stretch is a moderate bluff for the first 7 miles, thence a range of 200- to 400-foot hills for next 8 miles, and thence low bluffs for the next 20 miles to Michigan City. Deep water is within 0.6 mile of shore. The Donald C. Cook Nuclear Plant, 10 miles south-southwest of St. Joseph, is prominent. A security zone has been established in the waters of Lake Michigan off the Donald C. Cook Nuclear Plant. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33 and 165.910**, chapter 2 for limits and regulations.)

(363) **New Buffalo, MI,** is a small-craft harbor about 25 miles southwest of St. Joseph and about 10 miles northeast of Michigan City.

Channels

(364) A dredged entrance channel leads east from deep water in Lake Michigan between converging breakwaters, thence southeast to the head of the project at the Whittaker Street Bridge across the **Galien River**. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the breakwaters are marked by lights.

(365) The outer basin enclosed by the breakwaters has an area of about 6 acres; it is not adapted for anchorage of vessels, but reduces wave action in the lower section

Structures across Trail Creek

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
1	Franklin Street Bridge (bascule)	41°43'22"N., 86°54'16"W.	0.50	120	17	Note 1
2	Amtrack Bridge (swing)	41°43'22"N., 86°53'53"W.	0.85	41 (right) 44 (left)	7	Note 2
3	Second Street/U.S. 12 Bridge (fixed)	41°43'16"N., 86°53'47"W.	1.00	120	46	
4	Sixth Street Bridge (bascule)	41°43'07"N., 86°53'39"W.	1.19	69	10	Note 1
5	Overhead cable	41°43'02"N., 86°53'33"W.	1.33		N/A	Clearance data not available
6	Overhead cable	41°43'01"N., 86°53'24"W.	1.48		N/A	Clearance data not available
7	E Street Bridge (fixed)	41°43'02"N., 86°53'21"W.	1.49	N/A	N/A	Head of navigation

* Miles above West Pierhead Light
** Clear width proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 2 – See 33 CFR 117.1 through 117.59 and 117.401, chapter 2, for drawbridge regulations.

of the river. Mooring to the breakwaters is prohibited. Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

Small-craft facilities

(366) The harbor was developed by the Michigan State Waterways Commission. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps are available. Hoists to 30 tons are available for complete marine repairs.

(367) The **State boundary** between Michigan and Indiana is about 4.5 miles southwest of New Buffalo entrance. **Central Standard Time** is observed on the lakeshore areas of Indiana and in the States of Illinois and Wisconsin.

Charts 14905, 14926

(368) **Michigan City, IN** is a small-craft and fishing harbor at the mouth of **Trail Creek,** 35 miles south-southwest of St. Joseph and 38 miles southeast of the mouth of the Chicago River.

Prominent features

(369) A cooling tower and the tallest of four stacks, south and south-southeast of the harbor entrance respectively, are prominent.

(370) **Michigan City East Pierhead Light** (41°43'44"N., 86°54'42"W.), 55 feet above the water, is shown from a white octagonal tower with a red roof attached to a building on the outer end of the east pier. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(371) The entrance to Trail Creek is protected on the west by a detached breakwater. A dredged entrance channel leads south from deep water in Lake Michigan past the east end of the breakwater, turns southeast, then south again between two piers at the mouth of the creek. The ends of the detached breakwater and the outer ends of the piers are marked by lights. Inside the creek, the channel leads upstream for about 1.3 miles to the E Street bridge. Turning basins are in the channel bend below the Franklin Street bridge and on the southwest side of the channel in Trail Creek just above the Second Street bridge. A small-craft basin, on the northeast side of the entrance channel, is entered through a cut in the east pier. (See Notice to Mariners and the latest edition fo the chart for controlling depths.)

(372) The piers and breakwaters are riprapped with large stones on all water sides. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(373) **Caution.**—Strong north-northwest winds may cause large swells in the outer harbor and the entrance channel. Under heavy sea conditions, small craft are advised to use extreme caution when transiting this area.

Coast Guard

(374) **Michigan City Coast Guard Station** is on the east side of the harbor entrance.

Harbor regulations

(375) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local regulations have been established by the city of Michigan City and are enforced by the **harbormaster.** Copies of regulations may be obtained from the harbormaster's office at Washington Park Marina, just east of the Coast Guard Station.

Small-craft facilities

(376) The municipal marina on the east side of the entrance channel provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and launching ramps. Marine supplies and hoists to 50 tons for hull, engine, and electronic repairs are available at several marinas in the lower mile of Trail Creek.

(377) From Michigan City southwest for about 23 miles to Gary, the shore is bordered by 100- to 200-foot hills, and deep water is within 0.5 mile. An obstruction, covered ½ foot, is close to shore 1.5 miles southwest of the mouth of Trail Creek.

(378) The south end of Lake Michigan is fully exposed to storms from the north, the fetch being about 300 miles. All severe storms from northwest to northest create hazardous conditions, including powerful and dangerous seas, and strong currents running east to west or west to east, depending on the prevailing winds. An added unfavorable condition is found in the sandy nature and gentle slope of the lake bottom, depths of 70 feet occurring 8 to 10 miles from shore.

(379) **Indiana Dunes National Lakeshore** is at the south end of Lake Michigan, generally between Michigan City and Gary, Indiana. The Lakeshore was authorized in 1966 and formally established within the National Park Service in 1972. Rules and regulations in **36 CFR 31** and Indiana State laws governing the Lakeshore area are enforced by National Park Service personnel on Federally owned lands. Copies of the Federal Regulations are generally available in major libraries.

(380) The National Park Service does not provide facilities for boaters. Although the land acquisition program is nearly complete, not all sections of land to be included in the Park have actually been acquired to date. All mariners are advised that portions of the shore area remain as private property and occupancy in any manner may constitute trespassing on private property.

(381) Certain portions of the shore have been designated as swimming beaches; these areas are closed to boats and are marked by buoys during the swimming season.

(382) **Burns International Harbor**, 14 miles southwest of Michigan City, is an artificial harbor formed by a breakwater extending lakeward from the shore and turning east to enclose a harbor basin and two dredged arms which extend south from the basin into the shoreline. The harbor is entered southwest from deep water in Lake Michigan on the south side of the breakwater. The north and south sides of the harbor entrance are marked by lights. (See Notices to Mariners and the latest edition of the chart for controlling depths.)

(383) The Indiana Port Commission has constructed a bulkhead and fill in the area between East Harbor Arm and West Harbor Arm, and Bethlehem Steel Corporation has constructed a bulkhead and fill that extends about 1 mile east of the harbor entrance. These bulkheads are riprapped with stone. Mariners are advised to exercise caution when navigating in this area.

Dangers

(384) A submerged pipe, covered 1½ feet, has been reported about 125 feet north of the light marking the north side of the harbor entrance.

Towage

(385) Tugs to 1,640 hp are available at Burns International Harbor from Great Lakes Towing Co. (800–321–3663) or from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.) At least 3 hours advance notice is requested.

Harbor regulations

(386) Local regulations are established and enforced by the Indiana Port Commission. Copies of the regulations can be obtained from Burns International Harbor, 6600 U.S. Highway 12, Portage, IN 46368.

Radio facility

(387) The Indiana Port Commission operates a radio facility on VHF-FM channels 16, 10, 12, and 68, call sign, KVF 866. Communication with commercial and pleasure craft provides improved traffic control, and in conjunction with the State Police patrol boat, improved harbor security.

Wharves

(388) Burns International Harbor has deep-draft facilities in East and West Harbor Arms. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the Indiana Port Commission or the operator.) Water and electrical shore-power connections are available at most berths in the harbor.

Facilities in West Harbor Arm:

(389) **Midwest Steel, Barge Dock:** inner end of west side; 684-foot face; 27 feet alongside; deck height, 6 feet except 13 feet for center 300-foot section; open storage for 300,000 tons of steel products; cranes to 110 tons; receipt of coiled steel and shipment of steel products; owned and operated by Midwest Steel Division National Steel Corp.

(390) **Indiana Port Commission, Berth 5:** south end of arm; 600 feet of berthing space along dolphins; 27 feet alongside; deck height, 13 feet, 6 acres open storage; rental equipment available; receipt of stone, coal, and miscellaneous bulk materials by self-unloading vessels; conveyor to potash storage at rear, rate, 2,000 tons per hour; owned by Indiana Port Commission and operated by Indiana Port Commission and Domtar, Inc.

(391) **Indiana Port Commission, Berths 1, 2, 3, and 4:** inner end of east side; 1,800-foot face; 27 feet alongside; deck height, 13 feet; 118,000 square feet covered storage; 10 acres open storage; cranes to 150 tons; receipt and shipment of steel and general and containerized cargo; owned by Indiana Port Commission and operated by Indiana Port Commission and Ceres Marine Terminals, Inc.

Facility in the harbor basin:

(392) **Indiana Port Commission, Cargill Dock:** south side of basin between East and West Harbor Arms; 610 feet of berthing space with dolphins; 27 feet alongside; deck height, 13 feet; 4¼-million-bushel grain elevator; vessel loading spout, 90,000 bushels per hour; shipment of grain; owned by Indiana Port Commission and operated by Cargill, Inc.

Facilities in East Harbor Arm:

(393) **Indiana Port Commission, Berths 6 and 7:** inner end of west side; 1,280-foot face; 27 feet alongside; deck height, 13 feet; 13 acres open storage; tank storage for 4¾ million gallons; cranes to 150 tons; receipt and shipment of blast furnace slag, steel, liquid fertilizer, liquid caustic soda, and miscellaneous bulk materials; owned by Indiana Port Commission and operated by various operators.

(394) **Indiana Port Commission, Berth 8:** south end of arm; 360-foot face; 27 feet alongside; deck height, 13 feet; 2 acres open storage; tank storage for 2¾ million gallons; cranes to 150 tons; receipt and shipment of steel products, liquid fertilizer, liquid caustic soda, and miscellaneous bulk materials; owned by Indiana Port Commission and operated by various operators.

(395) **Bethlehem Steel Corp., Burns Harbor Plant Dock:** east side of arm; 3,742-foot face; 27 feet alongside; deck height, 14 feet; 25 acres open storage; two 20-ton bucket unloaders, maximum rate 1,800 tons per hour for iron ore pellets; receipt of iron ore pellets and limestone, shipment of steel mill products; owned and operated by Bethlehem Steel Corp.

(396) **Portage-Burns Waterway** is a drainage canal about 2 miles southwest of the entrance to Burns International Harbor. A small-craft harbor at the mouth of the waterway is protected on the northeast side by a jetty and on the north and west sides by breakwaters. The outer ends of the breakwaters are marked by lights. The waterway extends inland from the small-craft harbor for about 1.5 miles to connect with Little Calumet River.

(397) A dredged entrance channel leads east between the outer ends of the breakwaters and turns south to a small-craft harbor basin. A dredged channel continues inland for about 1 mile from the basin. In 2009, the controlling depths were 8 feet in the entrance channel, thence depths of 8 to 10 feet were available in the basin; thence in 2006, 4 feet to the head of the project. Dangerous shoals form rapidly in the dredged sections of the waterway, and mariners are advised to navigate the waterway with extreme caution.

(398) The waterway is crossed by bridges and overhead cables and pipelines, all of unknown clearance.

(399) There are two large marina's on the east and west sides of the waterway, about 1 mile above the entrance.

Charts 14905, 14926, 14927

(400) **Gary Harbor** is a private harbor at the south extremity of Lake Michigan, about 22 miles southwest of Michigan City and 14 miles southeast of Calumet Harbor entrance. The entirely artificial harbor was developed and is owned by United States Steel Corp.

Channels

(401) The harbor comprises a channel extending south into the shoreline for about 1 mile between parallel piers to a turning basin. The entrance to the channel is protected by a breakwater extending generally northeast from the west side of the entrance. The outer end of the breakwater and outer ends of the piers are marked by private lights. A private sound signal is at the breakwater light. A bulkhead, enclosing a fill area along the shore, extends 1.8 miles east from the east side of the channel entrance and is marked at its east end by a light. An unmarked shoal extends about 400 yards north-northeast of the east entrance point.

(402) Depths in the channel are maintained to at least 27 feet. Just inside the entrance, the channel is crossed by an overhead pipeline with a clearance of 125 feet and an overhead power cable with a clearance of 132 feet. About 0.65 mile above the entrance, the channel is crossed by an overhead conveyor with a clearance of 125 feet.

Towage

(403) Tugs are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(404) United States Steel Corp. operates deep-draft berths along both sides of the channel at Gary Harbor. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for these berths are reported depths. (For information on latest depths, contact the operator.)

(405) **West Dock:** 5,280 feet of berthing space; 27 to 31 feet alongside; deck height, 11 feet; open storage for over 4 million tons of material; four hulett-type unloaders, 600 tons per hour each; receipt of iron ore, iron ore pellets, and limestone.

(406) **East Dock:** 4,352 feet of berthing space; 27 to 29 feet alongside; deck height, 11 feet; open storage for

Structures across Indiana Harbor Canal

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
1	Elgin, Joliet & Eastern Railroad Bridge (bascule)	41°39'37"N., 87°27'07"W.	0.68	61	7	Note 1
2	Overhead cables	41°39'37"N., 87°27'07"W.	0.68		199	
3	CSX Railroad Bridge (bascule)	41°39'37"N., 87°27'07"W.	0.70	66	8	Note 1
4	Conrail Railroad Bridge (bascule)	41°39'37"N., 87°27'08"W.	0.71	65	7	Note 1
5	Conrail Railroad Bridge (bascule)	41°39'36"N., 87°27'08"W.	0.72	65	7	Note 1
6	Overhead pipeline	41°39'36"N., 87°27'09"W.	0.73	65	125	
7	Indiana Harbor Belt Railroad Bridge (bascule)	41°39'36"N., 87°27'09"W.	0.73	65	7	Bridge is permanently open
8	Overhead power cable	41°39'19"N., 87°27'33"W.	1.20		110	
9	Dickey Road Bridge (bascule)	41°39'18"N., 87°27'33"W.	1.21	118	18	Notes 1 and 2
10	Overhead cable	41°39'18"N., 87°27'34"W.	1.23		145	
11	Cline Avenue Bridge (fixed)	41°39'04"N., 87°27'54"W.	1.61	230	100	
12	Overhead power cables	41°38'56"N., 87°28'05"W.	1.86		140	
13	Elgin, Joliet & Eastern Railroad Bridge (bascule)	41°38'55"N., 87°28'06"W.	1.89	65	5	Note 1
	Calumet River Branch					
14	Overhead cable	41°38'22"N., 87°28'17"W.	2.58		N/A	Clearance data not available
15	Columbus Drive Bridge (fixed)	41°38'21"N., 87°28'17"W.	2.60	41	8	
	Lake George Branch					
16	Overhead cable	41°38'48"N., 87°28'50"W.	2.58		N/A	Clearance data not available
17	Indianapolis Boulevard Bridge (bascule)	41°38'48"N., 87°28'51"W.	2.59	68	12	Notes 1 and 2
18	Overhead cable	41°38'48"N., 87°28'52"W.	2.60		111	
19	Overhead cable	41°38'48"N., 87°29'20"W.	3.00			Clearance data not available
20	CSX Railroad Bridge (fixed)	41°38'48"N., 87°29'21"W.	3.01	65	5	
21	Overhead power cable	41°38'48"N., 87°29'25"W.	3.07		26	

* Miles above Indiana Harbor Outer Basin

Note 1 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 2 – Vertical clearance is at center of span.

500,000 tons of material; cranes to 100 tons; receipt of limestone and dolomite, shipment of scrap metal and steel mill products.

Charts 14905, 14926, 14927, 14929

(407) From Gary Harbor to Wilmette, IL, 36 miles northwest, the southwest shore of Lake Michigan is developed with extensive private commercial facilities, public utilities, marinas, and yacht clubs.

(408) **Buffington Harbor**, a private harbor owned by the Carmeuse Lime Company, is about 3 miles southeast of Indiana Harbor and 4.5 miles northwest of Gary Harbor. The harbor is built in the lake in front of the company's plant on bulkheaded and filled land that extends 2,400 to 2,900 feet beyond the natural shoreline.

Channels

(409) The harbor basin is protected on the west and north sides by a breakwater that extends from the shore west of the wharf; the wharf forms the east side of the basin. The outer end of the breakwater is marked by a private light; a wave gauge is about 500 feet north of the light. The basin has been dredged to 26 feet, but the depths gradually decrease to about 12 feet along the breakwater on the west side of the harbor. A breakwater extends from the west breakwater and from the south shore of the harbor forming a protected inner basin at the southwest corner of the harbor.

(410) From the northeast end of the wharf, the entire shoreline for about 4.5 miles southeast to Gary Harbor has been bulkheaded and filled.

(411) The wharf on the east side of the basin provides 2,128 feet of berthing space with dolphins and a deck height of 8 feet. The reported depth alongside is 20 to 28 feet. There is open storage for about 1¼ million tons of material, and a retractable conveyor can load vessels with slag at 1,000 tons per hour. Limestone, bauxite, cement clinker, and bulk materials are received, and slag and miscellaneous bulk materials are shipped.

Facilities in Indiana Harbor

	Name	Location	Berthing Space (feet)	Depths* (feet)	Deck Height (feet)	Mechanical Handling Facilities and Storage	Purpose	Owned/ Operated by:
1	Mittal Steel Company No. 6 Dock	41°40'26"N., 87°26'14"W.	2,570	28	6.5	• Open storage: 320,000 tons of limestone 1.7 million tons of iron ore 130,000 tons of limestone • Cranes to 150 tons	• Reciept of iron ore pellets and coke • Shipment of steel mill products and scrap metal	Mittal Steel Company
2	Mittal Steel Company No. 4 Dock	41°40'11"N., 87°26'06"W.	1,875	14-22	3-5	• Open storage (240,000 tons of limestone) • Electric belt conveyor	Receipt of limestone	Mittal Steel Company
3	Mittal Steel Company Indiana Harbor Works Barge Dock	41°39'59"N., 87°26'40"W.	1,263	18-24	7.5	• Open storage: 36,000 tons of limestone 597,000 tons of iron ore • Electric belt conveyor	• Reciept of iron ore pellets and limestone • Shipment of processed slag	Mittal Steel Company
4	Mittal Steel Company Plant No. 2 Dock	41°39'48"N., 87°26'49"W.	3,465	20-25	6-8	• Open storage (9½ acres) • Bin storage: 1.5 million tons of iron ore 490,000 tons of iron ore 30,000 tons of limestone • Five 20-ton bridge cranes	Receipt of iron ore pellets, ferromanganese, maganese ore, sinter flux and limestone	Mittal Steel Company
5	Mittal Steel Company Indiana Harbor Works Ore Dock	41°39'51"N., 87°26'52"W.	2,275	20-25	7.5	• Bin storage: 877,000 tons of iron ore pellets 287,000 tons iron ore 94,000 tons of limestone • Two electric bridge cranes • Electric belt conveyor	Receipt of iron ore pellets, iron ore and limestone	Mittal Steel Company
6	United States Gypsum Company Dock	41°38'51"N., 87°28'14"W.	991	15-19	6	• Covered storage (100,000 tons) • Open storage (23,000 tons) • One 15-ton overhead crane	Receipt of gypsum rock	United States Gypsum Company
7	American Terminals, Inc. South Dock	41°38'51"N., 87°28'10"W.	991	15-18	6	• Tank storage (30,000 tons) • One 100-ton crawler crane • Portable conveyor	• Receipt of calcined petroleum coke • Shipment of metallurgical coke	American Terminals, Inc.
8	BP Oil Company Dock	41°38'49"N., 87°28'23"W.	1,430	25	6	Tank storage (2.1 million barrels)	Receipt and shipment of petroleum products	BP Oil Company
9	Citgo Petroleum Corporation	41°38'32"N., 87°28'18"W.	600	15-19	9	Tank storage (4 million barrels)	Occasional receipt and shipment of petroleum products	Citgo Petroleum Corporation
10	Mobile Oil Corperation	41°38'25"N., 87°28'18"W.	640	10-15	9	Tank storage (1 million barrels)	Shipment of petroleum products	Mobile Oil Corporation

* The depths given above are reported. For information on the latest depths contact the port authorities or the private operators.

Towage

(412) Tugs are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago.) Harbor.)

(413) **Indiana Shoals,** an extensive bank in the approaches to Indiana Harbor and Calumet Harbor, extends about 5 miles northeast from the outer end of the fill area which forms the east side of the entrance to Indiana Harbor. The bank has several ridges with depths of 15 to 18 feet near its inner end, and has depths of 22 to 30 feet near its outer end. A lighted gong buoy marks the northeast side of the bank.

(414) A wreck covered 25 feet, is north of Indiana Shoals in about 41°46'05"N., 87°23'30"W. The wreck is marked on the northeast side by a buoy.

(415) **Indiana Harbor**, an artificial harbor at **East Chicago**, IN is about 3 miles northwest of Buffington Harbor and 6 miles southeast of Calumet Harbor. The harbor has an outer basin which is entered from north and is enclosed by bulkheaded fill areas that extend 2.6 miles northeast from the natural shoreline. The outer corners of the bulkheads are marked by private lights. The inner harbor is formed by a dredged canal that extends southwest from the outer basin into the shoreline.

(416) **Indiana Harbor East Breakwater Light** (41°40'51"N., 87°26'28"W.), 78 feet above the water, is shown from a square tower on the east side of the entrance channel. A mariner radio activated seasonal sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(417) The dredged entrance channel leads south-southeast from deep water in Lake Michigan between breakwaters to an outer harbor basin. The entrance channel is marked by lights on the outer and inner ends of the breakwaters. From the outer harbor basin, a canal entrance channel extends southwest to **Indiana Harbor Canal,** which continues southwest for 1.4 miles to a turning basin at **The Forks.** The entrance to the canal is marked by lights. The channel width in the canal is restricted by the clear width of the bridge span openings of 61.7 feet. From The Forks, **Calumet River Branch** extends south for about 0.4 mile to just below Columbus

Drive bridge, and **Lake George Branch** extends west for about 0.6 mile.

(418) A Federal project provides for a depth of 29 to 28 feet in the entrance channel and outer harbor basin, thence 27 feet from the basin to the first set of railroad bridges crossing Indiana Harbor Canal, thence 22 feet in the remainder of the project. (See Notice to Mariners and latest editions of charts for controlling depths.)

(419) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(420) **Caution**.—A floating oil boom is permanently moored across Lake George Branch just above the dredged channel.

Towage

(421) Tugs for Indiana Harbor are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(422) Indiana Harbor has numerous deep-draft facilities in the outer basin and along both sides of Indiana Harbor Canal. Only the major deep-draft facilities are listed in the table. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given in the table are reported depths. (For information on the latest depths, contact the operator.) Some of the facilities listed have water and electrical shore-power connections and most have highway and rail connections. Many of the facilities are used for mooring vessels during the closed navigation season.

Small-craft facility

(423) A marina on the lakeshore just south of the fill area that forms the east side of Indiana Harbor provides gasoline and a 5-ton hoist.

(424) Commonwealth Edison Co. of Indiana powerplant is on a bulkheaded fill area 4 miles northwest of the entrance to Indiana Harbor.

(425) The **State boundary** between Indiana and Illinois is just west of the powerplant about 4 miles northwest of Indiana Harbor entrance.

(426) **Calumet (South Chicago) Harbor** is 14 miles northwest of Gary Harbor and about 333 miles by water from the Straits of Mackinac. The harbor is in the south part of the city of **Chicago, IL,** and comprises an outer harbor protected by breakwaters and the **Calumet River.** The city of Chicago, including Calumet and Chicago Harbors, is one of the largest inland ports in the world. Deep-draft traffic enters the harbors from Lake Michigan, and barge traffic enters from the Mississippi River via the Illinois Waterway. The principal commerce in the port includes receipt of iron ore, coal, and limestone.

Prominent features

(427) Stacks at the Commonwealth Edison Co. of Indiana powerplant 1.8 miles south of the mouth of Calumet River and the towers of the lift bridge 0.5 mile above the mouth of the Calumet are prominent. A spire, 1.1 miles northwest of the river mouth, is also prominent.

(428) **Calumet Harbor Breakwater South End Light** (41°43'34"N., 87°29'36"W.), 50 feet above the water, is shown from a white square skeleton tower with red band on the outer end of the breakwater extension; a seasonal sound signal is at the light.

Channels

(430) A breakwater and breakwater extension extend east from the shore about 0.5 mile north of the mouth of Calumet River and turn southeast to protect the river entrance and provide an outer harbor of refuge 1 square mile in extent. The outer end of the breakwater and each end of the extension are marked by lights. A dredged approach channel from Lake Michigan leads southwest around the south end of the breakwater extension to the outer harbor basin, thence a dredged channel continues through the basin to the mouth of the Calumet River. The approach channel is marked by lighted buoys and the southwest limit of the outer harbor basin is marked by buoys. A Federal project provides for a depth of 29 feet in the approach channel and 28 feet in the channel through the outer harbor basin. (See Notice to Mariners and latest editions of charts for controlling depths.)

(431) **North Slip** opens into the outer harbor 0.5 mile north of the mouth of Calumet River. Overhead power cables with a clearance of 109 feet cross the mouth of the slip. **South Slip** is entered 0.4 mile above the river mouth. A system of submerged bubbler pipes crosses the mouth of each slip; vessels are cautioned not to drop or drag anchor in the vicinity.

(432) The undredged portion of the outer harbor between the river mouth and the entrance to North Slip has depths of about 2 to 20 feet extending about 0.25 mile from shore. In 1985, a rock covered 1 foot, was reported about 470 feet east-northeast of Calumet Pierhead Light in about 41°44'04"N., 87°31'40"W.

(433) A diked disposal area is on the west side of the outer harbor south of the entrance to Calumet River. The northeast corner of the area is marked by a light.

(434) A dredged channel leads from the west end of the outer harbor basin, between piers at the mouth of the Calumet River and upstream to Turning Basin No. 5, 6.06 miles above the mouth. Turning Basin Nos. 1 and 3 are on the east side of the channel 0.9 and 4.63 miles above the mouth of the river, respectively. The outer ends of the piers are marked by lights. A Federal project provides for a depth of 27 feet in the dredged channel from the mouth of the river to Turning Basin No. 5. (See Notice to Mariners and latest editions of charts

Structures across Calumet River and Little Calumet River

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
	Calumet River					
1	Overhead power cable	41°43'44"N., 87°32'20"W.	0.58		145	
2	Elgin, Joliet & Eastern Railroad Bridge (vertical lift)	41°43'43"N., 87°32'22"W.	0.62	200	7 (down); 125 (up)	Note 1
3	92nd Street Bridge (bascule)	41°43'39"N., 87°32'29"W.	0.76	180	18	Note 1
4	95th Street Bridge (bascule)	41°43'22"N., 87°32'36"W.	1.09	193	23	Note 1
5	Overhead power cable	41°43'12"N., 87°32'35"W.	1.33		148	
6	Norfolk Southern Railroad Bridges (vertical lift)	41°43'11"N., 87°32'35"W.	1.34	138	23 (down); 120 (up)	Note 3 (Permanently open)
7	Norfolk Southern Railroad Bridges (vertical lift)	41°43'10"N., 87°32'35W.	1.36	138	23 (down); 120 (up)	Notes 3 and 4
8	Chicago Skyway Bridge (fixed)	41°43'05"N., 87°32'36"W.	1.50	200	125	
9	Overhead power cables	41°42'54"N., 87°32'33"W.	1.70		155	
10	100th Street Bridge (bascule)	41°42'50"N., 87°32'33"W.	1.78	189	17	Note 1
11	106th Street Bridge (bascule)	41°42'10"N., 87°32'45"W.	2.58	192	17	Note 1
12	Overhead pipeline	41°41'39"N., 87°33'08"W.	3.31	166	130	
13	Overhead power cable	41°41'15"N., 87°33'08"W.	3.81		144	
14	Overhead power cable	41°40'14"N., 87°33'26"W.	5.10		147	
15	Chicago & Western Indiana Railroad Bridge (vertical lift)	41°40'10"N., 87°33'33"W.	5.24	200	22 (down); 125 (up)	Note 1
16	Torrence Avenue Bridge (vertical lift)	41°40'09"N., 87°33'34"W.	5.26	200	22 (down); 126 (up)	Note 1
17	Norfolk Southern Railroad Bridge (vertical lift)	41°39'58"N., 87°33'51"W.	5.59	200	22 (down); 126 (up)	Notes 1 and 2
18	130th Street Bridge (fixed)	41°39'33"N., 87°34'22"W.	6.25	219	29	
19	Overhead power cable	41°39'33"N., 87°34'22"W.	6.26		49	
20	Overhead cable	41°39'31"N., 87°34'22"W.	6.30		121	
21	Chicago, South Shore & South Bend Railroad (fixed)	41°39'30"N., 87°34'22"W.	6.33	250	29	
22	Overhead cable	41°39'29"N., 87°34'22"W.	6.34		N/A	Clearance data not available
	Thomas J. O'Brien Lock	41°39'11"N., 87°34'06"W.	6.84			
	Little Calumet River					
23	Norfolk Southern Railroad Bridge (fixed)	41°38'21"N., 87°34'00"W.	7.92	250	24	
24	Overhead gas pipeline	41°38'21"N., 87°34'02"W.	7.93		27	
25	I-94 Bridge (fixed)	41°38'28"N., 87°34'44"W.	8.59	250	39	
26	Overhead power cables	41°38'59"N., 87°36'21"W.	10.23		64	

* Miles above North Pierhead Light

Note 1 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 2 – Bridge is kept in the open position except for the passage of a train.
Note 3 – See 33 CFR 117.1 through 117.59 and 117.389, chapter 2, for drawbridge regulations.
Note 4 – Vessel operators should signal the bridge for openings on VHF-FM channel 16 (156.8 MHz) and provide vessel type/size (freighter/700 feet, tug without barge, tug with two barges/200 feet overall). Vessel operators should update ETA's as necessary.
INBOUND
Contact Norfolk Southern bridgetender when vessel is:
1. 15 minutes from Calumet Harbor Breakwater South End Light with ETA at railroad bridge.
2. passing South End Light with ETA at railroad bridge.
3. passing Calumet River Entrance Light at mouth of river with ETA at railroad bridge.
OUTBOUND
Contact Norfolk Southern bridgetender:
1. at least 15 minutes prior to departing dockside facilities and provide ETA at railroad bridge.
2. when underway and confirm/update ETA at railroad bridge.

for controlling depths.) Several large pieces of concrete have fallen into water along the south edge of Turning Basin No. 3 and pose a potential danger to navigation.

(435) From Turning Basin No. 5, the Calumet River leads south for 0.7 mile to the Thomas J. O'Brien Lock at the entrance to the Illinois Waterway. About 0.5 mile above the lock, the Calumet River branches into the Little Calumet River and the Grand Calumet River. (The lock and the Little Calumet River are described under Illinois Waterway, this chapter.)

(436) **Grand Calumet River** formerly emptied into Lake Michigan at Gary, IN but its mouth is now closed, and it is a dead river 18 miles long with a very small drainage area. There is no current in the river except what is caused by floods and freshets. Except for several shoals, the river is navigable by shallow-draft launches that can pass under the bridges.

(437) The limiting clearances under the bridges are 8 feet for about 3.5 miles, thence 5 feet for about 11 miles. The swing and bascule bridges across the river are inoperable. Several bridges have been replaced by earthfill causeways with only culverts to carry the flow. About 6 miles above the junction with Calumet River, a nonnavigable branch connects with Calumet River Branch of Indiana Harbor Canal.

(438) **Lake Calumet,** northwest of Turning Basin No. 5, is about 1.2 miles long north and south and about 1 mile wide. The lake is at practically the same level as Lake Michigan and has an average depth of about 2 feet. A temporary earth dike has been constructed at the south end of Lake Calumet by the Illinois International Port.

(439) A dredged channel leads northwest from Turning Basin No. 5 in Calumet River to Lake Calumet. A Federal project provides for a depth of 27 feet in the dredged channel. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages

(440) The outer harbor basin provides good anchorage in mud and sand bottom. Due to the large number of vessels using this important shelter during severe weather, it is important that anchorage space within the harbor be utilized in an orderly manner. Accordingly, it is requested that vessels do not anchor closer than 1,000 feet to any part of the breakwaters unless no other anchorage space is available, and that, if it is necessary to anchor closer than 1,000 feet to the breakwaters, vessels anchor in such manner as not to unreasonably obstruct the free passage and progress of other vessels through the harbor. In good weather, vessels may also find anchorage within 3 miles east to south of Calumet Harbor Breakwater South End Light.

Dangers

(441) Several shoals are in the approach to Calumet Harbor. A rocky bank with a least depth of 24 feet is 1 mile northeast of Calumet Harbor Breakwater South End Light. A lighted buoy at the southeast end of the ledge marks the north side of the dredged approach channel. Two 23-foot spots and a 27-foot spot, 2 to 2.5 miles northeast of Calumet Harbor Light, are marked on the east side by a lighted buoy. **Calumet Bar**, an extensive area with depths of 22 to 24 feet, is on the northeast side of the breakwater and extension.

(442) The gap between the breakwater and the extension provides an entrance to the harbor for small craft. However, small craft should exercise caution when using the entrance gap. Dangerous currents frequently exist in the entrance gap, especially during storms. Hazardous currents are also caused by surges resulting from a sudden rise or fall in the lake level. This frequently occurs during periods of calm. The Lake Carriers' Association recommends that cargo vessels use the south entrance exclusively.

(443) In general, the dredged areas of the outer harbor do not extend closer than 300 feet from the breakwaters. Mariners should exercise caution and not attempt to navigate in the undredged areas adjoining the breakwaters. Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

(444) **Fluctuations of water level.**—In addition to the normal fluctuations which affect Lake Michigan somewhat uniformly, local oscillations of up to 2 feet above or below Low Water Datum are reported to have durations of a few minutes to a few hours. These changes are produced by winds and barometric pressure changes which accompany storms. Strong sustained winds may also affect the water levels for as long as a day.

(445) **Caution**.—Since the opening of Calumet Sag Channel, the Calumet River has a gentle flow away from Lake Michigan except at times of sudden fluctuations of water levels from heavy rains and/or flooding.

Towage

(446) Tugs to 1,640 and 1,250 hp are available in the Calumet (South Chicago) Harbor area from Great Lakes Towing Co. and Calumet River Fleeting, respectively. Arrangements for the Great Lakes Towing Co. tugs are made through the dispatcher in Cleveland (800–321–3663) or via VHF-FM remote antenna. The Calumet River Fleeting dispatcher is in Chicago (773–721–1600) and has VHF-FM capability to a 25-mile radius. At least 3 hours advance notice is requested for either company.

Quarantine, customs, immigration, and agricultural quarantine

(447) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(448) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(449) Chicago is a **customs port of entry**.

Coast Guard Station

(450) **Calumet Harbor Coast Guard Station** is on the lakefront in the south part of Calumet Park, about 1.1 miles south of Calumet River entrance.

Harbor regulations

(451) Local harbor regulations for Calumet Harbor have been established by the Illinois International Port and are enforced by various local law enforcement agencies, who can be reached through the Port. Copies of the regulations can be obtained from the Illinois International Port, 3600 E. 95th Street, Chicago, IL 60617. A

Facilities in Calumet Harbor

	Name	Location	Berthing Space (feet)	Depths* (feet)	Deck Height (feet)	Mechanical Handling Facilities and Storage	Purpose	Owned/ Operated by:
1	North AmericanSteve-doring Iroquois Landing Wharf	41°43'50"N., 87°32'02"W.	2,825	27	9	• Open storage (80 acres) • Covered storage (210,000 square feet) • Cranes to 200 tons	Reciept and shipment of conventional and contain-erized general cargo, steel products and vehicles	Illinois International Port District/North American Stevedoring
2	Scrap Processing Wharf	41°43'40"N., 87°32'24"W.	520	27	6	• Open storage (2 acres) • One 20-ton gantry crane	Receipt and shipment of scrap metal	Cozzi Iron & Metal, Inc./Scrap Processing, Inc.
3	North American Salt Company Chicago Plant Wharf	41°43'33"N., 87°32'34"W.	955	23-28	6-8	• Open storage (1½ acres) • Covered storage (19,000 tons) • One crawler crane	Receipt of salt	North American Salt Company
4	Morton Salt Calumet River Wharf	41°42'46"N., 87°32'31"W.	727	17	7	Open storage (4 acres)	Receipt of salt	Morton International, Inc.
5	KCBX Terminals Com-pany Loading Wharf	41°42'41"N., 87°32'36"W.	1,472	27-31	7	• Open storage (9 acres) • Two unloading towers	Shipment of miscel-laneous dry bulk com-modities	KCBX Terminals Company
6	KCBX Terminals Com-pany Barge Unloading Slip	41°42'35"N., 87°32'50"W.	2,865	17-21	6-10	• Open storage (10 acres) • Two crawler cranes • Belt conveyor system	Shipment of miscel-laneous dry bulk com-modities	KCBX Terminals Company
7	ELG Metals Incorperated Dock	41°42'28"N., 87°32'55"W.	1,300	20-22	7	• Open storage (8 acres) • One 100-ton locomotive crane • Three 15-ton mobile cranes	Receipt and shipment of scrap stainless steel and nickel alloy	ELG Metals Incorper-ated
8	Carmeuse Lime Com-pany North Wharf	41°42'26"N., 87°32'42"W.	929	18-26	9	Open storage (5 acres)	• Receipt of limestone • Shipment of lime products	Carmeuse Lime Company
9	Carmeuse Lime Com-pany South Wharf	41°42'20"N., 87°32'42"W.	1,030	18-26	7	Open storage (5.5 acres)	Receipt of limestone and coal	Carmeuse Lime Company
10	Beemsterboer Slag and Ballast Wharf	41°42'15"N., 87°32'47"W.	1,990	15-23	6-12	• Open storage (30 acres) • Crawler cranes to 100 tons	Receipt and shipment of miscellaneous dry bulk commodities	George J. Beemster-boer Incorperated/ Beemsterboer Slag and BallastCorperation
11	Reserve Marine Termi-nals Ore Dock	41°41'24"N., 87°33'05"W.	2,788	25-29	11	• Open storage (13 acres) • Two Hulett unloaders • One 22-ton gantry crane • Two bridge cranes	Receipt of coking coal	Reserve Marine Terminals, Inc.
12	Nidera Grain Company Elevator B Dock	41°41'00"N., 87°33'10"W.	1,050	27	8	• Covered storage (7.5 million bushels) • Two marine legs and five unloading spouts	Receipt and shipment of grain	Continental Grain Company
13	Midwest Marine Termi-nals Dock	41°40'32"N., 87°33'10"W.	1,145	25-29	9	Two mobile cranes and four payloaders	Receipt and shipment of pig iron and bulk materials	Midwest Marine Terminals Incorperated
14	Cargill Chicago Salt Wharf	41°40'24"N., 87°33'13"W.	690	14-27	9	• Open storage (10,000 tons of salt) • One crawler crane	Reciept of salt and potash	Cargill Incorperated
15	Maryland Pig Corperation Butler Wharf	41°39'38"N., 87°34'24"W.	500	27	6-7	• Open storage (10 acres) • Ten crawler cranes	Receipt and shipment of scrap metal	Maryland Pig Corperation
16	Maryland Pig Corperation Pennsylvania Wharf	41°39'42"N., 87°34'28"W.	930	27	6-7	• Open storage (10 acres) • Ten crawler cranes	Receipt and shipment of scrap metal	Maryland Pig Corperation
17	Reserve Marine Termi-nals Shed Number Three	41°39'46"N., 87°34'43"W.	1,034	27	8	• Open storage (1 acre) • Two 130-ton crawler cranes	Receipt and shipment of general cargo, scrap metal and other dry bulk commodities	Reserve Marine Terminals Incorperated
18	Reserve Marine Termi-nals Shed Number One	41°39'54"N., 87°35'06"W.	1,777	27	8	• Open and covered storage • Two 100-ton crawler cranes	• Receipt and shipment of steel and scrap metal • Receipt of sugar	Reserve Marine Terminals Incorperated
19	Kinder-Morgan North Terminal Wharf	41°39'52"N., 87°34'43"W.	1,485	23-28	6	• Open storage (30 acres) • Covered storage (111,000 square feet) • Cranes to 65 tons	• Receipt and shipment of steel products • Receipt of miscellaneous dry bulk commodities	Kinder-Morgan Corperation
20	Kinder-Morgan A and B Wharves	41°40'02"N., 87°35'02"W.	1,675	23-28	6	Tank storage (28 million gallons)	Receipt and shipment of bulk liquid	Kinder-Morgan Corperation
21	EmEsCo Marine Terminal Lake Calumet slip	41°40'33"N., 87°34'50"W.	2,725	27	8	• Open storage (41 acres) • Two 60-ton gantry cranes	• Receipt and shipment of general cargo • Receipt of dry bulk com-modities	EmEsCo Marine Terminals Corperation
22	Cemex Cement Com-pany Chicago Distribution Terminal Dock	41°40'20"N., 87°35'25"W.	620	30	12-26	Storage (12,000 tons of cement)	Receipt of bulk cement	Cemex Cement Company

* The depths given above are reported. For information on the latest depths contact the port authorities or the private operators.

speed limit of 5 mph (4.3 knots) is enforced within the harbor.

Wharves

(452) Calumet Harbor has numerous deep-draft facilities in Calumet River and in the entrance to Lake Calumet. Only the major deep-draft facilities are listed in the table. (For a complete description of the port facilities, refer to Port Series No. 46, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given in the table are reported depths. (For information on the latest depths, contact the operator.) Most of the facilities listed have highway and rail connections and many have water and electrical shore-power connections. Many of the piers, wharves, and docks are used for mooring vessels during the closed navigation season.

Supplies

(453) Complete marine supplies and services are available. Bunker C and diesel fuel are delivered by barge or tank truck. Water is available at many of the wharves.

Repairs

(454) There are no facilities available for repairing, drydocking, or hauling out large, deepdraft vessels in Calumet Harbor. The nearest such facilities are located at Sturgeon Bay, WI.

Small-craft facilities

(455) A yacht yard is on the east side of Calumet River, just above the 95th Street bridge. The yard can provide hull/engine repairs and has lifts to 70 tons; dry storage is also available.

(456) Calumet Harbor is served by several major rail lines, several interstate highways, and three airports for passenger and freight service.

Charts 14927, 14926

(457) From Calumet Harbor north for 11 miles to the mouth of the Chicago River, the shore is bordered by shoals, detached shoal spots, and submerged wrecks extending about 4 miles off. A wreck, covered 14 feet, is about 0.3 mile north of the Calumet Harbor breakwater gap. **Clark Point Shoal,** 1.2 miles north of Calumet Harbor breakwater and marked on the outer end by a buoy, has depths of 5 to 9 feet extending about 0.7 mile from shore. A wreck, covered 20 feet, is 1 mile north-northeast of Clark Point Shoal.

(458) Chicago South District Filtration Plant is on a bulkheaded fill area 1.5 miles northwest of the Calumet Harbor breakwater. The plant is protected by a detached breakwater marked on either end by a private light. The area between the breakwater and the plant and the area within 150 feet of the plant's southeast bulkhead is a **no mooring-restricted area.** A jetty and a submerged dike, covered 6 feet, extend 0.5 mile northwest from the plant to enclose a bathing beach.

(459) **Jackson Park Harbor,** 2 miles northwest of the water filtration plant, is a small-craft refuge comprising an outer harbor and an inner harbor. The entrance to the harbor is protected on the north side by a pier that extends 0.2 mile east-northeast and bends north for 0.2 mile. The pier is marked by lights at the outer end and at the bend. The entrance to the harbor, marked on either side by a private light, has depths of about 3 feet. Outer Harbor (Outer Lagoon) has depths of 6 to 10 feet with shoaling within 150 feet of shore. A narrow channel with depths of 6 feet leads to Inner Harbor (Inner Lagoon). A fixed highway bridge with a clearance of 11 feet crosses the channel. A footbridge of unknown clearance crosses the channel on the east side of the highway bridge. Inner Harbor has depths of about 7 feet. Transient berths, gasoline, water, ice, a launching ramp, and sewage pump-out facilities are available in the harbor.

(460) **Fifty-ninth (59th) Street Harbor,** about 0.6 mile north of Jackson Park Harbor, is entered between parallel piers. The outer ends of the piers are marked by private lights. In 1979, depths of 10 feet were reported in the entrance channel with 5 feet in the basin. A fixed highway bridge with a clearance of 10 feet crosses the entrance channel.

(461) **South Park Shoal,** with a least depth of 7 feet and marked on the east side by a buoy, is 1.7 miles east-northeast of the entrance to 59th Street Harbor. **Madison Park Shoal,** with a depth of 13 feet, is 1.2 miles northeast of 59th Street Harbor. **Clemson Shoal,** a rock ledge covered 18 feet, is marked on the east side by a lighted bell buoy 0.6 mile northeast of South Park Shoal. **Hyde Park Outer Shoal,** covered 8 feet and marked on the east side by a buoy, is 0.7 mile north of South Park Shoal and 0.4 mile northwest of Clemson Shoal. **Morgan Shoal,** with a least depth of 2 feet, extends 0.7 mile offshore, 1.3 miles north of 59th Street Harbor; a seasonal lighted buoy marks the outer end of the shoal; closeeast of the lighted buoy is an 11-foot shoal. **Hyde Park Inner Shoal,** covered 11 feet, is 0.4 mile east of the outer end of Morgan Shoal. **Oakland Shoal,** with a least depth of 7 feet, extends 0.5 mile from shore about 1 mile north of Morgan Shoal.

(462) **Burnham Park Harbor,** a small-craft basin 2 miles south of the mouth of Chicago River, is enclosed on the east by Northerly Island. **Northerly Island** is an artificial island, attached at the north end to the mainland by a causeway which closes the north end of Burnham Park Harbor. The entrance to the harbor, from south, is marked by a private light on shore southwest of the south end of Northerly Island and has a depth of about 16 feet. The harbor has central depths of about 15 feet with shoaling to less than 6 feet toward the east shore and depths of 7 to 10 feet along the piers on the west side of the harbor. Transient berths, gasoline, diesel

fuel, water, ice, electricity, sewage pump-out facilities, a launching ramp are available in the harbor.

(463) A **danger zone** marked by private buoys extends from the south end of the airfield on Northerly Island south across the entrance to Burnham Park Harbor. (See **33 CFR 334.840**, chapter 2, for limits and regulations.)

(464) A bathing beach protected by a submerged dike, covered 1 foot, is on the east side of the north end of Northerly Island. Vessels should not attempt to enter the bathing beach area.

(465) From Northerly Island north to the entrance to Chicago River, numerous scattered shoal spots with depths of 10 to 24 feet are within about 2.5 miles of shore.

(466) **A safety and security zone** has been established over all waters of Lake Michigan within Burnham Park Harbor. (See **165.1 through 165.9, 165.20 through 165.33, and 165.904**, chapter 2, for limits and regulations.)

Charts 14905, 14927, 14928, 14926

(467) **Chicago Harbor**, on the southwest shore of Lake Michigan 11 miles north of Calumet Harbor, serves the city of **Chicago, IL,** and along with Calumet Harbor, forms one of the largest inland ports in the world. The harbor comprises an outer harbor with outer and inner basins and an inner harbor formed by the **Chicago River** and its branches. While there is some deep-draft traffic in the harbor, barge traffic from the Mississippi River via the Illinois Waterway constitutes the major use of Chicago Harbor. The major commodities handled at the deep-draft facilities in the harbor are general cargo, newsprint, salt, and cement.

Prominent features

(468) The skyline of Chicago is prominent in general, and its three tallest buildings are conspicuous. The 1,450-foot Willis Tower, 1.3 miles southwest of the river mouth, is reported to be the tallest building in North America. Its top is usually obscured by any fog or inclement weather. The white 1,136-foot Aon Center building is 0.5 mile southwest of the river mouth. The dark brown trapezoidal 1,127-foot John Hancock Center 0.9 mile northwest of the river mouth has two prominent lighted towers on its roof.

(469) **Chicago Harbor Light** (41°53'22"N., 87°35'26"W.), 82 feet above the water, is shown from a white conical tower on the south end of the breakwater on the north side of the entrance channel; a seasonal sound signal is at the light.

Channels

(470) The harbor consists of an outer harbor of refuge protected by breakwaters on the northeast and east sides

Structures across North Shore Channel

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
1	Foster Avenue Bridge (fixed)	41°58'33"N., 87°42'17"W.	9.49	59	18	
2	Bryn Mawr Avenue Bridge (fixed)	41°58'59"N., 87°42'25"W.	10.00	62	18	
3	Peterson Avenue Bridge (fixed)	41°59'25"N., 87°42'33"W.	10.53	60	18	
4	Lincoln Avenue Bridge (fixed)	41°59'30"N., 87°42'34"W.	10.62	60	19	
5	Devon Avenue Bridge (fixed)	41°59'51"N., 87°42'38"W.	11.01	67	18	
6	Touhy Avenue Bridge (fixed)	42°00'43"N., 87°42'37"W.	12.02	67	19	
7	Howard Street Bridge (fixed)	42°01'09"N., 87°42'37"W.	12.52	81	19	
8	Chicago Transit Authority Bridge (fixed)	42°01'22"N., 87°42'37"W.	12.77	101	33	
9	Union Pacific Railroad Bridge (fixed)	42°01'29"N., 87°42'37"W.	12.92	60	19	
10	Oakton Street Bridge (fixed)	42°01'35"N., 87°42'36"W.	13.03	81	19	
11	Main Street Bridge (fixed)	42°02'01"N., 87°42'36"W.	13.53	67	19	
12	Dempster Street Bridge (fixed)	42°02'27"N., 87°42'35"W.	14.03	67	19	
13	Church Street Bridge (fixed)	42°02'54"N., 87°42'34"W.	14.54	67	19	
14	Emerson Street Bridge (fixed)	42°03'08"N., 87°42'30"W.	14.83	67	20	
15	Brown Avenue Bridge (fixed)	42°03'22"N., 87°42'03"W.	15.29	67	20	
16	Green Bay Road Bridge (fixed)	42°03'33"N., 87°41'40"W.	15.68	66	20	
17	Union Pacific Railroad Bridge (fixed)	42°03'33"N., 87°41'39"W.	15.69	59	26	
18	Lincoln Street Bridge (fixed)	42°03'44"N., 87°41'20"W.	16.03	60	20	
19	Central Street Bridge (fixed)	42°03'51"N., 87°41'14"W.	16.20	63	20	
20	Chicago Transit Authority Bridge (fixed)	42°03'56"N., 87°41'12"W.	16.31	45	35	
21	Isabella Street Bridge (fixed)	42°04'08"N., 87°41'11"W.	16.52	67	20	
22	Maple Avenue Bridge (fixed)	42°04'17"N., 87°41'11"W.	16.69	67	21	
23	Linden Avenue Bridge (fixed)	42°04'25"N., 87°41'10"W.	16.86	61	20	
24	Willmette Lock/Sheridan Road Bridge (fixed)	42°04'32"N., 87°41'06"W.	17.00	32	21	

* Miles above the west end of Chicago Lock (41°53'18"N., 87°36'28"W.)

and an inner basin at the natural mouth of the Chicago River. The inner basin is protected by breakwaters and bulkheads. The outer harbor is entered from Lake Michigan through a dredged entrance channel leading west between the northeast and east breakwaters; the ends of the breakwaters are marked by lights. The outer harbor affords access to the municipal pier on the west side of the harbor and to the entrance channel to the inner basin. A 400-foot-wide breakwater gap at the north end of the outer harbor is marked by lights. The end of the breakwater on the east side of the gap is partially submerged. Caution should be exercised when transiting the gap.

(471) The inner basin, on the south side of the mouth of Chicago River, is entered from the west side of the outer harbor through the **Chicago Lock.** The southeast guide wall of the lock is marked at the outer end by a light. The inner basin and the river may only be entered through the lock. The dredged river entrance channel extends from the lock across the north side of the inner basin through the mouth of the river upstream to Rush Street.

(472) Depths in the inner basin and river entrance shoreward of the Chicago Lock are referred to normal pool level, which is 0.6 foot below Low Water Datum, the plane of reference used in the outer harbor and elsewhere on Lake Michigan.

(473) In 2009, the controlling depths were 29 feet in the entrance channel to the outer harbor, thence depths of 21 to 26 feet in the dredged portion of the outer harbor, thence 20 feet to the Chicago Lock (except for lesser depths to 17 feet in the northern section of the channel); thence in 1990, 21 feet for midwidth of 100 feet from the lock through the mouth of the river upstream to Rush Street.

(474) Navigators are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

(475) **Ogden Slip,** at the north end of the inner basin, is north of and parallel to the mouth of the Chicago River. The slip extends about 0.4 mile into the shoreline, and in 1977, had a centerline controlling depth of 16 feet except for shoaling at the west end.

Structures across Chicago River and its Branches

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
	Main River Channel					
1	Lake Shore Drive Bridge (bascule)	41°53'18"N., 87°36'50"W.	0.32	210	25	Note 1
2	Lake Shore Drive Bridge (fixed)	41°53'25"N., 87°36'50"W.	0.42	70	20	
3	Columbus Drive Bridge (bascule)	41°53'19"N., 87°37'14"W.	0.67	176	21	Note 1
4	Michigan Avenue Bridge (bascule)	41°53'20"N., 87°37'28"W.	0.85	195	17	Notes 1 and 2
5	Wabash Avenue (bascule)	41°53'16"N., 87°37'37"W.	0.98	193	21	Notes 1 and 3
6	State Street Bridge (bascule)	41°53'15"N., 87°37'41"W.	1.05	200	21	Note 1
7	Dearborn Street Bridge (bascule)	41°53'15"N., 87°37'46"W.	1.13	200	22	Note 1
8	Clark Street Bridge (bascule)	41°53'15"N., 87°37'52"W.	1.21	200	19	Notes 1 and 2
9	La Salle Street Bridge (bascule)	41°53'15"N., 87°37'57"W.	1.29	200	17	Notes 1 and 2
10	Wells Street Bridge (bascule)	41°53'15"N., 87°38'02"W.	1.37	200	17	Note 1 (railroad/highway bridge)
11	Franklin-Orleans Street Bridge (bascule)	41°53'14"N., 87°38'09"W.	1.47	210	17	Notes 1 and 3
	South Branch					
12	Lake Street Bridge (bascule)	41°53'09"N., 87°38'16"W.	1.64	195	18	Note 1
13	Randolph Street Bridge (bascule)	41°53'04"N., 87°38'17"W.	1.73	160	21	Note 1
14	Washington Street Bridge (bascule)	41°53'00"N., 87°38'17"W.	1.81	160	17	Notes 1 and 3
15	Madison Street Bridge (bascule)	41°52'55"N., 87°38'18"W.	1.90	168	18	Notes 1 and 3
16	Monroe Street Bridge (bascule)	41°52'50"N., 87°38'18"W.	1.99	165	17	Notes 1 and 3
17	Adams Street Bridge (bascule)	41°52'45"N., 87°38'17"W.	2.08	151	17	Notes 1 and 3
18	Jackson Boulevard Bridge (bascule)	41°52'41"N., 87°38'16"W.	2.17	140	17	Notes 1 and 3
19	Van Buren Street Bridge (bascule)	41°52'36"N., 87°38'15"W.	2.26	170	17	Notes 1 and 3
20	Eisenhower Expressway Bridge (bascule)	41°52'32"N., 87°38'12"W.	2.35	169	17	Note 1
21	Harrison Street Bridge (bascule)	41°52'28"N., 87°38'09"W.	2.44	170	17	Notes 1 and 3
22	Roosevelt Road Bridge (bascule)	41°52'02"N., 87°38'05"W.	2.94	170	17	Notes 1 and 3
23	Baltimore & Ohio Chicago Terminal Railroad Bridge (bascule)	41°51'40"N., 87°38'04"W.	3.36	170	19	Notes 1 and 3
24	Norfolk Southern Railroad Bridge (bascule)	41°51'39"N., 87°38'04"W.	3.37	170	20	Notes 1 and 3
25	18th Street Bridge (bascule)	41°51'28"N., 87°38'06"W.	3.60	125	22	Notes 1 and 3
26	Amtrack Bridge (vertical lift)	41°51'20"N., 87°38'13"W.	3.77	156	10 (down); 120 (up)	Notes 1 and 7
27	Canal Street Bridge (bascule)	41°51'17"N., 87°38'19"W.	3.88	167	17	Notes 1 and 3
28	Cermak Road Bridge (bascule)	41°51'10"N., 87°38'25"W.	4.05	140	17	Note 1
29	Dan Ryan Expressway Bridge (fixed)	41°50'58"N., 87°38'39"W.	4.36	170	63	
30	South Halsted Street Bridge (bascule)	41°50'58"N., 87°38'47"W.	4.47	163	24	Notes 1 and 3
31	South Loomis Street Bridge (bascule)	41°50'45"N., 87°39'39"W.	5.29	144	22	Notes 1, 3 and 5
32	South Ashland Avenue Bridge (bascule)	41°50'42"N., 87°39'57"W.	5.57	183	21	Notes 1 and 3
33	South Damen Avenue Bridge (fixed)	41°50'30"N., 87°40'32"W.	6.14	140	28	
	South Fork of South Branch					
34	Canadian National Railroad Bridge (fixed)	41°50'23"N., 87°39'52"W.	5.78	100	17	
35	Adlai E. Stevenson Expressway Bridge (fixed)	41°50'21"N., 87°39'52"W.	5.83	90	31	
36	Archer Avenue Bridge (fixed)	41°50'19"N., 87°39'51"W.	5.86	90	17	
37	35th Street Bridge (fixed)	41°49'50"N., 87°39'27"W.	6.53	121	12	
	North Branch					
38	Chicago & Northwestern Railroad Bridge (bascule)	41°53'19"N., 87°38'21"W.	1.76	100	6	Notes 1 and 6
39	Kinzie Street Bridge (bascule)	41°53'21"N., 87°38'21"W.	1.81	105	6	Note 1
40	Grand Avenue Bridge (bascule)	41°53'29"N., 87°38'28"W.	2.00	134	17	Notes 1 and 3
41	Ohio Street Bridge (bascule)	41°53'33"N., 87°38'31"W.	2.09	138	27	Note 1
42	Chicago Avenue Bridge (bascule)	41°53'47"N., 87°38'39"W.	2.40	145	17	Notes 1 and 2
43	North Halsted Street Bridge (bascule)	41°53'53"N., 87°38'53"W.	2.65	140	17	Note 1
44	Division Street Bridge (bascule)	41°54'13"N., 87°39'27"W.	3.30	100	17	Notes 3 and 4

Structures across Chicago River and its Branches

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
45	North Avenue Bridge (fixed)	41°54'39"N., 87°39'25"W.	3.81	169	17	
46	Canadian Pacific Railroad Bridge (Swing)	41°54'56"N., 87°39'49"W.	4.43	81	10	Notes 1 and 3
47	Cortland Street Bridge (bascule)	41°55'01"N., 87°39'51"W.	4.48	101	17	Note 4
48	Overhead power cable	41°55'17"N., 87°40'04"W.	4.83		36	
49	Webster Avenue Bridge (bascule)	41°55'18"N., 87°40'04"W.	4.85	128	17	Note 4
50	North Ashland Avenue Bridge (bascule)	41°55'20"N., 87°40'07"W.	4.90	140	17	Note 4
51	Union Pacific Railroad Bridge (bascule)	41°55'21"N., 87°40'14"W.	5.01	123	19	Note 4
52	Fullerton Avenue Bridge (fixed)	41°55'30"N., 87°40'28"W.	5.30	92	22	
53	North Damen Avenue Bridge (fixed)	41°55'41"N., 87°40'42"W.	5.59	118	24	
54	Diversey Parkway Bridge (fixed)	41°55'56"N., 87°40'58"W.	5.99	52	17	
55	Western Avenue Bridge (fixed)	41°56'10"N., 87°41'17"W.	6.39	95	18	
56	Belmont Avenue Bridge (bascule)	41°56'22"N., 87°41'33"W.	6.76	75	18	
57	Overhead power cable	41°56'25"N., 87°41'37"W.	6.80		40	
58	Overhead power cable	41°56'45"N., 87°41'46"W.	7.24		48	
59	Addison Street Bridge (fixed)	41°56'48"N., 87°41'46"W.	7.30	73	18	
60	Overhead cable	41°56'54"N., 87°41'47"W.	7.41			Clearance data not available
61	Irving Park Road Bridge (fixed)	41°57'14"N., 87°41'40"W.	7.83	62	18	
62	Montrose Avenue Bridge (fixed)	41°57'40"N., 87°41'41"W.	8.33	68	17	
63	Wilson Avenue Bridge (fixed)	41°57'53"N., 87°41'49"W.	8.60	73	17	
64	Overhead cable	41°57'58"N., 87°41'54"W.	8.72			Clearance data not available
65	Chicago Transit Authority Bridge (fixed)	41°57'58"N., 87°41'55"W.	8.73	40	19	
66	Lawrence Avenue Bridge (fixed)	41°58'06"N., 87°42'03"W.	8.94	54	18	
67	Argyle Street Bridge (fixed)	41°58'20"N., 87°42'13"W.	9.24	59	18	
68	Overhead water pipeline	41°58'20"N., 87°42'13"W.	9.36		18	
	North Branch Canal					
69	Overhead power cable	41°54'05"N., 87°38'50"W.	2.80		72	
70	Overhead power cable	41°54'05"N., 87°38'50"W.	2.81		72	
71	North Halsted Street Bridge (bascule)	41°54'07"N., 87°38'53"W.	2.85	56	15	Note 4
72	Division Street Bridge (bascule)	41°54'13"N., 87°38'58"W.	2.99	74	17	Notes 3 and 4
73	Overhead pipeline	41°54'20"N., 87°39'04"W.	3.13	137	30	
74	Overhead power cable	41°54'34"N., 87°39'15"W.	3.41		76	
75	Canadian Pacific Railroad Bridge (swing)	41°54'37"N., 87°39'20"W.	3.54	113	8	Note 5

* Miles above the west end of Chicago Lock (41°53'18"N., 87°36'28"W.)

Note 1 – See 33 CFR 117.1 through 117.59 and 117.391, chapter 2, for drawbridge regulations.
Note 2 – Resident bridgetender assisted by roving tender. Advance notice is required for opening.
Note 3 – Operated by roving bridgetender. Advance notice is required for opening.
Note 4 – See 33 CFR 117.391(c), chapter 2, for drawbridge regulations.
Note 5 – Vertical clearance is for center width of 93 feet.
Note 6 – Bridge kept in open position except for passage of a train.
Note 7 – The bridgetender can be contacted on VHF-FM channel 16, call "South Branch" or WHU-713; or by telephone, 312-930-4125.

(476) From its mouth, the Chicago River leads west for 1.3 miles to the junction of North Branch and South Branch. From the junction, **North Branch** leads north-northwest for 1 mile to the junction with **North Branch Canal**, thence these two channels continue north-northwest, separated by Goose Island, and rejoin at a turning basin at North Avenue. South Branch extends 4 miles south and southwest to the junction with **South Fork** and continues southwest for 0.8 mile to the Chicago Sanitary and Ship Canal. South Fork extends 1.3 miles south from South Branch.

(477) A Federal project provides for dredged channels in the Chicago River from its mouth to the junction with the North and South Branches, thence in North Branch and North Branch Canal to the turning basin at North Avenue.

(478) In 1990, the midchannel controlling depth was 19 feet in the Chicago River from Rush Street to the junction with the North Branch; thence the midchannel

controlling depths were 15 feet to the junction with North Branch and North Branch Canal; thence the midchannel controlling depth in North Branch was 12 feet to the turning basin with depths of 9 to 12 feet in the southeast part of the basin and 5 to 8 feet in the northwest part of the basin except for shoaling to less than 3½ feet along the west edge, and 4 feet along the southeast edge. The midchannel controlling depth in the North Branch Canal was 9 feet to the Ogden Avenue bridge, thence decreasing from 9 to 4 feet to the turning basin.

(479) The city of Chicago has improved the channel in North Branch north of the turning basin at North Avenue bridge. In 1977, the centerline controlling depth was 6 feet from the turning basin upstream to Addison Street bridge. In 1957, the channel from Addison Street bridge to Foster Avenue, just inside the south end of North Shore Channel, was dredged to a depth of 8 feet.

(480) The city of Chicago has also improved the channel in South Branch to the South Damen Avenue bridge, including turning basins at the junction with South Fork and on the west side of the South Damen Avenue bridge. In 1977, the centerline controlling depths were 20 feet at midchannel to the Baltimore and Ohio Chicago Terminal Railroad bridge at mile 3.64, thence 15 feet to the turning basin at the junction with South Fork, thence 3 to 14 feet in the basin with the best water on the east side, thence 19 feet on the centerline to the South Damen Avenue bridge with 8 to 23 feet in the basin on the west side of the bridge. Obstructions not disclosed by the soundings may exist in these channels.

(481) South Fork is badly fouled with oily waste. In 1980, the reported controlling depth was 6 feet to the 35th Street bridge. Obstructions not disclosed by the soundings may exist.

(482) **North Shore Channel** joins North Branch about 5.5 miles above the turning basin at North Avenue and extends about 8 miles north to the harbor at Wilmette, IL The controlling depth in the channel is about 7 feet. A lock which blocks the channel at Wilmette is inoperable and is closed to all navigation.

(483) **Measured course**.–A 121°-301° measured course, 5,307 feet long, is on the lakeward side of the breakwater on the northeast side of the outer harbor. The markers are one vertical white stripe between two vertical red stripes, painted on the breakwater.

Lock

(484) The Chicago Lock, operated by the U.S. Army Corps of Engineers, at the mouth of the Chicago River was constructed to prevent the flow of the river into the lake. The lock is 600 feet long and 80 feet wide with a depth of 23 feet over the sill. The zero of the water level gages set in the lock walls is at **Chicago City Datum,** which is 1.4 feet above Low Water Datum. A sound amplifier system is maintained by the lock operators for communication with vessel operators. (See **33 CFR 207.420,** chapter 2, for lock signals and regulations.) Vessels within the lock normally tie up to the south lock wall. However, under adverse weather conditions, such as strong south winds, vessels may wish to use the north lock wall.

(485) Ice may, at times, prevent full opening of the sector gates at the Chicago Lock. When the gates cannot be fully opened (due to ice build-up in the recessed areas), they are vulnerable to excessive damage from vessels entering or departing the lock chamber. When barges have ice build-up on their sides and considerable ice flows are present in the channel, the width of the tows may be restricted by the lockmaster to facilitate passage of the tow into the lock chamber and to minimize lock structural damage from ice.

(486) Due to the lock at the mouth of the Chicago River and other projects by the Chicago Sanitary District, the flow of the river has been reversed and is now away from the lake, except in North Branch.

Anchorages

(487) General and small-craft anchorages are in Chicago outer harbor and in the small-craft basin at the southwest corner of the outer harbor. (See **33 CFR 110.1, 110.83, and 110.205**, chapter 2, for limits and regulations.)

(488) **Danger**.—A rock-filled pile pier 3 to 6 feet high, marked at the outer end by a private light, extends 0.5 mile east from shore into the outer harbor, parallel to and 400 feet north of the Chicago River entrance lock.

Regulated Navigation Area

(489) A safety zone has been established from Lake Michigan to Brandon Road Lock and Dam, including Des Plaines River, Chicago Sanitary and Ship Canal, Chicago River, and Calumet-Saganashkee Channel. (See **33 CFR 165.1 through 165.9, 165.20 through 165.23, and 165.930**, chapter 2, for limits and regulations.)

(490) **Caution**.—Submerged wrecks are along the west side of North Branch Canal about 0.4 and 0.8 mile above the junction with North Branch. The northernmost wreck is marked by a buoy.

(491) Four Mile Crib, marked by a private light with a private sound signal, is 2.6 miles east-southeast of Chicago Harbor Light. (See **33 CFR 165.1 through 165.9, 165.30 through 165.33 and 165.910**, chapter 2 for limits and regulations.).

Bridges

(492) The city has instituted a system of roving bridgetenders to operate or to assist the resident tender to operate certain bridges across the Chicago River, the North Branch, and the South Branch. The bridges affected are annotated in the tables of bridges, following. At least 30 minutes advance notice is required for the first bridge through which a vessel intends to pass. Thence, telephone advice of vessel movements will be passed from bridge to bridge. Notice may be given to the Bridge Desk of the Chicago Department of Transportation, telephone 312–744–4200/4201.

(493) The city of Chicago is attempting to minimize noise in the area bounded by the Michigan Avenue bridge on the east, the Chicago Avenue bridge on the north, and the Roosevelt Road bridge on the south. Pilots of vessels should give the customary whistle signal for the first bridge approached within this area and, when in the draw of the bridge, should inform the bridgetender of their destination. The bridgetenders will then telephone ahead for the necessary bridge openings. Pilots are asked not to signal for other bridge openings in this area unless prompt service is not provided.

(494) **Submarine tunnels**.—Numerous submarine tunnels cross Chicago River and its branches.

Weather, Chicago and vicinity

(495) Chicago, IL, is located on the extreme southwestern shore of Lake Michigan and in the northeastern portion of the state. The location averages about 18 days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 84°F (28.9°C) and an average minimum of 63°F (17.2°C). January is the coolest month with an average high of 29°F (-2°C) and an average minimum of 14°F (-10°C). The highest temperature on record for Chicago is 104°F (40°C) recorded in June 1988 and July 1995 and the lowest temperature on record is -27°F (-32.8°C) recorded in January 1985. About 132 days each year experience temperatures below 32°F (0°C) and an average twenty days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 41°F (5°C) and every month except June, July, and August has recorded temperatures below freezing (0°C).

(496) The average annual precipitation for Chicago is 35.25 inches (895 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter months. Precipitation falls on about 190 days each year. The wettest month is August with 4.10 inches (104 mm) and the driest, February, averages only 1.37 inches (34.8 mm). An average of 37 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 68 days each year and averages about 38 inches (965 mm) each year. January averages about ten inches (254 mm) per year and December averages about eight inches (203 mm) each year. Ten-inch (254 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About seven days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June through September. Fog is present on average 131 days each year and is rather evenly distributed throughout the year with a slight maximum during the winter season.

(497) The prevailing wind direction in Chicago is the south-southwest. The average wind speed is nine knots. Winter through early spring is the windiest period and a maximum gust of 73 knots occurred in March 1991.

(498) (See Appendix B for **Chicago climatological table**.)

Towage

(499) Tugs for the Chicago area are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Quarantine, customs, immigration, and agricultural quarantine

(500) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(501) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A U.S. Public Health Service **outpatient clinic** is in Chicago. (See Appendix A for address.)

(502) Chicago is a **customs port of entry**.

Wharves

(503) The principal use of Chicago Harbor is by barges which reach the port from the Mississippi River via the Illinois Waterway. There are several facilities for barges in the harbor. (For complete information on the port facilities, refer to Port Series No. 46, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.)

(504) **Morton Salt, Elston Avenue Wharf:** west side of North Branch, 0.25 mile below North Avenue turning basin; 532-foot face; 14 to 18 feet alongside; deck height, 8 to 12 feet; warehouse storage for 25,000 tons of salt; receipt of salt; owned and operated by Morton Salt Co.

(505) The **Jardine Water Filtration Plant** is on a bulkheaded fill area just north of Navy Pier. The outer ends of the bulkheads are marked by private lights. A **security zone** has been established in the waters along the north side of the water filtration plant. (See **33 CFR 165.1 through 165.9, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.) An area of fish nets, marked by private lighted buoys and floodlighted, adjoins the north bulkhead of the filtration plant.

Supplies

(506) All types of marine supplies and provisions are available at Calumet Harbor. Tank vessels provide bunker fuel to vessels at their berths.

Repairs

(507) There are no facilities available for repairing, drydocking, or hauling out large, deep-draft vessels in Chicago Harbor. The nearest such facilities are located at Sturgeon Bay, WI.

Small-craft facilities

(508) A small-craft basin, protected by breakwaters, is entered from eastward through an opening in the breakwaters about 0.9 mile south of the natural entrance of the Chicago River. The entrance to the basin is marked by lights. Gasoline, diesel fuel, water, ice and launching ramps are available. Several other small-craft basins

Structures across Calumet Sag Channel			
Name•Description•Type	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)
Junction with Little Calumet River	13.48		
Ashland Avenue Bridge (fixed)	13.98	223	26
Overhead power cable	14.02		68
Dan Ryan Expressway / I-57 Bridge (fixed)	14.04	225	41
Overhead power cable	14.47		43
Division Street Bridge (fixed)	14.49	225	24
Chatham Street Bridge (fixed)	14.77	225	24
Western Avenue Bridge (fixed)	15.01	225	44
Chicago, Rock Island & Pacific Railroad Bridge (fixed)	15.05	225	24
Baltimore & Ohio Chicago Terminal Railroad Bridge (fixed)	15.37	225	24
Grand Trunk Western Railroad Bridge (fixed)	15.38	225	24
Grand Trunk Western Railroad Bridge (fixed)	15.39	225	24
Baltimore & Ohio Chicago Terminal Railroad Bridge (fixed)	15.41	225	24
Grand Trunk Western Railroad / Chicago, Rock Island & Pacific Railroad Bridge (fixed)	15.42	225	24
Francisco Avenue Bridge (fixed)	15.63	225	24
Overhead power cable	15.64		36
Overhead power cable	15.82		60
Kedzie Avenue Bridge (fixed)	16.01	225	24
Overhead pipeline	16.04		30
Overhead pipeline	16.22		31
Overhead power cable	16.25		54
Overhead power cable	16.27		54
Overhead pipeline	16.37		27
Overhead power cables	16.81		60
Crawford Avenue Bridge (fixed)	17.01	198	26
Northern Illinois Toll Highway Bridges (fixed)	17.35	225	39
Overhead power cable	17.48		59
Overhead power cable	17.50		58
Cicero Avenue Bridge (fixed)	18.08	198	24
127th Street Bridge (fixed)	18.81	225	24
Ridgeland Avenue Bridge (fixed)	20.47	225	24
Overhead power cable	21.44		67
Overhead power cable	21.45		44
Overhead telephone cable	21.47		35
Harlem Avenue Bridge (fixed)	21.48	225	24
Norfolk Southern Railroad Bridge (fixed)	22.13	225	43
Overhead telegraph cable	22.16		37
Southwest Highway Bridge (fixed)	22.25	188	26
Overhead power cable	22.27		62
Overhead power cable	22.33		72
Overhead power cable	22.37		72
96th Avenue Bridge (fixed)	24.56	225	24
104th Avenue Bridge (fixed)	25.56	225	24
Overhead telephone cable	28.58		39
Overhead power cable	28.60		68
Sag Highway Bridge (fixed)	28.76	225	39
Overhead power cable	28.90		100
Illinois Gulf Central Railroad Bridge (fixed)	29.01	225	24
Overhead power cable	29.19		62
Junction with Chicago Sanitary and Ship Canal	29.44		

* Miles above Calumet Harbor Pierhead Light

Structures across the Chicago Sanitary and Ship Canal

	Name•Description•Type	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
1	South Western Avenue Bridge (vertical lift)	6.7	155	22	Note 1
2	Baltimore & Ohio Chicago Terminal Railroad Bridge (bascule)	6.9	120	17	Note 1
3	South California Avenue Bridge (bascule)	7.3	128	17	Note 1
4	Canadian National Railroad Bridge (swing)	7.7	85 (right draw), 50 (left draw)	19	Note 1
5	South Kedzie Avenue Bridge (fixed)	7.8	130	22	
6	Grand Trunk Western Railroad Bridge (swing)	8.4	45 (right draw), 80 (left draw)	18	Note 1
7	South Pulaski Road Bridge (fixed)	8.9	140	31	
8	Belt Railroad Bridge (swing)	9.7	97 (left draw)	17	Note 1
9	South Cicero Avenue Bridge (bascule)	10.0	140	18	Note 1
10	South Central Avenue Bridge (fixed)	11.1	170	42	
11	Atchison, Topeka & Santa Fe Railroad Bridge (swing)	12.5	130 (right draw), 85 (left draw)	18	Note 1
12	South Harlem Avenue Bridge (bascule)	13.3	140	23	Note 1
13	Adlai E. Stevenson Expressway Bridges (fixed)	13.9	160	41	
14	Lawndale Avenue Bridges (fixed)	14.3	160	39	
15	Baltimore & Ohio Chicago Terminal Railroad Bridge (swing)	15.1	90	18	Note 1
16	La Grange Road (Justice) Bridges (fixed)	17.9	260	40	
17	Northern Illinois Toll Highway Bridges (fixed)	18.1	242	39	
18	Willow Springs Road Bridge (bascule)	19.4	165	39	Note 1
19	Sag Highway Bridge (fixed)	23.2	160	39	
	Junction with Calumet Sag Channel				
20	Overhead pipeline	24.0		55	
21	Burlington Northern Santa Fe Railroad Bridge (swing)	26.7	160	19	Note 1
22	Lemont High-Rise Bridge (fixed)	26.7	227	47	
23	I-355/Veterans Memorial Tollway (fixed)	28.3	160	72	
24	Overhead pipeline	30.7		44	
25	135th Street Bridge (fixed)	31.1	160	48	
26	Overhead pipeline	31.9		46	
27	Butterfly dam	34.2	80		
28	9th Street Bridge (fixed)	34.6	225	47	
29	16th Street Bridge (swing)	35.2	160	4	
	Lockport Lock				
30	Lockport Lock Bridge (fixed)	36.2	110	51	
	Junction with Des Plaines River				

* Miles above the west end of Chicago Lock (41°53'18"N., 87°36'28"W.)
** Clear width in feet proceeding away from the lake

Note 1 – See 33 CFR 117.391(c), chapter 2, for drawbridge regulations.

along the Chicago lakefront are described under separate headings.

Communications

(509) Chicago has excellent rail, highway, and air connections for passengers and freight.

Illinois Waterway

(510) This waterway is a system of channels connecting Lake Michigan with the **Mississippi River** at Grafton, IL From the mouth of the Chicago River to the Mississippi River, the waterway is 327 miles long. The **Illinois River,** from its headwaters at the confluence of the **Des Plaines River** and **Kankakee River** to its mouth at the junction with the Mississippi River, constitutes about 273 miles of the waterway. The waterway may be entered through Chicago Harbor via the Chicago River and the Chicago River South Branch, or through Calumet Harbor via the Calumet River, the **Little Calumet River,** and the **Calumet Sag Channel.** These channels connect with the **Chicago Sanitary and Ship Canal** which leads southwest

Structures across Des Plaines River

	Name•Description•Type	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Water Datum (feet) Pool Level	High Water	Information
	West end of the Chicago Sanitary and Ship Canal	37.1				
1	Lockport-Elgin, Joliet & Eastern Railroad Bridge (vertical lift)	37.2	225	24	20	Notes 1 and 9 (WHX-746)
2	Ruby Street / State Route 53 Bridge (bascule)	38.5	200 (right draw)	16	13	Notes 2, 3, 5 and 9 (WZQ-8761)
3	Jackson Street Bridge (bascule)	38.8	150	16	13	Notes 4 and 5
4	Cass Street / US 30 Bridge (bascule)	39.1	150	16	13	Notes 4 and 5
5	Jefferson Street Bridge (bascule)	39.4	150	16	13	Notes 4 and 5
6	Chicago, Rock Island & Pacific Railroad Bridge (vertical lift)	39.6	150	9	6	Notes 6, 8 and 10 (KUF-907)
7	McDonough Street / US 6 / US 52 Bridge (bascule)	39.8	150	16	14	Notes 2, 4, 5 and 9 (WZQ-8761)
8	I-80 Bridges (fixed)	40.3	300	46	43	
	Brandon Road Lock and junction with Illinois and Michigan Canal	41.2				
9	Brandon Road Bridge (bascule)	41.4	110		8	WZQ-8761
10	Overhead conveyor	42.3	480		48	Suspension
11	I-55 Bridges (fixed)	49.3	420	47	41	
	Junction with Kankakee River (Head of Illinois River)	54.3				Note 7

* Miles above the end of Chicago Lock (41°53'18"N., 87°36'28"W.)
** Clear width in feet proceeding away from Lake Michigan

Note 1 – Bridge kept in the open position except for the passage of a train.
Note 2 – Bridge clearance gages have been installed at Joliet near the upstream end of the retaining wall above Ruby Street for the guidance of downbound vessels and on the left bridge pier downstream of McDonough Street for the guidance of upbound vessels. The gages are set to show the actual clearance between the water surface and the low steel of the bridges for the center 80-foot width of span. A sign over the gages reads, "Closed Vertical Clearance for Center 80 Feet of Span Joliet City Bridges." Masters of all vessels that can safely pass under the bridges in closed position are requested to do so and refrain from opening the bridges whenever possible.
Note 3 – Clear heights are for 105-foot width.
Note 4 – Clear heights are for 80-foot width.
Note 5 – See 33 CFR 117.1 through 117.59 and 117.395, chapter 2, for drawbridge regulations.
Note 6 – Span raises 41.5 feet above heights shown. Several collisions have occurred at this bridge, and vessel masters are urged to reduce speed and exercise caution when
passing the bridge.
Note 7 – For continuation, see the table of bridges across the Illinois River.
Note 8 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 9 – The bridgetender monitors VHF-FM channel 16 and works on channel 13.
Note 10 – The bridgetender monitors VHF-FM channel 16 and works on channel 14.

to connect with the Des Plaines River at Lockport. The waterway follows the Des Plaines River to the head of the Illinois River and thence down the Illinois River to the junction with the Mississippi River at Grafton. The Mississippi River below Grafton is discussed in U.S. Coast Pilot 5.

(511) **Water Diversion from Lake Michigan.**–The State of Illinois is authorized by a United States Supreme Court decree to divert 3,200 cubic feet per second of water from Lake Michigan into the channels of the Illinois Waterway. As a result, the flow of water is normally away from the lake, except during excessive storm runoff or when lake levels are more than 2 feet below Low Water Datum.

(512) In addition to entering the waterway through the Chicago and Calumet Rivers, water from Lake Michigan also enters the waterway through the North Shore Channel at Wilmette Harbor. North Shore Channel then connects with the North Branch of the Chicago River. Vessels, however, may not enter the waterway at Wilmette as the lock there is inoperable.

Channels

(513) The channels in the Illinois Waterway are maintained at the Federal project depth of 9 feet.

(514) The minimum horizontal clearance, normal to the channel, is 80 feet at the butterfly dam in the Chicago Sanitary and Ship Canal.

Structures across the Illinois River

	Name•Description•Type	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Water Datum (feet)		Information
				Pool Level	High Water	
	Dresden Island Lock	55.7				
1	Elgin, Joliet & Eastern Railroad Bridge (vertical lift)	56.6	113	26	8	Notes 1 and 5 Span raises 30.3 feet above heights shown
2	Morris Highway/State Route 47 Bridge (fixed)	63.8	388	50	34	
3	Chessie System Railroad Bridge (vertical lift)	73.1	140	21	9	Notes 1 and 5 Span raises 26.2 feet above heights shown
4	State Route 170 Bridge (fixed)	74.5	354	47	37	
	Marseilles Canal	80.2				
5	Marseilles Bridge (fixed)	80.3	295	45	-	
	Marseilles Lock	82.6				
6	State Route 23 / Veterans Memorial Bridge (fixed)	87.5	476	47	38	Note 9
7	Burlington Northern Bridge	87.8	167	21	12	Notes 5 and 8 (WRD-810) Span raises 26.4 feet above heights shown
	Starved Rock Lock	96.2				
8	State Route 178 Bridge (fixed)	97.6	356	63	44	
9	Route 412 Bridge (fixed)	101.5	582	66	44	
10	Illinois Central Railroad Bridge (fixed)	101.7	260	61	43	
11	State Route 351 Bridge (fixed)	102.5	360	64	41	
12	US Route 51 Bridge (fixed)	104.3	400	62	44	
13	State Route 89 Bridge (fixed)	108.7	350	60	43	
	Illinois and Mississippi Canal	117.0				
14	I-180 Bridge (fixed)	119.4	350	59	42	
15	State Route 26 Bridge (fixed)	119.6	350	59	42	
16	State Route 18 Bridge (fixed)	131.2	350	59	42	
17	State Route 17 Bridge (fixed)	138.0	350	59	41	
18	Atchison, Topeka & Santa Fe Railroad Bridge (fixed)	145.3	360	58	41	
19	McCluggage Highway Bridges (fixed)	161.4	411	65	58	
20	Murray-Baker / I-74 Bridge (fixed)	164.5	500	65	48	
21	Robert H. Michel Bridge (fixed)	164.9	309	65	58	WZQ-8761
22	Atchison, Topeka & Santa Fe Railroad Bridge (swing)	165.0	118 (left draw)	13	3	Note 2
23	Cedar Street / State Routes 8, 29,116 Bridge (fixed)	165.6	280	78	62	Clear heights are for 210-foot width
24	Peoria & Pekin Union Railroad Bridge (vertical lift)	166.5	307	19	2	Notes 1, 5, 6, and 8 (WQX-651)
25	Shade Lohmann / I-474 Bridge (fixed)	169.2	500	64	48	
	Peoria Lock	169.5				
26	State Route 9 Bridge (fixed)	174.3	430	72	56	
27	Chicago & North Western Railroad Bridge (vertical lift)	176.0	153	30	9	Notes 5 and 8 (KVF-831) Span raises 41.7 feet above heights shown
28	US Route 136 / State Routes 78, 97 Bridge (fixed)	207.6	350	67	47	
29	Burlington Northern Railroad Bridge (vertical lift)	238.4	300	54	34	Notes 4 and 8 (KLU-801)
30	US Route 67 / State Route 100 Bridge (fi xed)	239.3	526	69	49	
	LaGrange Lock	247.0				
31	State Route 104 Bridge (fixed)	255.9	554	72	47	
32	Norfolk Southern Railroad Bridge (vertical lift)	265.9	300	32	6	Notes 6 and 8 (KTR-857) Span raises 45.5 feet above heights shown
33	Valley City Bridge (fixed)	266.9	535	71	55	
34	Valley City Bridge (fixed)	267.1	540	71	55	

Structures across the Illinois River

	Name•Description•Type	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Water Datum (feet) Pool Level	High Water	Information
35	US Route 36 / State Route 100 Bridge (vertical lift)	271.2	202	26	4	Notes 1, 5 and 8 (WZQ-8761) Span raises 56.8 feet above heights shown
36	Illinois Central Gulf Railroad Bridge (vertical lift)	284.0	315	20	0	Notes 5 and 8 (KLU-797) Span raises 69.5 feet above heights shown
37	State Route 100 Bridge (vertical lift)	305.7	300	25	8	Notes 1, 5 and 8 (WZQ-8761) Span raises 56.9 feet above heights shown
	Junction with Mississippi River	327.2				

* Miles above the west end of Chicago Lock (41°53'18"N., 87°36'28"W.)
** Clear width in feet proceeding away from Lake Michigan

Note 1 – Bridge signals are as follows: alternately fl ashing upper and lower vertically arranged green lights indicate draw is to open immediately, and alternately fl ashing right and left horizontally arranged red lights indicate draw cannot be opened immediately or must be closed immediately.
Note 2 – Swing span has been removed.
Note 3 – Bridge is kept in the open position except for the passage of a train.
Note 4 – See CFR 117.1 through 117.59 and 117.393, chapter 2, for drawbridge regulations. Bridge normally open, remotely controlled. Contact KLU-801 on VHF-FM channel 16, before transiting to ensure bridge remains open during passage.
Note 5 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 6 – Span raises about 47 feet above heights shown.
Note 7 – The bridgetender monitors VHF-FM channel 16 and works on channel 13.
Note 8 – The bridgetender monitors VHF-FM channel 16 and works on channel 14.
Note 9 – Clear heights are for 417-foot width.

U.S. Army Corps of Engineers (USACE) Emergency Numbers

(515) The U.S. Army Corps of Engineers, Rock Island District, has emergency telephone numbers for reporting navigation channel groundings, closures, and other situations of importance for both the Illinois Waterway and the Mississippi River: Illinois Waterway 309–676–4601; Mississippi River 309–794–4512.

Water levels

(516) Water levels in the Chicago Sanitary and Ship Canal are governed by the controlling works located at the mouth of the Chicago River, in the Calumet River, at Wilmette Harbor, and at Lockport.

Currents

(517) Currents in Calumet Sag Channel are 0.2 to 0.4 mph with a maximum of 1.3 mph during periods of heavy runoff.

Bridges

(518) Minimum vertical clearances are 18 feet in the Little Calumet River and 24 feet in Calumet Sag Channel. (For bridge clearances in the Chicago River and the Chicago River South Branch, see the Chicago River bridge tables.) From the South Branch of the Chicago River, the minimum vertical clearance in the Sanitary and Ship Canal is 17 feet to Lemont, thence from Lemont to the junction with the Des Plaines River the minimum clearance is 44 feet. Due to this great change in vertical clearances in the Sanitary and Ship Canal, lake-bound barges change tugs at Lemont for smaller tugs which can navigate under the bridges between Lemont and Lake Michigan. The minimum vertical clearance in the Des Plaines River and the Illinois River is 46 feet above normal pool level (34 feet above extreme High water). (See the bridge tables following.)

(519) **Overhead cables**–Numerous overhead cables cross all these channels, but do not obstruct any craft which can pass under the bridges.

Locks

(520) The Illinois Waterway has nine U.S. Government locks including Chicago Lock at the mouth of the Chicago River. (See **33 CFR 207.300,** chapter 2, for lock regulations in the Illinois Waterway.)

(521) The **Thomas J. O'Brien Lock** is on the west side of the Calumet River about 0.7 mile above Turning Basin No. 5 in Calumet Harbor. A dam with controlling works extends from the lock wall east across the river and allows passage through the lock only. The lock is 1,000 feet long and 110 feet wide with a depth over the sills of 15 feet and a nominal lift of 2 feet. Passage through the lock is governed by flashing traffic signal lights on the west lock wall near the upper and lower lock gates. (See 33 CFR 207.300 and 207.425, chapter 2, for lock regulations.) With favorable river conditions or when for any reason the lock is not being operated, the lock gates at both ends of the chamber will be fully opened. At such times, navigation through the lock remains under control of the lockmaster and the following regulations apply: for commercial craft, the **speed limit** through the chamber is 4 mph, passing in the lock chamber in either direction is prohibited, and stopping along or tying up to the lock or guide walls is prohibited; for recreational craft, speed through the chamber shall be commensurate with safety but not more than 4 mph, passing

commercial craft in either direction is prohibited, and the lock is to be used for through navigation only.

(522) **Lockport Lock**, in the Chicago Sanitary and Ship Canal at the junction with the Des Plaines River, is 600 feet long and 110 feet wide with a nominal lift of 39.6 feet. An adjoining auxiliary lock is inoperable. Occasionally when heavy precipitation is predicted, the water level in the Sanitary and Ship Canal will be lowered to accommodate the expected water runoff in the canal. When the water in the canal falls below a level of 566.68 feet above mean water level at Father Point (Points au Pere), QC, International Great Lakes Datum (1955), or its equivalent, locking operations are suspended for lack of navigable depth over the upper lock sill. During periods of heavy discharge through the controlling works adjacent to the lock, currents in the channel below the lock may be strong enough to break mooring lines or stop the progress of low power vessels and large tows. Vessels moored in the vicinity or transiting the lock should monitor VHF-FM channel 16 for announcements of changes in discharge rates.

(523) The Lockport Controlling Works and a butterfly dam are about 2 miles north of Lockport Lock. The controlling works are on the west bank of the canal just north of the butterfly dam. The sluice gates of the controlling works are equipped with two oscillating red warning lights, one directed each way in the canal so as to be readily visible to mariners. The lights operate when the sluice gates are open and warn mariners to keep to the east side of the channel, clear of the sluice gates. The butterfly dam swings on pivots located in midstream. The dam is normally open and provides a horizontal clearance of 80 feet on either side. The dam is solely a safety device, providing a method of stopping the flow of water in the event of damage to the levee walls or to the Lockport Lock and powerplant complex downstream. Mariners are cautioned to watch out for this structure. Fluctuations in the water level of up to 10 feet may be expected immediately above the Lockport Lock, decreasing to 4 feet at the head of the canal.

(524) **Brandon Road Lock**, in the Des Plaines River about 4.8 miles below the Lockport Lock, is 600 feet long and 110 feet wide with a nominal lift of 34 feet. Immediately above the lock is a large basin well suited for turning and rearranging tows. The dam at Brandon Road has movable tainter and sluice gates which control the flow and make it possible to maintain a pool level, with small fluctuation above the dam, under normal conditions. Below the dam, an 8¾-foot fluctuation in water level may be expected.

(525) The remaining five locks are in the Illinois River at Dresden Island, Marseilles, Starved Rock, Peoria, and LaGrange. Each lock is 600 feet long and 110 feet wide.

(526) **Dresden Island Lock**, just below the confluence of the Des Plaines River and the Kankakee River, has a nominal lift of 21.75 feet. The pool above the lock is wide, while that below the lock is quite narrow for about 22 miles. High flows from rainfall runoff and spring thaws can cause the lower pool level to fluctuate drastically; fluctuations of 22 feet may be expected. When conditions of high flow exist, vessels must take into account overhead clearances, vessel draft, and available power. Bridge clearances are reduced so that many towboats cannot pass under the railroad bridge just below the lock. Shallow-draft vessels risk grounding on the lower guide wall which may be submerged. Fully laden barges, drawing 8 to 9 feet, under most circumstances may safely transit the lock by maintaining contact with the lower guide wall even when it is submerged. The outdraft from the dam can pull low or underpowered craft into the dam from the upper pool near the lock. In the lower pool, low or underpowered craft may be driven into the bank or the railroad bridge. When open and lighted, the outdraft sign must be heeded.

(527) **Marseilles Lock**, 27 miles below Dresden Island Lock, has a nominal lift of 24.25 feet. Spring thaws and rain runoff cause a maximum fluctuation of level of the lower pool of 9 feet. Once a year during this high level condition the lower guide wall is submerged, and shallow-draft vessels risk grounding. During conditions of high flow from the dam, vessels should exercise extreme caution when entering or exiting Marseilles Canal. A hazardous outdraft condition is indicated by an open and lighted outdraft warning sign at the head of the canal.

(528) **Starved Rock Lock**, 13 miles below Marseilles Lock, has a nominal lift of 18.7 feet. Variation in the lift can be as much as 17 feet depending on flow. Severe outdraft during moderate to high flow conditions makes downbound entry or upbound exiting of the lock difficult to dangerous. When the lower pool reaches a level of 450 feet above MSL 1929, shallow-draft vessels risk grounding on the lower guide wall or the bullnose on the lower left lock wall. Tows should exit the lock at a low rate of speed to prevent backlash.

(529) **Peoria Lock**, 73 miles below Starved Rock Lock, and **LaGrange Lock**, 77 miles below Peoria Lock, have nominal lifts of 11 and 10 feet, respectively. These locks were designed to accommodate flooding and have Chanoine Wicket dams for pool level control. The dams are lowered to the river bottom when the lower pool levels rise and approach the upper pool levels. When the dams are lowered to the river bottom, about 40 percent of the time, they are said to be in the "open pass" or "navigable pass" status. Tows should exit these locks at a low rate of speed to prevent backlash.

(530) Special restrictions are in effect concerning all locks and dams of the Illinois Waterway and the Chicago Lock at the mouth of the Chicago River. The restrictions are as follows: Boat crews, repairmen, and company officials will be permitted to embark or disembark at the above locations only after identification has been established satisfactorily to the lockmaster. Such identification can be established by the vessel master or pilot on duty personally signing a Necessity for Admission form which will be furnished by the lockmaster. The

privilege of entering the lock premises is for the express purpose only of embarking or disembarking from a vessel, and shall not be construed as permission to use the reservation for waiting or any other purpose. Supplies, packages, and parcels, including laundry, will not be accepted by the lockmaster for delivery to or from vessels.

Navigation Charts

(531) Charts of the Illinois Waterway is a booklet of charts showing this maintained waterway from the Mississippi River at Grafton, IL, to Lake Michigan at Chicago, IL The booklet is published and sold by the U.S. Army Corps of Engineers, Rock Island District. (See Appendix A for address.)

Light List

(532) Aids to navigation of the Illinois Waterway are contained in Light List, Volume VII, Great Lakes, and Light List, Volume V, Mississippi River System, for above and below the Lockport Lock, respectively. The Light List is available from the U.S. Government Printing Office. (See Appendix A for address.)

(533) From Chicago Harbor north for 13.5 miles to Wilmette, the shore is bordered by shoals and detached spots that extend 4 miles off. Carter H. Harrison Crib, 2.1 miles north-northeast of Chicago Harbor Light, is connected to William E. Dever Crib, close northeast, by a bridge with a clearance of about 27 feet. William E. Dever Crib is marked by a private light with a private sound signal. A **security zone** has been established in the waters of Lake Michigan around the William E. Dever Crib. (See **33 CFR 165.1 through 165.9, 165.30 through 165.33 and 165.910,** chapter 2 for limits and regulations.)

(534) A submerged bulkhead, covered 2 feet, parallels the shoreline about 450 feet off, from 1.9 to 2.8 miles north of the Chicago River entrance. The bulkhead is marked at intervals by 5-foot-high piles. Small craft should not attempt to cross the bulkhead. At the south end of the bulkhead, a private light marks North Avenue Jetty.

(535) **Diversey Harbor** is a small-craft basin protected by breakwaters about 3 miles north of Chicago River entrance. The ends of the north and south breakwaters are seasonally marked by private lights. The controlling depths are about 9 feet in the entrance channel with 8 feet in the basin and shoaling toward shore. Mariners should use caution when using the harbor during high waves and swells. The entrance channel is crossed by a fixed highway bridge with a clearance of 14 feet. Vessel traffic control lights on the bridge are directed either direction in the channel and operate as follows: green, 10 minutes; red, 10 minutes. These lights operate 24 hours during good weather.

(536) **Belmont Harbor** is a small-craft basin 4 miles north of Chicago River entrance. The entrance to the basin is marked on the north side by private lights. The entrance channel has a controlling depth of about 17 feet, and the basin has central depths of 17 to 24 feet with shoaling toward shore. Gasoline, diesel fuel, ice, and sewage pump-out facilities are available in the basin.

(537) An 8-foot shoal, marked on the east side by a buoy, is 0.3 mile northeast of the entrance to Belmont Harbor. An 11-foot shoal is 0.8 mile northeast of the entrance.

Charts 14905, 14927, 14926

(538) The shore from Belmont Harbor north for 1.3 miles to Montrose Harbor is paralleled 16 feet off by a submerged shore-protection bulkhead, covered about 4½ feet. The bulkhead is marked at 20-foot intervals by 5½-foot-high piles. Small-craft should not attempt to cross the bulkhead.

(539) **Montrose Harbor** is a small-craft basin about 5 miles north of Chicago Harbor. The entrance to the basin, from south, is protected by two breakwaters, each marked on the outer end by a private light. The entrance channel has depths of about 18 feet with 17 feet in the basin. Sewage pump-out facilities are available in the basin.

(540) A breakwater, marked at the inner and outer ends by private lights, extends north from the point of land which forms the north and east sides of Montrose Harbor.

(541) Wilson Avenue Crib, marked by a private light with a private sound signal, is 2.6 miles east of Montrose Harbor entrance. A security zone has been established in the waters of Lake Michigan, surrounding the crib. (See **33 CFR 165.1 through 165.9, 165.30 through 165.33 and 165.910**, chapter 2 for limits and regulations.) An automatic wave recorder, covered 6½ feet, is about 400 feet northwest of the crib.

(542) A shoal with rock outcroppings covered 15 to 18 feet extends 3.5 miles offshore from about 1 to 4 miles north of Montrose Harbor.

(543) **Grossepoint Light** (42°04'00"N., 87°41'00"W.), 119 feet above the water, is a prominent private aid shown from a white conical tower with a red roof close to shore 7.3 miles north of Montrose Harbor and 1 mile south of Wilmette. An automatic wave recorder, 13 feet high, is close offshore 0.25 mile southeast of the light.

(544) **Wilmette, IL**, is a small-craft harbor at the north terminous of North Shore Channel, about 13.5 miles north of Chicago Harbor. The harbor is used primarily by pleasure craft. The white dome of the Baha'i Temple 0.3 mile southwest of the harbor entrance is prominent.

Channels

(545) The harbor is entered northwest from deep water in Lake Michigan between two piers to an inner harbor basin. A breakwater extending east from the shore north of the entrance piers provides some protection from north winds. The outer ends of the piers and the breakwater are marked by private lights. In 1978, the

entrance channel was reportedly being maintained to a depth of 8 feet during the boating season. In 1971, the controlling depth in the basin was about 3 feet. In 1987, shoaling to an unknown depth was reported at the entrance to the harbor, extending about 50 yards south from the Wilmette Harbor Entrance North Light.

(546) **Caution**.—When approaching the harbor during periods of reduced visibility, mariners are cautioned against mistaking the breakwater for the north pier. Vessels approaching from the north are advised to pass well clear of the north pier before hauling around to the entrance.

(547) **Sluice Gate**.—To regulate the flow of water from Lake Michigan into North Shore Channel, a sluice gate has been constructed at the southwest end of the harbor basin by the Chicago Sanitary District. A navigation lock in the structure is inoperable and blocks access from the harbor to the channel. Since there may be considerable current through the harbor when the gate is open, an oscillating red warning light is operated near the gate.

Coast Guard

(548) **Wilmette Coast Guard Station** is on the north side of the harbor basin.

Small-craft facilities

(549) Limited transient berths, gasoline, sewage pump-out facilities, and limited supplies are available in the harbor. A hoist can handle 30-foot craft for minor repairs.

Chart 14905

(550) From Wilmette, the shore extends 21 miles north-northwest to Waukegan. This reach is low for the first 5 miles, thence has 70-foot bluffs north to Waukegan. In the vicinity of Wilmette, shoals extend 2.3 miles offshore, but over the rest of the reach, the shoal border is less than 2 miles wide. A wreck, covered 15 feet and marked by a lighted bell buoy, is 2 miles northeast of Wilmette. A rocky spot, covered 22 feet and marked on the east side by a lighted bell buoy, is about 6 miles northeast of Wilmette. **Glencoe Shoal,** reported to be covered 3 feet, is 1 mile offshore about 5.5 miles north-northwest of Wilmette. A detached 21-foot spot is 3.3 miles offshore about 3 miles north of Glencoe Shoal. In 1958, a wreck was reported 3.4 miles offshore 5.3 miles north of Glencoe Shoal.

(551) **Great Lakes Naval Training Center Harbor,** about 3.5 miles south of Waukegan, is a protected area of about 100 acres enclosed by breakwaters on the north, east, and south. The harbor is used by training vessels and by pleasure craft of personnel stationed at the base. Permission to enter the harbor must be obtained from the **harbormaster,** who may be contacted on VHF-FM channel 14, call Great Lakes Harbor, or at the boathouse, Building 13, in the inner basin. The harbor is available as a refuge during storm or other emergency.

(552) The north breakwater extends east from the shore and joins the east breakwater, which then extends south to the entrance channel. The south breakwater extends east from shore to the entrance channel. The outer ends of the breakwaters are marked by lights. In 1977, the entrance channel had a centerline controlling depth of 12 feet. A channel through the outer harbor has a depth of about 13 feet. From the outer harbor a channel leads between piers to an inner basin. The outer ends of the piers are marked by lights. The channel to the inner basin has a depth of about 14 feet.

(553) A **restricted area** extends 1 mile into Lake Michigan, from Great Lakes Naval Training Center Harbor south breakwater, north for 1.6 miles. A **danger zone** for rifle firing practice extends 2 miles into the lake just north of the harbor. (See **33 CFR 334.820 and334.830,** chapter 2, for limits and regulations.)

Charts 14904, 14905

(554) **Waukegan, IL,** is a city and small commercial harbor on the west side of Lake Michigan 35 miles north of Chicago Harbor. The principal cargoes handled in the port are bulk cement and gypsum rock. Prominent are stacks at the Commonwealth Edison Co. 1.5 miles north of the harbor and the light on the intake crib 2.1 miles north of the harbor.

(555) **Waukegan Harbor Light** (42°21'38"N., 87°48'48"W.), 36 feet above the water, is shown from a cylindrical tower with a green band on the outer end of the south pier. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A. The light is sometime difficult to distinguish from shore lights in the background.

Channels

(556) The harbor is entered through a dredged entrance channel leading west from deep water in Lake Michigan between parallel piers to an inner harbor basin. A breakwater extending from shore on the north side of the entrance channel protects the entrance from northeast seas. The outer ends of the piers and breakwater are marked by lights. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The entrance channel is subject to shoaling caused by the drift of sand from the north.

(557) The inner harbor basin is not adapted for anchorage, but vessels may moor to the revetments on the west side or in the waters north of the inner harbor basin. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

(558) **Danger**.—A foul area with a number of detached rock ledges is east of the harbor entrance. The area is

marked by a buoy on the east side and a lighted buoy on the north side. Mariners should keep to north of the lighted buoy.

(559) **Caution**.—Sudden wind direction or barometric pressure changes may cause water levels in the harbor to rise or fall as much as 3 feet in a short time.

Harbor regulations

(560) Federal regulations specify a **speed limit** of 4 mph (3.5 knots) in the harbor. (See **33 CFR 162.120**, chapter 2, for regulations.)

(561) Local harbor regulations have been established by the Waukegan Port District and are enforced by the Executive Director, Port of Waukegan, whose office is at South Harbor Marina. Copies of the regulations can be obtained from the Executive Director, Port of Waukegan, 55 South Harbor Place, P.O. Box 620, Waukegan, IL 60079. A **speed limit** of 5 mph (4.3 knots) is enforced in the inner and outer harbor of Waukegan.

Towage

(562) Tugs are available in Waukegan at Kadinger Marine Services, Inc.

Wharves

(563) Waukegan has two deep-draft facilities in the slip on the northwest side of the inner basin. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(564) **La Farge Cement Dock:** south side of the slip; 620-foot face; about 16 to 17 feet alongside; deck height, 7 feet; covered storage for 32,000 tons of bulk cement; receipt of bulk cement; owned by Waukegan Port Authority and operated by La Farge Cement Co.

(565) **National Gypsum Company Dock:** north side of the slip; about 750 feet of berthing space; 15 to 16 feet alongside; deck height, 4 to 5 feet; open storage for 120,000 tons of gypsum rock; owned by Elgin, Joliet, and Eastern Railway and operated by National Gypsum Company.

Small-craft facilities

(566) The Waukegan Port District operates a marina adjacent to the south pier of the entrance channel. The marina is entered from the south between protecting breakwaters and can provide 50 transient berths, gasoline, diesel fuel, electricity, water, ice, a launching ramp, and sewage pump-out.

Chart 14904

(567) The shore from Waukegan north for 16 miles to Kenosha is low with some woods behind the beach. Shoals extend no more than 0.8 mile offshore. Small craft should avoid the rock awash 50 yards off the mouth of Barnes Creek. The rock is about 2.2 miles north of Winthrop Harbor in about 42°31'24"N., 87°48'30"W.; mariners are advised to pass well offshore of this obstruction.

(568) About 1.5 miles north of Waukegan, a breakwater extends 1,200 feet from shore to protect the intake channel of the Waukegan Generating Station, Public Service Co. The outer end of the breakwater is marked by a private light. A fish net is placed annually, between April and August, from the outer end of the breakwater to the shore about 1,200 feet southwest. The net shows above the water and is marked by private buoys and floats. Three lighted stacks at the generating station are prominent from offshore.

(569) The towers of the Commonwealth Edison Co. nuclear powerplant (Zion Nuclear Power Plant) at **Zion**, 6 miles north of Waukegan, are reported to be prominent from offshore. A **security zone** has been established in the waters of Lake Michigan off the Commonwealth Edison Co. nuclear power plant. (See **CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.)

(570) A large marina (42°29'05"N., 87°48'05"W.), along the Illinois shore is close east of the town of **Winthrop Harbor,** about 2 miles north of Zion.

(571) The marina basins are protected on the north and east sides by breakwaters. The south breakwater is marked by three lights. The north breakwater is marked by two lights. Both breakwaters have a light marking the entrance between the outer ends.

(572) Both the smaller north basin and the large south basin had a reported depth of 8 feet in 2006. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, launching ramps, haul-out to 70 tons, and full service marine repairs are available. The **harbormaster** monitors VHF-FM channel 16.

(573) The **State boundary** between Illinois and Wisconsin is about 9 miles north of Waukegan and 7 miles south of Kenosha.

(574) **Prairie Cove** is a small-craft harbor on the Illinois-Wisconsin State boundary. There is a private marina in the harbor. The harbor is marked by private lights and buoys. In 1993, the reported controlling depth in the harbor was 8 feet. The Harbormaster monitors VHF-FM channels 16 and 9.

(575) **Kenosha Harbor**, 50 miles north of Chicago Harbor at the original mouth of **Pike Creek,** serves as a base for commercial fisherman and pleasure craft. The harbor serves the city of **Kenosha, WI.**

Prominent features

(576) Prominent from the lake are a white tank on the north side of the entrance channel and a radio tower 3.2 miles west-southwest of Kenosha Light.

(577) **Kenosha Light** (42°35'20"N., 87°48'31"W.), 50 feet above the water, is shown from a red conical tower on the outer end of the north pier; a seasonal sound signal is at the light. Kenosha Light and the light on the southeast end of the detached breakwater form a range useful for approaching the harbor entrance.

Structures across Root River at Racine

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
1	Main Street Bridge (bascule)	42°44'02"N., 87°47'03"W.	0.31	90	12	Note 1
2	State Street Bridge (bascule)	42°43'54"N., 87°47'09"W.	0.53	69	12	Note 1
3	Overhead power cable	42°43'46"N., 87°47'22"W.	0.97		53	
4	Marquette Street Bridge (fixed)	42°43'45"N., 87°47'34"W.	1.17	58	9	
5	Overhead power cable	42°43'42"N., 87°47'39"W.	1.27			Clearance data not available
6	Overhead pipeline	42°43'39"N., 87°47'42"W.	1.32	137	12	
7	Sixth Street Bridge (fixed)	42°43'33"N., 87°47'45"W.	1.46	49	24	
8	Chicago & North Western Railroad Bridge (fixed)	42°43'26"N., 87°47'47"W.	1.65	107	17	Note 2

* Miles above the mouth of the river
** Clear width in feet proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.59 and 117.1095, chapter 2, for drawbridge regulations.
Note 2 – Neither draw is accessible. The depth would only permit passage of very small boats.

Channels

(578) The harbor is entered through a dredged entrance channel leading from deep water in Lake Michigan between parallel piers to an inner harbor basin. (See Notice to Mariners and the latest edition of the chart for controlling depths.) A detached breakwater on the north side of the entrance channel protects the entrance from northest seas. The outer ends of the piers and the breakwater are marked by lights.

(579) The entrance channel is subject to shoaling caused by the drift of sand from the north. Severe east gales cause considerable disturbance in the basin. The inner basin is not adapted for anchorage, but vessels may moor to the revetments surrounding it. Mooring to the breakwater or piers is prohibited.

(580) **Caution.**—The original mouth of Pike Creek has been bulkheaded and filled. The creek has been diverted and now enters the harbor basin at the foot of 52nd Street through a 13-foot pipe. The creek flows into the harbor with velocities to 2 mph.

Bridge

(581) The 50th Street bridge at the north end of the dredged part of the basin has a fixed span with a clearance of 16 feet.

Harbor regulations

(582) A **slow no-wake speed limit** exists in the area from the breakwaters at the east end of the harbor entrance to above the 50th street bridge at the end of the basin.

Coast Guard

(583) **Kenosha Coast Guard Station** is on the east side of the inner basin.

Small-craft facilities

(584) A large public marina is about 0.4 mile southwest of the harbor entrance. The marina is protected by breakwaters and the entrance is marked by private lights. Marinas are also located inside the harbor above and below the 50th Street bridge. Transient berths, gasoline, diesel fuel, water, ice, electricity, limited marine supplies, sewage pump-out, launching ramp, haul-out to 60 tons, and harbormaster services are available.

(585) From Kenosha, the shore is bluff for 10 miles north to Racine. The shoal border is less than 1 mile wide with several detached spots beyond. About 1 mile north of Kenosha, 20- and 23-foot spots are 1 and 1.6 miles off-shore, respectively. A prominent lighted cross is 1.3 miles north-northwest of Kenosha Harbor. A wreck, covered 30 feet, is 1.2 miles offshore and 4 miles north of Kenosha Harbor. Detached 21-foot spots are 1 mile and 1.4 miles offshore, 2.4 and 3.8 miles south of Racine, respectively.

Charts 14904, 14925

(586) **Racine Reef,** southeast of the entrance to Racine Harbor, is a large shoal extending from 0.6 to 2.3 miles offshore. The reef has a least depth of 1 foot over a crib near its center. **Racine Reef Light** (42°43'39"N., 87°44'10"W.) 50 feet above the water, is shown from a skeleton tower on the east side of the reef; a seasonal sound signal is at the light. The light should not be passed close aboard even by shallow-draft vessels. The west end of the reef is marked by a lighted buoy.

(587) **Racine Harbor,** serving the city of **Racine, WI,** is at the mouth of the **Root River,** 60 miles north of Chicago Harbor and 21 miles south of Milwaukee Harbor. The harbor is used primarily by pleasure craft and fish tugs.

(588) A small-craft facility is in the south part of the outer harbor basin. A launching ramp basin is just south of the outer harbor basin. The entrances to the basins are marked by lighted buoys and lights.

Channels

(589) From the outer harbor basin, a dredged channel in the Root River leads upstream for about 0.7 mile to just below Fourth Street. In 1992, the reported controlling depths were 15 feet to the mouth of Root River, thence 11 feet to the Main Street bridge, thence 8 feet near midchannel to the head of the project. Above the dredged channel, depths are about 4 feet to about 200 yards below Marquette Street bridge, thence depths of 1 to 4 feet for about 2.5 miles above Marquette Street bridge. There are rocks on the river bottom just inside the mouth between the north channel limit and the north revetment.

(590) The outer basin is not adapted for anchorage by large vessels but reduces wave action in the lower section of the river. Mooring to the breakwaters and the pier on the north side of the river mouth is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(591) The channel inside the river is narrow and tortuous, making navigation for large vessels difficult. Currents in the river attain velocities to 3 mph.

Dangers

(592) Several detached shoal spots with depths of 21 to 24 feet are 0.3 to 1.1 miles northeast of the harbor entrance. Racine Harbor is subject to considerable wave action during periods of strong winds from northeast to southeast.

Local bridge regulations

(593) In case street traffic is delayed by reason of the draws of either bridge having been continuously opened for 5 minutes or more for the passage of boats, the draws may be closed, but shall be again opened for the passage of boats as soon as practicable; provided however, that no boat shall be delayed for a longer period than 15 minutes.

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

(595) All boats when passing any bridge in the city shall be moved past as expeditiously as is consistent with proper movement in the river, and in no case shall any boat, while passing any bridge and obstructing the same, remain or obstruct the passage across such bridge more than 5 minutes, nor shall any boat be so anchored or fastened as to prevent the free and speedy opening of any bridge or the free passage of other boats through the same.

(596) No person shall in any manner obstruct the free passage over and upon the bridges of the city.

(597) No person except the bridgetender or person authorized to act in his stead shall open or in any manner interfere with opening any bridge.

(598) The person having charge of any boat desiring to move past any bridge shall allow a reasonable time for the opening of such bridge, and no person shall move any boat against any bridge or draw thereof before the bridge is opened.

(599) No person shall willfully injure or damage any bridge or abutment, or part thereof. No person shall fasten or hitch any boat, timber or other floating material to any bridge or abutment.

(600) No person shall damage or remove any portion of the improved shore protection of any navigable waters within the city.

(601) Any person who violates any provision of this section shall, upon conviction thereof, be liable for the cost of repairing any damage resulting from such violation, in addition to the penalty provided for violation of this code.

Quarantine, customs, immigration, and agricultural quarantine

(602) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(603) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(604) Racine is a **customs port of entry.**

Harbor regulations

(605) Federal regulations specify a **speed limit** of 4 mph (3.5 knots) in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(606) Local harbor regulations are under the control of the harbor commission and are enforced by the **harbormaster** who can be reached through the Racine County Water Patrol. A **slow-no wake speed** is enforced within the harbor limits. Copies of the regulations can be obtained from the Commissioner of Public Works, City Hall, 730 Washington Avenue, Racine, WI 53403.

Small-craft facilities

(607) Marinas at Racine provide transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps. Hoists to 25 tons are available for hull, engine, and electronic repairs.

(608) From Racine Harbor, the shore is bluff and curves northeast for 3.5 miles to **Wind Point**. Shoals extend about 0.9 mile offshore. Detached 21- and 20-foot depths are 1.1 miles northeast and 1.3 miles north-northeast of the entrance to Racine Harbor. **Wind Point Light** (42°46'52"N., 87°45'30"W.), 111 feet above the water, is shown from a white conical tower with attached dwelling on the point. The light may display a false or double flash at certain bearings.

(609) **Wind Point South Shoal,** with a least depth of 17 feet, is 1.3 miles southeast of Wind Point Light. The shoal is marked on the east side by a buoy.

Chart 14904

(610) **Wind Point North Shoal**, with boulders covered 14 feet and marked on the southeast side by a lighted buoy, is 1.7 miles northeast of Wind Point Light. All vessels should keep well outside the buoy, especially in heavy weather.

(611) From Wind Point, the shore trends northwest and then north for 18 miles to Milwaukee Harbor. The shore in this stretch is bluff. For the first 7 miles of the stretch, shoals extend about 0.6 mile offshore, thence north to Milwaukee, the shoal border is irregular and extends as much as 1.5 miles from shore. A detached bank with a least depth of 18 feet is from 1.2 to 2 miles offshore in the vicinity of South Milwaukee, about 9.5 miles north of Wind Point. The greatest extent of the shoal border is 3.5 miles southeast of the entrance to Milwaukee Harbor and is marked at the outer edge by a lighted bell buoy. Vessels should stay outside the buoy. A wreck, covered 27 feet, is marked by a lighted buoy 5.3 miles northeast of South Milwaukee.

(612) **Caution**.—A firing area for small caliber weapons is at the Racine County Line Rifle Club Range about 3.5 miles northwest of Wind Point. The firing creates a caution zone about 3,500 feet wide extending about 3 miles into the lake. Mariners should navigate the area with caution and consult the Local Notice to Mariners for latest information.

(613) **Oak Creek Harbor** is a private harbor of the Wisconsin Electric Power Co., about 5.6 miles northwest of Wind Point. Two stacks at the powerplant, the northernmost lighted, are prominent from the lake. A fill area for coal storage extends about 900 feet into the lake and has a combined water intake and docking slip along its south side. The slip is protected by a breakwater on the north side of the entrance and along the south side by a jetty. In 1977, the reported controlling depth was 21 feet in the approach with 20 feet in the north half of the slip and 15 feet in the south half. In 1993, it was reported that the slip was being maintained to a depth of about 20 feet. Strong currents may exist at the west end of the slip due to a large volume of plant intake water.

(614) About 3 miles north of Oak Creek Harbor, the city of Milwaukee has constructed a sewage treatment plant on a landfill that extends about 1,000 feet into the lake. A stack about 0.5 mile south of the plant is prominent.

(615) **South Milwaukee, WI,** is at the mouth of **Oak Creek,** about 8.5 miles south of the entrance to Milwaukee Harbor. Clay bluffs north and south of the creek mouth have an elevation of 60 feet or more. A rock jetty extends lakeward from the north side of the mouth of the creek. A row of submerged piling extends about 200 feet lakeward from the end of the rock jetty. Another pier extends from the south side of the mouth and then bends southwest to enclose a small-craft basin. The south side of the basin is enclosed by a breakwater extending from shore. In 1978, the reported controlling depths were 6 feet in the entrance and 4 feet in the basin. Gasoline is available in the basin.

Charts 14904, 14924

(616) **Milwaukee Harbor**, serving the city of **Milwaukee, WI,** is one of the major ports on the Great Lakes. The harbor is at the mouth of the **Milwaukee River,** which flows into **Milwaukee Bay,** a broad indentation on the west side of Lake Michigan about 80 miles north of Chicago Harbor. The harbor comprises an outer harbor formed by breakwaters paralleling the shore and an inner harbor in Milwaukee River, **Menomonee River,** and **Kinnickinnic River.** The principal cargoes handled in the port are general cargo, steel products, coal, cement, and grain. Freighters and petroleum tankers ply the waters year round between this port and other ports on south Lake Michigan.

Prominent features

(617) Prominent are lighted television towers 4.5 miles north of the Milwaukee River mouth, the U.S. Bank Center 0.95 mile north-northwest of the river mouth, a stack 0.4 mile southwest of the river mouth, the Allen-Bradley Co. clock and temperature towers 1 mile southwest of the river mouth, and an apartment building close southwest of the Coast Guard Station at the south end of the outer harbor.

(618) **Milwaukee Breakwater Light** (43°01'37"N., 87°52'55"W.), 61 feet above the water, is shown from a black lantern on a white square structure on the end of the breakwater on the north side of the main entrance channel; a seasonal sound signal is at the light.

Channels

(619) Milwaukee outer harbor is protected by a series of breakwaters which generally parallel the shore on either side of the mouth of Milwaukee River. The main entrance to the harbor is through a dredged channel which leads from deep water in Lake Michigan between the breakwaters across the outer harbor to the mouth of the river. The ends of the breakwaters at the main entrance are marked by lights. The breakwater gaps at the north and south ends of the outer harbor are marked by lights. A dredged anchorage basin extends south from the entrance channel between the breakwater and the deep-draft piers along the shore.

(620) The inner harbor is entered from the outer harbor through the piers at the mouth of the Milwaukee River. The outer ends of the piers are marked by lights. The Milwaukee River flows from the north and is joined by the Menomonee River from the west about 1 mile above the pierheads and by the Kinnickinnic River from the south at the inner end of the piers at the northwest end of **Jones Island.** Channels have been dredged in the lower parts of the rivers, for about 1.2 miles in the

Structures across Milwaukee, Menomonee and Kinnickinnic Rivers

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
	Milwaukee River					
1	Lake Freeway / I-794 Bridge (fixed)	43°01'30"N., 87°53'56"W.	0.19	200	120	Note 2
	Junction with Kinnickinnic River		0.38			
2	Union Pacific Railroad Bridge (swing)	43°01'41"N., 87°54'18"W.	0.59	87	7	Note 1
3	Broadway Street Bridge (bascule)	43°01'48"N., 87°54'27"W.	0.79	100	14	Note 1
4	Water Street Bridge (bascule)	43°01'52"N., 87°54'36"W.	0.94	130	14	Note 1
	Junction with Menomonee River		1.01			
5	St. Paul Avenue Bridge (vertical lift)	43°02'06"N., 87°54'36"W.	1.21	50	14	Note 1
6	East-West Expressway / I-794 Bridges (fixed)	43°02'08"N., 87°54'35"W.	1.26	116	28	
7	Clybourn Street Bridge (vertical lift)	43°02'10"N., 87°54'35"W.	1.28	52	14	Note 1
8	Michigan Street Bridge (vertical lift)	43°02'14"N., 87°54'35"W.	1.37	50	12 (down), 28 (up)	Note 1
9	Skywalk Pedestrian Bridge (fixed)	43°02'17"N., 87°54'36"W.	1.41	160	32	
10	Wisconsin Avenue Bridge (vertical lift)	43°02'19"N., 87°54'36"W.	1.46	50	12 (down), 28 (up)	Note 1
11	Skywalk Pedestrian Bridge (fixed)	43°02'21"N., 87°54'36"W.	1.48	145	29	
12	Wells Street Bridge (vertical lift)	43°02'26"N., 87°54'41"W.	1.61	50	12 (down), 28 (up)	Note 1
13	Kilbourn Avenue Bridge (bascule)	43°02'30"N., 87°54'45"W.	1.70	100	14	Note 1
14	State Street Bridge (bascule)	43°02'35"N., 87°54'47"W.	1.79	80	14	Note 1
15	Overhead cable	N/A	1.88			Clearance data not available
16	Highland Avenue Pedestrian Bridge (vertical lift)	43°02'39"N., 87°54'48"W.	1.97	51	12 (down), 26 (up)	Note 1
17	Juneau Avenue Bridge (bascule)	43°02'44"N., 87°54'48"W.	2.06	90	14	Note 1
18	Knapp Street / Park Freeway Bridges (vertical lift)	43°02'48"N., 87°54'48"W.	2.14	50	16 (down), 28 (up)	Note 1
19	Cherry Street Bridge (bascule)	43°02'55"N., 87°54'41"W.	2.29	80	14	Note 1
20	Pleasant Street Bridge (vertical lift)	43°03'06"N., 87°54'28"W.	2.58	50	14 (down), 27 (up)	Note 1
21	Holton Street Bridge (fixed)	43°03'16"N., 87°54'16"W.	2.84	79	29	
22	Humboldt Avenue Bridge (fixed)	43°03'25"N., 87°53'53"W.	3.22		17	Head of navigation
	Menomonee River					
23	Canadian Pacific Railroad Bridge (swing)	43°01'56"N., 87°54'42"W.	1.05	75	8	Note 1
24	North Plankinton Avenue Bridge (bascule)	43°01'57"N., 87°54'45"W.	1.08	90	14	Note 1
25	North Sixth Street Bridge (bascule)	43°01'59"N., 87°55'05"W.	1.37	92	23	Note 1
26	North-South Freeway / I-94 Bridge (fixed)	43°01'56"N., 87°55'21"W.	1.61	137	90	
27	Muskego Avenue Bridge (bascule)	43°01'57"N., 87°55'45"W.	1.95	75	12	Note 1
28	Sixteenth Street Bridge (bascule)	43°01'58"N., 87°55'59"W.	2.14	120	35	Note 1
29	Twenty-fifth Street Bridge (fixed)	43°01'57"N., 87°56'41"W.	2.80	65 (right draw) 70 (left draw)	10	Note 3
	South Menomonee Canal					
30	South Sixth Street Bridge (bascule)	43°01'46"N., 87°55'05"W.	1.51	80	14	Note 1
31	North-South Freeway / I-94 Bridge (fixed)	43°01'42"N., 87°55'22"W.	1.71	136	103	
	Burnham Canal					
32	Canadian Pacific Railroad Bridge (swing)	43°01'39"N., 87°55'18"W.	1.74	65	8	Note 1
33	North-South Freeway / I-94 Bridge (fixed)	43°01'37"N., 87°55'19"W.	1.79	75	91	
34	South Eleventh Street Bridge (swing)	43°01'35"N., 87°55'31"W.	1.96	45 (right draw) 46 (left draw)	7	
	Kinnickinnic River					
35	Union Pacific Railroad Bridge (swing)	43°00'49"N., 87°54'15"W.	1.19	61 (right draw) 61 (left draw)	8	Note 1
36	Kinnickinnic Avenue Bridge (bascule)	43°00'30"N., 87°54'30"W.	1.67	100	12	Note 1
37	Canadian Pacific Railroad Bridge (swing)	43°00'30"N., 87°54'32"W.	1.67	93	15	Note 1
38	Union Pacific Railroad Bridge (swing)	43°00'29"N., 87°54'35"W.	1.71	93	15	Note 1
39	South First Street Bridge (bascule)	43°00'30"N., 87°54'41"W.	1.78	70	14	Note 1
40	Overhead power cables	43°00'24"N., 87°54'50"W.	2.00		30	
41	Becher Street Bridge (fixed)	43°00'24"N., 87°54'50"W.	2.02	50	12	

Structures across Milwaukee, Menomonee and Kinnickinnic Rivers

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
42	Overhead cable	43°00'20"N., 87°54'50"W.	2.09			Clearance data not available
43	Overhead cable	43°00'19"N., 87°54'50"W.	2.11			Clearance data not available
44	Lincoln Avenue Bridge (fixed)	43°00'10"N., 87°54'42"W.	2.30		10	Head of navigation

* Miles above Milwaukee Pierhead Light
** Clear width in feet proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.59 and 117.1093, chapter 2, for drawbridge regulations.
Note 2 – The minimum vertical clearance at the channel limits is 96 feet.
Note 3 – Vertical clearance is 16 feet at north edge of the channel decreasing to 10 feet at the south edge.

Milwaukee River, 1.7 miles in the Menomonee River, and 1.2 miles in the Kinnickinnic River. The channels are narrow and tortuous and are not provided with turning basins. Several of the bridge openings are also narrow and their navigation difficult. Channels have also been dredged in the **South Menomonee Canal** and **Burnham Canal,** which branch south from the Menomonee River just above its mouth.

(621) The Federal project depths are 30 feet in the approach channel from deep water in Milwaukee Bay, thence 28 feet in the entrance channel to the lakeward ends of the piers and in the outer harbor basin south of the entrance channel, thence 27 feet in Milwaukee River and Kinnickinnic River to the first railroad bridge on each river, thence 21 feet in the remainder of Kinnickinnic River to the south. First Street bridge and in Milwaukee River to east. Buffalo Street, thence 21 feet in Menomonee River to north. Twenty-fifth Street, and 21 feet in Burnham Canal to south. Eleventh Street and South Menomonee Canal. (See Notice to Mariners and latest edition of charts for controlling depths.)

(622) In the outer harbor, mooring to the breakwaters or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

(623) In the outer harbor, south of the entrance channel, the city of Milwaukee has dredged the pier slips on the west side of the anchorage basin. South Slip No. 1 has been dredged to 26 feet and South Slip Nos. 2 and 3 have been dredged to 27 feet.

(624) Municipal Mooring Basin, also known as Kinnickinnic Basin, is on the southeast side of the Kinnickinnic River about 0.6 mile above the mouth. The basin, used primarily for the winter moorage of vessels, has general depths of 25 to 30 feet with lesser depths along the edges.

(625) A diked disposal area extends from shore in the southwest corner of the outer harbor. The southeast corner of the area is marked by a light.

Anchorages

(626) Deep-draft vessels may find anchorage in the dredged part of the outer basin south of the entrance channel. Medium-draft vessels may anchor in the north part of the outer harbor, taking care to avoid dropping or dragging anchor in the vicinity of the submerged cables which cross the outer harbor just north of the entrance channel. Special anchorages are in the small-craft basins at the north end of the outer harbor and shoreward of the County Park Commission's breakwater which parallels the shore south of the outer harbor. (See **33 CFR 110.1 and 110.80,** chapter 2, for limits and regulations.)

(627) In 1983, a sunken wreck was reported in the special anchorage area behind the County Park Commission's breakwater in about 42°59'58"N., 87°53'04"W.

Dangers

(628) During rough weather, the entire breakwater system may be obscured by wave action. At these times, the only safe entrance is through the main entrance channel.

(629) A wreck, covered 40 feet, is about 3.8 miles east of the harbor entrance.

Caution

(630) Fish nets in the north outer harbor are a hazard. A water intake for a sewage disposal plant is on the south side of the Milwaukee River about 800 feet west of the Interstate 794 highway bridge and may, at times, cause hazardous crosscurrents for small vessels.

(631) Navigators are advised to use extreme caution when entering slips of the general cargo terminals in the outer harbor. Ships accidentally penetrating the dock wall or ships having a large rake angle of the bow can strike the steel and concrete superstructure of Interstate 794 highway bridge. This could result in heavy ship or bridge damage and possible personal injury or loss of life.

(632) Vessels moored in the outer harbor may be subject to severe surging when there are strong north-northeast to east-northeast winds. During periods of adverse

weather, the Coast Guard recommends that vessels moored in the outer harbor be adequately manned at all times to maintain mooring lines and/or safely get underway.

Currents

(633) Currents attain velocities to 4 mph in the main entrance channel and 3 mph in the river channels.

Weather, Milwaukee and vicinity

(634) Milwaukee, WI, is located on the western shore of Lake Michigan and in the southeastern portion of the state. The location averages about ten days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 80°F (26.7°C) and an average minimum of 62°F (16.7°C). January is the coolest month with an average high of 27°F (-2.8°C) and an average minimum of 13°F (-10.6°C). The highest temperature on record for Milwaukee is 103°F (39.4°C) recorded in August 1988 and again in July 1995 and the lowest temperature on record is -26°F (-32.2°C) recorded in January 1982. About 139 days each year experience temperatures below 32°F (0°C) and an average 21 days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 40°F (4.4°C) except August and every month except June, July, and August has recorded temperatures below freezing (0°C).

(635) The average annual precipitation for Milwaukee is 32.23 inches (819 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter months. Precipitation falls on about 198 days each year. The wettest month is July with 3.61 inches (92 mm) and the driest, February, averages only 1.44 inches (37 mm). An average of 36 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 77 days each year and averages about 49 inches (1245 mm) each year. January averages about 13 inches (330 mm) per year and December averages nearly 11 inches (279 mm). One foot (305 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About ten days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June through September. Fog is present on average 137 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer and then again in the early winter.

(636) The prevailing wind direction in Milwaukee is the west-northwest. Spring is the windiest period and a maximum gust of 70 knots occurred in July 1984.

(637) (See Appendix B for **Milwaukee climatological table.**)

Towage

(638) Tugs to 1,600 hp are available at Milwaukee. Arrangements for tugs are made through the Great Lakes Towing Co. dispatcher in Cleveland (800–321–3663) or via VHF-FM remote antenna; at least 4 hours advance notice is requested. Arrangements for tugs can also be made through the JMS Towing Service, Inc. in Sturgeon Bay (414–743–9611).

Quarantine, customs, immigration, and agricultural quarantine

(639) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(640) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(641) Milwaukee is a **customs port of entry.**

Coast Guard

(642) Milwaukee Coast Guard Station and Lake Michigan Sector Office are at the south end of the outer harbor. (See Appendix A for address.)

Harbor regulations

(643) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations are enforced by the **harbormaster.** Copies of these regulations may be obtained from the Legislative Reference Bureau, Room 404, City Hall, 200 East Wells Street, Milwaukee, WI 53202.

Wharves

(644) Milwaukee has numerous wharves, piers, and docks in the outer harbor and in the Milwaukee, Menomonee, and Kinnickinnic Rivers. Only the deep-draft facilities are described. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Special cargo handling equipment is described with the individual facility. Cranes to 220 tons are available in the harbor. All the facilities have highway connections and some have railway connections. Water and electrical shore-power connections are available at some of the facilities.

Facilities in the outer harbor:

(645) **Port of Milwaukee South Slip No. 1, Bulk Cargo Dock** (43°01'18"N., 87°53'44"W.): 0.2 mile south of the river mouth; 780-foot east face, 23 to 26 feet alongside; 1,320-foot south face, 25 to 27 feet alongside; deck height, 11 feet; open storage for 90,000 tons of bulk materials; receipt and shipment of miscellaneous bulk materials, including sand, salt, gravel, and coal; mooring vessels on east side; owned by Port of Milwaukee and operated by Milwaukee Bulk Terminals, Inc.

(646) **Port of Milwaukee South Pier No. 1, North Side Open Dock** (43°01'12"N., 87°53'46"W.): 0.3 mile south of the river mouth; 945-foot face; 25 to 27 feet alongside; deck height, 11 feet; use of cranes from General Cargo Terminal No. 2; tank storage for 200,000 barrels; receipt and shipment of conventional and containerized general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metal; receipt of petroleum products; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd. and PTW, Inc.

(647) **Port of Milwaukee South Pier No. 1, General Cargo Terminal No. 2** (43°01'10"N., 87°53'44"W.): 0.35 mile south of the river mouth; 330-foot face, 25 feet alongside; 978-foot south side, 26 to 27 feet alongside; deck height, 11 feet; 3 crawler cranes to 120 tons; 1 mobile crane, 25 tons; 2 locomotive cranes to 34 tons; tank storage for 200,000 barrels; receipt and shipment of conventional general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metals; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(648) **Port of Milwaukee South Pier No. 2, General Cargo Terminals Nos. 3, 4, and 4A** (43°01'06"N., 87°53'40"W.): 0.45 mile south of the river mouth; 945-foot north side, 25 to 30 feet alongside; 545-foot face, 26 to 28 feet alongside; 1,005-foot south side, 26 to 29 feet alongside; deck height, 12 feet; use of cranes from General Cargo Terminal No. 2; 1.6 acres open storage; receipt and shipment of conventional and containerized general cargo in foreign and domestic trade, including steel products, dry bulk commodities, and scrap metal; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(649) **Port of Milwaukee Liquid Cargo Pier** (43°00'50"N., 87°53'30"W.): 0.8 mile south of the river mouth; 1,066-foot north side, 20 to 27 feet alongside; 1,088-foot south side, 20 to 27 feet alongside; deck height, 11 feet; storage tanks for 285,700 barrels; receipt of asphalt; owned by Port of Milwaukee, and operated by Jacobus Petroleum Products.

Facilities in the Kinnickinnic River:

(650) **Port of Milwaukee, Municipal Heavy-Lift Dock** (43°01'07"N., 87°54'07"W.): east side of Kinnickinnic River 0.35 mile above the mouth; 1,659-foot face; 22 to 28 feet alongside; 160-foot north side; 14 to 25 feet alongside; deck height, 6 feet; cranes to 220 tons; 5 acres open storage; receipt and shipment of conventional and containerized general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metal; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(651) **Port of Milwaukee, North Bulk Cargo Wharf** (43°00'55"N., 87°54'02"W.): outer end of east side of Municipal Mooring Basin; 1,270-foot face; 25 feet alongside; deck height, 6 feet; open storage for 290,000 tons of salt, storage domes, capacity 30,000 tons; receipt of salt; owned by Port of Milwaukee, and operated by North American Salt Co.

(652) **Port of Milwaukee, South Bulk Cargo Wharf** (43°00'35"N., 87°53'53"W.): inner end of east side of Municipal Mooring Basin; 1,930-foot face; 19 to 25 feet alongside; deck height, 7½ feet; open storage for 57,000 tons of salt; covered storage for 15,000 tons of salt; receipt of bulk salt; owned by Port of Milwaukee, and operated by Akzo Nobel Salt, Inc.

(653) **Continental Grain Co., Kinnickinnic Elevator Wharf** (43°00'46"N., 87°54'08"W.): outer end of west side of Municipal Mooring Basin; 1,490-foot face; 27 to 28 feet alongside; deck heights, 6 and 9 feet; 3¼-million-bushel grain elevator; one marine leg, unloading rate 12,000 bushels per hour; 6 vessel-loading spouts, loading rate 9,000 bushels per hour each; receipt and shipment of grain; owned by Chicago and North Western Railway and operated by Continental Grain Co.

(654) **Southdown Cement Co. Dock** (43°00'31"N., 87°54'26"W.): east side of river below Kinnickinnic Avenue bridge; 550-foot face; 20 feet alongside; deck height, 5 feet; storage silos for 264,000 tons of cement; receipt of bulk cement; owned and operated by Southdown Cement Co.

(655) **Wisconsin Wrecking Co. Wharf** (43°00'46"N., 87°54'18"W.): west side of the river above Chicago and North Western Railway bridge; 670-foot face; 22 feet alongside; deck height, 7 feet; 45 acres of open storage; receipt and shipment of crushed stone; owned and operated by Wisconsin Wrecking Co.

(656) **Milwaukee Bulk Terminal Wharf** (43°00'55"N., 87°54'14"W.): west side of the river, about 0.25 mile below the Chicago and North Western Railway bridge; 826-foot face, 27 feet alongside; deck height, 5 feet; open storage for 400,000 tons of coal; receipt and shipment of coal and miscellaneous dry bulk materials; owned by Port of Milwaukee and operated by Milwaukee Bulk Terminals, Inc.

(657) **Construction Resources Management Wharf** (43°01'10"N., 87°54'20"W.): south side of slip on west side of river 0.35 above the mouth; 723-foot north face, 14 feet alongside; deck height, 4 feet; storage tanks for 47,600 barrels; receipt and shipment of asphalt; owned and operated by Construction Resources Management, Inc.

(658) **Miller Compressing Co. Dock** (43°01'11"N., 87°54'18"W.): north side of the slip on west side of river 0.35 mile above the mouth, and the riverfront adjacent downstream; 600-foot south side, 12 to 27 feet alongside; 710-foot east face, 20 to 27 feet alongside; deck height, 6 feet; cranes to 50 tons; 10 acres open storage; shipment and receipt of scrap metal; owned and operated by Miller Compressing Co.

Facilities in the Menomonee River:

(659) **St. Mary's Cement Co., Milwaukee Terminal Dock** (43°01'56"N., 87°55'15"W.): south side of the river 0.1 mile above North Sixth Street bridge; 490-foot face; 17

to 25 feet alongside; deck height, 6 feet; silo storage for 22,550 tons of cement; receipt of cement; owned and operated by St. Mary's Cement Co.

(660) **Tews Co., Dock** (43°01'59"N., 87°56'04"W.): north side of the river above the Sixteenth Street bridge; 720-foot face; 35 feet alongside; deck height, 6 feet; open storage for 250,000 tons of stone; receipt of stone, owned and operated by Tews Co.

Facilities in South Menomonee Canal:

(661) **Wisconsin Electric Power Co., Valley Plant Coal Dock** (43°01'42"N., 87°55'25"W.): north side of the canal above North-South Freeway bridge; 660-foot face; 18 to 21 feet alongside; deck height, 7½ feet; open storage for 250,000 tons of coal; receipt of coal; owned and operated by Wisconsin Electric Power Co.

(662) **Didon, Milwaukee Terminal Wharf** (43°01'41"N., 87°55'31"W.): south side of the canal just below the head; 910-foot face; 21 feet alongside; deck height, 6 to 6½ feet; 2½-million-bushel grain elevator; two loading spouts, combined rate 26,000 bushels per hour; occasional shipment of grain; owned by J.R. Investments and operated by Didon, Inc.

Facilities in Burnham Canal:

(663) **Lafarge Corp., Milwaukee Terminal Wharf** (43°01'35"N., 87°55'29"W.): north side of the canal below South Eleventh Street bridge; 400-foot face; 19 to 21 feet alongside; deck height, 3 feet; silo storage for 18,000 tons of cement; receipt of bulk cement; owned by Lafarge Corp., Great Lakes Division and operated by Lafarge Corp. and Selvic Marine Towing Corp.

Supplies

(664) All types of marine supplies and provisions are available in Milwaukee. Bunker fuel and diesel oil are available by truck to facilities on Jones Island. Water is available at all the municipal docks and at some of the private facilities.

Repairs

(665) There are no facilities for drydocking deep-draft vessels at Milwaukee. Two companies on the east side of the Municipal Mooring Basin perform above-the-waterline and major engine repairs. Another company maintains portable equipment for making above-the-waterline repairs to vessels at their berths.

Small-craft facilities

(666) South of the outer harbor, a series of breakwaters parallels the southwest shore of Milwaukee Bay for about 2 miles. The basin thus formed provides good anchorage for small-craft, and gasoline and diesel fuel are available at the yacht club at the north end. The basin may be entered from the south end of the outer harbor, marked by a light, or through a breakwater gap marked by a lighted buoy about 0.7 mile south of the outer harbor. The open south end of the basin and the small breakwater gap 0.45 mile northwest should not be used without local knowledge.

(667) The municipal marina at the north end of the outer harbor provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and launching ramps. A marina on the west side of the mouth of Kinnickinnic River provides gasoline, diesel fuel, sewage pump-out, and marine supplies. A 60-ton stiff-leg crane is available for complete hull and engine repairs. A repair yard on the east side of Kinnickinnic River 1.1 miles above the mouth has a 20-ton hoist and makes hull and small engine repairs. A detached crescent-shaped breakwater, marked at each end by a private daybeacon, is 300 feet north of Pier Wisconsin in the north part of the outer harbor.

Ferries

(668) A ferry which carries passengers and/or vehicles operates between Milwaukee and Muskegon, MI from a terminal near the Coast Guard Station at the south end of the outer harbor.

Communications

(669) Milwaukee has excellent highway and rail freight connections. General Mitchell Field at the south end of the city provides freight and passenger air service.

Chart 14904

(672) **Whitefish Bay** is a slight recession in the shoreline between North Point and **Fox Point**, 6.5 miles north. The shoal border around the bay is about 0.7 mile wide. Submerged net stakes extend about 0.9 mile from shore.

(673) From Fox Point north for 15 miles to Port Washington, the shore is a steep bluff about 100 feet high. Shoals extend 0.5 to 1 mile offshore. A wreck, covered 1 foot, is 0.6 mile offshore 3.3 miles north of Fox Point. A bell tower, reported to resemble a spire, is prominent about 6 miles north of Fox Point.

(674) **Port Washington, WI,** is an artificial harbor about 25 miles north of Milwaukee Harbor. **Sauk Creek,** a very small stream, enters the south side of the harbor at the inner end of the coal wharf.

Prominent features

(675) Two church spires northwest of the inner end of the north breakwater are prominent.

(676) **Port Washington Breakwater Light** (43°23'10"N., 87°51'35"W.), 78 feet above the water, is shown from a square tower on the outer end of the north breakwater; a seasonal sound signal is at the light.

Channels

(677) A dredged entrance channel leads from deep water in Lake Michigan to an outer basin protected on the

Structures across Sheboygan River

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
1	South Eighth Street Bridge (bascule)	43°44'40"N., 87°42'47"W.	0.69	75	14	Note 1
2	Overhead cable	43°44'41"N., 87°42'52"W.	0.77			Clearance data not available
3	Overhead power cable	43°44'44"N., 87°42'55"W.	0.87		141	
4	Pennsylvania Avenue Bridge (fixed)	43°44'59"N., 87°43'01"W.	1.14	38	19	
5	Overhead cable	43°45'02"N., 87°43'04"W.	1.22			Note 2
6	Overhead cable	43°45'18"N., 87°43'17"W.	1.56			Clearance data not available
7	Chicago & North Western Railroad Bridge (fixed)	43°45'18"N., 87°43'17"W.	1.57	60 (right draw) 60 (left draw)	20	
8	Fourteenth Street Bridge (fixed)	43°45'19"N., 87°43'23"W.	1.65	54	14	
9	Chicago & North Western Railroad Bridge (fixed)	43°44'51"N., 87°43'45"W.	2.29			Clearance data not available
10	Overhead cable	43°44'50"N., 87°43'46"W.	2.30			Clearance data not available
11	Overhead cable	43°44'48"N., 87°43'47"W.	2.35			Clearance data not available
12	New Jersey Avenue Bridge (fixed)	43°44'47"N., 87°43'48"W.	2.36			Clearance data not available

* Miles above North Pierhead Light
** Clear width in feet proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.59 and 117.1097, chapter 2, for drawbridge regulations.
Note 2 – Cable extends from west side of the river to an island at midchannel.

north by a breakwater and on the south by a breakwater and coal wharf. The outer ends of the breakwaters are marked by lights. From the northwest corner of the outer basin, a channel leads to a small-craft basin, a launching ramp and inner basin. The small-craft basin is protected by breakwaters, marked at the outer ends by lights.(See Notice to Mariners and the latest editions of the charts for controlling depths.)

(678) The intake channel of the Wisconsin Electric Power Co. is 1,200 feet southwest of the harbor entrance. The south side of the channel is protected by a jetty. An overhead power cable with unknown clearance crosses the mouth of the channel.

(679) **Caution**.—Power company cooling water is discharged into the harbor in the vicinity of Sauk Creek and creates a very dangerous current across the entrance to the west inner basin. Extreme caution should be exercised when maneuvering in this vicinity. With 30 minutes advance notice of vessel arrival in the harbor, the Wisconsin Electric Power Co. will reduce cooling water discharge at the request of the vessel master and will make arrangements to handle lines when entering or leaving harbor. The power company can be contacted via the marine operator or by telephone, 414–284–5161, 24 hours a day.

(680) In 1983, a dangerous wreck was reported in about 43°23'27"N., 87°51'47"W., about 0.4 mile northwest of Port Washington Breakwater Light.

Harbor regulations

(681) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(682) **Wisconsin Electric Power Co., Port Washington Plant Coal Dock:** south side of Port Washington Harbor; 1,000-foot face, 21 to 30 feet alongside; deck height, 10 feet; 40-inch electric belt conveyor, rate 500 tons per hour; open storage for 500,000 tons of coal; receipt of coal; owned and operated by Wisconsin Electric Power Co.

Charts 14904, 14903

(683) From Port Washington for about 26 miles north-northeast to Sheboygan, the shore is bold. Shoals extend about 0.6 mile offshore, and numerous net stakes are within 2 miles of shore. A wreck, covered 26 feet, is 0.9 mile from shore 8.2 miles north-northeast of Port Washington. A sunken caisson, covered 16 feet, is 0.6 mile offshore 8 miles south-southwest of Sheboygan. Tanks at Belgium, Cedar Grove, and Oostburg, WI, are prominent.

Charts 14903, 14922

(684) **Sheboygan, WI**, is a port city about 51 miles north of Milwaukee Harbor at the mouth of the **Sheboygan River.**

(685) **Sheboygan Breakwater Light** (43°44'58"N., 87°41'34"W.), 55 feet above the water, is shown from a cylindrical tower with the outer end of the breakwater on the north side of the entrance channel; a seasonal sound signal is at the light.

(686) **Caution**.—A Sheboygan Police Department firing zone is about 2 miles south of the south pier at Sheboygan Harbor. The firing area is 3,500 feet wide and extends about 3 miles lakeward. Firing is conducted from 0600 to 2100, 7 days a week, year round; red flags are displayed while firing is in progress. Extreme caution is advised.

Channels

(687) A dredged entrance channel leads northwest from deep water in Lake Michigan between a breakwater on the north and a pier on the south to an outer harbor turning basin. The outer ends of the breakwater and pier are marked by lights. The channel leads across the south side of the basin to the mouth of Sheboygan River and thence upstream for about 1 mile. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The north side of the river mouth is marked by a light.

(688) The entrance channel is subject to shoaling caused by the drift of sand from the south.

(689) Currents in the river attain velocities up to 3 mph.

(690) The outer basin is not adapted for anchorage, but greatly reduces wave action in the lower river. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Bridge regulations

(691) All watercraft navigating the Sheboygan River and harbor or other navigable waters connected herewith within the limits of the city of Sheboygan, when passing any bridge in said city, shall move or be moved past the same as expeditiously as is consistent with the proper use of the river by other watercraft; but in no case shall any watercraft, while passing through any bridge, remain or obstruct the passageway more than 5 minutes, and no watercraft shall be so anchored or fastened as to prevent any bridge from a free and speedy opening. Any master or other person having charge of any watercraft, who shall violate any provisions in this section, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $25.

(692) **Time allowed for opening bridge**–Whenever any person having charge of any watercraft shall wish to move the same past any bridge, reasonable time shall be allowed for the opening of the same; and any person who shall move any watercraft against any bridge, or the center or protection pier thereof, before the same shall be opened, to the injury thereof, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $50, and shall likewise be liable to the city of Sheboygan for all damages done to the bridge and center or protection piers thereof.

Towage

(693) Tugs are available from Milwaukee and Sturgeon Bay. (See Towage under those ports.)

(694) Sheboygan is a **customs port of entry.**

Coast Guard

(695) **Sheboygan Coast Guard Station** is on the north side of the mouth of Sheboygan River.

Harbor regulations

(696) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(697) Local harbor regulations are enforced by the **harbormaster** who can be reached through the Department of Public Works, City Hall, Sheboygan, WI 53081. A **speed limit** of 4 mph (3.5 knots) is enforced within the harbor limits. Copies of the regulations may be obtained from the harbormaster.

Small-craft facilities

(698) Marinas on the Sheboygan River and in the outer harbor basin can provide transient berths, gasoline, diesel fuel, water, ice, launching ramp, electricity, sewage pump-out, and limited marine supplies. Hoists can handle 35-foot boats for engine and minor hull repairs.

(699) From Sheboygan, the shore is a moderate bluff for 24 miles north-northeast to Manitowoc. The shoal border in this stretch is up to 1.4 miles wide and has scattered rocks and boulders covered 8 to 12 feet near the outer edge. **Sheboygan Reef**, with depths of 4 to 18 feet and marked on the east side by a buoy, is 0.6 mile north of Sheboygan Breakwater Light. A dangerous boulder, covered 2 feet, is 0.7 mile offshore 9.6 miles north of Sheboygan. A dangerous submerged rock is 1 mile offshore at the village of Northeim, WI, 17 miles north of Sheboygan.

Chart 14903

(700) **Caution**.—The Sheboygan Rifle and Pistol Club, Inc., conducts firing daily on the lakefront about 5.5 miles north of the entrance to Sheboygan harbor. This firing creates a caution zone about 3,500 feet wide extending 3 miles lakeward from the shoreline. Mariners are advised to consult Local Notices to Mariners for schedules of firing and instructions.

(701) **Cleveland, WI,** formerly **Hika**, is 11.5 miles north of Sheboygan. In 1978, only a natural ramp and a small pier with shallow water alongside were available for boats at Cleveland.

Charts 14903, 14922

(703) **Manitowoc, WI,** is a port city at the mouth of **Manitowoc River,** about 75 miles north of Milwaukee Harbor. The most prominent feature at Manitowoc is the lighted elevator 0.6 mile southwest of Manitowoc Breakwater

Structures across Manitowoc River

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
1	Eighth Street Bridge (bascule)	44°05'32"N., 87°39'28"W.	0.29	120	12	Note 1
2	Tenth Street Bridge (bascule)	44°05'31"N., 87°39'38"W.	0.43	120	14	Note 1
3	Canadian National Railroad Bridge (bascule)	44°05'48"N., 87°39'56"W.	0.91	93	6	Notes 1 and 2
4	Canadian National Railroad Bridge (swing)	44°05'55"N., 87°40'08"W.	1.60	61 (right draw) 61 (left draw)	6	Opening mechanism is hand operated and seldom opened
5	Chicago & North Western Railroad Bridge (fixed)	44°05'49"N., 87°40'14"W.	1.75	60 (right draw) 60 (left draw)	11	
6	Overhead power cable	44°05'48"N., 87°40'14"W.	1.76		84	
7	Overhead power cable	44°05'47"N., 87°40'21"W.	1.86		64	
8	Overhead power cables	44°05'49"N., 87°40'25"W.	1.95		84	
9	Twenty-first Street Bridge (fixed)	44°05'49"N., 87°40'27"W.	1.97	107	16	
10	Overhead cables	44°05'50"N., 87°40'28"W.	2.02			
11	Overhead cable	44°06'01"N., 87°40'43"W.	2.30			
12	Canadian National Railroad Bridge (fixed)	44°06'02"N., 87°40'43"W.	2.33	45 (right draw) 45 (left draw)	11	Head of navigation

* Miles above the mouth of the river
** Clear width in feet proceeding upstream

Note 1 – See 33 CFR 117.1 through 117.59 and 117.1089, chapter 2, for drawbridge regulations.
Note 2 – No bridgetender is on duty on Saturdays or Sundays and from 2000 to 0400 on weekdays from about December 15 to March 15 annually. Bridge will be opened on 2-hour advance notice; from 0630 or 1530 telephone the telegraph operator, 648-6861, and at all other times call the Soo Line section foreman, 414-722-4228.

Light. The lighted stack 0.5 mile south of the elevator has horizontal red and white bands.

(704) **Manitowoc Breakwater Light** (44°05'34"N., 87°38'37"W.), 52 feet above the water, is shown from a cylindrical tower on a building on the outer end of the north breakwater. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(705) A dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters through Manitowoc Harbor to the mouth of the Manitowoc River, and thence upstream for about 1.8 miles. The outer ends of the breakwaters and the north side of river mouth are marked by lights. A Federal project provides for a depth of 25 feet in the approach channel, thence 23 feet in the channel through the harbor to the mouth of the river, thence 22 feet in the river channel to the Chicago & North Western Railroad Bridge, thence 12 feet to the head of the project, about 0.1 mile above the bridge. (See Notice to Mariners and latest edition of charts for controlling depths.)

(706) A small-boat basin, entered through an opening in the north breakwater, is about 0.3 mile above Manitowoc Breakwater Light. The east side of the entrance is protected by a short jetty, marked at its outer end by a light. The ends of the breakwater are marked by a light and a daybeacon. The Federal project depths are 12 feet in the entrance channel and 10 feet in the basin. (See Notice to Mariners and latest edition of charts for controlling depths.)

(707) The river channel is quite winding and should be navigated with care. The river banks are generally hardpan and firm clay, quite stony in places.

(708) Above the dredged channel, the river has depths of 6 feet in the northwest half and 10 feet in the southeast half to the Chicago and North Western Railway bridge except for a 5-foot shoal extending downstream from the center bridge pier, thence about 4 feet to the Twenty-first Street bridge, and thence about 3 feet to the third Canadian National Railroad bridge.

(709) Manitowoc Harbor is not adapted for anchorage, but reduces wave action in the lower section of the river. Mooring to the breakwaters is prohibited. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

(710) The currents in the river attain velocities up to 3 mph.

(711) An irregularly shaped diked disposal area extends 1,700 feet north from the north side of the north breakwater.

(712) **Caution.—Manitowoc Shoal**, on the south side of the approach to the harbor, has a least depth of 14 feet about 0.65 mile southeast of Manitowoc Breakwater Light. The northeast side of the shoal area is marked by a buoy. A shoal with a least depth of 14 feet is about 1.2 miles southeast of the breakwater light.

Towage

(713) Tugs are available from Milwaukee, Sturgeon Bay, and Green Bay. (See Towage under those ports.)

(714) Manitowoc is a **customs port of entry.**

Harbor regulations

(715) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(716) Local harbor regulations are under the control of the Harbor Commission and are enforced by the **harbormaster** who can be reached through the Board of Harbor Commissioners, City Hall, 817 Franklin Street, Manitowoc, WI 54220. Copies of the regulations can be obtained from the Board of Harbor Commissioners. A **speed limit** of 4 mph (3.5 knots) is enforced within the harbor limits.

Wharves

(717) Manitowoc has several deep-draft facilities along the Manitowoc River. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) The facilities described have highway connections and some have railway connections. Some of the facilities have water and electrical shore-power connections.

(718) **C. Reiss Coal Co. Dock:** west side of the slip extending south at the river mouth; 900-foot face; 17 to 23 feet alongside; deck height, 8 feet; open storage for 175,000 tons of coal; receipt of coal; owned and operated by C. Reiss Coal Co.

(719) **Anheuser-Busch, Grain Dock:** south side of the river 700 feet above the mouth; 190-foot face; 19 feet alongside; deck heights, 4 and 6 feet; silo storage for over 4 million bushels of grain; one marine leg, unloading rate 9,500 bushels per hour; one vessel-loading spout, loading rate 12,500 bushels per hour; receipt of grain; owned and operated by Anheuser-Busch, Inc.

(720) **The Manitowoc Co., Berths A and B:** west side of the river 0.15 mile above the first Soo Line Railroad bridge; Berth A, 450-foot face, 21 feet alongside; Berth B, 680-foot face, 16 to 18 feet alongside; deck height, 3½ feet; shipment of heavy machinery; owned and operated by The Manitowoc Co., Inc.

(721) **The Manitowoc Co., Berths C and D:** west side of the river 0.3 mile above the first Soo Line Railroad bridge; Berth C, 260-foot face, 14 to 16 feet alongside; Berth D, 360-foot face, 14 to 16 feet alongside; deck height, 3½ feet; 75-ton stiff-leg derrick; shipment of heavy-lift items; owned and operated by The Manitowoc Co., Inc.

(722) **CEMEX Terminal:** northwest side of the river at the upper end of the dredged channel; 1,200-foot face; 20 feet alongside; deck height, 6 feet; silo storage for 53,000 tons of cement; receipt of bulk cement; owned and operated by Medusa Cement Co.

Small-craft facilities

(723) Transient berths, electricity, water, ice, gasoline, diesel fuel, marine railway with lift capacity of 35 tons for vessels up to 70 feet for hull and engine repairs, sewage pump-out facilities, and a launching ramp are available on the north side of the river mouth.

Ferries

(724) Ferry service is available for passengers and autos to Ludington, MI The ferry operates from the east side of the slip at the river mouth from about mid May to October.

Supplies and repairs

(725) Large vessels do not normally bunker or take on supplies at Manitowoc. Bunker oil can be supplied by tank truck. Emergency above-the-waterline repairs are available.

Chart 14903

(726) The shore trends 5.7 miles northeast from Manitowoc to Two Rivers. A shoal with a least depth of 8 feet is 1 mile northeast of Manitowoc Breakwater Light. Otherwise, the 18-foot contour is within 0.5 mile of shore in this stretch. Net stakes extend about 1.5 miles from shore.

(727) **Two Rivers, WI,** is a town and harbor at the mouth of the **Twin Rivers**, about 80 miles north of Milwaukee Harbor. The harbor is used mainly by local fish tugs and recreational craft.

Prominent features

(728) Prominent is a spire, 0.5 mile north-northwest of the harbor entrance, and a lighted blue tank with "Twin Rivers" in black letters 0.9 mile north-northeast of the harbor entrance.

Channels

(729) A dredged entrance channel leads northwest from deep water in Lake Michigan between parallel piers to a harbor basin at the confluence of **East Twin River** and **West Twin River** and thence upstream in East Twin River for about 0.5 mile to the 22nd Street bridge. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the piers are marked by lights and a mariner radio activated sound signal is on the outer end of the northeast pier, initiated by keying the microphone five times on VHF-FM channel 83A. The entrance channel is subject to shoaling, especially during the winter and after severe storms.

(730) A small basin at the shoreward end of the north pier is not used by vessels, but reduces wave action in the inner harbor. The inner basin is not adapted for

Structures across East and West Twin Rivers

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
	East Twin River					
1	17th Street Bridge (bascule)	44°08'55"N., 87°33'50"W.	0.48	70	14	
2	22nd Street Bridge (bascule)	44°09'14"N., 87°33'50"W.	0.82	60	14	
3	Overhead cable	44°09'31"N., 87°33'56"W.	1.00		38	
	West Twin River					
4	Washington Street Bridge (fixed)	44°08'42"N., 87°34'06"W.	0.53	53	15	
5	Chicago & North Western Railroad Bridge (swing)	44°08'44"N., 87°34'11"W.	0.62	50 (both draws)	12	
6	Overhead power cables	44°08'45"N., 87°34'12"W.	0.62		95	
7	Madison Street Bridge (bascule)	44°08'50"N., 87°34'22"W.	0.82	59	14	
8	Overhead cable	44°08'54"N., 87°34'28"W.	0.91		37	

* Miles above North Pierhead Light
** Clear width in feet proceeding upstream

anchorage, and mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(731) Currents in the river attain velocities up to 3 mph.

(732) West Twin River has depths of about 9 feet in the south part of the channel from the basin to Washington Street bridge. The nominal head of navigation on the East and West Twin Rivers is 3 and 7 miles, respectively, from the mouth, the navigable depth being not over 4 feet. Only small recreational craft operate on these rivers above the dredged channels.

Bridge regulations

(733) (a) Notice to Open Bridges Required. The operator of any boat desiring to pass through any bridge in the city of Two Rivers shall notify the city of his intention to pass through such bridge, and the city employees shall be allowed a reasonable time thereafter to open such bridge.

(734) (b) Bridges on West Twin River. To avoid traffic congestion, the bridges on the West Twin River shall not be opened between 6:30 a.m. and 7:00 a.m., 7:30 a.m. and 8:00 a.m., 11:55 a.m. and 1:00 p.m., 3:30 p.m. and 4:15 p.m. and 4:45 and 5:15 p.m. on any day except Saturday, Sunday, and holidays when they may be opened at anytime.

(735) Request to open bridges should be given to the Two Rivers Police Department, telephone 414–793–1155, via land telephone or marine operator.

Coast Guard

(736) **Two Rivers Coast Guard Station** is on the northeast side of the entrance channel.

Harbor regulations

(737) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(738) A marina on the south side of the West Twin River provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and a launching ramp. A 40-ton crane is available for engine and electronic repairs.

(739) **Rawley Point** is a broad, rounding, wooded point northeast of Two Rivers. **Rawley Point Light** (44°12'39"N., 87°30'32"W.), 113 feet above the water, is shown from a cylindrical tower on the point, 5.3 miles northeast of Two Rivers. Between Two Rivers and Rawley Point Light, shoals extend about 0.8 mile from shore. Net stakes reach over 2 miles from shore.

(740) From Rawley Point Light the moderately bluff shore trends generally north for about 17 miles to Kewaunee. Rocky shallows extend about 1 mile from shore. A dangerous wreck that bares is about 1.5 miles north of Rawley Point Light in about 44°13'58"N., 87°30'22"W. Extreme caution should be exercised in the area. Point Beach Nuclear Power Plant, 5 miles north of Rawley Point Light, has a square green building prominent from offshore. Kewaunee Nuclear Power Plant is on **Observation Point,** 9 miles north of Rawley Point Light. The cooling tower at the plant is prominent.

(741) **Security zones** have been established in the waters off the Point Beach Nuclear Power Plant and Kewaunee Nuclear Power Plant, between Rawley Point and Kewaunee. (See **33 CFR 165.1 through 165.8,** 165.30 through 165.33, and 165.916, chapter 2 for limits and regulations.)

(742) **Kewaunee Shoal** is a hard gravel and boulder reef extending about 1.8 miles east from shore just south of the entrance to Kewaunee harbor. The shoal has a least depth of 13 feet near the outer end. **Kewaunee Shoal Light** (44°27'03"N., 87°27'55"W.), 43 feet above the water, is shown from a white cylindrical tower with a green band on the outer end of the shoal; a seasonal sound signal is at the light. Due to protective riprap, the light should not be passed close aboard, even by shallow-draft vessels.

Charts 14902, 14903, 14910

(743) **Kewaunee, WI**, is a town and small-craft harbor at the mouth of **Kewaunee River**, about 102 miles north of Milwaukee Harbor and 25 miles south of the entrance to the Sturgeon Bay Ship Canal.

(744) **Kewaunee Pierhead Light** (44°27'27"N., 87°29'34"W.), 45 feet above the water, is shown from a square tower on the outer end of the pier on the south side of the harbor entrance. A sound signal at the light is operated by keying the microphone five times on VHF-FM channel 83A.

Channels

(745) A dredged entrance channel leads from deep water in Lake Michigan northwest to an outer harbor basin protected by a breakwater on the northeast side and a pier on the south side. The outer ends of the breakwater and pier are marked by lights. From the outer basin, the channel leads between piers at the mouth of Kewaunee River to a turning basin inside the mouth, thence north inside the shoreline to the north harbor basin. The outer end of the pier on the north side of the river mouth is marked by a light. A Federal project provides for a depth of 20 feet throughout the entire project. (See Notice to Mariners and latest edition of charts for controlling depths.)

(746) The outer basin is not adapted for anchorage, but reduces wave action in the inner harbor. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(747) Currents in the river attain velocities up to 3 mph.

(748) Above the turning basin, the Kewaunee River is navigable for about 6.5 miles by craft drawing not more than 4 feet.

(749) **Caution**.—Kewaunee Shoal and a shoal with a least depth of 15 feet that extends 0.5 mile east from the outer end of the breakwater should be avoided in approaching the harbor.

Bridges

(750) A fixed bridge with a clearance of 16 feet crosses Kewaunee River about 0.4 mile above the mouth. Overhead power cables, 0.3 and 0.5 mile above the mouth have clearances of 46 and 28 feet, respectively.

Harbor regulations

(751) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(752) Local harbor regulations have been established by the city of Kewaunee and are enforced by the **harbormaster,** usually found at the city launch ramps, and by the police department. A **speed limit** of 5 mph (4.3 knots) is enforced in the harbor. Copies of regulations can be had from the City Clerk, 413 Milwaukee Street, Kewaunee, WI 54216.

Small-craft facilities

(753) A municipal marina is about 0.1 mile upstream from the turning basin. Transient berths, electricity, gasoline, sewage pump-out, water, ice, and launching ramp located close west of the facility are available. Another marina, on the north side of the north harbor basin, provides transient berths, electricity, gasoline, diesel fuel, sewage pump-out, water, ice, launching ramp, hull and engine repair, marine supplies, and a 35-ton lift.

(754) From Kewaunee north for 11 miles to Algoma the shore is low bluffs decreasing in height at the north end of the reach. Shoals extend about 0.8 mile offshore. Boulders covered 11 to 12 feet are near the outer edge of the bank just north of Kewaunee. Detached 11- and 12-foot spots are from 0.2 to 0.5 mile south of the entrance to Algoma harbor.

(755) **Algoma, WI**, is a town and small-craft harbor at the mouth of the **Ahnapee River,** about 112 miles north of Milwaukee Harbor and 14 miles south-southwest of the entrance to the Sturgeon Bay Ship Canal. The harbor is used mainly by local fish tugs and recreational craft.

Prominent features

(756) Two black stacks are 0.9 mile northwest of the entrance and a gray spire is 0.4 mile north of the entrance.

(757) **Algoma Light** (44°36'25"N., 87°25'45"W.), 48 feet above the water, is shown from a cylindrical tower on the outer end of the pier on the north side of the entrance channel. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Channels

(758) A dredged entrance channel leads from deep water in Lake Michigan between a north pier with a detached outer section and a south breakwater to an outer harbor basin, thence through the mouth of Ahnapee River upstream for 0.2 mile to the Second Street bridge. (See Notices to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the breakwater, the detached pier and the main outer sections are marked by lights. The river channel bottom is rock and should be navigated with caution. Above the dredged

channel, depths of about 3 feet can be carried for about 2 miles. The bottom in this reach is also rock.

(759) The outer basin is not adapted for anchorage, and mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(760) Currents in the river attain velocities up to 3 mph.

Bridges

(761) Second Street bridge, about 0.2 mile above the mouth of Ahnapee River, has a fixed span with a clearance of 11 feet. Fourth Street bridge, 0.4 mile above the river mouth, has a 42-foot fixed span with a clearance of 11 feet. Overhead cables just below and about 0.2 mile above the Fourth Street bridge have unknown clearances. An overhead power cable about 300 feet above the bridge has a clearance of 39 feet.

Harbor regulations

(762) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations have been established by the city of Algoma, and are enforced by a Water Safety Patrol. Copies of regulations may be obtained from the Chief of the Water Safety Patrol.

Small-craft facilities

(763) A marina on the northeast side of the river just above the mouth provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and marine supplies. Hoists to 40 tons are available for complete hull, engine, and electronic repairs. In 1978, the reported controlling depth was 8 feet alongside the fuel dock.

(764) From Algoma north-northeast for 14 miles to the entrance to the Sturgeon Bay Ship Canal, the shore is wooded and hilly, becoming lower in the north 4 miles. The shoal border varies in width from 0.5 to 1.3 miles. A buoy 2.2 miles south of the canal entrance marks the outer edge of the shoals.

Charts 14902, 14910, 14919

(765) **Sturgeon Bay Ship Canal** provides a navigable connection between Lake Michigan and the south end of Green Bay. A canal has been cut from Lake Michigan across a narrow strip of land to the head of **Sturgeon Bay,** and thence a dredged channel leads through Sturgeon Bay to Green Bay. The Lake Michigan entrance to the canal is about 126 miles north of Milwaukee Harbor, across the lake west of Frankfort, MI

(766) **Sturgeon Bay Ship Canal Light** (44°47'42"N., 87°18'48"W.), 107 feet above the water, is shown from a cylindrical tower on the north side of the canal entrance.

Channels

(767) The dredged channel from Lake Michigan to Green Bay is about 8.6 miles long. The channel leads northwest from deep water in Lake Michigan through detached piers and converging breakwaters, thence through a revetted canal to the southeast end of Sturgeon Bay and thence through Sturgeon Bay to the vicinity of Sherwood Point. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The outer ends of the piers are marked by lights, and the approach channel is marked by unlighted buoys 0.2 mile southeast of the pierhead lights. A sound signal at the north pierhead light is operated by keying the microphone five times on VHF-FM channel 83A/157.175 MHz. A seasonal lighted buoy marks the south edge of a detached shoal about 1.3 miles southeast of the pierhead lights. The dredged channels through the canal and Sturgeon Bay are well marked with lights, a lighted range, and lighted and unlighted buoys.

(768) Currents in the canal and bay attain velocities up to 7 mph in either direction.

(769) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(770) The channels and basin are not adapted for anchorage of vessels; vessels entering the canal for shelter may moor at the west end of same.

(771) Sturgeon Bay is a natural branch of Green Bay, but the navigational aids that mark the channel through it are placed with respect to proceeding from Lake Michigan through the ship canal to Green Bay.

Dangers

(772) A shoal with a least depth of 16 feet is 1.3 miles southeast of the Lake Michigan entrance to the canal. A lighted buoy at the south end of the shoal marks the approach to the canal.

(773) A solid rock ledge, covered 10 feet, borders the southwest side of the dredged approach channel. Vessels entering the canal should avoid courses which will carry them close to this ledge and should enter the dredged approach channel between the unlighted buoys at its outer end.

Bridges

(774) An overhead power cable with a clearance of 140 feet crosses the canal 1.25 miles above the Lake Michigan entrance. Bay View (State Routes 42/57) bascule highway bridge, with a clearance of 42 feet, crosses the canal 3 miles above the entrance. The Maple-Oregon Street bascule bridge, 1.3 miles above the Bay View bridge, has a clearance of 25 feet at the center, decreasing to 15 feet at the channel limits. The Michigan Street bridge, 700 feet above the Maple-Oregon bridge, has a bascule span with a clearance of 14 feet. (See **33 CFR 117.1 through 117.59 and 117.1101**, chapter 2, for drawbridge regulations.)

Coast Guard

(775) **Sturgeon Bay Canal Coast Guard Station** is on the north side of the Lake Michigan entrance.

(776) A **speed limit** of 5 mph (4.3 knots) is enforced in the Sturgeon Bay Ship Canal. (See **33 CFR 162.125 and 207.470,** chapter 2, for navigation regulations.)

(777) **Sturgeon Bay, WI**, is a city on the Sturgeon Bay Ship Canal midway between Lake Michigan and Green Bay. The city is an important repair center, having facilities for repairs to all types and sizes of craft.

Anchorages

(778) Special anchorages are on the north side of the dredged channel at the Bayview Bridge and on the south side of the channel 0.8 mile west of the bridge. (See **33 CFR 110.1 and 110.78,** chapter 2, for limits and regulations.)

Towage

(779) Tugs to 2,000 hp are available at Sturgeon Bay from Selvick Marine Towing Corporation. Arrangements are made through their dispatch office in Sturgeon Bay at 920–743–6016. Tugs are also available from Green Bay. (See Towage under Green Bay.) The tugs monitor VHF-FM channel 16.

(780) The Coast Guard maintains a **Marine Safety Detachment** office at Sturgeon Bay. (See Appendix A for address.)

Repairs

(781) Bay Shipbuilding Corp. operates two graving docks and a floating drydock on the east side of Sturgeon Bay 0.7 mile north of the Michigan Street bridge. The largest graving dock is 1,150 feet long, 140 feet wide, and has 18 feet over the keel blocks. The floating drydock can handle vessels to 604 feet long, 68 feet wide, and 7,150 tons.

Small-craft facilities

(782) There are several marinas on both the northeast and southwest sides of Sturgeon Bay between the two bridges. The marinas can provide: transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps. Mobile hoists to 50 tons are available for complete hull, engine, and electronic repairs. Reported depths alongside the docks were 3 to 13 feet.

(783) Just northwest of the Michigan Street bridge, a narrow spit of land, the remains of a former railroad bridge, extends northeast from shore to near the edge of the dredged channel. A buoy off the end of the spit marks the channel limit.

(784) **Dunlap Reef,** marked on the northeast side by a light, is on the west side of the dredged channel from about 0.3 to 0.7 mile northwest of the Michigan Street bridge. The center of the reef bares. A buoy midlength of the east side of the reef marks the edge of the dredged channel. There is deep water to west of the reef, but only about 11 feet between the south end of the reef and the spit of land northwest of the Michigan Street bridge.

(785) **Hills Point,** marked by a light, is on the west side of Sturgeon Bay 2.2 miles northwest of the Michigan Street bridge. **Sturgeon Bay Entrance Leading Light,** on shore 0.8 mile northwest of Hills Point, shows on the centerline of the entrance channel to Sturgeon Bay from Green Bay.

(786) **Sawyer Harbor** is a small shallow inlet on the west side just inside the mouth of Sturgeon Bay. A marina on the north side of the inlet provides transient berths, water, and electricity.

(787) **Sherwood Point** is the north point of the spit of land that extends north and east from shore to form the west side of the entrance to Sturgeon Bay. Sherwood Point Light (44°53'34"N., 87°26'00"W.), 61 feet above the water, is shown from a white square tower with an attached dwelling on the point. A lighted bell buoy marks the entrance to the Sturgeon Bay Ship Canal, 1 mile east of Sherwood Point Light.

(788) **Sherwood Point Shoal,** a detached shoal with a least depth of 11 feet, is marked on the north side by a lighted horn buoy 2 miles northwest of Sherwood Point Light. The shoal is a hazard to vessels approaching Sturgeon Bay from south. A shoal bank with depths of 2 to 18 feet extends from shore southwest of Sherwood Point to within 0.3 mile of the south side of Sherwood Point Shoal.

Chart 14902

(789) From the southeast entrance to the Sturgeon Bay Ship Canal, the west shore of Lake Michigan trends north-northeast for 38 miles to the north tip of Door Peninsula, which separates the south end of Green Bay from Lake Michigan. This stretch is composed of a series of points with small bays between. The offshore areas are interspersed with submerged net stakes. The shore is low, sloping, and wooded.

Charts 14902, 14910

(790) **Whitefish Point** (44°52'30"N., 87°12'18"W.) is 7.7 miles northeast of Sturgeon Bay Canal Light. A shoal with a least depth of 10 feet, marked at the outer end by a buoy, extends 1 mile southeast from the point.

(791) **Whitefish Bay** is a bight between Whitefish Point and **Cave Point,** 4 miles north-northeast. From the Sturgeon Bay Ship Canal north-northeast to Cave Point, the shoal border varies in width from 0.3 to 1 mile. A detached rock ledge, covered 16 feet, is off the mouth of Whitefish Bay, 1.8 miles south of Cave Point.

(792) **Jacksonport, WI,** a small village 3.4 miles north of Cave Point, is used by only a few recreational craft. There is a launching ramp at the State park.

(793) A shoal with a least depth of 3 feet extends 1.8 miles southeast from shore just north of Jacksonport and is marked at the outer end by a gong buoy. A detached bank with depths of 13 to 17 feet is about 1 mile offshore 3.7 miles northeast of Jacksonport.

Charts 14902, 14909

(794) **Baileys Harbor**, about 14 miles north of Whitefish Point, is a small bay protected on the east by a point that extends east, then south, from shore. Shoals extend 1 mile south from the point and from the western shore at the harbor entrance. **Baileys Harbor Directional Light** (45°04'11"N., 87°07'10"W.), at the northwest corner of the harbor, shows a higher intensity beam on **340°** which marks the best water into the harbor. Vessels approaching Baileys Harbor should keep 1.5 miles offshore until the white sector is visible. A lighted bell buoy 3 miles south-southeast of the light, in the white sector, marks the harbor entrance.

(795) Baileys Harbor is sheltered and affords good anchorage, but is subject to considerable surge during heavy seas. Vessels should not anchor nearer than 0.5 mile of the north shore of the harbor, as the water is shallow and the sea that sets in during south gales is only partially broken by the shoals outside. The best holding ground is on the east side of the harbor.

(796) A yacht club on the northeast side of Baileys Harbor provides transient berths, gasoline, diesel fuel, water, ice, electricity, and sewage pump-out. Emergency repairs are available.

(797) **Moonlight Bay** opens on the northeast side of the point which forms the east side of Baileys Harbor. The bay has deep water to just inside the entrance and affords fairly good anchorage with protection from all but east to south winds.

(798) **Cana Island Light** (45°05'17"N., 87°02'51"W.), 83 feet above the water, is shown from a conical tower on a small island connected to shore by a narrow neck 1.5 miles northeast of Moonlight Bay. From the light north to North Bay, the shore is clear except for numerous submerged net stakes extending about 0.7 mile offshore. In 1995, a dangerous wreck was reported 2 miles north-northeast of Cana Island Light in about 45°06'52"N., 87°00'52"W.

(799) **North Bay,** 3 miles north of Cana Island Light, has a small area of deep water near its mouth and affords fair anchorage for small craft with protection from all but east winds. Entrance to the bay is constricted by shoals that extend off each entrance point. The shoals are marked at the ends by buoys. Vessels should take care to avoid abandoned net stakes in the entrance.

(800) From the point that encloses the east side of the North Bay, the shore extends north to Rowley Bay, enclosed on the east by a point on which is located Newport State Park. **Rowley Bay** affords only limited shelter, and the anchorage is not good. The north end of the bay is fouled by many rocky spots covered 2 to 14 feet.

(801) The approach to Rowley Bay is obstructed by numerous shoals. **Four Foot Shoal**, 3 miles long north and south, lies with its north end 1.4 miles south of the point which encloses the east side of the bay. A bank with numerous rocks awash is on the south end of the shoal, and the north end of the shoal has limiting depths of 2 to 6 feet. Buoys mark the west side and south end of the shoal. A shoal with rocks awash near the inner end and a depth of 11 feet near the outer end extends 1.1 miles south from Newport State Park and is marked by a buoy at the outer end. A detached shoal, marked on the south side by a buoy, has 2- and 9-foot spots 1 mile southwest of Newport State Park. A shoal with a least depth of 1 foot extends from shore west of the north end of Four Foot Shoal and is marked at the outer end by a buoy. Rowley Bay may be entered west of Four Foot Shoal, between it and the shore to west. This passage is obstructed by a detached 9-foot shoal west of the midpoint of Four Foot Shoal; the shoal is marked by a buoy on the east side. The bay may also be entered north of Four Foot Shoal.

(802) **Sand Bay** is a small indentation on the west side of Rowley Bay 1.4 miles south of the head. Slips on the west side of the bay used by commercial fishermen are protected by breakwalls and provide shelter in all winds. The slips have depths of about 6 feet. A resort marina on the west side of the bay provides berths, electricity, gasoline, and sewage pump-out.

(803) The waters from Rowley Bay north to Porte des Morts Passage are rendered foul by an irregular bottom with shallow banks and detached spots. **Spider Island** is a heavily wooded island 0.6 mile southeast of Newport State Park with very shallow spots between. A shoal with a least depth of 9 feet, marked on the south side by a buoy, is 0.7 mile southeast of Spider Island. **Outer Shoal,** marked on the east side by a buoy, is the outermost part of the foul area and lies 2.5 miles northeast of Spider Island. A 4-foot spot is 0.5 mile west of the buoy, and detached spots covered 6 to 18 feet are within 1.3 miles southwest of the buoy.

(804) Waverly Shoal and Nine Foot Shoal are on the northeast and southeast corners, respectively, of an offshore bank east of the north end of Door Peninsula and on the south side of Porte des Morts Passage. **Waverly Shoal,** with a least depth of 12 feet and marked on the northeast end by a lighted bell buoy, is 5.2 miles north of Spider Island. **Nine Foot Shoal,** just south of Waverly Shoal, has a least depth of 4 feet and is marked on the east side by a buoy.

(805) The north shore of Door Peninsula is deep-to through Porte des Morts Passage into Green Bay.

Charts 14902, 14908, 14909, 14910

(806) **Green Bay** is 118 miles long northeast and southwest, from the head of Big Bay de Noc to the mouth of Fox River, and has a maximum width of 23 miles. The bay is separated from Lake Michigan by two mainland peninsulas; **Garden Peninsula**, the north one, is 20 miles long, and **Door Peninsula,** the south one, is about 70 miles long. The entrance to Green Bay between the peninsulas is about 28 miles wide, but is so congested with islands and shoals that the passages between them have acquired the reputation of being dangerous. The main entrances are through Porte des Morts Passage, Rock Island Passage, St. Martin Island Passage, and Poverty Island Passage.

Charts 14902, 14909

(807) **Porte des Morts Passage**, the south entrance to Green Bay, is known as **Deaths Door,** due to the numerous detached shoals which obstruct it and the strong currents which set in or out of the passage according to the wind direction. The shores are rockbound and almost certain destruction to vessels going aground. These conditions have been the cause of many vessel disasters. The passage is bordered on the north side by Plum Island and Pilot Island and on the south side by Waverly Shoal and Door Peninsula.

(808) The entrance to Porte des Morts Passage from Lake Michigan is marked by a **330°30'** lighted range on the southwest shore of Plum Island. The approach to the passage is marked by a lighted bell buoy on the range line 5.4 miles south-southeast of Plum Island.

(809) **Plum Island**, about 1 mile long and 0.7 mile wide, is about midway between Door Peninsula and Washington Island, the largest island in the entrance to Green Bay. Shoals extend about 0.3 mile off the west and east sides of the island. Detached 16- and 19-foot spots are about 0.6 mile east of the south end of the island. A shoal with a least depth of 1 foot extends north from the island and is marked on the east side by a lighted buoy 0.6 mile north of the island. The buoy can be passed close aboard on the east side, but a narrow ridge of 15- to 20-foot depths extends 0.4 mile north from the buoy. Anchorage on the east side of Plum Island, between it and Detroit Island, is safe and is occasionally used in east gales, but it is subject to considerable swell.

(810) **Pilot Island**, 1.7 miles southeast of Plum Island, is on the northeast side of the Lake Michigan entrance to Porte des Morts Passage. Shoals extend 0.3 mile southeast and southwest from the island. **Pilot Island Light** (45°17'03"N., 86°55'11"W.), 48 feet above the water, is shown from a square yellow tower, with a red roof, attached to a dwelling on the island.

(811) **Detroit Island,** 3.5 miles long, extends southeast from the southwest end of Washington Island. The northeast side of the island is connected to the south side of Washington Island by a very shallow rocky bank. The width of this bank diminishes toward the southeast end of Detroit Island, where the bank extends 0.5 mile southeast and south.

(812) **Detroit Island Passage** leads between the southwest end of Washington Island and Detroit Island on the northeast and Plum Island on the southwest. The passage is obstructed by several shoals off the southwest side of Detroit Island. The most dangerous is a 3-foot spot marked on its southwest side by a buoy near the middle of the passage. Vessels should not pass northeast of the buoy without local knowledge. There is good water between the buoy and the shoals off Plum Island. A shoal bank with depths of 8 to 10 feet parallels the southwest side of Detroit Island about 0.8 mile offshore.

(813) **Washington Island,** the largest in the entrance to Green Bay, is a wooded island about 5.5 miles square. The west and north shores of the island are bluff with deep water close-to. The northwest point of the island is marked by a light. The east side of the island is bordered by a shoal bank with a greatest extent of 1.25 miles and depths of 9 to 12 feet at the outer edge. **Hog Island** is a small island on the widest part of the bank. A detached 9-foot spot is 0.6 mile southeast of the southeast point of the Washington Island.

(814) **Detroit Harbor** is a large, but shallow indentation in the south shore of Washington Island. The mouth of the harbor is protected by the north end of Detroit Island. A semicircular bight in the north end of Detroit Island forms a well protected area in the south part of the harbor. North of Detroit Island, the harbor has general depths of 7 to 10 feet and a rocky spot, covered 3 feet, near the center. Shallow-draft vessels with local knowledge may enter the harbor across the rocky bank which connects the northeast side of Detroit Island to Washington Island. The main entrance to the harbor is west of Detroit Island. **Washington Island Coast Guard Station**, seasonally operated, is on the southwest side of Detroit Harbor at the south end of Washington Island.

Channels

(815) A dredged entrance channel leads north from deep water in Detroit Island Passage between Washington Island and the west side of Detroit Island for 0.7 mile to a turning basin in the southwest corner of Detroit Harbor. In 2010, the controlling depth was 13 feet in the channel with lesser depths along the edges of the channel, thence depths of 10 to 14 feet were available in the basin. The channel and basin are marked by lighted and unlighted buoys and lights. A mariner radio activated sound signal at the entrance light, is initiated by keying the microphone five times on VHF-FM channel 83A.

Small-craft facilities

(816) Transient berths, gasoline, diesel fuel, water, ice, and electricity are available on the west side of the basin. A boatyard on the east side of Detroit Harbor provides transient berths, gasoline, diesel fuel, water, ice,

electricity, sewage pump-out, and some marine supplies. An 8-ton mobile hoist and a 65-ton marine railway that can handle 65-foot craft are available for hull and engine repairs.

Ferry

(817) An automobile and passenger ferry operates from the west side of the basin to Gills Rock and Northport, on the north end of Door Peninsula.

(818) **Figenscaus Harbor (West Harbor)** is a small shallow indentation in the west shore of Washington Island. Its shoal water and exposure to west and northwest winds make it practically of no value for commercial purposes.

(819) **Washington Harbor** is a deep indentation in the north shore near the northwest corner of Washington Island. The harbor has good water with bold shores, and although the bottom is ledge rock and poor holding ground for anchors, good protection is afforded from all but north winds.

(820) **Jackson Harbor** is a small shallow indentation in the northeast corner of Washington Island. Immediately inside of the entrance, a small area about 250 feet by 200 feet in size has depths of 8 to 10 feet. A considerable part of the remainder of the harbor is from 7 to 4 feet deep.

Channels

(821) A channel leads from Green Bay across the bar at the mouth of the harbor to deeper water inside. The entrance is marked by two buoys and a light on the west side. The buoys may be shifted in position to mark best water; local knowledge is advised. In 2008, the controlling depths were 4½ feet in the east half and 9 feet in the west half of the channel.

(822) Limited transient berths are available at Jackson Harbor.

Ferry

(823) A passenger ferry operates from Jackson Harbor to Rock Island, just northeast.

(824) **Rock Island** is a State park connected close northeast of Washington Island by a shallow rocky bank. The west, north, and east sides of the island are bluff with deep water close-to. A light on the northwest corner of the island marks the south side of Rock Island Passage. The light is obscured from **275°** to **020°** by the dense foliage on Rock Island. A ferry operates from the State park pier on the southwest side of the island to Jackson Harbor.

(825) **Fish Island** is a small island on a rocky bank 2.2 miles southeast of Rock Island. The bank extends about 0.8 mile north and south from the island. **Fisherman Shoal,** 1.5 miles south-southwest of Fish Island, is about 1.3 miles long northwest and southeast and has several spots awash. The southeast end of the shoal is marked by a lighted bell buoy. Both Fish Island and Fisherman Shoal are hazards to vessels navigating Rock Island Passage. A deep channel is between these banks and Washington and Rock Islands.

(826) **Rock Island Passage,** the widest passage into Green Bay, leads between Fish Island and Rock Island on the south and St. Martin Island Shoals on the north.

(827) The **State boundary** between Wisconsin and Michigan passes through Rock Island Passage.

(828) **St. Martin Island** is a wooded and hilly island 4.5 miles north-northeast of Rock Island. The west, north, and east shores of the island are generally deep-to. A shoal with depths of 3 to 19 feet extends 1.4 miles south from the southeast point of the island.

(829) **St. Martin Island Shoals** are detached spots from about 1.5 to 2.3 miles south of St. Martin Island. The shoalest spot, covered 7 feet, is 2 miles south of the island with an 8-foot spot close north. From the 7-foot spot, the shoal extends 0.4 mile southwest with depths increasing to 20 feet and is marked at the outer end by a buoy. A detached 13-foot shoal 0.7 mile east of the 7-foot spot is marked on the southeast side by a buoy.

(830) **St. Martin Island Light** (45°30'16"N., 86°45'28"W.), 84 feet above the water, is shown from a hexagonal tower on the northeast point of St. Martin Island and marks the west side of St. Martin Island Passage.

(831) **Gull Island** and **Little Gull Island** are on the north and south ends, respectively, of a shoal bank 1.7 Miles east of the north end of St. Martin Island. Between the islands, the bank has depths of 2 to 3 feet. **Gravelly Island,** on the continuation of the bank north of Gull Island, is surrounded by very shallow water. A channel with a depth of about 17 feet leads east and west between Gull and Gravelly Islands. A buoy 0.6 mile southwest of Gravelly Island marks the west side of the bank. **Gravelly Island Shoals** comprise three detached shoals north of the island; a 14-foot spot 0.4 mile north, a 13-foot spot 0.7 mile north, and an 18-foot spot 1.2 miles north. These shoals are a hazard to vessels transiting Poverty Island Passage.

(832) **St. Martin Island Passage** leads between Gravelly and the Gull Islands on the east and St. Martin Island on the west. A lighted bell buoy about 0.4 mile south of Little Gull Island marks the Lake Michigan entrance to the passage. From a point about 0.6 mile south of the buoy, the course through the passage is **319°.**

(833) **Poverty Island,** 2.6 miles east-northeast of Gull Island, is marked on the south end by an abandoned lighthouse. The west side of the island, fronting Poverty Island Passage, is deep-to. A shoal extends 0.4 mile east from the south end of the island, and a shoal bank connects the northeast side of the island with Summer Island, 1 mile northeast. A dangerous wreck was reported in 1995, 2.5 miles south of Poverty Island Light.

(834) **Poverty Island Shoal,** 1.8 miles northwest of Poverty Island, extends 1 mile north and south and has a least depth of 13 feet.

(835) **Poverty Island Passage** leads between Poverty Island and Poverty Island Shoal on the northeast and the Gull Islands, Gravelly Island, and Gravelly Island Shoals on the southwest. In addition to Poverty Island Shoal and Gravelly Island Shoals, the passage is also obstructed by a detached 20-foot spot 1 mile northeast of Gravelly Island. Vessels bound for Green Bay should pass about 0.75 mile south of Poverty Island and then shape their course to pass between Poverty Island Shoal and Gravelly Island Shoals. The passage should only be navigated by light-draft vessels.

Charts 14902, 14908, 14909

(836) **Summer Island** and **Little Summer Island,** the northernmost islands in the mouth of Green Bay, are 2 miles south and 3 miles west, respectively, of **Point Detour,** the south tip of Garden Peninsula which encloses the north end of Green Bay. The islands are connected by a sandy and stony flat which also reaches northeast to the mainland. There are numerous rocks awash in this area. Depths over the flat are 1 to 3 feet between the islands and 5 feet between the islands and the mainland except for a narrow 6-foot channel that closely follows the shore. This channel is obstructed by a 1-foot spot marked on the northwest side by a buoy. Shoals extend 1 mile west from Little Summer Island. **Rocky Island** and several small bare spots are on this bank. **Little Summer Island Shoal,** with a least depth of 6 feet, is 1 mile southwest of Little Summer Island. A shoal bank with depths of 10 to 19 feet connects the south end of Summer Island to Poverty Island. The deeper water is close to Poverty Island. Summer Island is marked on the northeast side by a light.

Charts 14902, 14909

(837) From Porte des Morts Passage, the west shore of Door Peninsula extends generally south-southwest for 34 miles to the mouth of Sturgeon Bay. **Hedgehog Harbor,** a deepwater bight at the north end of the peninsula, is enclosed on the east by **Table Bluff** and on the west by **Deathdoor Bluff.** The harbor is well sheltered from south winds. **Gills Rock, WI,** a small village on the southeast side of the harbor, is the terminous for passenger and automobile ferries operating to Detroit Harbor and Rock Island. A detached 15-foot shoal is 0.3 mile north of Deathdoor Bluff.

(838) **Ellison Bluff,** 3.5 miles south-southwest of Deathdoor Bluff, encloses the west side of **Ellison Bay.** The bay opens to the northwest and provides protection from south and east winds. Good holding ground is in the south part of the bay in depths of 15 to 40 feet. **Ellison Bay, WI,** is a village at the head of the bay. Berths, gasoline, water, ice, and launching ramps are available.

(839) From Ellison Bluff, the bluff shore extends 4.7 miles south to the head of Sister Bay. There is deep water close-to, except for a 15-foot shoal extending 0.5 mile from shore about 2.5 miles south of Ellison Bluff. **Sister Bay,** enclosed on the west by **Sister Bluffs,** provides good anchorage with protection from east-northeast to west winds, mud and sand bottom. **Sister Bay, WI,** a village at the head of the bay, has a marina which provides complete small-craft services. Craft to 38 feet can be hauled out for hull and engine repairs.

(840) The waters northwest of the mouth of Sister Bay are obstructed by several shoals and small islands. **Sister Islands,** two small islands on a shallow bank, are 2.5 miles north-northwest of the head of Sister Bay. The bank, which extends 0.2 mile north and 0.6 mile south from the islands, is marked on the west side by a buoy. A detached shoal with least depths of 12 feet is 1.2 miles south of the Sister Islands. **Sister Shoals** comprise a group of detached shoals from 0.6 to 1.5 miles north of the west end of Sister Bluffs. The shoals, with a least depth of 1 foot at the north end, are marked on the west side by a buoy. **Horseshoe Reefs,** 3 miles northwest of Sister Bluffs, extend 2.6 miles northeast and southwest. These rocky reefs have a least depth of 1 foot and are marked on the southeast side by a lighted buoy.

(841) **Eagle Harbor** is a bay extending 2 miles south into the shoreline between Sister Bluffs on the east and Eagle Bluff on the west. The harbor has deep water within 0.8 mile of its head, except for detached 16- and 17-foot spots in the center. The outer part of the harbor affords good anchorage with protection from all but north and northwest winds. **Ephraim, WI,** a village on the southeast side of the harbor, has small-craft facilities providing gasoline, diesel fuel, water, ice, and engine repairs.

(842) **Eagle Bluff,** forming the west side of the mouth of Eagle Harbor, is marked by a prominent observation tower. **Nicolet Bay (Shanty Bay)** is a small bight opening just west of the tower. **Eagle Bluff Light** marks the west side of the point that encloses the west side of Nicolet Bay. The light is obscured from **220°** to **030°** by trees. **Horseshoe Island,** off the mouth of Nicolet Bay, is marked on the southwest side by a light.

(843) From Eagle Bluff Light, the shore is bluff for 2.7 miles south to Fish Creek. The **Strawberry Islands** are a group of four small islands on a shoal bank which parallels this stretch about 1 mile offshore, from about 2.5 miles southwest to 1 mile northwest of Eagle Bluff Light. The southwest edge of the shoal bank is marked by a buoy. **Strawberry Channel,** leading between the island group and the mainland, is marked on the east by Eagle Bluff Light and on the west by a lighted bell buoy and a buoy which mark the southeast and northeast edges of the shoal bank, respectively. The narrowest part of the channel, abreast the lighted bell buoy, has a depth of 13 feet. The buoy should be passed close aboard to avoid a shoal that extends from the shore.

(844) **Chambers Island,** 3.5 miles west of the Strawberry Islands, is in the middle of Green Bay. Shoals that extend about 1.9 miles north from the northeast point of the island are marked on the outer end by a lighted bell

buoy. A shoal with depths of 12 to 16 feet that extends 1.4 miles west from west side of the island is marked at the outer end by a lighted bell buoy. Shoals extend 0.7 mile off the southwest shore of the island and 1.5 miles off the east shore. An 8-foot spot is on the outer edge of the shoals off the east shore. **Hanover Shoal,** with depths of 1 to 5 feet, extends 2 miles southeast from the southeast point of the island and is marked at the outer end by a buoy. Strangers should not attempt passage between Hanover Shoal and the Strawberry Islands. **Chambers Island Light** (45°12'06"N., 87°21'56"W.), 97 feet above the water, is shown from a skeleton tower on the northwest side of the island. The light is a guide to the passage between the island and the west shore of Green Bay.

(845) **Fish Creek, WI,** is a village on the southwest side of **Fish Creek Harbor** 2.7 miles south of Eagle Bluff Light. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and hull and engine repairs are available. A **special anchorage** is in the bight. (See **110.79c,** chapter 2, for limits and regulations.)

(846) From Fish Creek Harbor south for about 6 miles to Egg Harbor the shore is bluff and deep-to. **Hat Island** is 2.8 miles offshore at about the middle of this stretch. Shoals extend 0.4 mile southeast from the island. A detached 14-foot shoal is 1.3 miles northeast of the island, and a rock awash, marked on the east side by a buoy, is 0.7 mile south.

(847) **Egg Harbor**, 8 miles south of Eagle Bluff Light, is a deep indentation open to the northwest. The harbor affords good anchorage with protection from all but northwest to north winds, mud bottom. **Egg Harbor, WI**, a village on the southeast side of the bay, has a public dock with transient berths, electricity, gasoline, sewage pump-out, and a launching ramp.

Charts 14902, 14909, 14910

(848) From Egg Harbor, the shore is deep-to for 1.5 miles southwest to **Leroys Point.** From Leroys Point for the stretch of 5 miles southwest, to a point 3 miles southwest of **Horseshoe Point,** the shore is bordered by shoals and numerous detached spots with depths of 6 to 10 feet within 1 mile of shore. **Monument Shoal,** near the south end of this stretch, is marked on the west side by a buoy. A 7-foot shoal is 1 mile south of the buoy. The shore in this stretch should be given a berth of 2 miles.

Charts 14902, 14910, 14918, 14919

(849) The shore from Monument Shoal south-southwest for 6 miles to the mouth of Sturgeon Bay is clear except for a 17-foot spot 0.6 mile offshore 3 miles north of the bay.

(850) **Sturgeon Bay** (described with the Sturgeon Bay Ship Canal) extends about 8 miles southeast from Green Bay.

(851) **Caution.**—Aids to navigation in Sturgeon Bay have been placed with respect to traversing the bay from Lake Michigan through the Sturgeon Bay Ship Canal to Green Bay.

(852) **Sherwood Point Light** (44°53'34"N., 87°26'00"W.), 61 feet above the water, is shown from a white square tower with attached dwelling on the southwest side of the entrance to Sturgeon Bay.

(853) From Sherwood Point Light the shore trends southwest for 4 miles to a narrow peninsula that extends 1.2 miles northwest from shore. **Snake Island** is close off the end of the peninsula. From the northeast side of the peninsula and Snake Island, a shoal bank with depths of 2 to 18 feet extends 3.5 miles north-northeast. **Sherwood Point Shoal,** a detached 11-foot shoal marked on the north side by a lighted buoy, is off the north end of this shoal bank and 1.9 miles north-northwest of Sherwood Point. These shoals are a hazard to vessels navigating between Sturgeon Bay and the south end of Green Bay and should be given a wide berth.

(854) **High-Cliff Park** is a small privately maintained artificial harbor 1.5 miles southwest of Sherwood Point Light. The west side of the harbor entrance is protected by a breakwater. In 1978, the reported controlling depths were 4 feet in the entrance channel and harbor. Due to obstructions in the entrance, the harbor should not be entered without local knowledge.

(855) A small bay on the south side of Snake Island has depths of 15 feet or more in the center and shoals toward shore. A privately dredged canal cuts across the west point of the bay to Little Sturgeon Bay.

(856) **Little Sturgeon Bay** opens to the north about 6 miles southwest of the mouth of Sturgeon Bay. The bay has central depths of 7 to 15 feet with shoals along the shores. In 1987, severe shoaling was reported to exist on the northwest side of the bay in about 44°50'38"W., 87°33'04"W. An inn on the west side of the bay has transient berths with water and electricity.

(857) From Little Sturgeon Bay southwest for about 7 miles, the shore is generally deep-to, thence for 16 miles southwest to the village of **Red Banks, WI**, the shoal border is 0.25 to 1 mile wide. A detached 10-foot shoal is 1.5 miles offshore 3.5 miles north of Red Banks. The south end of Green Bay, from Red Banks to the mouth of Fox River, has depths of 18 feet and less. From **Point Sable** (44°34'42"N., 87°54'42"W.), 3 miles southwest of Red Banks, **Frying Pan Shoal,** with 1-foot depths and spots awash extends west across the Bay to Long Tail Point. A dredged deep-draft channel leads through the shoals at the south end of Green Bay to the mouth of Fox River.

Charts 14910, 14916, 14918

(858) **Green Bay Harbor,** at the mouth of **Fox River** at the south end of Green Bay, serves the cities of **Green Bay, WI,** and **De Pere, WI** The major commodities handled

at the port are coal, limestone, wood pulp, cement, aggregates, and agricultural products.

Prominent features

(859) The most prominent objects in the approach to Green Bay are a tank 4 miles east-southeast of the mouth of Fox River, a lighted stack 1.1 miles south of the river mouth, a stack 2.1 miles northwest of the river mouth, and a tank 3.5 miles northwest of the river mouth at the town of Howard.

(860) **Green Bay Harbor Entrance Light** (44°39'11"N., 87°54'04"W.), 72 feet above the water, is shown from a white conical tower on a cylindrical base on the west side of the entrance channel 9.3 miles northeast of the mouth of the Fox River; a seasonal sound signal is at light.

Channels

(861) The dredged entrance channel leads generally southwest through the shallow water in the south end of Green Bay for about 11.5 miles to the mouth of Fox River and thence upstream for about 7.2 miles to a turning basin at De Pere. Other turning basins are on the east side of the channel 1.4 miles above the mouth, at the mouth of East River, and on the west side of the channel 3.6 miles above the mouth, just above the Canadian National Railroad bridge. (See Notice to Mariners and the latest of the chart for controlling depths.) The entrance channel is well marked by lighted ranges, lights, lighted and unlighted buoys. The river channel is marked by buoys from the second turning basin to the turning basin at De Pere.

(862) **East River** empties into the east side of Fox River 1.3 miles above the mouth. The river is navigable to Baird Street bridge, 1.3 miles above the mouth. A depth of about 5 feet can be carried through the narrow and tortuous channel.

(863) **Caution**.—**Grassy Island**, on the east side of the entrance channel, 1.3 miles northeast of the Fox River mouth, and **Cat Island,** on the west side of the channel opposite, partially cover during periodic high-water conditions. Grassy Island is marked on the northwest end by a light.

(864) In the approaches to Fox River, outside the limits of the dredged channel, numerous uncharted fish nets and stakes make navigation hazardous, particularly for strangers.

(865) A crescent-shaped spoil area is about 1 mile east of the mouth of Fox River.

(866) **Fluctuations of water level**.—Changes in wind direction or barometric pressure occasionally cause temporary water level fluctuations of up to 2½ feet above or below the prevailing mean lake level.

Currents

(867) Currents in Fox River attain velocities to 3 mph and may run in either direction.

Weather, Green Bay and vicinity

(868) Green Bay Wisconsin, is located in the eastern portion of the state at the head or southwest end of Green Bay. The Bay is oriented northeast-southwest and is separated from Lake Michigan to the southeast by the Door Peninsula. The location averages about seven days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 81°F (27.2°C) and an average minimum of 59°F (15°C). January is the coolest month with an average high of 23°F (-5°C) and an average minimum of 7°F (-13.9°C). The highest temperature on record for Green Bay is 103°F (39.4°C) recorded in July 1995 and the lowest temperature on record is -31°F (-35°C) recorded in January 1951. About 163 days each year experience temperatures below 32°F (0°C) and an average 38 days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 40°F (4.4°C) and every month except July and August has recorded temperatures at or below freezing (0°C).

(869) The average annual precipitation for Green Bay is 28.49 inches (724 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter months. Precipitation falls on about 189 days each year. The wettest month is July with 3.45 inches (88 mm) and the driest, February, averages only 1.02 inches (25.9 mm). An average of 33 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 80 days each year and averages about 47 inches (1194 mm) each year. December and January each average about 11 inches (279 mm) per year. Ten-inch (254 mm) snowfalls in a 24-hour period have occurred in each month November, December, March and April. About ten days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June, July, and August. Fog is present on average 129 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer season.

(870) The prevailing wind direction in Green Bay is the southwest. Winter through early spring is the windiest period and a maximum gust of 70 knots occurred in May 1989.

(871) (See Appendix B for **Green Bay Climatological table**.)

Towage

(872) Tugs to 1,200 hp are available at Green Bay. Arrangements are made through Selvick Marine Towing Corporation's dispatch office in Sturgeon Bay at 414–743–6016 or Great Lakes Towing Company's dispatch office in Cleveland at 800–321–3663; at least 4 hours advance notice is requested.

(873) **Green Bay Coast Guard Station,** seasonally operated, is on the east side of the mouth of Fox River.

Quarantine, customs, immigration, and agricultural quarantine

(874) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(875) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(876) Green Bay is a **customs port of entry.**

Harbor regulations

(877) Local harbor regulations are established by the City of Green Bay and enforced by the Port Director who can be reached at the Brown County Board of Harbor Commissioners, The Port of Green Bay, Wisconsin, Courthouse, Green Bay, WI 54301. Copies of the regulations can be obtained from the Port Director. A 4 mph (3.5 knots) **speed limit** is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Local bridge regulations

(878) Section 1. (a) Except on Sundays and legal holidays, the draws of bridges will not be required to open from 7:00 a.m. to 8:00 a.m., from 12:00 noon to 1:00 p.m., and from 4:00 p.m. to 5:00 p.m.: Provided, that the draw shall be opened promptly at all times for the passage of vessels carrying United States mails, vessels belonging to the United States, vessels of 300 short tons or over cargo capacity engaged in commercial transportation and their attendant towing tugs, and tugs or fireboats when responding to emergency calls.

(879) Sec. 2. No vessel, craft, or float shall approach or pass through any such bridge at a greater speed than 5 miles per hour.

Wharves

(880) Green Bay has numerous docks and wharves on both sides of the Fox River. Only the deep-draft facilities are described. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Most of the facilities described have rail and highway connections. Water and electrical shore-power connections are available at several docks.

Facilities on the west side of Fox River:

(881) **Wisconsin Public Service Corp., Pulliam Power Plant Slip:** north side of the slip 0.2 mile above the river mouth; 480 feet of berthing space between breasting dolphins; 19 feet alongside; deck height, 6½ feet; open storage for 600,000 tons of coal; receipt of coal; bunkering of vessels; owned and operated by Wisconsin Public Service Corp.

(882) **Koch Fuels, North Dock:** outer part of the north side of the slip 0.3 mile above the river mouth; 355-foot face; 18 feet alongside; deck height, 5 feet; pipeline extends to tank storage for 40,000 barrels; receipt of petroleum products; owned by F. Hurlbut Co. and operated by Koch Fuels, Inc.

(883) **Hurlbut North Dock:** center part of the north side of the slip 0.3 mile above the river mouth; 745-foot face; 18 feet alongside; deck height, 5 feet; open storage for 50,000 tons of sand and limestone; receipt of limestone, sand, salt, coal, and petroleum coke; owned and operated by F. Hurlbut Co.

(884) **Hurlbut South Docks:** two sections on south side of the slip 0.3 mile above the river mouth; 200- and 500-foot faces; 19 feet alongside; deck height, 5 feet; open storage for 200,000 tons of material; receipt of limestone, aggregate, salt, and coal; owned and operated by F. Hurlbut Co.

(885) **Koch Fuels, South Dock:** center part of the south side of the slip 0.3 mile above the river mouth; 425-foot face; 19 feet alongside; deck height, 5 feet; tank storage for 55,000 barrels of asphalt and 55,000 barrels of bunker C; receipt of asphalt and bunker C; owned by F. Hurlbut Co. and operated by Koch Fuels, Inc.

(886) **Hurlbut Salt Dock:** outer end of the south side of the slip 0.3 mile above the river mouth; 150-foot face, natural bank; 19 feet alongside; deck height, 4 feet; open storage for 100,000 tons of salt; receipt of salt; owned and operated by F. Hurlbut Co.

(887) **Amoco Oil Co. Dock:** 0.8 mile above the river mouth; 355-foot face; 19 to 21 feet alongside; deck height, 5 feet; tank storage for 737,000 barrels; receipt and shipment of petroleum products; owned and operated by Standard Oil Division of Amoco Oil Co.

(888) **Anamax Corp. Wharf:** 0.2 mile above Amoco Oil Co. Dock; 241-foot face; 23 feet alongside; deck height, 5 feet; tank storage for about 6,000 tons of tallow; shipment of liquid tallow; owned and operated by Anamax Corp.

(889) **Western Lime and Cement Co. Wharf:** 0.25 mile above Anamax Corp. Wharf; 450-foot face; 23 feet alongside; deck height, 4 to 5 feet; open storage for 105,000 tons of limestone; receipt of limestone; owned and operated by Western Lime and Cement Co.

(890) **Leicht Transfer and Storage Co., North Dock No. 1:** immediately above Western Lime and Cement Co. Wharf; 500-foot face; 22 to 25 feet alongside; deck height, 8 feet; cranes to 30 tons; 43,000 square feet covered storage; 30,000 square feet open storage; receipt and shipment of general cargo; owned and operated by Leicht Transfer and Storage Co.

(891) **Leicht Transfer and Storage Co., North Dock No. 2:** immediately above Leicht Transfer and Storage Co., North Dock No. I; 961 feet of berthing space; 24 to 28 feet alongside; deck height, 8 feet; cranes to 30 tons; 105,000 square feet covered storage; 52,000 square feet open storage; receipt and shipment of general cargo, pig iron, and miscellaneous bulk materials; owned and operated by Leicht Transfer and Storage Co.

(892) **Fort Howard Paper Co., Northern Coal Dock:** 0.3 mile above Walnut Street bridge; 503-foot face; 24 feet

alongside; deck height, 5 feet; open storage for 140,000 tons of material; receipt of salt and coal; owned and operated by Fort Howard Paper Co.

(893) **The C. Reiss Coal Co. Wharf:** immediately above Tilleman Memorial (Mason Street) Bridge; 1,592-foot face; 18 to 23 feet alongside; deck height, 7 feet; open storage for 580,000 tons of coal; bridge crane with unloading rate 700 tons per hour; receipt of coal, pig iron, salt, and miscellaneous bulk materials; coal and oil bunkering; owned and operated by C. Reiss Coal Co.

(894) **LaFarge Corporation Terminal:** north side of the slip 0.65 mile above Tilleman Memorial Bridge; 426 feet of berthing space with dolphins; 19 feet alongside; deck height 8½ feet; storage silos for 15,000 tons of cement; receipt of bulk cement; owned and operated by Lafarge Corporation of Green Bay.

(895) **Leicht Transfer and Storage Co., State Street Dock:** north side of the slip 0.2 mile above Lafarge Corporation Terminal; 540-foot face; 19 feet alongside; deck height, 6 feet; open storage for 40,000 tons of salt; receipt of wood pulp and salt; owned and operated by Leicht Transfer and Storage Co.

(896) **Fort Howard Paper Co. Wharf:** south side of the slip 0.4 mile above the Lafarge Corporation Terminal; 1,100-foot face; 20 feet alongside; deck height, 7 feet; open storage for 450,000 tons of coal and salt; 110-ton derrick; receipt and shipment of heavy-lift items; receipt of coal, wood pulp, and salt; owned and operated by Fort Howard Paper Co.

Facilities on the east side of Fox River:

(897) **James River Dock:** immediately below the mouth of East River; 1,027 feet of berthing space; 11 to 20 feet alongside; deck height, 6 feet; receipt of pulp wood; owned and operated by James River Co.

(898) **U.S. Oil, Inc., Dock:** 0.3 mile above river mouth; 298 feet of berthing space with dolphins; 21 feet alongside; deck height, 8 feet; storage tanks for 488,000 barrels; receipt of petroleum products; owned and operated by U.S. Oil, Inc.

Supplies

(899) Limited marine supplies and adequate foodstuffs are available. Water is available upon arrangements at Anamax Corp. Wharf, Leicht Transfer and Supply Co., North Dock Nos. 1 and 2, Lafarge Corporation Terminal, and James River Dock. Bunker C and diesel oil are available by truck.

Repairs

(900) Marine radio and radar repairs are available at Green Bay.

Small-craft facilities

(901) Most of the facilities along the shores of Fox River offer all or some of the following services: transient berths, gasoline, diesel fuel, water, ice, electricity, marine supplies, launching ramps, pumpout service, a lift and /or a marine railway. Demasting service is available on the east side of the river at the mouth, about 3 miles above the mouth, and on the west side about 0.9 mile above the mouth.

Communications

(902) Green Bay has highway and rail connections. Passenger and freight air service is available at the airport west of the city.

Chart 14916

(903) **Fox River** rises above Berlin, WI, and flows generally east, flowing through Lake Butte des Morts before emptying into the west side of **Lake Winnebago** at Oshkosh, WI The lower Fox River flows from the north end of Lake Winnebago at Menasha, WI, and flows generally northeast for about 39 miles to Green Bay. Above De Pere, WI, the lower Fox River has been improved as necessary to provide a 6-foot channel to Lake Winnebago.

(904) **Caution**.—Mariners transiting the Fox River from De Pere to Menasha are cautioned to stay within the channel. Depths outside the channel are very shallow over bedrock. Vessels have suffered severe damage from slight departures from the channel. The river is marked by private buoys and they may be relocated without prior notice.

(905) The rise from Low Water Datum at Green Bay to the level of Lake Winnebago is about 168.3 feet. This rise is accomplished by 17 locks and 2 guard locks. These locks have an available length of 144 feet, width of 35 feet, and depth of 6 feet over the sills at normal pool level. Lockage is provided from about May 15 to October 15, as determined by the District Engineer, U.S. Army Corps of Engineers. Under a lease agreement, the locks are operated by the State of Wisconsin, Fox River Management Commission. Information about specific operating hours and user fees can be obtained from the Fox River Management Commission, 1163 W. Main Street, Appleton, WI 54911 (telephone 920–993–6999) or the U.S. Army Corps of Engineers, Fox River Sub-Office (telephone 920–766–3531). (See **33 CFR 207.460(a)**, chapter 2, for lock regulations.)

(906) High-water periods on the Fox River, with currents up to 3 to 5 mph, continue for about 2 months on the average, beginning the latter part of March and extending into May. The low-water periods on the river average about 40 days, beginning in July and extending into September.

(907) **Caution**.—During periods of moderate to high flow, mariners should be careful to avoid being drawn over the Menasha Dam by the hazardous outdraft.

(908) **Drydock**.—A drydock basin is adjacent to the third lock at **Kaukauna, WI,** 23 miles above the mouth of Fox River. The drydock is owned by the U.S. Government, but is available for public use. It is fitted with wooden

Structures across Fox River (between Green Bay and De Pere) and East River

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)	Clear Height above Low Water Datum (feet)	Information
	Fox River					
1	Overhead power cable	44°32'15"N., 88°20'20"W.	0.08		155	
2	Tower Drive Bridge (fixed)	44°32'00"N., 88°00'27"W.	0.41	402	120	Note 1
3	Overhead power cable	44°31'58"N., 88°00'29"W.	0.45		159	
4	Canadian National Railroad Bridge (swing)	44°31'28"N., 88°00'38"W.	1.03	84 (both draws)	7	Note 2
	Junction with East River		1.21			
5	Main Street Bridge (bascule)	44°31'06"N., 88°00'55"W.	1.58	120	12	Note 3
6	Walnut Street Bridge (bascule)	44°30'54"N., 88°01'05"W.	1.81	124	11	Note 3
7	Overhead power cable	44°30'43"N., 88°01'12"W.	2.02		153	
8	Tilleman Memorial Bridge (bascule)	44°30'31"N., 88°01'17"W.	2.27	124	32	Note 3
9	Wisconsin Central Railroad Bridge (swing)	44°30'14"N., 88°01'22"W.	2.61	75 (both draws)	8	Note 2
10	Canadian National Railroad Bridge (swing)	44°29'38"N., 88°01'26"W.	3.31	75 (both draws)	31	Note 2
11	Allouez and Ashwaubenon Bridge (fixed)	44°28'34"N., 88°02'49"W.	5.02	150	60	
	East River					
12	Overhead power cable	44°31'11"N., 88°00'26"W.	1.41		66	
13	Monroe Avenue Bridge (fixed)	44°31'04"N., 88°00'23"W.	1.56	60	13	
14	Overhead power cable	44°30'56"N., 88°00'20"W.	1.72		61	
15	Webster Avenue Bridge (fixed)	44°30'53"N., 88°00'06"W.	1.92	41	10	
16	Main Street Bridge (fixed)	44°30'42"N., 87°59'54"W.	2.28	60	7	
17	Baird Street Bridge (fixed)	44°30'36"N., 87°59'35"W.	2.66	40	10	
18	Pedestrian Bridge (fixed)	44°30'17"N., 87°59'24"W.	2.95	55	12	
19	Overhead power cable	44°30'05"N., 87°59'34"W.	3.31			Clearance data not available
20	Mason Street Bridge (fixed)	44°29'56"N., 87°59'41"W.	3.52	124	32	
21	Overhead power cable	44°29'53"N., 87°59'49"W.	3.64			Clearance data not available
22	Overhead power cable	44°29'13"N., 88°00'08"W.	4.71			Clearance data not available
23	Canadian National Railroad Bridge (fixed)	44°29'13"N., 88°00'08"W.	4.72		13	

* Miles above the mouth of Fox River
** Clear width in feet proceeding upstream

Note 1 – Vertical clearance at center of span.
Note 2 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.
Note 3 – See 33 CFR 117.1 through 117.59 and 117.1087, chapter 2, for drawbridge regulations.

lock gates, and is filled by gravity through valves in the gates and emptied through a concrete culvert below the third lock. The drydock is 142 feet long with 132 feet on the keel blocks, has a width of 35 feet at the entrance, and has a depth of 6 feet over the sill. The widths inside the basin are 125 to 64 feet at the bottom and 173 to 91 feet at the top. (See **33 CFR 207.460(b),** chapter 2, for drydock regulations.)

(909) **Menasha, WI,** is on the north side of Fox River at the outlet from Lake Winnebago. The dredged channel in the river leads from the lake between Menasha and **Doty Island,** in the center of the lake outlet. Two highway bridges and a railroad bridge cross the river at Menasha.

Menasha bridge regulations

(910) Section 1. It shall be unlawful for any person, persons, firm, partnership, or corporation to operate a boat upon the Government Canal within the corporate limits of the city of Menasha in such manner as to require the opening of the Racine Street or Washington-Tayco Street drawbridges during the following hours: 12:00 midnight to 8:00 a.m.; 11:50 a.m. to 12:10 p.m.; 12:45 p.m. to 1:00 p.m. and 3:40 p.m. to 4:15 p.m.

(911) Sec. 2. Any person, persons, firm, partnership, or corporation violating the provisions of section 1 shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed $25 or by imprisonment in the county jail not more than 30 days, or by both such fine and imprisonment.

Structures across Fox River from De Pere to Lake Butte des Morts

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
	De Pere Lock		7.15			
1	Overhead power cable	44°27'00"N., 88°03'47"W.	7.17		69	
2	Claude Allouez Bridge (fixed)	44°26'51"N., 88°03'48"W.	7.34	129	27	Note 1
3	Overhead power cable	44°22'59"N., 88°07'05"W.	12.67		83	
4	Overhead power cable	44°22'50"N., 88°07'12"W.	12.86		85	
5	Overhead power cable	44°22'41"N., 88°07'24"W.	13.10		77	
	Little Kaukauna Lock		13.12			
6	Overhead power cable	44°19'38"N., 88°09'50"W.	17.28		80	
7	Wrightstown Bridge (bascule)	44°19'36"N., 88°09'54"W.	17.36	70	16	Note 3
	Rapide Croche Lock		19.16			
8	Overhead power cable	44°18'58"N., 88°12'13"W.	19.50		86	
	Kaukauna Lock 5		22.69			
	Kaukauna Lock 4		23.04			
	Kaukauna Lock 3		23.22			
9	Fox River Valley Railroad Bridge (swing)	44°16'58"N., 88°15'29"W.	23.34	40	14	Note 3 (right draw not available)
	Kaukauna Lock 2		23.36			
10	Overhead power cable	44°16'57"N., 88°15'45"W.	23.55		80	
	Kaukauna Lock 1		23.57			
11	Wisconsin Avenue Bridge (fixed)	44°16'51"N., 88°15'59"W.	23.78	90	4	
12	Lawe Avenue Bridge (bascule)	44°16'52"N., 88°16'07"W.	23.89	90	23	Note 3
	Kaukauna Guard Lock		23.98			
	Combined Locks		25.40			
13	Overhead power cable	44°16'34"N., 88°17'45"W.	25.47		75	
14	Overhead power cable	44°16'31"N., 88°18'11"W.	25.81		70	
	Little Chute Lock 2		26.34			
	Little Chute Guard Lock		26.53			
15	Mill Street Bridge (bascule)	44°16'35"N., 88°19'02"W.	26.53	35	4	
16	Kimberly Bridge (fixed)	44°16'38"N., 88°19'13"W.	26.70	143	54	
17	Overhead power cable	44°16'47"N., 88°19'46"W.	27.20		82	
	Cedars Lock		27.32			
18	Overhead power cable	44°16'38"N., 88°20'31"W.	27.91		99	
19	Appleton-Tri-County Expressway (fixed)	44°16'35"N., 88°21'19"W.	28.06	100	54	
20	Overhead power cable	44°16'06"N., 88°22'29"W.	29.89		85	
	Appleton Lock 4		30.76			
21	College Avenue Bridge (fixed)	44°15'36"N., 88°23'18"W.	30.80	100	54	
22	Overhead power cable	44°15'19"N., 88°23'35"W.	31.21		73	
23	Fox River Valley Railroad Bridge (swing)	44°15'19"N., 88°23'35"W.	31.22	60 (right draw) 59 (left draw)	4	Note 3 (right draw not available)
	Appleton Lock 3		31.31			
24	Overhead power cable	44°15'18"N., 88°23'46"W.	31.36		67	
25	Lawe Street Bridge (bascule)	44°15'18"N., 88°23'46"W.	31.37	70	3	Note 3
	Appleton Lock 2		31.60			
26	Oneida Street Bridge (bascule)	44°15'14"N., 88°24'13"W.	31.74	30	10	Note 3
27	Oneida Skyline Bridge (fixed)	44°15'17"N., 88°24'21"W.	31.85	70	54	
	Appleton Lock 1		31.96			
28	Overhead power cable	44°15'13"N., 88°24'31"W.	32.01		83	

Structures across Fox River from De Pere to Lake Butte des Morts

	Name•Description•Type	Location	Miles*	Clear Width of Draw or Span Opening (feet)**	Clear Height above Low Water Datum (feet)	Information
29	Memorial Drive Bridge (fixed)	44°15'09"N., 88°24'55"W.	32.36	132	54	
30	Overhead power cable	44°14'20"N., 88°26'53"W.	34.36		64	
31	Overhead power cables	44°14'10"N., 88°27'00"W.	34.56		56	
32	Little Lake Butte des Morts Bridge (fixed)	44°13'06"N., 88°27'38"W.	35.94	217	54	Navigation through east center span
	Menasha Lock		37.05			
33	Overhead power/television cable	44°12'01"N., 88°27'28"W.	37.27		64	
34	Soo Line Railroad / Chicago, Milwaukee, St. Paul & Pacific Railroad Bridge (bascule)	44°12'00"N., 88°27'27"W.	37.28	60 (right draw)	3	Note 3
35	Tayco Street Bridge (bascule)	44°11'54"N., 88°27'12"W.	37.52	63	3	Note 3
36	Racine Street Bridge (bascule)	44°12'03"N., 88°26'47"W.	37.91	101	3	Note 3
37	Overhead power cable	44°12'03"N., 88°26'46"W.	37.92		60	
38	Fox River Valley Railroad Bridge (swing)	44°00'41"N., 88°32'01"W.	55.72	70 (both draws)	6	Note 3
39	Main Street Bridge (bascule)	44°00'48"N., 88°32'16"W.	55.97	89	11	Note 2
40	Jackson Street Bridge (bascule)	44°00'53"N., 88°32'33"W.	56.22	97	11	Note 2
41	Overhead power cable	44°01'01"N., 88°32'55"W.	56.57		72	
42	Wisconsin Street Bridge (bascule)	44°01'05"N., 88°33'04"W.	56.72	75	12	Note 2
43	Overhead power cable	44°01'29"N., 88°33'23"W.	57.24		75	
44	Congress Avenue Bridge (bascule)	44°02'04"N., 88°33'49"W.	58.01	75	13	Note 2
45	Overhead power cable	44°02'44"N., 88°34'53"W.	59.22		78	
46	US Route 41 Bridges (fixed)	44°02'45"N., 88°34'54"W.	59.24	76	31	

* Miles above the mouth of Fox River
** Clear width in feet proceeding upstream

Note 1 – Bridge clearances are reported
Note 2 – See 33 CFR 117.1 through 117.59 and 117.1087(c), chapter 2, for drawbridge regulations.
Note 3 – See 33 CFR 117.1 through 117.49, chapter 2, for drawbridge regulations.

Anchorages

(912) Special anchorages are at **Neenah, WI** in the Fox River south of Doty Island at its confluence with Lake Winnebago. (See **33 CFR 110.1 and 110.79**, chapter 2, for limits and regulations.)

(913) **Lake Winnebago** is about 28 miles long with a maximum width of about 10 miles and a greatest depth of 20 feet. The waters of the lake are contained by dams on either side of Doty Island and by a lock at Menasha. Lake levels are usually highest between April and June and lowest between December and February.

(914) During the navigation season, water levels are regulated to stay within prescribed limits above Low Water Datum, 745.1 feet above Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

(915) **Lighthouse Reef**, with rocks awash, is in the approach to the dredged river channel at Menasha.

(916) **Caution**.—Extensive fish nets are placed in Lake Winnebago from April through June by the Wisconsin Department of Natural Resources. Information on the location of the nets may be obtained from Wisconsin Department of Natural Resources, Calumet Harbor Station, P.O. Box 374, Fond du Lac, WI 54935.

(917) The north shore of the lake is wooded and of moderate height. **High Cliff State Park,** at the northeast corner of the lake, has a small-craft basin. The entrance to the basin is protected by converging breakwaters. Transient berths and launching ramps are available.

(918) **Stockbridge Harbor** and **Brothertown Harbor** are small harbors on the east side of Lake Winnebago, 10.5 and 17 miles southeast of Menasha, respectively.

(919) **Calumet Harbor** is on the southeast side of the lake at the mouth of **Pipe Creek.** In 1978, the dredged entrance channel had a controlling depth of 4 feet except for shoaling along the channel edges. Transient berths, water, and launching ramps are available.

(920) **Fond du Lac** is a small-craft harbor at the south end of Lake Winnebago at the mouth of **Fond du Lac River.** A tank 1.4 miles south of the river mouth is prominent.

Channels

(921) A dredged channel leads from Lake Winnebago to the mouth of Fond du Lac River and upstream for 0.6 mile. In 1978, the midchannel controlling depth was 3½ feet. Overhead cables crossing the channel about 0.5

mile above the mouth have a reported least clearance of 60 feet.

Small-craft facilities

(922) Transient berths, gasoline, water, electricity, and sewage pump-out facilities are available in the municipal basin 0.8 mile east of the river mouth. The entrance channel and basin have depths of 4 to 7 feet.

(923) **Oshkosh, WI**, is on the west side of Lake Winnebago, 13 miles south of Menasha, at the mouth of the upper Fox River. A tank 0.3 mile southwest of the river mouth and a tower 0.8 mile northeast of the river mouth are prominent.

Small-craft facilities

(924) A marina protected by breakwaters just south of the mouth of Fox River provides transient berths, gasoline, diesel fuel, water, electricity, and a launching ramp. Sewage pump-out facilities, marine supplies, hoists, and hull and engine repairs are available at marinas on the south side of Fox River.

Anchorage

(925) A **special anchorage** area is in the south part of **Miller Bay,** about 1.8 miles north of the mouth of Fox River.

(926) From Lake Winnebago, the **Fox River** extends 3 miles northwest to **Lake Butte des Morts.** This section of the river has depths of 12 feet or more at midchannel. A winding channel leads through Lake Butte des Morts, and thence Fox River extends southwest from the southwest side of the lake. The towns of **Omro, WI, Eureka, WI**, and **Berlin, WI,** are about 4, 10, and 18 miles above the lake, respectively. In 1978, it was reported that depths of about 3 feet could be carried to Berlin.

(927) Pools on the upper Fox River are maintained by water control structures at Fort Winnebago, Governor Bend, Montello, Grand River, Princeton, White River, and Berlin. The locks at these locations have been removed; hand-operated haulovers are available at Montello, Grand River, Princeton, White River, Berlin, and Eureka to move small-craft between pools. A lock at Eureka is operated on weekends and holidays from May 25 through September 30

(928) **Wolf River** flows from the north and joins Fox River at **Winneconne, WI,** at the northwest end of Lake Butte des Morts. Wolf River has a project depth of 4 feet from the mouth upstream for about 47 miles to New London. The river banks rise 4 to 10 feet above the low-water surface; during flood stage the river rises 6 to 12 feet above the summer stage and during freshets the banks are generally overflowed.

Charts

(929) The east half of Lake Butte des Morts is covered by NOAA Chart 14916. Coverage of the upper Fox River and the Wolf River above Lake Butte des Morts is on maps available from Fox River Marina, Inc., Oshkosh, WI.

Charts 14918, 14910

(930) The head of Green Bay, from the mouth of Fox River north for about 3.5 miles to Long Tail Point on the west and Point au Sable on the east, is filled by a shallow expanse through which the entrance channel to the Fox River has been dredged.

(931) **Long Tail Point,** a low ridge submerged in places, reaches southeast about 3 miles from the shoreline just south of the mouth of Suamico River. **Dead Horse Bay,** on the southwest side of Long Tail Point, has good anchorage for small craft in depths of 8 to 10 feet, sand and gravel bottom. A marina on the west side of the bay provides berths, electricity, gasoline, and sewage pump-out.

(932) **Duck Creek**, flowing into Green Bay 1.5 miles northwest of the mouth of Fox River, is navigable by small craft for 2.7 miles above the mouth. The creek has depths of 1 to 3 feet through marshy areas near the mouth, thence 3 feet in the creek.

(933) **Suamico River** is a small stream flowing into Green Bay about 6 miles north of the mouth of Fox River.

Channels

(934) A dredged entrance channel leads from deep water in Green Bay to the mouth of the river and thence upstream for 0.15 mile. The entrance channel is marked by private lighted buoys. In 2012, the controlling depth was 2 feet in the entrance channel to the head of the project.

(935) A submerged discharge structure, marked by a buoy, is on the south side of the bend at the entrance to the river. Caution should be exercised in the area.

(936) A fixed highway bridge with a clearance of 10 feet crosses the river about 1.5 miles above the mouth.

(937) From Suamico River north for 14 miles to Pensaukee, the shore is bordered by shoals extending about 3 miles off. Depths of 2 feet are as much as 1.7 miles off. **Little Tail Point,** 3 miles north of Suamico River, is a narrow ridge, nearly level with the water surface, that extends about 1.8 miles southeast from shore. **Little Suamico River** is a small stream 5 miles north of Suamico River.

Charts 14902, 14910

(938) **Pensaukee Harbor** is at the mouth of **Pensaukee River,** on the west shore of Green Bay about 14 miles north of Suamico River.

Channels

(939) A dredged entrance channel leads from deep water in Green Bay to the mouth of the river. A lighted buoy marks the dredged channel, and a light marks the pier ruins on the north side of the entrance channel. In 2011, the controlling depth was 3 feet.

(940) The only facilities available at Pensaukee Harbor are for fish tugs which moor on the south side of the river mouth.

(941) From Pensaukee Harbor northeast for 6.5 miles to the mouth of Oconto River, shoals extend 3.8 miles from shore. **Pensaukee Shoal,** with depths of 1 to 4 feet, extends 3 miles southeast from shore about 2 miles northeast of Pensaukee Harbor. A wreck covered 4 feet is 4.2 miles east-northeast of the mouth of Pensaukee River. A shoal bank with depths of 1 to 5 feet extends 2.3 miles southeast from shore just south of the mouth of Oconto River. **Oconto Shoal,** with a least depth of 11 feet, is a detached bank 3.6 miles southeast of Oconto River mouth.

(942) **Oconto Harbor** is at the mouth of **Oconto River,** on the west shore of Green Bay about 27 miles norht of the mouth of Fox River. The city of **Oconto, WI,** is about 2 miles up the river. Below Oconto the river traverses an area of low, swampy ground, the elevation of which is only slightly above the surface of the river.

Channels

(943) A dredged entrance channel leads from deep water in Green Bay between two piers to a turning basin inside the mouth of the river. The outer ends of the north and south piers are marked by lights. A stub about midlength of the north pier juts out southeast toward the channel; a buoy is near the outer end of the stub, marking the northwest boundary of the channel. Just northeast of the stub, the harbor channel decreases in width to the turning basin (See Notice to Mariners and the latest edition of the chart for controlling depths.) A spoil bank extends about 350 feet into the center of the turning basin from the southwest end.

(944) Inside the shoreward ends of the piers, the banks of the river are generally unprotected by revetments, and bars form in the wide portions of the channel from scour in the narrower parts during severe freshets. A depth of about 3 feet can be carried for 1 mile in the river with local knowledge.

(945) A fixed highway bridge with a clearance of 9 feet crosses the river at Oconto.

Small-craft facilities

(946) Marinas on the north side of the river provide transient berths, gasoline, water, electricity, sewage pumpout, limited marine supplies, and launching ramps. A 15-ton hoist is available for hull and engine repairs.

(947) From the mouth of Oconto River, the shore trends north for about 3 miles and then curves east for about 9 miles to the mouth of **Peshtigo River.** The shore in this stretch is low and wooded, and the broad bight between the mouths of the two rivers is shallow, with prevailing depths of 1 to 12 feet. A detached shoal with a least depth of 17 feet is 6.5 miles east of the mouth of Oconto River. The approach to Peshtigo River is marked by a lighted bell buoy 0.9 mile south of the mouth.

(948) **Peshtigo Point** is a low marshy point just east of the mouth of Peshtigo River. **Peshtigo Reef,** with depths of 1 to 6 feet, extends 3 miles southeast from the point. **Peshtigo Reef Light** (44°57'24"N., 87°34'45"W.), 72 feet above the water, is shown from a white column with a red band at the outer end of the reef; a seasonal sound signal is at the light.

Charts 14902, 14910, 14909

(949) From Peshtigo Point north for 8 miles to Menominee River, the shore is bordered by a sandy ledge that extends 2 miles offshore. In the south part of the reach, depths on the ledge are 5 to 10 feet, but in the north part of the reach, **Menekaunee Shoal** uncovers and is marked on the outer edge by a buoy. A wreck, covered 2 feet, 0.4 mile southeast of Menominee Pierhead Light, is a hazard to small craft.

(950) A private light marks the south side of the mouth of **Little River,** about 3.3 south-southwest of the mouth of Menominee River.

(951) **Green Island** is a wooded island 5 miles southeast of the mouth of Menominee River. Shoals extend about 0.2 mile off the north and south shores. A shoal that extends 0.7 mile southeast from the east end of the island is marked off the outer end by a buoy, and a shoal with depths of 3 to 11 feet that extends west from the island is marked at the outer end by a lighted buoy. The area surrounding Green Island should be avoided by deep-draft vessels, because it is foul with stones and waste discharged from dredging operations. **Green Island Light** (45°03'20"N., 87°29'30"W.), 80 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on the southeast end of the island. A dangerous wreck about 1.8 miles north of Green Island Light was reported in 1995.

Charts 14909, 14917

(952) **Marinette, WI,** on the south side, and **Menominee, MI,** on the north side, form a deep-draft harbor at the mouth of **Menominee River.** The harbor is on the west side of Green Bay, about 33 miles southwest of Porte des Morts Passage and 17 miles northwest of the Sturgeon Bay Ship Canal. Menominee River forms the **State boundary** between Wisconsin and Michigan for about

150 miles from the mouth. The principal commodities handled in the harbor are coal, stone, sand, and salt.

Prominent features

(953) Prominent are the easternmost stack on the north side of the river mouth, a radio tower 1.1 miles northwest of the river mouth, and a yellow brick stack 2.3 miles north-northwest of the river mouth.

(954) **Menominee Pierhead Light 4** (45°05'50"N., 87°35'10"W.), 46 feet above the water, is on the outer end of the north pier.

Channels

(955) A dredged entrance channel leads southwest from deep water in Green Bay between parallel piers at the mouth of Menominee River and thence upstream for about 1.7 miles to about 600 feet below the Dunlap Avenue bridge. A turning basin is on the south side of the channel about 1.2 miles above the mouth. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The entrance channel is marked by lighted buoys, and the outer ends of the piers and inner end of the north pier are marked by lights.

(956) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(957) Currents in the river attain velocities up to 3 mph.

(958) Above the dredged channel, the river has depths of 1 to 5 feet and is obstructed by numerous rocks. A dam blocks the river 0.7 mile above the dredged channel.

Restricted Area

(959) A restricted area is along Marinette Marine Corporation's pier on the south side of the channel. (See **33 CFR 334.815**, chapter 2, for limits and regulations.)

Dangers

(960) The entrance channel, lakeward of the piers, is bordered closely by shoals on either side. **Menominee Shoal,** a detached shoal with a least depth of 15 feet, is 0.8 mile northeast of Menominee Pierhead Light and is marked on the east side by a lighted bell buoy. A 14-foot spot is 0.2 mile northeast of the light.

Bridges

(961) A bascule highway bridge with a clearance of 18 feet at the center crosses Menominee River about 0.7 mile above the pierheads. (See **33 CFR 117.1 through 117.59 and 117.1091**, chapter 2, for drawbridge regulations.)

Towage

(962) Tugs for Menominee and Marinette are available from Sturgeon Bay and Green Bay. (See Towage under those ports.)

Quarantine, customs, immigration, and agricultural quarantine

(963) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(964) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(965) Marinette is a **customs port of entry.**

Harbor regulations

(966) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(967) There are three deep-draft facilities at Menominee and Marinette. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(968) **Menominee Paper Co. Dock:** north side of the river mouth; 550 feet of berthing space; 18 feet alongside; deck height, 6 feet; open storage for 60,000 tons of coal; receipt of coal for plant consumption; owned and operated by Menominee Paper Co.

(969) **Marinette Fuel and Dock Co. Dock:** (45°05'42"N., 87°35'42"W.), south side of river mouth; 1,400-foot face, north side, and 700-foot face, south side; 22 feet and 16 feet depth alongside, respectively; deck height, 2 feet; two 50-ton crawler cranes; open storage for 150,000 tons of coal; receipt of dry bulkhead commodities, including coal, pig iron, salt, limestone and lime; owned and operated by Marinette Fuel & Dock Co.

(970) **Ansul Fire Protection, Coal Dock:** (45°05'42"N., 87°36'42"W.), south side of the river 1.5 miles above the pierheads; 600-foot face; 19 feet alongside; deck height, 8 feet; open storage for 8,000 tons of coal; receipt of coal by self unloading vessel; owned and operated by Ansul Fire Protection.

Repairs

(971) Marinette Marine Corp., a shipbuilder on the south side of the river 1.7 miles above the pierheads, can make emergency above-the-waterline repairs. Two 100- and one 40-ton crawler cranes are available.

Small-craft facilities

(972) A municipal marina developed by the city of Menominee and the Michigan State Waterways Commission is protected by breakwaters on the lakefront 1 mile northwest of the river mouth and a private marina is on the south side of the river 2 miles above the pierheads. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A hoist for small sailboats and a 40-ton hoist that can handle craft to 65 feet long for hull and engine repairs are available.

Charts 14902, 14909

(973) From Menominee River, the shore is low and wooded for 24.5 miles north-northeast to Cedar River. Shoals extend as much as 1.3 miles from shore, with depths of 8 to 12 feet near the outer edge. **Ingallston** and **Arthur Bay** are small fishing settlements about 8 and 16 miles north of Menominee River, respectively.

(974) **Cedar River, MI,** is a small village at the mouth of **Cedar River,** across Green Bay west of Porte des Morts Passage. The mouth of the river is protected by rubble mound breakwaters on the east and west sides. The approach to the river is marked by lighted and unlighted buoys, and the outer ends of the breakwaters are marked by lights. In 2011, the controlling depth was 3½ feet between the breakwaters and upstream for 0.4 mile to the fixed highway bridge at the head of navigation. The bridge has a clearance of 10 feet. A marina on the east side of the river just below the highway bridge provides transient berths, gasoline, diesel fuel, biodiesel fuel, electricity, water, sewage pump-out, and launch ramp.

(975) **Whaleback Shoal**, with a least depth of 3 feet, is in the middle of Green Bay, 8.5 miles east of Cedar River. The shoal is marked at the northwest end by a buoy and at the southeast end by a lighted bell buoy. The shoal is a hazard to vessels, especially in foul weather. A dangerous wreck in about 45°21'29"N., 087°10'57"W. was reported in 1995, on the northeast side of the shoal.

Charts 14902, 14909, 14908

(976) The shore is low and wooded from Cedar River north-northeast for 21 miles to Ford River. The shoal border in this stretch is irregular, and there are numerous submerged rocks. A 4-foot spot is 0.6 mile northeast of **Deadmans Point,** 2 miles north of Cedar River. Just south of **Deer Creek,** 5.8 miles north of Cedar River, a shoal with two rocks covered about 1 foot near its outer end extends 0.7 mile from shore. A rock awash is 0.7 mile offshore 10 miles north of Cedar River.

Time

(977) Areas generally south and west of Deer Creek observe central standard time or central daylight saving time. Michigan communities north of Deer Creek observe eastern standard time or eastern daylight saving time.

Charts 14908, 14915

(978) **Little Bay de Noc** is the west arm of the north end of Green Bay. The bay is entered between **Fishery Point** on the west and Peninsula Point on the east. Very shallow ledges extend off both sides of the bay, but the natural channel up the middle of the bay has good deep water and permits the passage of the deeper draft vessels on the lakes.

(979) **Ford River, MI,** is a small fishing village at the mouth of **Ford River** on the west side of the entrance to Little Bay de Noc.

(980) From a point on shore about 4 miles southwest of Ford River, a shoal bank extends about 6.5 miles east and thence north for about 7 miles to Sand Point at the city of Escanaba. The bank, forming the west limit of the deepwater channel into the bay, is marked on the southeast side by a lighted buoy. Depths on the bank are 1 to 20 feet, but at the edge increase quickly to 50 feet and more in the channel.

(981) A 24-foot spot, marked on the west side by a lighted buoy, is on the east side of the vessel route into the bay, 1.1 miles southeast of Sand Point.

(982) **Escanaba, MI,** is on the west side of Little Bay de Noc, 6 miles northeast of Ford River and 7 miles northwest of Peninsula Point. A lighted red brick cylindrical building in the city is prominent. **Sand Point,** marked by a private light, extends east from shore at the city. The harbor has depths of 28 to 40 feet within 0.4 mile of shore and affords access for the largest vessels on the lakes. **Escanaba River** flows into the harbor 2.5 miles northwest of Sand Point.

(983) **Escanaba Light** (45°44'48"N., 87°02'13"W.), 45 feet above the water, is shown from a white square tower with a green stripe on a crib on the northeast side of the shoal north of Sand Point. A mariner radio activated sound signal at the light is initiated by keying the microphone five times on VHF-FM channel 83A.

Local magnetic disturbance

(984) Differences from normal variation of up to 17° have been observed in the vicinity of Escanaba.

(985) **Caution**.—A submerged piling, covered 22 feet, is 0.3 mile southeast of Chicago and North Western Transportation Co., Ore Dock No. 6.

Towage

(986) Tugs are available from Sturgeon Bay. (See Towage under Sturgeon Bay.)

Quarantine, customs, immigration, and agricultural quarantine

(987) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(988) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(989) Escanaba is a **customs station.**

Wharves

(990) Escanaba has several deep-draft facilities on the west side of the harbor north of Sand Point. (For complete information on the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported

depths. (For information on the latest depths, contact the operators.) All the facilities described have highway connections and some have railway connections.

(991) **The C. Reiss Coal Co., Dock No. 2:** 1 mile west-northwest of Escanaba Light; 1,900-foot face; 21 to 24 feet alongside; deck height, 7 feet: open storage for 120,000 tons of coal and 360,000 tons of limestone; receipt of coal and limestone; owned and operated by The C. Reiss Coal Co.

(992) **Chicago and North Western Railway, Ore Dock No. 6:** 1.7 miles northwest of Escanaba Light: 1,979-foot north and south faces; 28 to 31 feet alongside south face, 28 to 32 feet alongside north face; deck height, 2 feet at pilings increasing to 8 feet at top of dock fill; open storage for 2 million tons of material; one traveling ship loader, average rate, 4,000 tons per hour; shipment of iron ore and iron ore pellets; owned and operated by Chicago and North Western Railway.

(993) **The C. Reiss Coal Co., Escanaba Dock No.1:** 2.1 miles northwest of Escanaba Light, 1,050-foot face; 21 to 27 feet alongside; deck height, 5 feet; open storage for 125,000 tons of coal; receipt of coal; owned by The C. Reiss Coal Co. and operated by The C. Reiss Coal Co. and Upper Peninsula Power Co.

(994) **Defense Fuel Supply Center, Escanaba Terminal Dock:** 1 mile north of the mouth of Escanaba River; offshore wharf, 435 feet of berthing space with dolphins; 28 feet alongside the face; deck height, 9 feet; tank storage for 640,000 barrels; receipt of petroleum products; owned by U.S. Government and operated by Continental Services Co., Inc.

Repairs

(995) T.D. Vinette Co. makes emergency above-the-waterline repairs to vessels at their berths.

Small-craft facilities

(996) A small-craft basin, developed by the city and the Michigan State Waterways Commission, is on the south side of Sand Point. A small island, connected to the mainland by a bridge at the west end, forms the south side of the basin. The entrance to the basin has depths of 9 feet, with 1 to 12 feet in the basin. A private light on Sand Point marks the north side of the entrance. Supplies and services available in the basin include transient berths, gasoline, diesel fuel, water, ice, electricity, pump-out facility and small boat launch. The harbormaster monitors VHF-FM channel 9. A boatyard 0.5 mile south of Escanaba River has a 50-ton vertical boat lift and can make repairs to 80-foot vessels.

(997) From Sand Point the shore extends north, then bends northeast to Saunders Point at Gladstone. Very shallow water extends up to 0.6 mile from shore in this reach.

(998) **Gladstone, MI**, is on the west side of Little Bay de Noc, 7 miles north of Escanaba. **Saunders Point**, marked by a light, extends east from shore at Gladstone and helps protect the upper part of the bay on its southwest side. The east part of the upper bay, just north of Gladstone, has depths of 23 to 30 feet, with shoaling to less than 10 feet in the west part. Buoys mark the east and north extent of shoals on the north side of Saunders Point.

(999) Lighted radio masts in Gladstone form a range useful as a guide into Little Bay de Noc, except in the vicinity of Sand Point where the range brings vessels too close to the shoals.

Channels

(1000) A dredged channel leads from the deep water in Little Bay de Noc to a basin off the waterfront at Kipling, 1.5 miles north of Saunders Point. In 2012, the controlling depth was 23 feet in the channel and basin.

Anchorage

(1001) **Squaw Point**, marked by a lighted buoy, extends from the east side of Little Bay de Noc 1.2 miles south of Saunders Point. A deep channel leads between the points to the upper part of the bay. Good anchorage, with mud bottom, is in the upper bay above Saunders Point, just north of Gladstone.

Towage

(1002) Tugs are available from Sturgeon Bay. (See Towage under Sturgeon Bay.)

Wharves

(1003) Gladstone has two deep-draft facilities on the north side of Saunders Point. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) The facilities described have highway connections.

(1004) **Payne and Dolan, Inc., Escanaba Dock:** 0.3 mile northwest of Saunders Point Light; 250 feet of berthing space with dolphins; 23 feet alongside; deck height, 5 feet; tank storage for 161,000 barrels; receipt of asphalt; owned and operated by Payne and Dolan, Inc.

(1005) **Upper Lakes Coal Co., Dock:** immediately west of Payne and Dolan, Inc. Dock; 910-foot face; 21 feet alongside; deck height, 10 feet; open storage for 328,000 tons of bulk material; receipt of limestone, coal, salt, and miscellaneous bulk materials; owned and operated by Upper Lakes Coal Co., Inc.

Small-craft facilities

(1006) A small-craft basin, developed by the city and the Michigan State Waterways Commission, is 1.2 miles southwest of Saunders Point. The entrance to the basin, with a reported depth of 7 feet in 1999, is protected on the southwest side by a pier and detached breakwater.

The east end of the breakwater is marked by a private light and the entrance channel is marked by buoys. The basin has reported depths of 4 to 8 feet. A municipal marina in the basin offers: gasoline, diesel fuel, water, ice, electricity, sewage pump-out, transient berths, marine supplies, launching ramp and harbormaster services. The **harbormaster** monitors VHF-FM channels 16 and 9. A 3-ton hoist is also available for engine and minor hull repairs. Another public launching ramp is about 1.4 miles northwest of Saunders Point Light on the shore west of Butlers Island.

(1007) **Tacoosh River, Rapid River,** and **Whitefish River** flow into the north end of Little Bay de Noc through a common mouth between spits of land that extend from the east and west shores of the bay. An undefined, narrow, and tortuous channel through the mouth had a controlling depth of 3 feet in 1965.

(1008) Shoals extend about 1 mile from the head of Little Bay de Noc. From the head of the bay to Squaw Point, depths of 1 to 3 feet extend about 0.3 mile off the east shore. Below Squaw Point, the shoal border increases to a width of over 2 miles and is marked on the west side by a lighted buoy 5.1 miles south of Squaw Point opposite the village of **Stonington, MI** The shore in the vicinity of Stonington is bluff. Below Stonington the shoal border decreases from 0.5 mile wide to about 0.2 mile wide at **Dutchman Point,** 4 miles south. From Dutchman Point to Peninsula Point, the shore should be given a berth of 0.8 mile.

(1009) **Peninsula Point** (45°40'N., 86°58'W.) is the south point of the peninsula that separates Little Bay de Noc and Big Bay de Noc at the north end of Green Bay. **Peninsula Point Shoal** a rocky ledge with depths of 1 to 6 feet, extends 1.1 miles south from the point. Depths less than 18 feet extend 1 mile farther south, and detached shoals reach about 8 miles south of Peninsula Point. **Eleven Foot Shoal**, with a least depth of 5 feet, is 2.2 miles south of the point; a lighted bell buoy is off the west side of the shoal. **Corona Shoal** is 3.4 miles south of Peninsula Point and has a least depth of 12 feet; the shoal is marked by a buoy on the south side.

Charts 14908, 14909

(1010) **Minneapolis Shoal**, with a least depth of 15 feet, is 6.2 miles south of Peninsula Point. **Minneapolis Shoal Light** (45°34'53"N., 86°59'55"W.), 82 feet above the water, is shown from a white square tower with a red stripe on a concrete base; a seasonal sound signal and racon are at the light. The light should be given a berth of at least 0.25 mile. **Drisco Shoal,** with a least depth of 9 feet, is 2.4 miles southeast of Minneapolis Shoal Light and is marked at the south end by a lighted bell buoy. **North Drisco Shoal,** a boulder bank covered 17 feet, is 1.5 miles east-southeast of Minneapolis Shoal Light. Several 21- to 24-foot spots are in the vicinity. These shoals lie close to the track of vessels bound from Rock Island and Porte des Morts Passages to Little Bay de Noc.

Chart 14908

(1011) **Big Bay de Noc** is the northeast arm of Green Bay, between Peninsula Point on the west and Garden Peninsula on the east. Numerous submerged net stakes are throughout the bay.

(1012) From Peninsula Point, the shore is low and wooded for 7.2 miles northeast to **Chippewa Point.** Shoals extend from about 1 to 2 miles offshore. From Chippewa Point north-northeast for 6 miles to **St. Vital Point,** numerous rocks awash are within 1.1 miles of shore. **Round Island,** 4 miles east-northeast of Chippewa Point, is surrounded by shoals, 0.7 mile to north and 0.5 mile to south. A shoal with least depths of 2 feet is 0.9 mile northwest of Round Island, 1.7 miles from the adjacent mainland shore. **Ripley Shoal,** with a least depth of 1 foot, is 1.3 miles north of Round Island. **St. Vital Island,** 1 mile east of St. Vital Point, is connected to it by a shallow bank with depths of 1 to 4 feet and rocks awash.

(1013) **Ogontz Bay** is a shallow bight on the northwest side of Big Bay de Noc between St. Vital Point on the west and **Indian Point** on the east. Between Indian Point and **Stony Point,** 3.5 miles east, **Big Bay de Noc Shoal** extends 6.6 miles south into the center of Big Bay de Noc. The bank has depths of 3 to 7 feet at the south end and is marked at the south end by a buoy.

(1014) **Nahma, MI,** is a small village on the shore west of Stony Point and at the mouth of **Sturgeon River.** It contains the mills and docks of the American Playground Device Co. Three dilapidated docks extend about 450 feet into the bay, and east therefrom are the ruins of four other docks. There is a reported depth of about 12 feet between the docks, but they should be approached with extreme caution. The water is shoal on the west side of the west dock and on the east side of the east dock.

(1015) From Stony Point, the northeast part of Big Bay de Noc extends northeast for 3.8 miles to **Porcupine Point,** thence curves around through north to **Valentine Point** on the east side, thence extends south-southwest for 4.1 miles to **Ansels Point.** This part of the bay has central depths of 15 to 22 feet with gradual shoaling toward the shores. **Garden Bay,** on the south side of Ansels Point, has available depths of 8 to 12 feet and affords anchorage with protection from all but southwest to northwest winds. Between **Garden Bluff,** on the south side of Garden Bay, and **Middle Bluff,** white in color and 4 miles south-southwest, the shore is indented by a shallow bay. **Snake Island** is in the south end of the mouth of this bay, just north of Middle Bluff.

(1016) **Snail Shell Harbor,** a small cove just south of Middle Bluff, provides excellent protection for recreational craft. The entrance to the harbor is marked by a lighted bell buoy. In 1978, depths of 20 feet were reported in

the entrance, with 10 feet along the west shore and 6 feet along the south shore. A Michigan State Waterways Commission dock with transient berths is in the cove. **Fayette, MI,** is a town at the head of the cove.

(1017) **Sand Bay,** the broad bight just south of Snail Shell Harbor, has deep water within 0.3 mile of shore. **Burnt Bluff,** on the south side of Sand Bay, is deep-to, and this trend continues south for 3 miles to the west point of Sac Bay. A small private artificial small-craft basin is on the west side of Burnt Bluff. Transient berths, water, and electricity are available.

(1018) **Sac Bay,** a small indentation in the southwest end of Garden Peninsula, provides anchorage with protection from all but southeast to west winds.

(1019) **Fairport, MI,** a small fishing settlement midway between Sac Bay and Point Detour, has several landings with depths of 5 to 6 feet at their outer ends. A sandy and stony flat connects the mainland shore at Fairport with the Summer Islands to the south. A narrow 6-foot channel leads across the flat, following close to the mainland shore. The channel is obstructed by a 1-foot spot.

(1020) **Point Detour** (45°36'12"N., 86°36'36"W.), the south extremity of Garden Peninsula, is the north entrance point to Green Bay. The islands and passages south of the point were described previously.

(1021) Between Point Detour and Point aux Barques, 18 miles northeast, the east shore of Garden Peninsula is broken by a series of bays and inlets opening to the east and south. Shoals extend about 0.8 mile south from Point Detour. A detached 16-foot shoal is 3.3 miles east of the first point north of Point Detour. From Point Detour to **Portage Bay,** 10 miles northeast, the shore should be given a berth of 1 mile. Between Portage Bay and **Parent Bay,** 15 miles northeast of Point Detour, rocks awash and shoals covered 1 to 6 feet extend as much as 2 miles offshore. Shoals extend over 1 mile southeast from each side of the entrance to Parent Bay. Between the shoals, deep water extends to within 0.4 mile of the head of the bay. From Parent Bay east to Point aux Barques, shoals and rocks awash extend 1 mile from the bluff shore. At **Point aux Barques** (45°48'N., 86°21'W.) a shoal extends southeast about 1.5 miles. In 1982, a rock covered 5 feet was reported at the outer end of the shoal in about 45°47'08"N., 86°19'48"W.

(1022) From Point aux Barques, the low sandy shore trends north and then northeast for about 12 miles to Manistique Harbor. In this stretch, shoals extend about 0.5 to 1 mile offshore, except at **Wiggins Point,** 4 miles north of Point aux Barques. **Wiggins Point Shoal,** with prevailing depths of 2 to 13 feet and rocks awash, extends about 2 miles offshore around the point. A lighted bell buoy marks the outer edge of the shoal.

(1023) **Manistique Harbor**, serving the town of **Manistique, MI,** is at the mouth of **Manistique River** on the north shore of Lake Michigan 73 miles west of the Straits of Mackinac. A stack 0.9 mile north-northwest of the river mouth and a silver tank 0.8 mile north-northeast of the river mouth are prominent.

(1024) **Manistique Light** (45°56'42"N., 86°14'51"W.), 50 feet above the water, is shown from a tower on the outer end of the east breakwater. A mariner activated seasonal sound signal at the light is operated by keying the microphone five times on VHF-FM channel 83A.

Channels

(1025) The dredged entrance channel leads northeast from deep water in Lake Michigan between converging breakwaters through an outer basin to the mouth of the Manistique River. (See Notice to Mariners and the latest edition of the chart for controlling depths.) The west side of the river entrance is protected by a pier. The outer ends of the breakwaters and the west pier are marked by lights.

(1026) The channel and basin are not adapted for anchorage, and mooring to the breakwaters and pier is prohibited.

(1027) The current in the channel attains velocities up to 3 mph.

(1028) Above the dredged channel, there are a number of abandoned wharves with channels between having depths of about 7 feet.

(1029) **Caution.**—Several shoals should be avoided by vessels approaching Manistique Harbor. A 23-foot spot is 3.1 miles south of Manistique Light. A rocky ledge, covered 18 feet, is 0.8 mile south-southwest of the light. Rock ledges, covered 8 to 17 feet, extend 0.4 mile south from the outer end of the east breakwater and 0.3 mile southwest from the outer end of the west breakwater.

Small-craft facilities

(1030) A small-craft basin developed by the town and the Michigan State Waterways Commission is on the east side of the river 0.3 mile above the mouth. Transient berths, gasoline, water, ice, electricity, launching ramps, and sewage pump-out facilities are available.

(1031) From Manistique Harbor east for 4.5 miles to **Dutch Johns Point,** shoals extend 0.3 to 1.2 miles offshore. A detached 16-foot spot is 2 miles southeast of the point, and detached 19-foot spots are 1.7 and 2.3 miles south of the point. These shoals should be avoided when approaching Manistique Harbor.

Chart 14911

(1032) About 2.5 miles east of Dutch Johns Point, the shoal border decreases to 0.3 mile wide for about 9.5 miles east-southeast to Seul Choix Point. **Seul Choix Point Light** (45°55'17"N., 85°54'43"W.), 80 feet above the water, is on **Seul Choix Point.**

(1033) A bay that opens between Seul Choix Point and **Hughes Point,** 4.5 miles northeast, is protected from the north and west and has deep water within 0.8 mile of shore. A detached shoal with a least depth of 9 feet is 0.9 mile south of Hughes Point.

(1034) **Port Inland** is a private harbor of Carmeuse Natural Chemicals, built on the lake in front of the company's plant about 4 miles northeast of Seul Choix Point.

(1035) The harbor basin is protected by a breakwater, marked at the outer end by a private light with a private sound signal, that extends south and west from shore. The privately dredged entrance channel is marked by a private **000°** lighted range and a private **047°** lighted range marks the channel through the harbor basin.

(1036) Limestone is shipped from a 900-foot wharf on the northwest side of the basin. The wharf has a deck height of 9 feet and reported depths of 25 feet alongside. There is open storage for 200,000 tons of limestone.

(1037) From Hughes Point, the shore trends east for 7 miles to **Scott Point** and thence 2 miles to **Point Patterson** (45°58'06"N., 85°39'18"W.). This stretch is filled with shoals and rocks extending 0.5 to 1 mile offshore.

(1038) From Point Patterson, the shore extends northeast for 11 miles, thence east for 3.5 miles to **Millecoquins Point** (46°05'12"N., 85°26'48"W.). northeast of Point Patterson the shoal border increases to a width of 2.8 miles and thence decreases to about 0.4 mile in the bight west of Millecoquins Point. Numerous submerged net stakes are within about 5 miles of shore in this stretch. **Cranberry Shoal,** with rocks awash, is 1.7 miles offshore 5.7 miles northeast of Point Patterson. A detached 11-foot shoal is 1.3 miles west-southwest of Millecoquins Point, and a rock awash is 0.3 mile offshore 1 mile west of the point.

(1039) **Naubinway Island,** about 0.8 mile south of Millecoquins Point and marked by a light, is a small island surrounded by rocks and shoals. A 1-foot spot is 0.6 mile east of the island, and a detached 14-foot shoal is 0.8 mile southwest of the island. **Naubinway Reef,** a rocky ledge with a least depth of 4 feet, is 1.5 miles southeast of Naubinway Island. A detached 14-foot spot is midway between the reef and island.

(1040) **Potter Reef,** with a least depth of 1 foot and marked on the northeast side by a buoy, is 7.3 miles south-southwest of Millecoquins Point and 6.5 miles east-northeast of Point Patterson. **Millecoquins Reefs** is a group of detached 7- to 13-foot spots that extend over 2 miles northwest and southeast, about 5 miles south of Millecoquins Point. A buoy marks the west end of the reefs. A number of detached shoal spots are within 3.5 miles south of Millecoquins Reefs. The shoalest are a boulder covered 9 feet 1.4 miles southeast, 12-foot spots 2.2 and 3 miles south, and a 14-foot spot 1.3 miles southwest. These reefs and shoals are out of the normal vessel routes and are unmarked.

(1041) Lansing Shoals, Fagan Reef, Simmons Reef, and other shoals farther south in the vicinity of Beaver Island are described earlier in the chapter.

(1042) Between Millecoquins Point and **Biddle Point,** 3.3 miles east, a small bay has general depths of 12 feet or more with shoals within 0.4 mile of shore. On the west side of the bay, 2- and 7-foot spots are 0.6 mile east-northeast and east of Millecoquins Point, respectively.

(1043) **Naubinway, MI,** is a village on the west side of the bay, just north of Millecoquins Point. A former lumber dock on the north side of the point has washed out except for a few piles. Good shelter for craft drawing up to 10 feet is behind the small point just northeast of Millecoquins Point, but the approach is rendered dangerous by the shoals east of Millecoquins Point. A small-craft harbor developed by the Michigan State Waterways Commission on the northeast side of Millecoquins Point is protected by a breakwater. Transient berths, water, electricity, and a launching ramp are available.

(1044) From Biddle Point east for 9 miles to **Point Epoufette** (46°02'48"N., 85°11'42"W.), the shore is irregular and rocks and shoals extend 3 miles offshore in the bight just east of Biddle Point decreasing to 1 mile offshore just west of Point Epoufette. **Pelkie Reef**, with a depth of 11 feet at the north end and a rock awash at the south end, is 1.7 miles offshore 2.7 miles southwest of Point Epoufette. A detached boulder ledge, covered 6 feet, is 1.5 miles west-southwest of Pelkie Reef. A 14-foot spot is 3 miles west of Pelkie Reef. Detached 16- and 17-foot spots are 1.1 miles south-southwest and 0.9 mile south of Point Epoufette, respectively.

Charts 14880, 14911, 14881

(1045) From Point Epoufette, the shore bends southeast for 17 miles to **Point aux Chenes** (45°55'30"N., 84°54'36"W.). The shoal border reaches an extent of 1.8 miles about 4 miles east of Point Epoufette, thence decreases to 0.2 mile wide 3 miles north of Point aux Chenes. At Point aux Chenes, shoals and boulders, covered less than 18 feet, reach 1.5 miles west and 2.5 miles northwest.

(1046) About 4.5 miles southeast of Point Epoufette, a privately dredged channel, with a controlling depth of 24 feet in 1978, leads from deep water in Lake Michigan east to a private harbor of Sand Products Corp.

(1047) **Manitou Paymen Shoal,** with depths of 1 to 10 feet and a dangerous rock awash at the center, is 4 miles offshore, 8 miles southeast of Point Epoufette. A buoy marks the south side of the shoal. A boulder, covered 18 feet, is 0.9 mile south-southeast of the buoy.

(1048) Between Point aux Chenes and **Gros Cap,** 5.7 miles southeast, the shore is indented by small bays with shallow depths and rocks, awash and submerged. A boulder ledge, with a least depth of 17 feet, is 2.2 miles south of Point aux Chenes. **West Moran Bay,** on the southeast side of Gros Cap, affords protection for small craft from north to east winds.

(1049) **St. Helena Island,** 2 miles southwest of Gros Cap, is marked by a light on the southeast end. Shoals extend about 0.3 mile off the northwest, southwest, and southeast sides of the island. A buoy marks the southeast edge of the shoals. Approaching from the west, the island should be given a wide berth.

(1050) **St. Helena Shoal,** 2 miles west of St. Helena Island, is 1.3 miles long east and west and has a least depth of 4 feet. A buoy marks the southwest side of the shoal. Do not attempt to round the northwest end of St. Helena Island at night unless its appearance under Gros Cap and the position of St. Helena Shoal are well understood.

(1051) From West Moran Bay southeast for 2.5 miles to Point La Barbe, shoals extend about 1 mile offshore. **Point La Barbe** is the southwest point of Point St. Ignace, which forms the south side of the Straits of Mackinac. **Green Island** and several small islets are on the shoal bank off Point La Barbe.

(1052) **Mackinac Bridge** crosses the Straits of Mackinac between Point St. Ignace on the north and Mackinaw City on the south. The center span of the suspension bridge has a clearance of 148 feet at the center decreasing to 135 feet at each end. The approaches to the bridge are marked by lighted and unlighted buoys. A private sound signal is under the main bridge span on the channel line. (Mackinac Bridge is described more completely at the beginning of this chapter.)

Currents

(1053) Currents in the Straits of Mackinac, particularly northeast of Mackinac Bridge in the vicinity of the Graham Shoals, are often strong and irregular.

(1054) The Straits of Mackinac east of Mackinac Bridge are described in chapter 10.