



US Army Corps
of Engineers
North Central Division

GREAT LAKES LEVELS

Update Letter No. 94

May 3, 1993

The Twin Ports Duluth-Superior Harbor Minnesota and Wisconsin

Twin Ports History

The port cities of Superior, Wisconsin and Duluth, Minnesota (Figure 1) were first settled in the early 1850s. Speculation on rich copper ore being found in the area brought hundreds of people seeking their fortunes. Federal improvements to navigation came soon after, with construction of a brick lighthouse on Minnesota Point in 1858.

Predecessors to today's Corps of Engineers, the "Topographical Engineers," surveyed the bay area in 1861, resulting in the first dredging of the harbor to ensure adequate depth in the shipping channels.

Planning also began in 1861 for the Lake Superior and Mississippi Railway connecting Duluth, Minnesota and St. Paul, Minnesota and initiated a commercial boom at the head of

the Lakes. Railroads, transporting enormous quantities of grain, made the Duluth-Superior port possible. By the time the railroad was completed in 1870, a new dock and a giant grain elevator stood ready to transfer cargoes from the rail cars into ships docked at the outer harbor on Lake Superior, protected by a breakwater which jutted out into the lake.

The Duluth Ship Canal, a canal

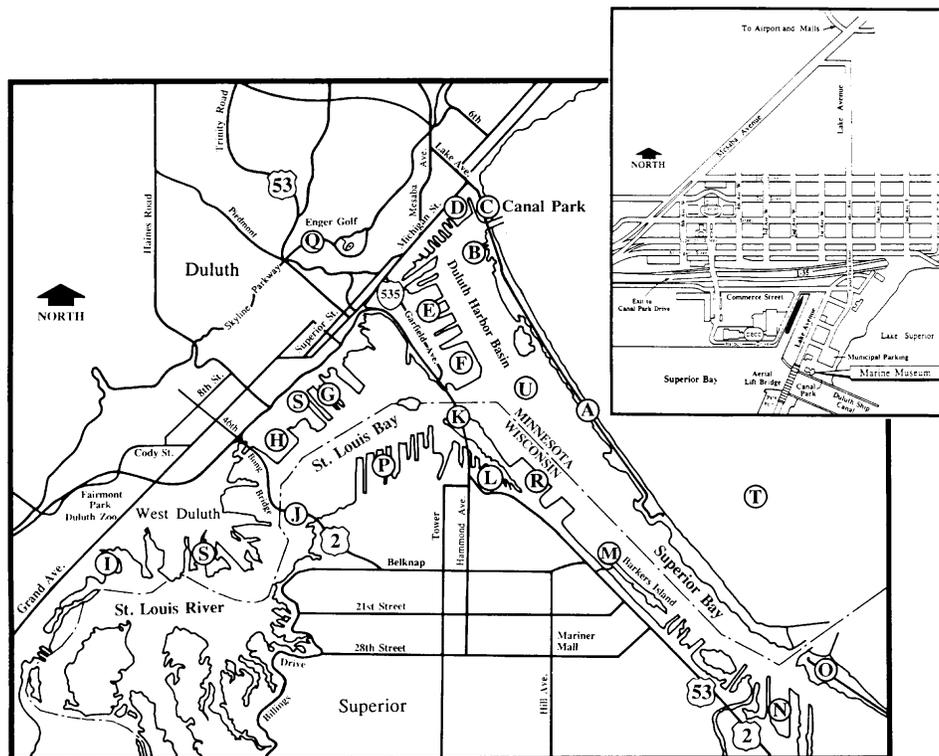


Figure 1. Map of area attraction locations.

excavated by private interests in 1871, passed through Minnesota Point and enabled ships to enter the bay on the Duluth side. Loading and unloading docks were constructed in the shelter of the new inner harbor soon afterward. To accommodate this growth, the natural harbor depths of six to eight feet were deepened by the Corps to 12 feet in 1867 and 1874, and to 16 feet in 1881-82, when new locks were also built by the Corps at Sault Ste. Marie, Michigan. Virtually all the Twin Ports shipping passes through the Corps' Soo Locks which connect Lake Superior to the lower Great Lakes.

Growth accelerated throughout the 1880s. Flour mills were built to process and package by-products. Millions of barrels of flour were shipped to Buffalo, New York and the east on steamers and sailing craft. Most upbound ships brought coal from Pennsylvania and Ohio for distribution all over the west, while others brought passengers and package freight of all kinds. Major shipyards prepared to build modern steel ships.

Iron ore from the nearby Mesabe Iron Range in Minnesota began to flow through the harbor in 1892, swelling shipments to millions of tons annually. Congress combined the Duluth and Superior ports in 1896, and for the first time provided a joint appropriation of \$3 million for harbor improvements. During the next ten years, channels were enlarged and deepened to 20 feet. Large anchorage basins were created inside the harbor, and both the Duluth and Superior entries were rebuilt and enlarged. Total cargo tonnage went from

100,000 tons in 1870, to 3.5 million in 1890, and to 10 million in 1900.

In addition to grain, coal and ore, another important cargo was lumber. At the turn of the century, cargoes of Minnesota and Wisconsin lumber grew tremendously. For the next ten years, about 400 million board feet of lumber (about one million tons) were shipped annually, making it the hub of the lumber industry until 1920, when focus shifted to the Pacific coast.

The Corps kept pace with the growing Twin Ports industry by widening, deepening, and extending channels to new locations as the harbor and vessels expanded to new sizes and capacities. Channels were deepened from 20 feet to 24 feet in the 1930s. With the development of the St. Lawrence Seaway system during the 1950s, the waterways throughout the lakes were made 27 feet deep to accommodate the largest lake ships, as well as the ocean-going foreign vessels.

The Twin Ports

The Ports of Duluth and Superior - The "Twin Ports" - are the leading bulk cargo ports on the Great Lakes, as well as among the busiest in the nation. Approximately 30 to 40 million tons of cargo are shipped through the port each season. Total tonnage has reached 75 million tons in some years.

Ideally located at the westernmost end of the Great Lakes-St. Lawrence Seaway System, the Twin Ports are the farthest inland seaport in the world at 2,342 miles from the Atlantic Ocean, yet set in the country's heartland, close to essential resources - grain, iron

ore, stone, and coal. Duluth-Superior Harbor has 17 miles of channels, 45 miles of frontage, and dozens of commercial docks, including some of the largest and most modern in the world. The ports serve nearly 200 foreign-flag vessels carrying over 60,000 tons per trip.

The two entry canals and the harbor channels in the Twin Ports are maintained by the Detroit District, U.S. Army Corps of Engineers, which has an area office at Canal Park, Duluth.

Canal Park

Hundreds of thousands of people visit Duluth-Superior Harbor each year. They are attracted by the beauty of Lake Superior and the North Shore, by the endless parade of passing ships, and by the bustle of maritime activity in the port (Figure 2). For The Boatwatchers Hotline, in season, call (218) 722-6489.

Canal Park, located along the shore at the Duluth Ship Canal, Aerial Bridge, and Lake Walk, focuses much of the public's interest in the port. Here, the Corps of Engineers provides visitor facilities and a marine museum which are handicap accessible, free of charge, and open to the public all year. Hours do vary by the season. For tour reservations, call (218) 727-2497.

The Canal Park Marine Museum (Figure 3) features information on the history of Lake Superior, the shipping activity of the Twin Ports, and the work of the Corps of Engineers throughout the region. Within the museum are full-sized replicas of ship cabins and a pilothouse, a massive steam engine, a working

radar, and dozens of the finest scale ship models in the Midwest.

Film showings, educational programs, fact sheets, and brochures are available. The museum staff also assists visitors in making the most of their stay in Duluth-Superior, one of America's busiest ports. The Visitor Center has an outside ramp and inside elevator for handicap access. Parking is nearby.

Canal Park Visitor Center and Marine Museum, Canal Park, Duluth, MN 55802 U.S.A., (218) 727-2497.

Attractions

The Twin Ports offer dozens of maritime activities on some 7,500 acres of protected water.

A. MINNESOTA POINT. A natural sand spit six and a half miles long, with a beautiful view of the harbor and also has swimming, picnicking, and hiking facilities. Walk the beach some three miles to the remains of the 1858 Superior Entry Lighthouse which is listed on the National Register of Historic Places.

B. GOVERNMENT DOCKS

and MARINAS. Corps of Engineers and U.S. Coast Guard facilities face St. Louis Bay. Corps working craft are visible at the 9th Street Vessel yard and a 180-foot Coast Guard cutter may be open to the public in late afternoons or weekends, when in port. Work boats and pleasure craft use the boat basin.

C. CANAL PARK, MARINE MUSEUM, LAKE WALK, LIGHTHOUSES, and AERIAL LIFT BRIDGE. This is a focal point for boat-watchers, with parking available at foot of Canal Park Drive. The ship canal is 300 feet



Figure 2. Boaters near aerial lift bridge at Duluth Harbor.

wide and 1,650 feet long, accommodating hundreds of vessels each year. Piers were rebuilt in 1985-87 for added strength and stability. The Lift Bridge with 900-ton span, rises to nearly 140 feet above the water. The bridge, canal, and lighthouses are on the National Register of Historic Places.

D. DULUTH ENTERTAINMENT & CONVENTION CENTER (DECC) and WILLIAM A. IRVIN. Duluth Entertainment & Convention Center plus excursion boats, fish tugs, pleasure craft, and ore boat museum are located in Minnesota Slip.

E. RICE'S POINT GRAIN ELEVATORS. Hundreds of grain

ships load here each season. They are visible from Garfield Avenue or from excursion boats.

F. SEAWAY PORT TERMINAL. Multi-million dollar Clure Public Mine Terminal is at the core of port's general cargo activity. The site located on 120 acres of farmland, includes gantry cranes, lay-by berths, tank farm, warehouses, bulk cement facility, and free trade zone. This is best seen from excursion boat. There is access to unique fishing pier beneath the old interstate bridge adjacent to the main ship channel and public boat launches. It is located off Garfield Avenue on I-535.

G. MISSABE ORE DOCKS. Iron ore and taconite docks,

operated by D.M. & I.R. Railroad, also used by hundreds of lake freighters loading at gravity docks and conveyor shiploaders. The docks have an open storage for three million tons of taconite. Observation platform is located off Oneota Street at 40th Avenue West exit from I-35 South.

H. ERIE PIER. This is an 82-acre dock property under development by the Corps. Built from dredged materials in diked disposal area. Large amounts of cleaned material is recycled from here for construction projects.

I. MARINA and CAMP-GROUND. This is located at a site with a view of St. Louis River, its islands, and marina activity. Follow Grand Avenue to Pulaski

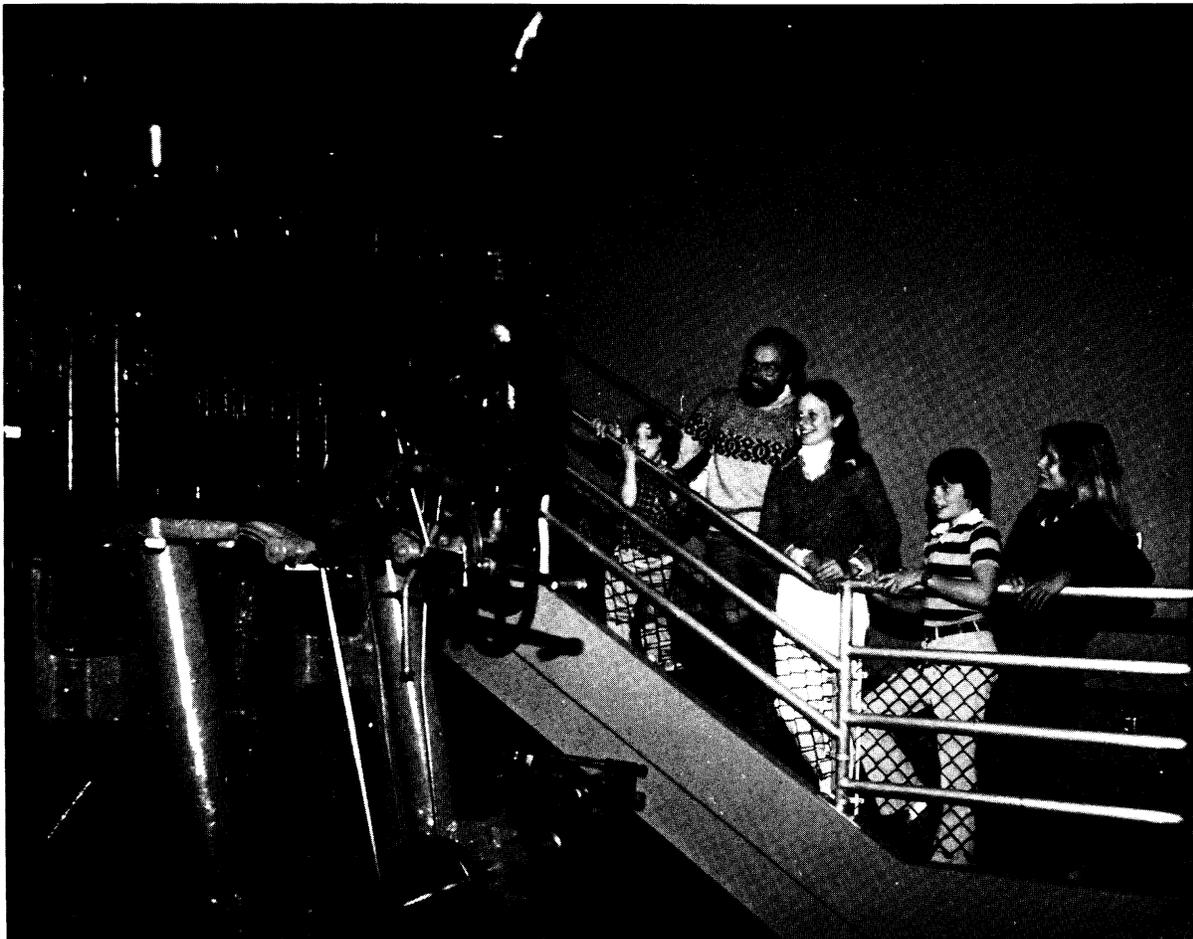


Figure 3. Canal Park Museum exhibit of two-story steam engine from an historic Corps of Engineers harbor tug, the ESSAYONS..

Street in Morgan Park Neighborhood.

J. RICHARD I. BONG BRIDGE. This is a one and one-half mile-long bridge which spans The St. Louis River overlooking bay and the Grassy Point railroad bridge. Pedestrian walkway on west side.

K. CONNORS POINT and BLATNIK INTERSTATE BRIDGE. Some of the world's largest and busiest grain elevators; bridge affords panoramic view of Twin Ports.

L. FRASER SHIPYARDS. Dating back to 1891, 65-acre shipyard was birthplace for dozens of historic lake crafts, including whalebacks, and was the focal point of shipbuilding in WWI and WWII. Visible from US-2 or Main Street off Fifth Avenue which was created by the Corps from harbor dredging projects.

N. BURLINGTON NORTH-ERN ORE DOCKS. First shipments of Minnesota iron ore from these docks occurred in 1892. Hundreds of bulk freighters load here at conveyor-type shiploader dock adjacent to old gravity ore docks.

O. WISCONSIN POINT and SUPERIOR ENTRY. Unspoiled natural area on sand spit with picnic grounds, boat launch, fishing areas, view of lake and ore docks. Lighthouse at end of breakwater. Piers are 2,100 and 1,600 feet long. Follow Moccasin Mike Road off US-2.

P. COAL DOCK. Facility handles millions of tons of low-sulphur western coal annually. Coal arrives by train from Montana coal fields for trans-shipment by boat to power plants in Lower Lakes ports. Best seen from excursion boat or Skyline Drive.

Q. SKYLINE DRIVE and ENGER TOWER. View of harbor and Lake Superior from 500 feet above. Drive extends from 60th Avenue East to Spirit Mountain with several scenic overlooks. Tower in center of park midway along drive affords unique vantage point.

R. CARGO FACILITIES. Grain elevators, stone and cement docks, and general cargo freight facilities along Superior bayfront. Best seen from excursion boat.

S. BULK FREIGHT DOCKS. Limestone, coal, coke, and salt are among cargoes which pass over docks on the St. Louis River and Bay.

T. LAKE SUPERIOR. World's most expansive freshwater lake is 350 miles across east and west, and 160 miles north and south, covering 31,700 square miles. Watershed area is 81,000 square miles. Deepest point is north of Munising, Michigan, reaching 1,333 feet. There are 2,980 miles of shoreline enclosing 2,935 cubic miles of water. Vessels cross the lake in 24 to 36 hours, depending on weather and destination from March into January. Ice cover varies greatly from year to year.

U. DULUTH-SUPERIOR HARBOR. Busiest bulk cargo trans-shipment port and physically the largest international harbor on the Great Lakes with 17 miles of dredged channels; forms the westernmost terminus of St. Lawrence Seaway System.

Additional Information

Much of the information presented was taken from a brochure published by the U.S. Army Corps of Engineers, Detroit District. The recently revised

brochures will be available in mid-May. Requests for copies can be made to the Detroit District's Public Affairs Office, P.O. Box 1027, Detroit, Michigan 48231-1027.

Previous Update Letters with related topics are Update Letter No. 93, April 1, 1993, Soo Locks at Sault Ste. Marie, Michigan and Update Letter No. 88, November 3, 1992, Shipwrecks of the Great Lakes.

Highwater Levels

The St. Lawrence Board has continued to increase the outflows from Lake Ontario to help alleviate the high level conditions on Lake Ontario. Lake Ontario supplies exceeded the records for the months of November 1992 and January and April 1993. As a result, the April monthly level exceeded Criterion (h) upper limit of regulation level. The International Joint Commission (IJC) and the International St. Lawrence River Board continue to monitor the situation and take all possible action to alleviate the extreme high level conditions upstream and downstream.



Russell L. Fuhrman
Brigadier General, USA
Commanding

Great Lakes Basin Hydrology

In April, precipitation in the Great Lakes Area was above average as were the water supplies to the Lakes. This is in contrast to the latter few months when these factors were generally below average. As a result, the May beginning elevations for Lakes Michigan-Huron through Lake Ontario are slightly higher than predicted last month. As compared to their April long-term averages (1900-1992), Lake Superior is average; Lakes Michigan-Huron are 6 inches above average; Lake St. Clair is 16 inches above average; Lake Erie is 21 inches above average; and Lake Ontario is 22 inches above average. Based on the above information and in anticipation of the normal spring rise, shoreline residents of Lakes St. Clair, Erie, and Ontario continue to be alerted to possible extreme lake levels. Water level setups and wave actions caused by storm conditions can often be very serious and may require residents to protect their property. Should conditions worsen, the Corps of Engineers will provide further information and advice to shoreline residents through these Update Letters.

The precipitation, water supplies, and outflows for the lakes are provided in Table 1. Precipitation data include the provisional values for the past month and the year-to-date and long-term averages. The provisional and long-term average water supplies and outflows are also shown.

**Table 1
Great Lakes Hydrology¹**

PRECIPITATION (INCHES)								
BASIN	APRIL				YEAR-TO-DATE			
	1993 ⁶	AVG. ⁷	DIFF.	% OF AVG.	1993 ⁶	AVG. ⁷	DIFF.	% OF AVG.
Superior	3.2	2.0	1.2	160	6.1	7.1	-1.0	86
Michigan-Huron	3.9	2.6	1.3	150	8.6	8.5	0.1	101
Erie	3.6	3.1	0.5	116	12.3	10.4	1.9	118
Ontario	4.1	2.9	1.2	141	12.3	10.6	1.7	116
Great Lakes	3.7	2.5	1.2	148	8.8	8.6	0.2	102

LAKE	APRIL WATER SUPPLIES ⁸		APRIL OUTFLOW ³	
	1993 ²	AVG. ⁴	1993 ²	AVG. ⁴
Superior	173,000	149,000	73,000	69,000
Michigan-Huron	348,000	286,000	182,000 ⁵	182,000
Erie	96,000	66,000	250,000 ⁵	203,000
Ontario	156,000	93,000	291,000	249,000

¹Values (excluding averages) are based on preliminary computations.

²Cubic Feet Per Second (cfs)

³Does not include diversions

⁴1900-89 Average (cfs)

⁵Reflects effects of ice/weed retardation in the connecting channels.

⁶Estimated

⁷1900-91 Average

⁸Negative water supply denotes evaporation from lake exceeded runoff from local basin.

For Great Lakes basin technical assistance or information, please contact one of the following Corps of Engineers District Offices:

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