

1959

## The Growth of Shipping on The Great Lakes - St. Lawrence Waterway As Related to Duluth Superior

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### Recommended Citation

Sielaff, R. (1959). The Growth of Shipping on The Great Lakes - St. Lawrence Waterway As Related to Duluth Superior. *Journal of the Minnesota Academy of Science, Vol. 27 No.1*, 38-42.

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**GEOGRAPHY**

THE GROWTH OF SHIPPING ON  
THE GREAT LAKES — ST. LAWRENCE WATERWAY  
AS RELATED TO DULUTH SUPERIOR

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**THE PROBLEM:** The problem of this paper is to determine the amount and nature of ship movement on the Great Lakes-St. Lawrence Waterway as related to the Port of Duluth-Superior. The problem is significant for three reasons: first, the opening of the St. Lawrence Seaway has created a renewed interest in shipping; second, few people in the Midwest understand the economics of ship movement, and third, data on foreign ship movement at Duluth-Superior is not generally available.

The information for this paper was obtained from a study of original records in the Army Corps of Engineers office at Duluth, Minnesota.

**VESSELS ENTERING THE PORT OF DULUTH-SUPERIOR:** Two general methods might be used to study traffic: 1. a study of products received or shipped; 2. a study of vessels entering and leaving a harbor. Because the purpose of this paper is to understand ship movement the second method is used.

Table 1 provides a ten-year record of movement of vessels into the Duluth-Superior harbor. There are several significant characteristics of this movement into the harbor.

A characteristic which is difficult for many to understand is the predominance of vessels without cargo entering the harbor. In 1958 there were 1,837 vessels arriving light out of a total of 2,565 vessels which sailed to Duluth-Superior. In 1957 there were 3,251 out of a total of 4,300. Even in 1953, the year of heaviest traffic in the last ten years, 4,483 vessels entered light out of 5,698. This situation is possible only because the demand for iron ore is so great and the supply until 1959 has been largely in the Lake Superior region. Now that the St. Lawrence Seaway has been completed it will be interesting to observe the movement of iron ore carriers from Canada to Lake Erie as compared with the movement from Lake Superior. The questions will be whether the Canadian vessels will operate light on the return voyage, and whether they will have any effect on the practices of the vessels sailing to Duluth-Superior.

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Table I—NUMBER OF VESSELS PER YEAR ENTERING THE PORT OF DULUTH-SUPERIOR

PRODUCTS RECEIVED	1949	1950	1951	1952	1954	1953	1955	1956	1957	1958
Automobiles, only	231	296	289	193	292	170	254	168	239	109
Automobiles and Coal	2	45	15	24	27	4	7			
Automobiles and Steel							1			
Automobiles and Grain						2				
Cement							8	8	13	16
Coal and Limestone					3	4	5	6	2	3
Coal and Salt							1			
Coal, Limestone and Salt							3			
Coal or Coke, only	567	887	653	529	528	455	524	610	505	347
Gasoline and/or Oils	63	49	58	52	44	42	54	63	54	42
Grains	85	50	139	140	173	71	64		37	27
Grain Screenings	85	50	139	140	173	71	22	56	12	14
Grain Screenings &/or Grain								19	2	
Limestone or Clinkers							96	106	106	102
Limestone or Cement	98	117	115	96	100	100				
Limestone and Salt				1	3		1	3		
Manganese Ore						1		1	2	1
Passengers	22	10	11	9	11	11	11	10	14	10
Salt				8	6	11	17	13	17	15
Scrap Iron		18	13	8	8	25	8	7	3	4
Steel, except Scrap	17	18	13	8	8	25	31	24	35	29
Twine				1	1	1	1	1		
Woodpulp					3	2	4	5	2	3
Woodpulp and Machinery								1		
Iron Ore							1			
Paperpulp				2						
Miscellaneous	10	9	10	2						
No Cargo	3452	3140	4351	3769	4483	2512	3641	3170	3251	1837
TOTAL	4581	4648	5685	4920	5698	3424	4765	4282	4300	2565

A second characteristic of the movement of ships into the Duluth-Superior harbor is that those ships which have cargo carry principally bulk materials with the one exception of automobiles. Coal, limestone, gasoline and oil, grain and grain screenings, steel and scrap iron, cement and salt are among the major, bulk products which are shipped to the port. In 1958 there were 347 vessels with coal, 109 with automobiles, 102 with limestone, 42 with gasoline and oil, 41 with grain and screenings, 33 with steel and scrap iron, 16 with cement, and 15 with salt. Practically no package freight enters the harbor, and the dominance of bulk commodities extends over the entire ten-year period. One or two passenger vessels have made regular weekly visits during the last ten years. The lack of vessels carrying package freight can be charged partly to the fact that the sparse individual and business population in Minnesota may not have required this service and partly to the fact that the United States government withdrew the package freight vessels from the Great Lakes during World War II without replacing them.

VESSELS LEAVING THE PORT OF DULUTH-SUPERIOR: Iron ore vessels, of course, predominate in movement from the Port of Duluth-Superior (Table 2). In Superior these vessels use the Great Northern and

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Northern Pacific ore loading docks, and in Duluth they use the Duluth, Missabe and Iron Range Railroad docks. Channels of a minimum depth of 25 feet are maintained to these well-known docks, and the docks themselves are regarded as outstanding examples of low cost and rapidity of loading in water-borne commerce. In 1958 there were 1,835 iron ore vessels out of a total of 2,551 vessels leaving the port. Next in importance were 351 vessels carrying grain and/or flaxseed, and 79 vessels departing with crude oil and fuel oil. Almost as many ships departed with steel and scrap iron as entered the harbor. 31 ships entered with such a cargo and 27 departed with steel and scrap iron.

A surprising fact is that quite a number of vessels depart without cargo, and this is true each year. Some of this occurs at the end of the

Table II — NUMBER OF VESSELS PER YEAR LEAVING THE PORT OF DULUTH-SUPERIOR

PRODUCTS SHIPPED AT DULUTH-SUPERIOR	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Coal or Coke	5					1		27	19	2
Crude Oil			160	245	226	59	41	61	54	25
Fuel Oil							1		6	54
Grains and/or Flaxseed	529	378	529	371	344	433-	399	463	376	351
Iron Ore	3715	4022	4665	3889	4771	2692	4064	3375	3570	1835
Iron Ore and Steel						1	1	2		
Iron Ore and Grain										1
Machinery						1	3			
Merchandise					7	3	4	1		
Molasses				1	1	1	2	2	1	2
Passengers	22	10	11	9	11	11	11	10	14	10
Scrap Iron	21	18	24	22	27	18	36	45	32	17
Steel, except Scrap	15	5	6	4	10	2	11	3	13	10
Soybean Oil									1	4
Miscellaneous	3	5	4	3						
No Cargo	266	211	284	370	296	204	199	291	205	240
TOTAL SHIPMENTS	4576	4649	5683	4914	5693	3426	4772	4280	4291	2551
TOTAL	9157	9297	11368	9834	11391	6850	9555	8562	8591	5116
Opening and Closing Dates of Navigation Season	Mar 27	May 1	Apr 11	Apr 4	Mar 29	Apr 16	Apr 13	Apr 5	Apr 9	Apr 20
	Dec 13	Dec 10	Dec 10	Dec 10	Dec 10	Dec 14	Dec 12	Dec 17	Dec 15	Dec 11

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season, but there are quite a few vessels which leave without cargo each month during the entire season. During April, 1958 there were 8 such departures, 41 in May, 25 in June, 31 in July, 28 in August, 24 in September, 38 in October, and 41 in November. Altogether 240 vessels without cargo departed from Duluth-Superior as compared with a total of 2,551 vessels. In 1957 there were 205 without cargo out of a total of 4,291. Some of these vessels do get loads of iron ore or other products at other Lake Superior ports. Shipments from Duluth-Superior are primarily of a bulk nature, and the great quantity of iron ore shipped makes possible the claim that Duluth-Superior is the second largest port in the United States in total tonnage, New York being first.

Grain shipments have been of importance over a long period, and many expect that a number of foreign ships will visit Duluth-Superior to load grain for overseas shipment.

Crude oil and fuel oil shipped are largely the result of the arrival of the Canadian pipeline in Duluth and subsequently two refineries to process that crude oil. Now that the pipeline has been extended through the Straits of Mackinac and Michigan to Sarnia and Toronto, there is less likelihood of crude oil being shipped by water in the future. However, the extensive competition among refineries in Duluth-Superior and those on other Great Lakes is likely to lead to continued shipment of oil products in and out of the port.

**OVERSEAS VESSELS AT DULUTH-SUPERIOR:** Not everyone realizes that for many years vessels from Duluth-Superior have sailed through the Great Lakes and the 14 foot Canadian canals to overseas ports. These vessels have been very small, but they have provided a beginning for overseas trade. Somewhat larger vessels can in 1959 sail to Duluth, and in about two years all connecting channels will have been dredged to 27 feet.

In Table 3 the number and foreign registry of overseas vessels visiting Duluth-Superior is given. These vessels are entirely from northern Europe. The number visiting Duluth-Superior fluctuates widely. The largest number in nine years was in 1958 with a total of 14 ships.

Two of these vessels in 1958 brought woodpulp to the port and others arrived light. Twelve of them departed with loads of corn, flaxseed, barley, or wheat. The two which brought woodpulp departed light.

Table III — OVERSEAS SHIPS — PORT OF DULUTH-SUPERIOR

BY COUNTRY OF	1950	1951	1952	1953	1954	1955	1956	1957	1958
	GREAT BRITAIN							1	
DENMARK									3
HOLLAND				1	1				1
FINLAND								2	1
GERMANY					3	2	1		
NORWAY	1	3		5			2		7
SWEDEN	1	1	3	7		3	3		2
TOTAL	2	4	3	13	4	5	7	2	14

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In 1957 two Finnish vessels brought woodpulp and departed light. There were 5 overseas ships in 1956 which brought woodpulp, one brought machinery, and one arrived light. The one arriving light departed with dried milk and one ship which brought woodpulp departed with honey. In 1953, 1954, and 1955 overseas vessels either brought woodpulp or arrived light, and they departed with such products as dried milk, corn, flaxseed, peas, and linseed meal. Only in 1950 was the pattern varied by one shipment of refrigerators overseas.

The conclusion to be drawn is that overseas trade, particularly in small tramp vessels, follows no fixed pattern. When there is a cargo to be carried, ships can be found for the work, even though this may mean a one-way cargo.

An essential requirement is that there be a real economic need and a profit in trade before overseas water traffic will develop. The same principle applies in domestic water traffic. It is significant to notice, too, that one-way water traffic is possible both in overseas and domestic trade.

CONCLUSIONS: Duluth-Superior vessel traffic has the following characteristics:

1. It has fluctuated widely from year to year in total amount.
2. It has involved large quantities of bulk materials both in domestic and in foreign trade.
3. It has involved a great deal of one-way trade both in domestic and foreign trade, and because of this characteristic has created a certain economic loss in ship utilization.
4. It is not impossible to continue one-way trade activities over a long period of years.