

LAKE MICHIGAN PORTS: A CLASSIFICATION BY ITEMS OF TRAFFIC

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Because ports are transfer points between two methods of transportation, the materials which are handled by a port can be indicative of the activities of a port city and its hinterland. For example, the iron ore shipped from Escanaba reveals the great mining activities nearby. Also, the variety of items which flow through a port can indicate the value of the waterside position to the economy of the port city. That these statements are true would hardly be denied, yet literature is lacking in methods of indicating the functional value of a port to its port city and hinterland.¹ As a step in this direction, this paper presents quantitative criteria for the classification of ports by items of traffic, and a classification of Lake Michigan ports based on that method. It is hoped that later studies may expand this idea and a contribution to the methodology of geography will result.

METHOD

The criteria for classification are derived from a study of the port statistics published yearly by the War Department.² To facilitate comparisons, the data for the principal items

of traffic were reduced to percentages of the total traffic of the port and these percentages form the basis for the classification (table 1). Many of the ports can be classified easily on this basis, but borderline cases exist, especially among the larger ports which tend to have a greater variety of traffic than do smaller ports. However, large volume is no indication of great variety; the fifth largest port in volume of tonnage has 94 percent of its traffic confined to one item.

In reducing the principal items of traffic to percentages of the total traffic, items of like origin or related use such as sand, stone, and gravel, or gasoline and fuel oils created a problem. In order to classify a port in a category representative of its traffic, these items of like origin or related use have been combined and treated as one item. Another problem has been the variety of items carried on the cars in car ferries. In all instances, the variety has been wide, and as the car ferries are essentially extensions of rail lines and no indication of the destination of the cars can be obtained from the statistics, a category of car ferry ports has been established to obviate classifying ports as General ports when they are merely shipping and receiving points for loaded cars.

¹ Several authors have discussed the value of ports to cities and the relation of ports to hinterlands, but have not attempted to evaluate, by quantitative measurements, the classification of ports. See especially E. Van Cleef, *Trade Centers and Trade Routes*: D. Appleton-Century Co., Inc., New York, 1937, pp. 106-138; W. D. Jones and D. S. Whittlesey, *An Introduction to Economic Geography*: University of Chicago Press, Chicago, 1925, pp. 347-358; J. R. Smith and M. O. Phillips, *Industrial and Commercial Geography*: Henry Holt and Company, New York, 3rd ed., 1946, pp. 755-780.

² U. S. War Department, *Annual Report of the Chief of Engineers*: Government Printing Office, Washington, annual.

TABLE 1.—CRITERIA OF CLASSIFICATION

Specialty ports (S): Ports with more than 80 percent of traffic confined to one item, and no other item constituting 5 percent of the total traffic.

Subtype (r): Receiving port.

Subtype (s): Shipping port.

Combination ports (C): Ports at which not more than three items, each of which is at least 10 percent of the total, constitute 80 percent or more of the traffic.

General ports (G): Ports at which no three items constitute as much as 80 percent of the total traffic.

CLASSIFICATION

In the classification, three principal types of ports have been recognized and each type has been designated by a letter (table 1). The two subtypes are applicable only to the Specialty ports, indicating the port's function as a shipping or receiving port.

Specialty ports.—Specialty ports are the most numerous type, comprising 57 percent of the total ports on the lake (figure 1). In view of the different functions of shipping and receiving ports to the port city and hinterland, subtypes have been adopted according to whether a port receives or ships the specialty item. Car Ferry ports are excluded from the subtype classification because of the cross-haul nature of their traffic.

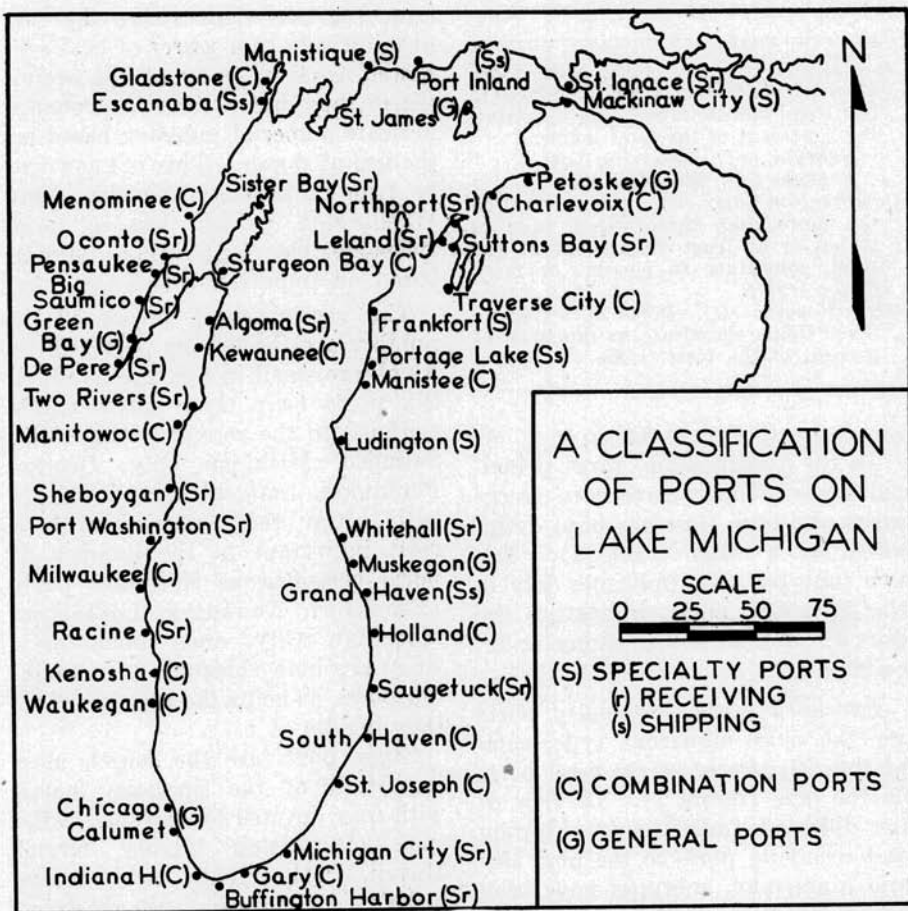
There are six different items of traffic which are handled by specialty ports. Coal, the item found most frequently in port statistics of Lake Michigan cities, accounts for classification of nine ports as Specialty Receiving ports (St. Ignace, Sister Bay, Two Rivers, Suttons Bay, Algoma, DePere, Port Washington, Racine and Sheboygan). Since the cost of trans-shipping coal inland

from the lake shore raises the cost prohibitively as a source of heat and power, further study of the activities of these port cities will probably indicate a special industry based on the use of power. This is known to be true in at least one city, Port Washington, which has a large steam-electric generating station based on imported coal.

The second most important in number are the fishing ports, all of which are small in tonnage handled. Six ports have their entire traffic confined to the receipt of fish (Big Saumico, Michigan City, Oconto, Pensaukee, Saugetuck, and Whitehall). Car ferry ports are third most important in the number of ports classified as Specialty ports (Frankfort, Kewaunee, Ludington, Mackinaw City, and Manistique). They are both shipping and receiving ports, as befits the type of traffic they handle.

Stone ports are the fourth most important of the Specialty ports, with four devoted to shipping of the item (Buffington Harbor, Grand Haven, Port Inland, and Portage Lake). Two fresh fruit receiving ports (Leland and Northport) and one iron ore shipping port (Escanaba) make up the remainder of the specialty classification.

Combination ports.—In Combination ports the items of traffic are diverse, and yet the variety of items shipped or received at any one port indicates a concentration either in a few types of activities at the port city or the relative unimportance of waterside location to the city in the shipping and receiving of its products. It was not found practical to use the sub-classifications of shipping



and receiving ports in this category because the items of traffic in some cases were both received and shipped.

Fuels ports, handling coal and petroleum products, are the most numerous of the Combination ports, with four examples (Charlevoix, Gladstone, Holland, and Traverse City) followed closely by coal and stone ports with three examples (Kenosha, South Haven, and Manistee). Only two other ports of this classification handle the same types of items—Menominee and Manito-

woc are both classified as car ferry, stone and coal ports. The other six ports classed as Combination ports are individual in the combination of items handled: iron ore, stone and coal (Gary); car ferry, coal, and petroleum products (Milwaukee); stone, coal, and petroleum products (St. Joseph); car ferry, stone, and petroleum products (Sturgeon Bay); iron ore, coal, and petroleum products (Indiana Harbor); and coal and steel billets (Waukegan).

General ports.—The five remain- ing ports on Lake Michigan for

which data are available are General ports (Chicago-Calumet, Green Bay, Petosky, St. James, and Muskegon). Each has a high percentage of its traffic confined to a few items, but a wide variety makes up the remainder of their traffic. Two of these ports (St. James and Petosky) are small in total tonnage handled, and it is felt that both of these would be in a more specialized classification if more detailed statistics on them were available. The other three ports are truly General ports, receiving and shipping a wide variety of goods.

DISTRIBUTION OF PORTS

The map of Lake Michigan ports shows that few ports are closer than ten miles apart and that there are few stretches of shore line of more than fifty miles without a port. Around the lake from St. Ignace to Mackinaw City the midpoint in the number of ports is reached between Chicago and Waukegan. The line dividing the ports on the northern half of the lake from those on the southern half crosses the lake from north of Kewaunee on the western shore to south of Portage Lake on the eastern side.

General ports are more or less evenly spaced around the lake. They are located at the head of Green Bay, the south end of Lake Michigan, in the middle and at the north end of the eastern shore, and on Beaver Island—situations, except for the last named, from which they serve a wide hinterland. The position of Milwaukee between the general ports of Chicago and Green Bay, with their overlapping hinterlands, helps to explain the puzzling lack of variety in its items of trade.

In contrast to the even distribution of the General ports is the concentration of the Specialty and Combination ports. Of the twenty-four ports which are located in the northern part of the lake, exactly two-thirds are Specialty ports. This is 9 percent more than the average for the lake as a whole. Among these northern Specialty ports are the two fruit ports, the iron ore port, four of the six fishing ports, five of the nine coal ports, two of the five car ferry ports, and one of the four stone ports.

Whereas the Specialty ports are concentrated on the northern part of the lake, a similar concentration of Combination ports is apparent in the southern part of the lake. Here are located two-thirds of the ports so classified. None of the ten Combination ports in the southern part of the lake has the same combination of items of trade, whereas three of the five ports classified in this category in the northern part of the lake are fuel ports—indicative, perhaps, of the broader economic base of the southern port cities or of larger hinterlands served by them.

CONCLUSIONS

The classification of ports on the basis of the number of items of trade into Specialty, Combination, and General ports presents a basis for the investigation and comparison of port cities and their hinterlands. It is not felt that this method should be an end product in itself, nor that the entire picture of a port's function can be obtained by this classification. However, the method recommends itself, by directing attention through the items of traffic, to activities of the port city or its hinterland.