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# **Staff Paper Series**

Staff Paper P94-19

August 1994

## **BARGE MOVEMENTS ON THE UPPER MISSISSIPPI RIVER: TRENDS AND PROJECTIONS 1963-2002**

by Jerry Fruin and Dan Halbach

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# **BARGE MOVEMENTS ON THE UPPER MISSISSIPPI RIVER: TRENDS AND PROJECTIONS 1963-2002**

by

Jerry Fruin and Dan Halbach

## **BACKGROUND**

The volume of commodities moved by barge on the upper Mississippi River had nearly 50 years of uninterrupted growth after the completion of the locks and dams and the nine foot channel system in the 1930s. This upward trend accelerated after towboats were switched from steam to diesel electric power in 1950s. Figure 1 shows the yearly total tonnage of barge shipments and receipts in the Twin Cities area for the 30 years from 1963-1992. Note, however, that volumes peaked in 1983 and 1984 and were followed by unprecedented declines in the late 80s. Annual movements in 1985 and later were sometimes less than 2/3 that of the peak.

This abrupt decline has raised a number of important questions about the future of commercial navigation on the Upper Mississippi River. Is the decline permanent or an aberration? Has commercial navigation in the region lost its competitiveness with other modes of transportation? If so, can the factors changing navigation competitiveness be identified? Have there been structural changes in the economy which reduce the need for the commodities commonly shipped by barge? If so, are these one time changes or long-term trends?

The remainder of this paper will review recent trends and identify contributing and/or confounding factors that should help answer these questions. A number of graphs accompany the text to illustrate trends. It should be pointed out that the left hand scale of volumes is not

Figure 1

## Twin Cities Waterborne Movement

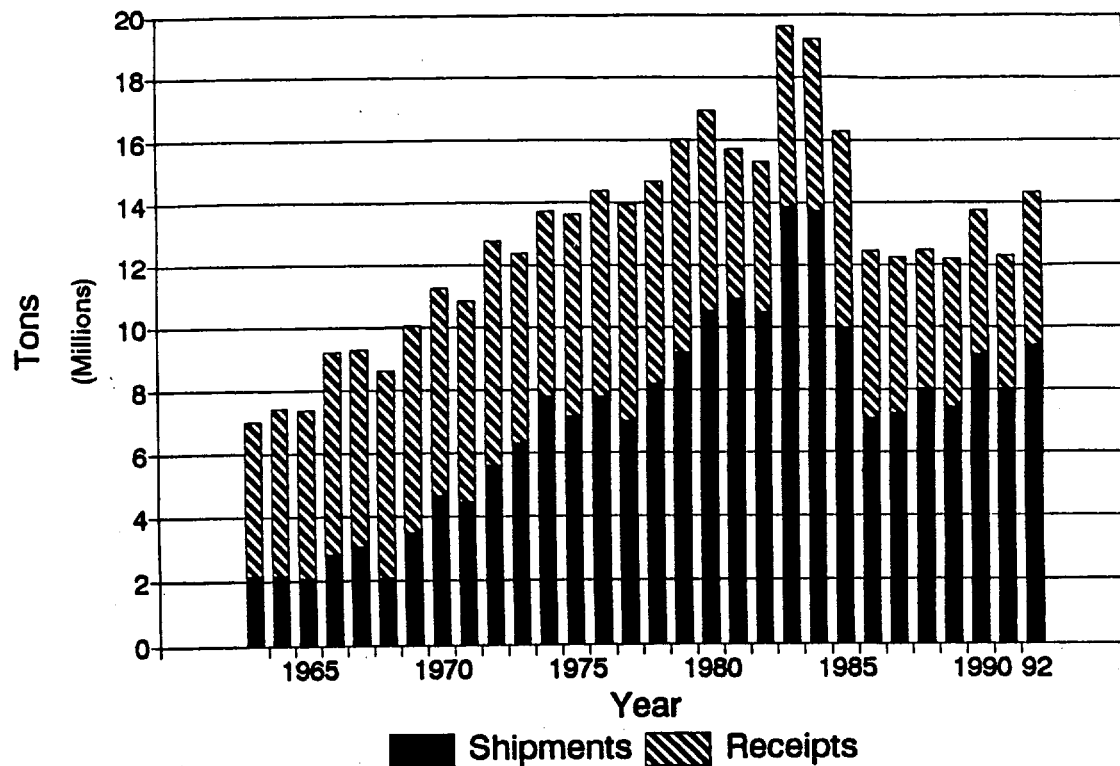
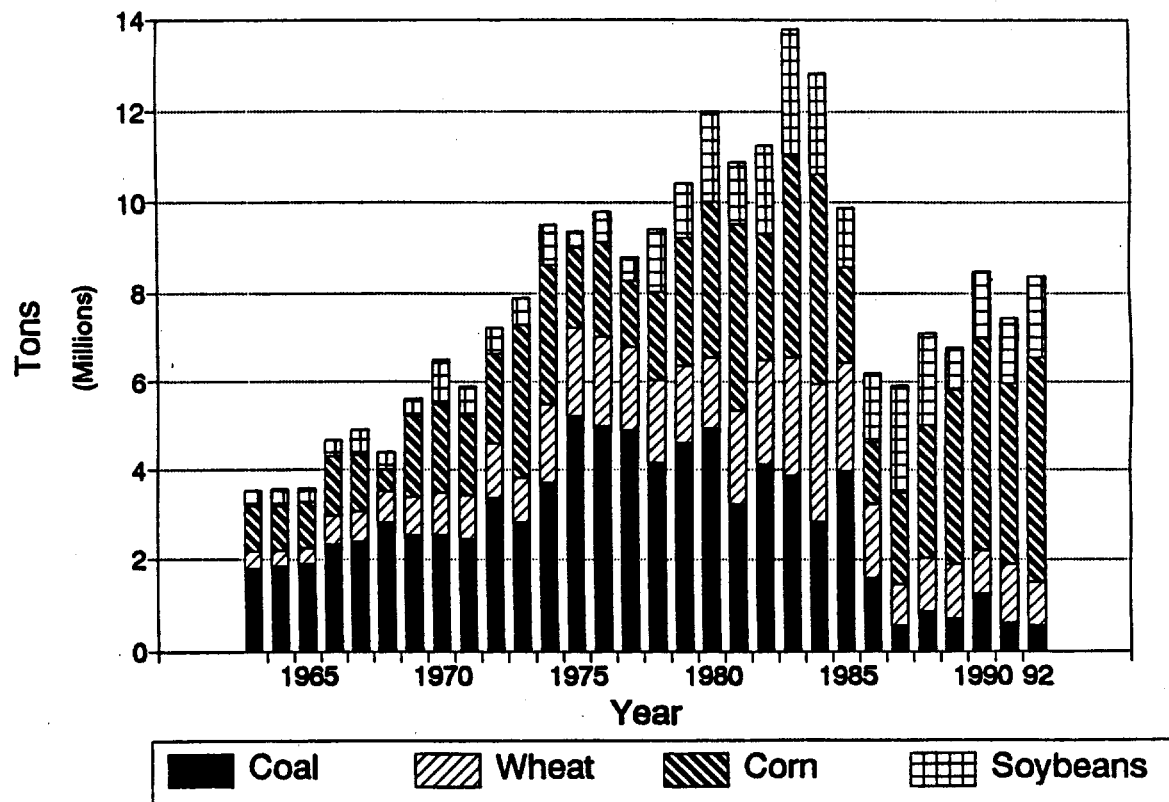


Figure 2

## Twin Cities Waterborne Movement



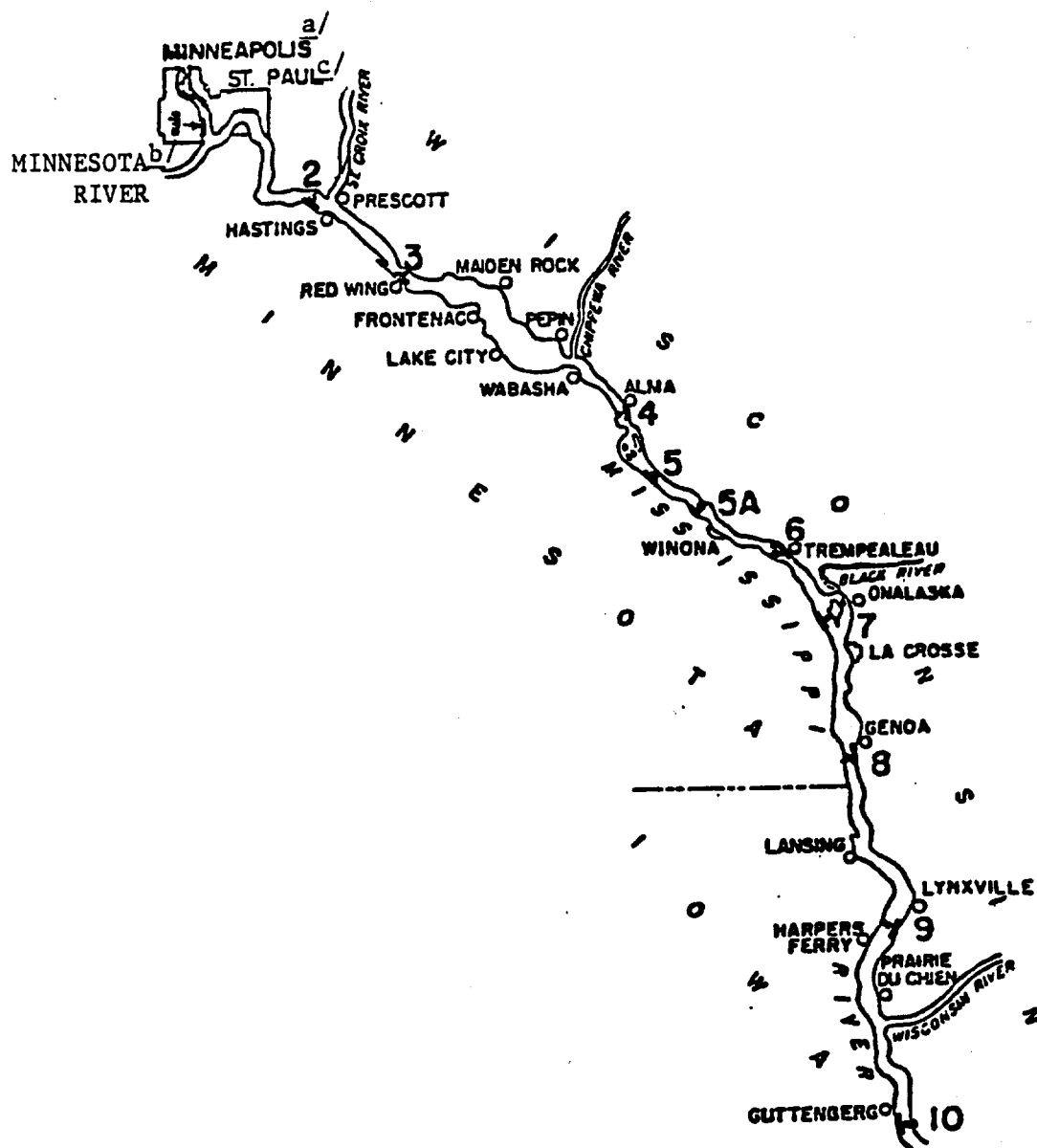
consistent between graphs. The reader should note the specific scale of each graph before making comparisons.

## DATA SOURCE

The barge tonnages in this report were obtained from *Waterborne Commerce of the United States (WCUS)*. Waterborne commerce is compiled and published annually by the U.S. Army Corps of Engineers (COE) from reports provided by barge operators. These reports to the COE are required by law and include the points of loading and unloading and identify the type and volume of commodity moved. The individual movements reports are confidential and are summarized in WCUS by river reach or port area. We have compiled a unique series of barge shipment and receipt volumes by commodity groupings that are important to Minnesota and the Twin Cities. The complete data set with further explanatory information is found in the Appendix to this report.

The waterway system in the Twin Cities area is divided into four parts or ports for reporting purposes. The port of Minneapolis includes the terminals above Lock and Dam 1 (The Ford Dam) to the head of navigation on the Mississippi, at mile 857.5. The Minnesota River includes the terminals on the Minnesota River from the NSP Blackdog plant to the Peavey terminal at mile 21.8. The Port of St. Paul includes the terminals on the Mississippi River above mile 830 and below Lock and Dam 1. The fourth port is the St. Croix River to the head of navigation near the NSP Allen S. King plant at mile 21.6 (Figure 3 ). It should be noted that with the exception of the St. Croix River, terminals below Mississippi River mile 830.0 are not included. This means that volume data from some terminals in Pool 2 and ports such as Red Wing and Winona are not included in this data series. Consequently, data on some commodities such as sand and gravel, fertilizers, chemicals, petroleum products, grain, and coal are

Figure 3. Locations of Locks and Pools in the U.S. Army Corps of Engineers' St. Paul District



a/ Minneapolis encompasses Lock and Dam 1 upstream to the head of navigation, including the Upper and Lower St. Anthony Falls locks.

b/ Minnesota River is defined as a separate pool.

c/ St. Paul includes the area from river mile 830 upstream to Lock and Dam



understated for Minnesota or the region. Some of the major understatements will be pointed out and discussed in the commodity movement sections.

## UNBALANCED GROWTH OF RECEIPTS AND SHIPMENTS

Figures 4 and 5 show Twin City area barge receipts and shipments from 1963-1992 separately. Note the different trends. Receipts were much more stable than shipments, gradually increasing to over 6 million tons in 1966 and being remarkably constant until after 1980. Total receipts then fell in 1981 to a level even lower than that of 1963. However, in Figure 1, this drop in the volume of receipts was masked by the continued increase in shipments through 1984. From 1987 through 1992 receipts have been relatively constant at about the same level as in 1963. On the other hand, shipments from Twin Cities ports fell dramatically from after the highs in 1983 and 1984 to a level that was still more than 3 times higher than that of the 1960s. Shipments declined abruptly to a 13 year low in 1986 but have generally been increasing since then.

The ratio of shipments to receipts of dry cargo is important in navigation economics because backhauls allow high utilization of equipment. Many of the costs of moving empties such as fuel and labor are nearly equal to those of moving cargo. This is especially important for dry cargo. Historically commodities such coal, fertilizer and salt were transported upstream to the Twin Cities and grain was transported downstream. These movements were much better balanced in the 60s and early 70s before the rapid expansion of U.S. grain exports. Currently there is a need to bring a substantial number of empty barges upstream for grain which is costly. However, this probably has little to do with the abrupt drop in volume after 1984 as the imbalance has existed for some time.

Figure 4

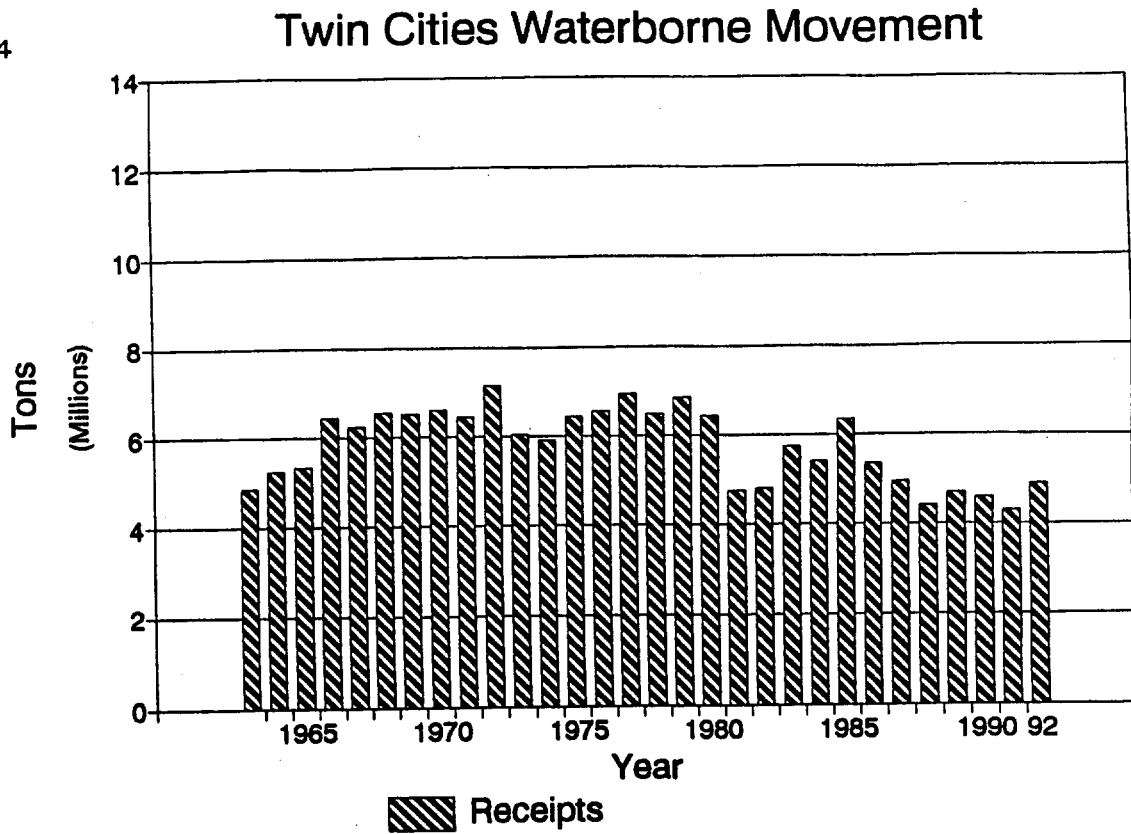
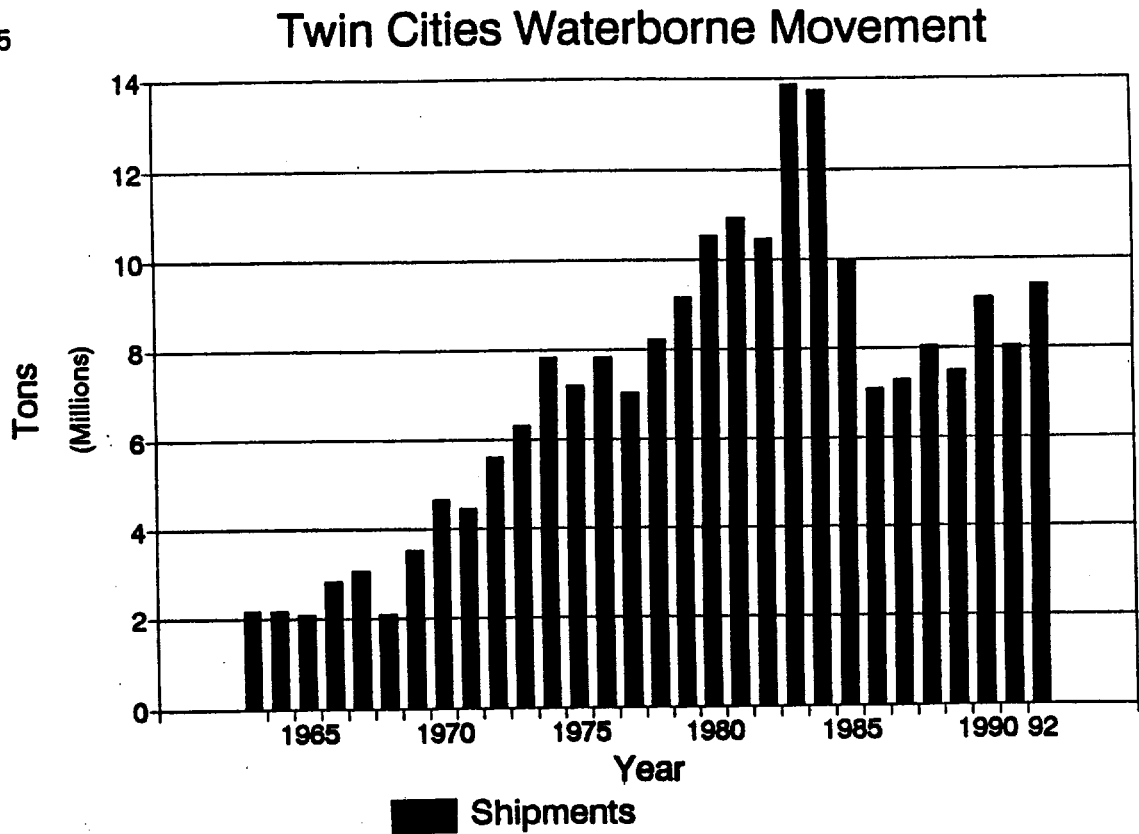


Figure 5



## MAJOR COMMODITY MOVEMENTS

Unlike some types of commerce, changes in barge movement volumes tend to be "lumpy." Because of the types of commodities and their uses, once a major commodity flow is committed to water, it tends to continue to move by water, year after year. However, once the flow stops, it probably will not be restarted. For example, a power plant or refinery located on the river will use water transportation and will require approximately the same amount of coal or crude oil year after year until expanded or retired. At that time the volume of barge traffic to that location would permanently change.

Rather than just analyzing total volumes to determine trends, it is necessary to look at individual commodities and their origins and destinations. Figure 2 shows the movements of the four commodities (coal, corn, wheat and soybean) that had the largest volumes from 1963-1992. If we compare figures 1 and 2, it is apparent that the two graphs are quite similar. That is, if we can explain the volume changes in these commodities we can explain most of the changes in area barge volume.

### Coal

Coal movement increased from less than 2 million tons in 1963 (when it was the most important commodity accounting for over 25% of total shipments and receipts) to over 5 million tons in 1975 when it accounted for over 38% of total Twin Cities barge movements (Figure 6). However, from 1987-1992 coal has averaged well under one million tons a year and in 1992 accounted for less than 4% of total volume.

Is this drop permanent and/or evidence of a structural change in our economy? Most definitely! The coal receipts in the 1960s were primarily shipments of relatively high sulfur coal from southern Illinois to local power plants. Due to environmental concerns over sulfur emissions and the increasing costs of southern Illinois coal, Northern States Power began to

Figure 6

## TC Waterborne Coal Movement

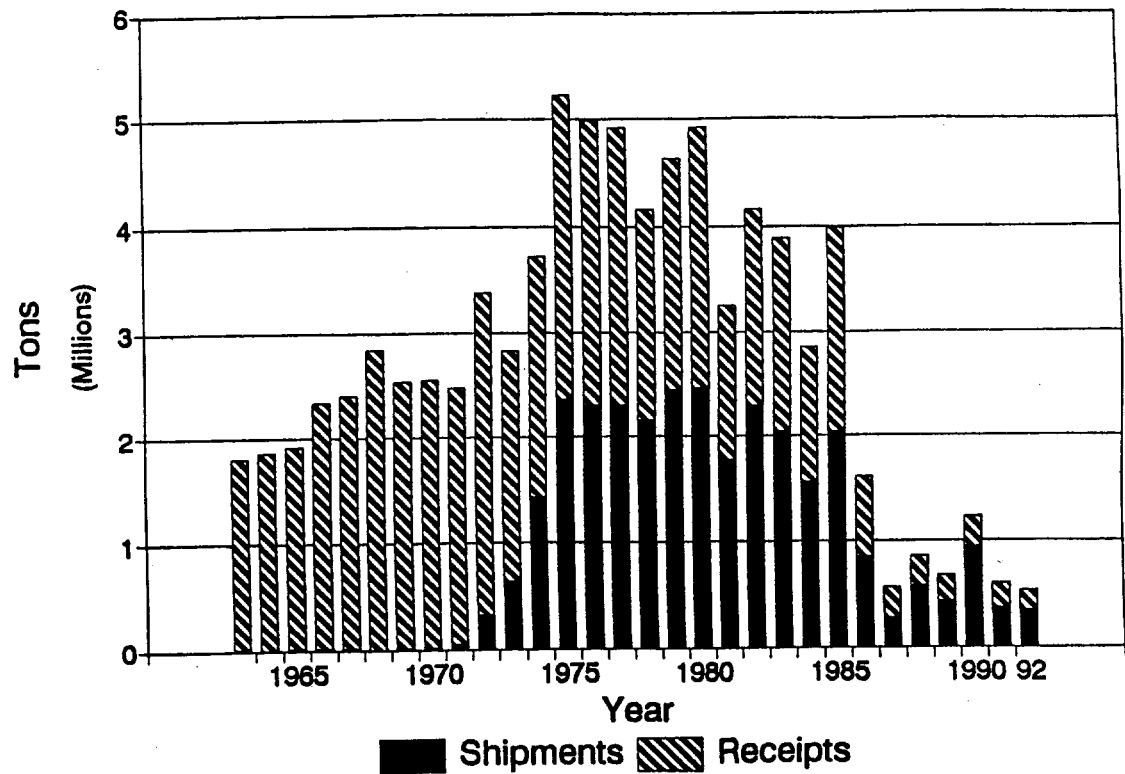
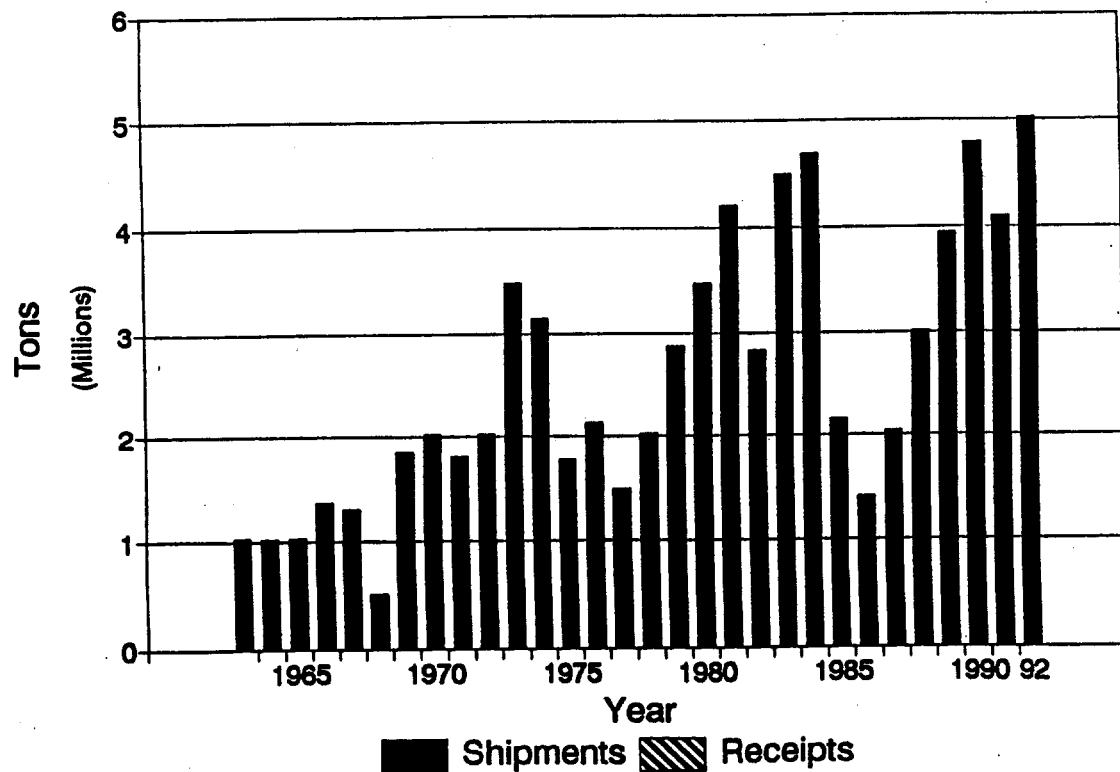


Figure 7

## TC Waterborne Corn Movement



switch the fuel in their 4 Twin Cities River generating plants to western coal. Originally, the western coal came by unit train to the Twin Cities and was transferred to barges for the final delivery to power plants that could not unload unit trains. These shipments first show up on Figure 6 in 1972 and increase through 1975 when the shift to western coal was completed.

Note that the local movement of western coal from 1975 on, is included both as a receipt in the Twin Cities area and also as a shipment. For a number of years coal receipts and shipments averaged between 4 and 5 million tons a year which means about 2.5 million tons of coal was a local move. From a practical standpoint, water transportation of coal remained very important, but because of local logistics (to get access to the plants) the long haul transportation from the mines was done by rail.

The drop in coal traffic after 1985 is due to the completion of unit train handling equipment at all the Twin Cities NSP plants so that the western coal is generally not transhipped locally by barge. The coal that has been shipped by barge in recent years is western coal for a down river power plant that does not have adequate unit train handling facilities. Twin Cities receipts are of types of eastern coal that meet specific requirements of users.

Consequently, the apparent decline of 3 to 4 million tons of coal traffic is permanent. Future volumes will resemble the last few years and volumes will not return to their pre-1985 levels.

The shift from eastern to western coal also explains the growth and decline of volume of the St. Croix River (Figure 21). Receipts increased from virtually nil to over one million tons per year when NSP's King plant at Stillwater became operational. Receipts and total volume on the St. Croix fell to nearly zero after the King plant started to receive its western coal by rail.

## Corn, Wheat and Soybeans

Figures 7, 8, and 9 show corn, wheat, and soybean volumes. The volume of corn increased (quite sporadically) to an all time high in 1992. The decline in the late 70s was due to the corn supply reduction after a severe drought. The causes of the decline in the 80s were more complex but corresponded to a decline in U.S. corn exports.

The volume of wheat shipments had an all time peak in 1984 before the drop in U.S. farm exports, but volumes did not recover through the 1990s. Wheat volumes have been relatively constant at one million tons a year, only about one-third that of 1984. Soybean shipments have not recovered to all time highs but resemble corn more than wheat.

Why the different trend patterns for wheat than for corn and soybeans? Has there been a permanent change? Yes. The diverging trends are the result of rail deregulation and associated adjustments in the rail industry structure and rate making.

The underlying situation for these three commodities is more complex than for coal. Virtually all of the grain shipped by barge from Minnesota is exported. Our export markets have been shifting westward to the Pacific Rim countries from the Atlantic. However, the shares of exports from Gulf ports served by the Mississippi River and the Pacific Northwest ports served by rail were relatively constant during 1982-1992.<sup>1</sup>

Much of the wheat that previously was shipped by barge came from the Dakotas and Montana. Our study of the *1992 ICC Public Use Waybill Sample* was done to estimate the average 1992 rates for multiple car trains of wheat from Minot, North Dakota to key destination points. The rail rate from Minot to the Twin Cities was 73¢ per bushel. The rail rate from the Twin Cities to the Gulf was 24¢ for a total of 97¢. (The direct rail rate from Minot to the Gulf

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<sup>1</sup>USDA, *Grain Market News*, various issues.

Figure 8

## TC Waterborne Wheat Movement

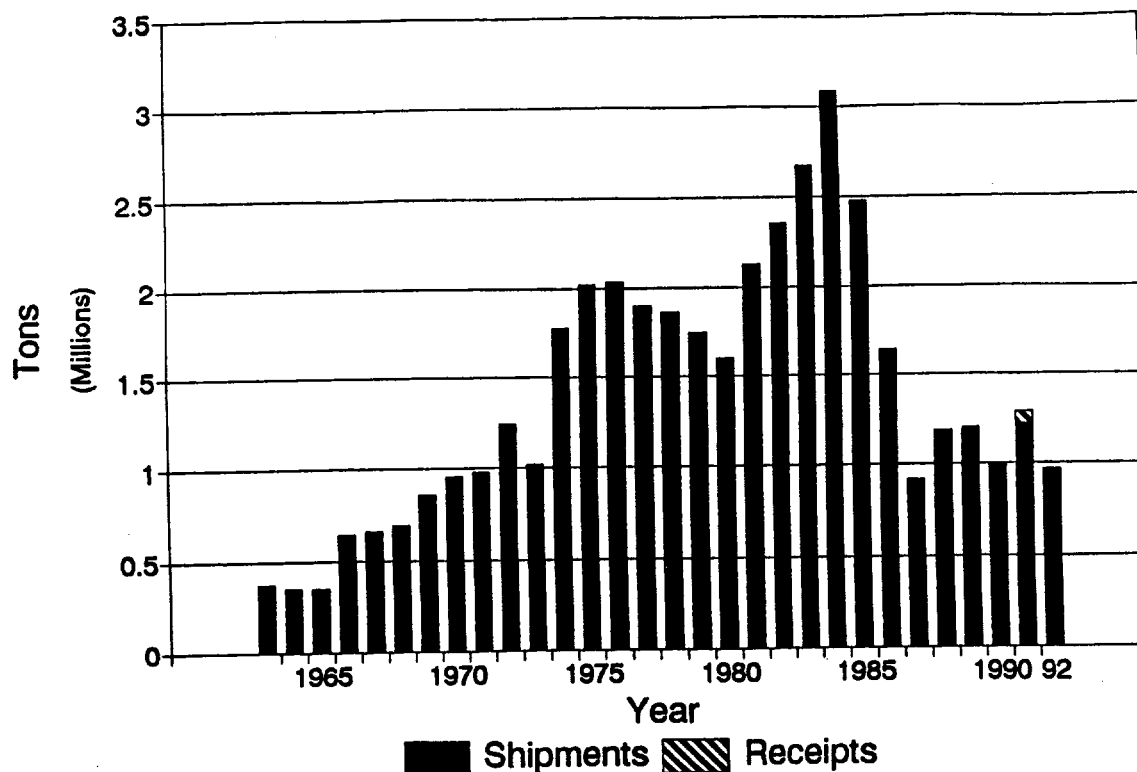
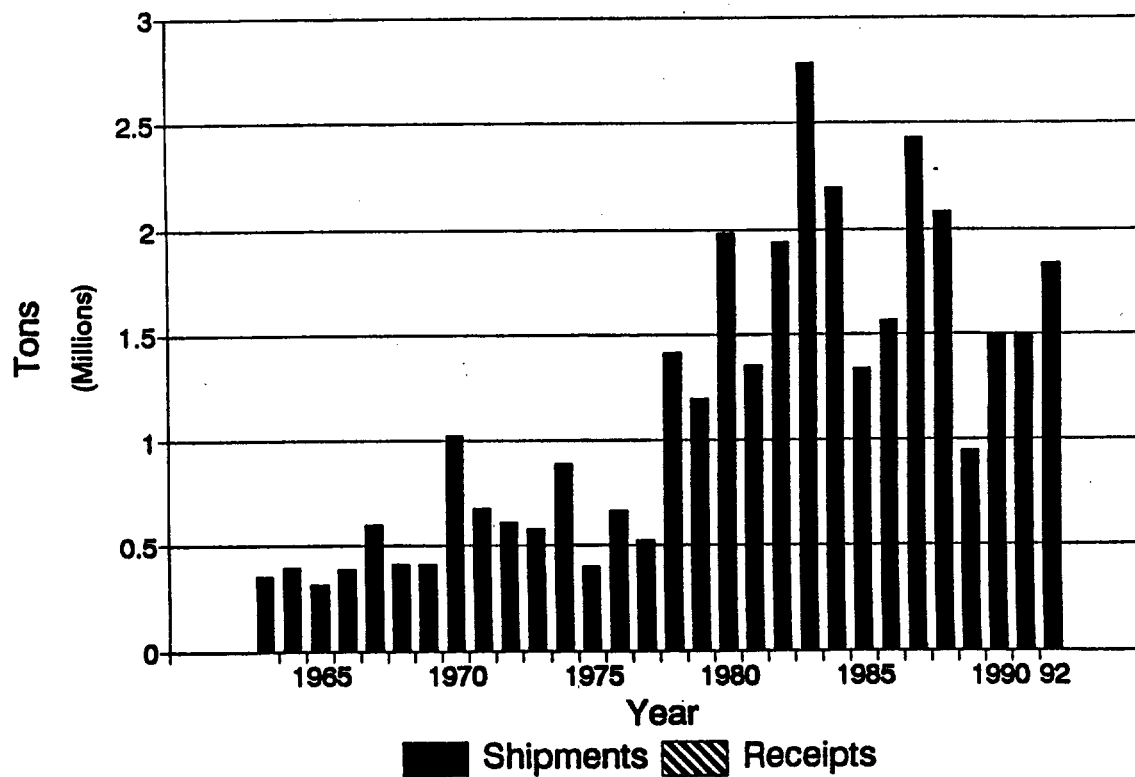


Figure 9

## TC Waterborne Soybean Movement



was approximately the same.) Although highly variable, barge rates are seldom as low as 24¢ a bushel. Thirty cents a bushel is more typical. Consequently, once wheat from North Dakota is in a rail car on a railroad with connections to the Gulf, it would have been uneconomical for the shipper to transfer the wheat to a barge at the Twin Cities under the 1992 rail rate structure. The rail rate for the second (and longer leg) is lower than the barge rate. There would be a cost of several cents per bushel to transfer wheat from rail to barge. Much of the export wheat from the North Dakota and Montana that went by barge in the early 80s is now captive to the railroads. The wheat now being barged is wheat that is near enough to the Twin Cities to be trucked to river elevators.

Most of the corn (and beans) that are barged on the river are within trucking distance of the river. In addition, newly created short line railroads that don't go to the Gulf traverse the corn growing areas of southern Minnesota and South Dakota and have truck competitive rates to the river. Under the current regulatory environment, we can expect to see corn and soybean barge volumes respond primarily to area production and world demand while the more distant wheat will remain rail dependent.

## **OTHER COMMODITIES**

### **Fertilizer**

Fertilizer receipts have shown consistent growth interrupted only by the farm recession and farm program variations (Figure 10). Phosphate and nitrogen fertilizers are manufactured near the lower river and are ideally suited for barging. They provide an excellent backhaul for grain barges. We can expect fertilizer receipts to grow with variations depending on the state of the farm economy.



Figure 10

## TC Waterborne Fertilizer Movement

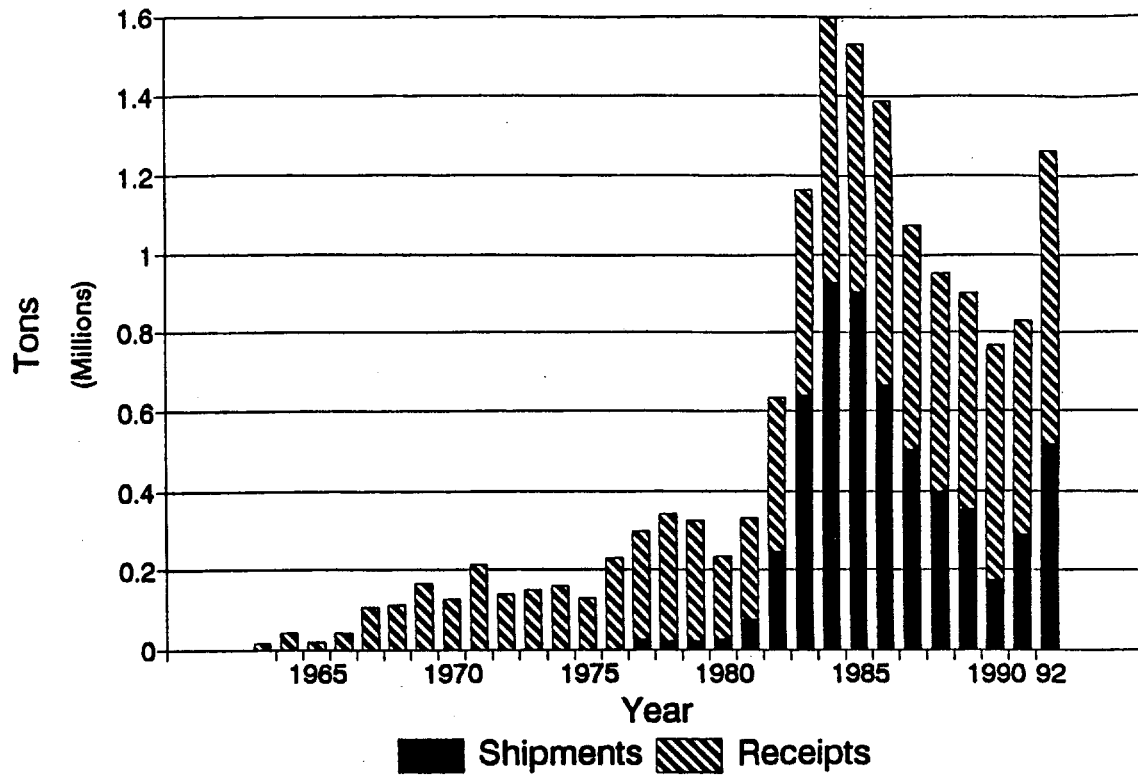
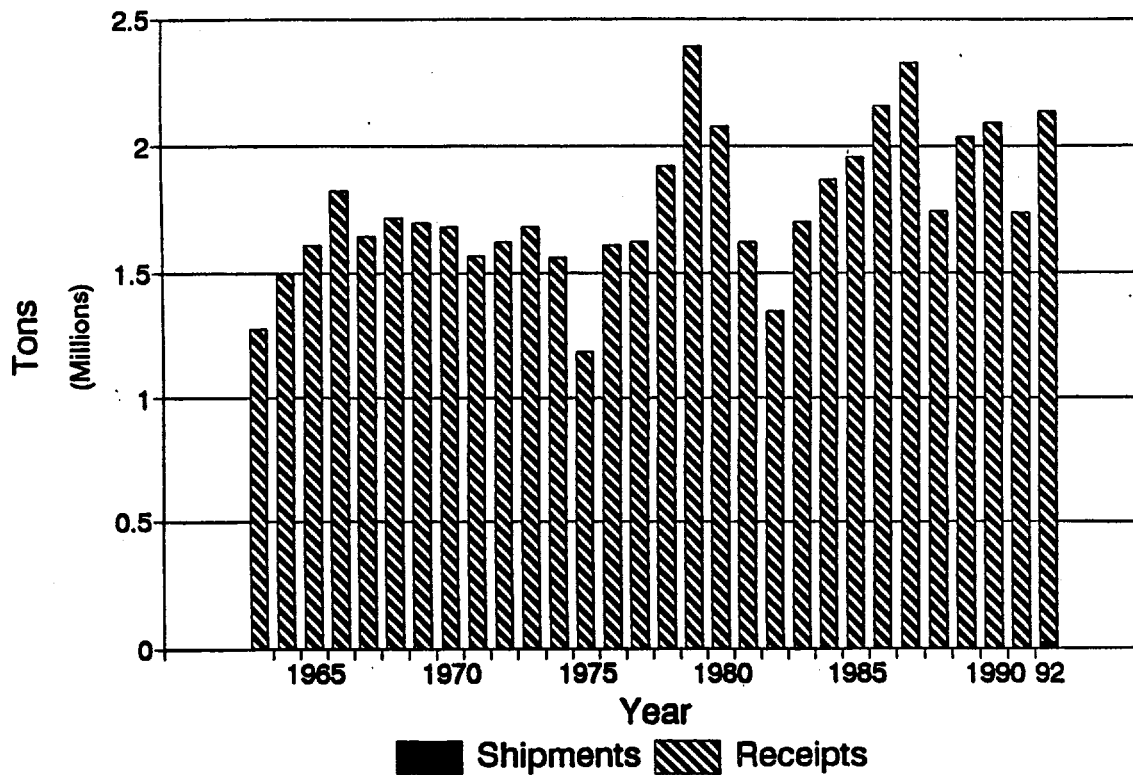


Figure 11

## TC Waterborne Sand Gravel Rock Movement



Fertilizer shipments grew rapidly from 1980-85 and then dropped precipitously. Fertilizer shipments consist almost exclusively of Canadian potash. Canadian mines supply over 80% of U.S. requirements. The increase in barge shipments occurred as the use of Canadian potash expanded throughout the Midwest. The river was used to provide low cost transportation. However, after 1985 the rail rate structure and rail interline arrangements were adjusted so that much of the potash was shipped directly to distributors by rail and the transfer to barge in the Twin Cities declined. Existing institutions may also allow rail shippers to capture "phantom freight" that would not be available if barges were used. That is, the mining companies can price and ship FOB destination and bill their customers for freight at the single car tariff rate while paying at a unit train contract rate. Consequently, the future level of potash shipments is almost completely dependent on the rail rate structure and industry pricing practices.

### **Sand, Gravel, Rock**

Figure 11 shows the annual receipts of sand, gravel and rock in the Twin Cities area. This is a local move from the Shiely gravel facilities at Grey Cloud Island at mile 826.6 to terminals in St. Paul and Minneapolis. Although a local move, only receipts are reported in WCUS because the shipments originate in Pool 2 below mile 830. This low cost movement is a very important factor in Twin Cities construction. Sand and gravel can be delivered to within a few miles of either downtown and avoid the cost of trucking a much longer distance through city congestion. It appears that this movement will continue until the sand and gravel supply at Grey Cloud Island is exhausted.

Figure 12

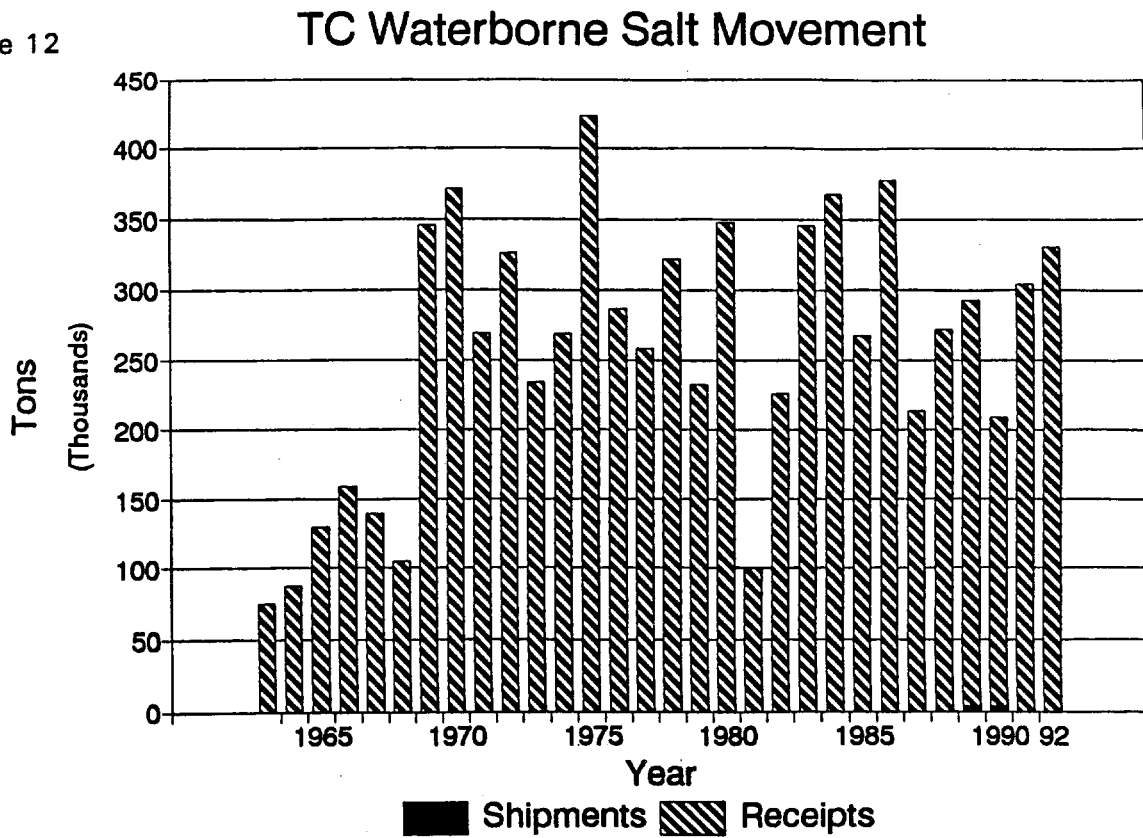
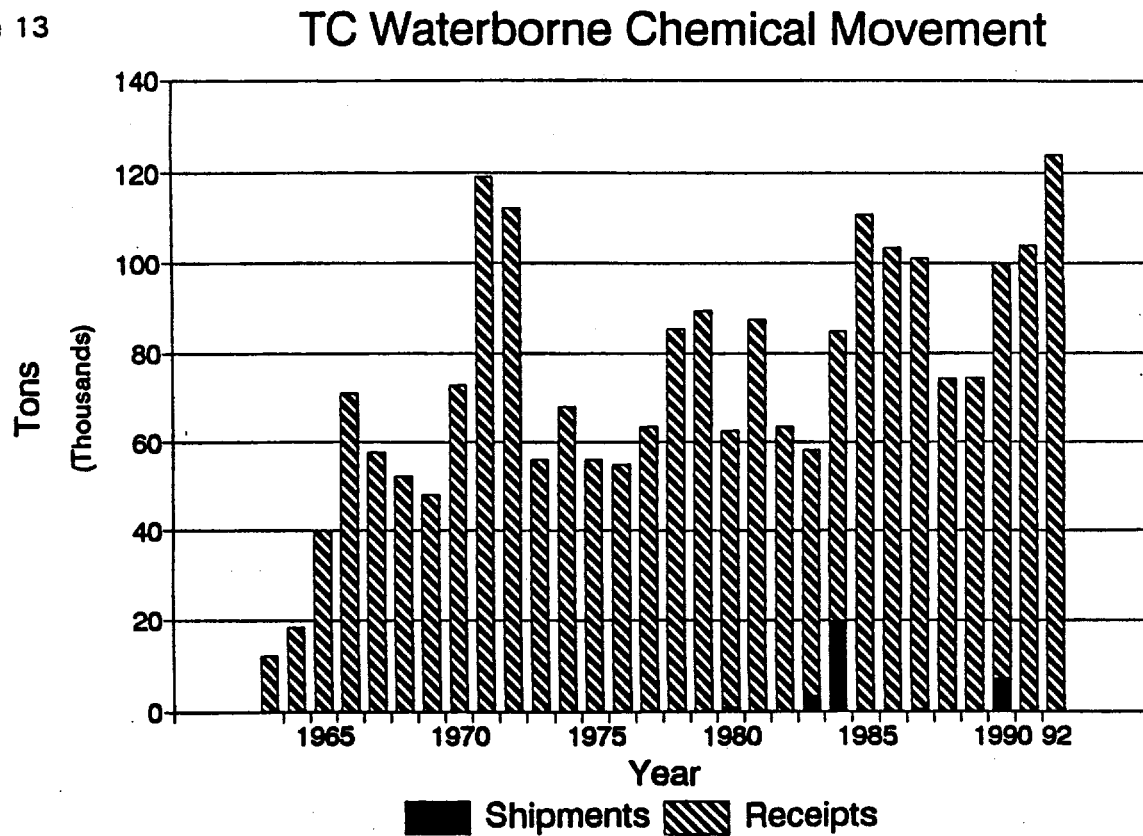


Figure 13



## **Salt**

Figure 12 shows salt receipts in the Twin Cities region. This product is used on roads and for industrial purposes. Volumes have been relatively consistent. This is a small but important backhaul for grain barges.

## **Chemicals**

Figure 13 shows the volume of bulk chemicals. It is one of the smallest categories in terms of volume but one of the highest value categories. Volume has essentially doubled since the first oil crisis in the 1970s. Quantities of chemicals are also received below mile 830 and not reported in WCUS.

## **Crude Petroleum and Petroleum Products**

Figures 14 and 15 graph the volumes of crude petroleum and petroleum products, respectively. Crude petroleum is graphed separately here to illustrate the "lumpiness" of barge transportation. This movement occurred after the first oil shock when Canada sharply reduced exports of crude oil. Minnesota had received substantial quantities of crude by pipeline from Canada. Cut off from Canadian supplies, Minnesota refineries had to obtain oil from the south immediately and turned to the river. However, it is most cost effective to transport crude petroleum in properly sized pipelines. The pipelines from the south were soon expanded and shipments since 1978 have been minimal. (Crude petroleum is included with all other in the Appendix tables.)

Petroleum product volumes are shown in Figure 15. Much of this represents local moves. The importance of barge movements of petroleum product is understated because the Koch refinery is below river mile 830 and consequently its activities are not reported in WCUS.

Figure 14

## TC Waterborne Crude Petrol Movement

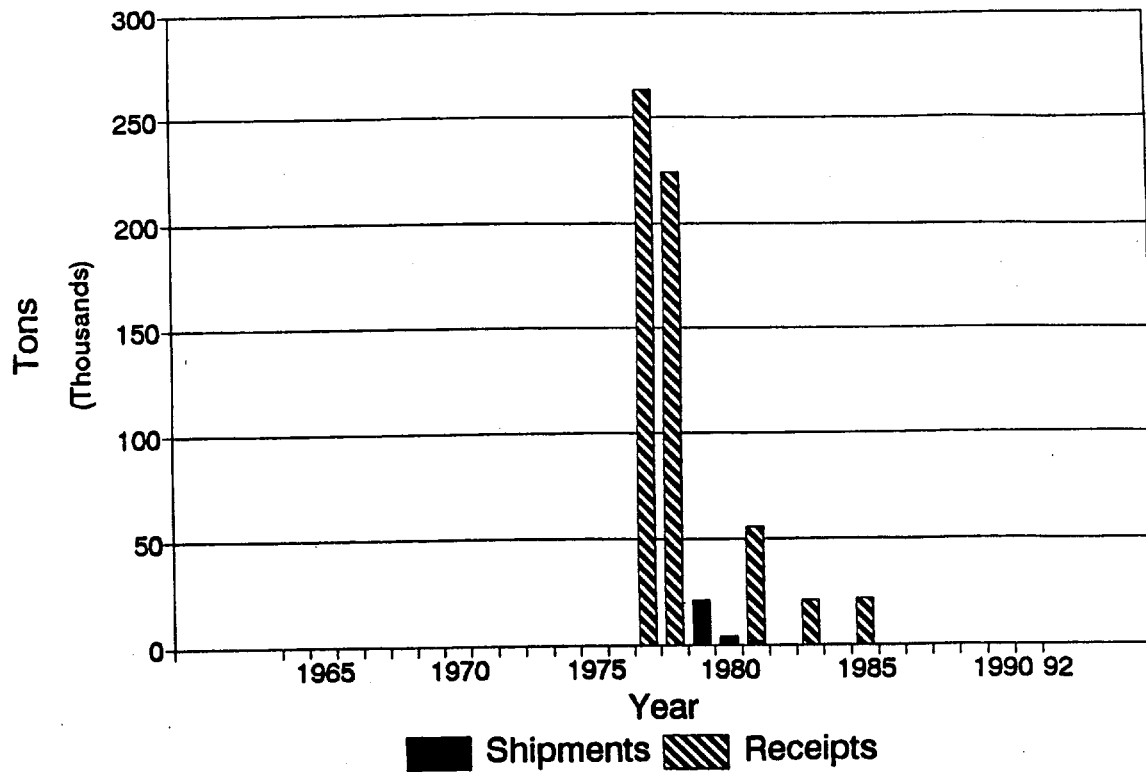
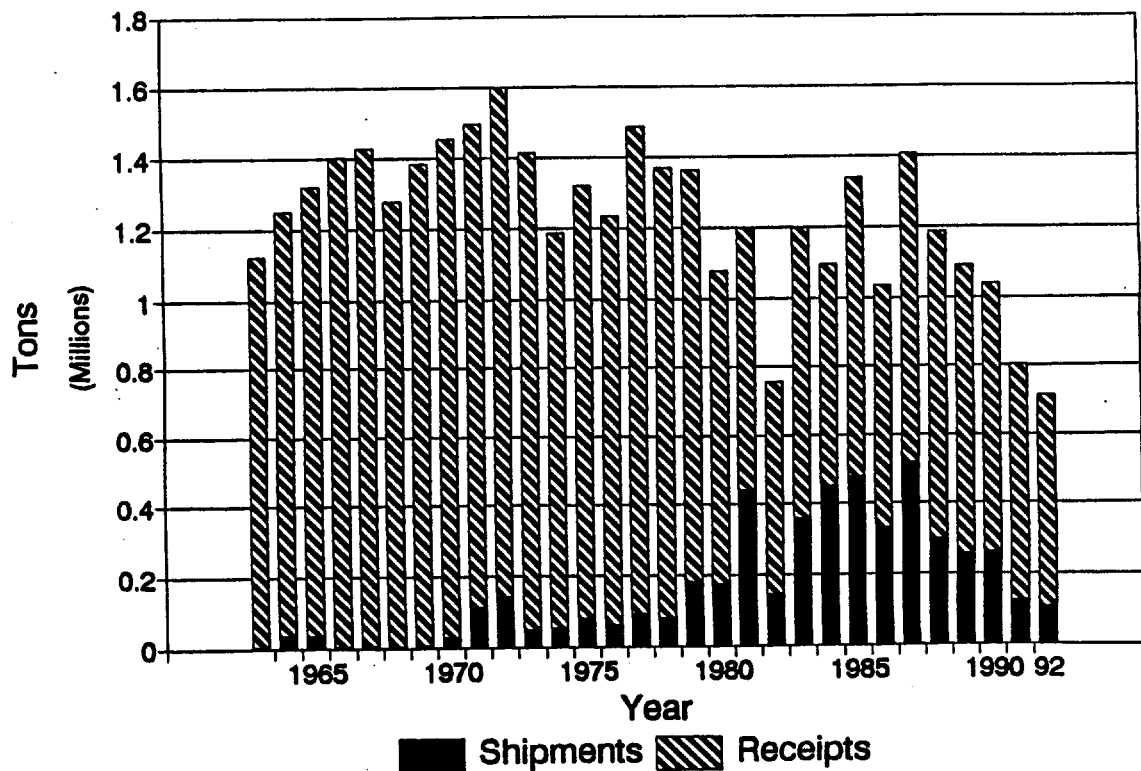


Figure 15

## TC Waterborne Petrol Prod Movement



## Farm Crops NEC and Other Ag Products

Farm Crops, not categorized elsewhere, and Other Ag Products are in Figures 16 and 17. The Appendix lists the commodities included in these categories. The surge in farm crops in the early seventies was primarily oats. Recent receipts have been oats and rice.

Other Ag Products include both animal feeds and food products. The decline after 1988 corresponds with the closing of a soybean crushing facility.

## Cement

Cement (Figure 18) is an example of a commodity that has shown a sharp increase in water transportation. This is due to national and international trends toward restructuring and consolidation in the cement industry.

## PORT GRAPHS

Figures 20-23 show the volume histories of each of the four port areas. Figure 20 shows that the Minnesota River volume (which is primarily grains) has increased since the agricultural recession of the mid-80's. (The dip in 1978-79 is apparently due to misreporting with part of the Minnesota River volumes being included in St. Paul.)

The influence of coal on the St Croix River volume (Figure 21) has been discussed in the Commodity section.

Minneapolis exhibited peak volumes in 1975 and 1976 due to shipments of western coal to local power plants. The last year of coal shipments through the Port of Minneapolis was 1980. Volumes have been relatively constant since then but were down in 1990 and 1991.

Figure 16

## TC Waterborne Farm Crops NEC Movement

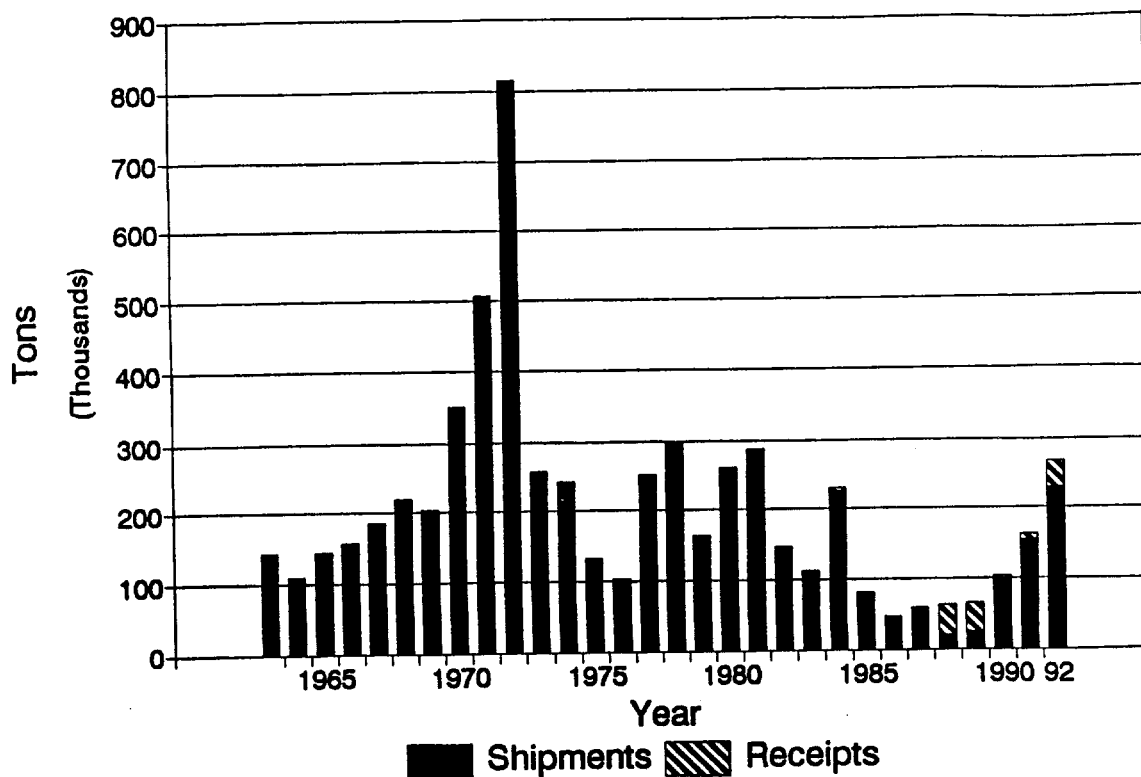


Figure 17

## TC Waterborne Other Ag Prod Movement

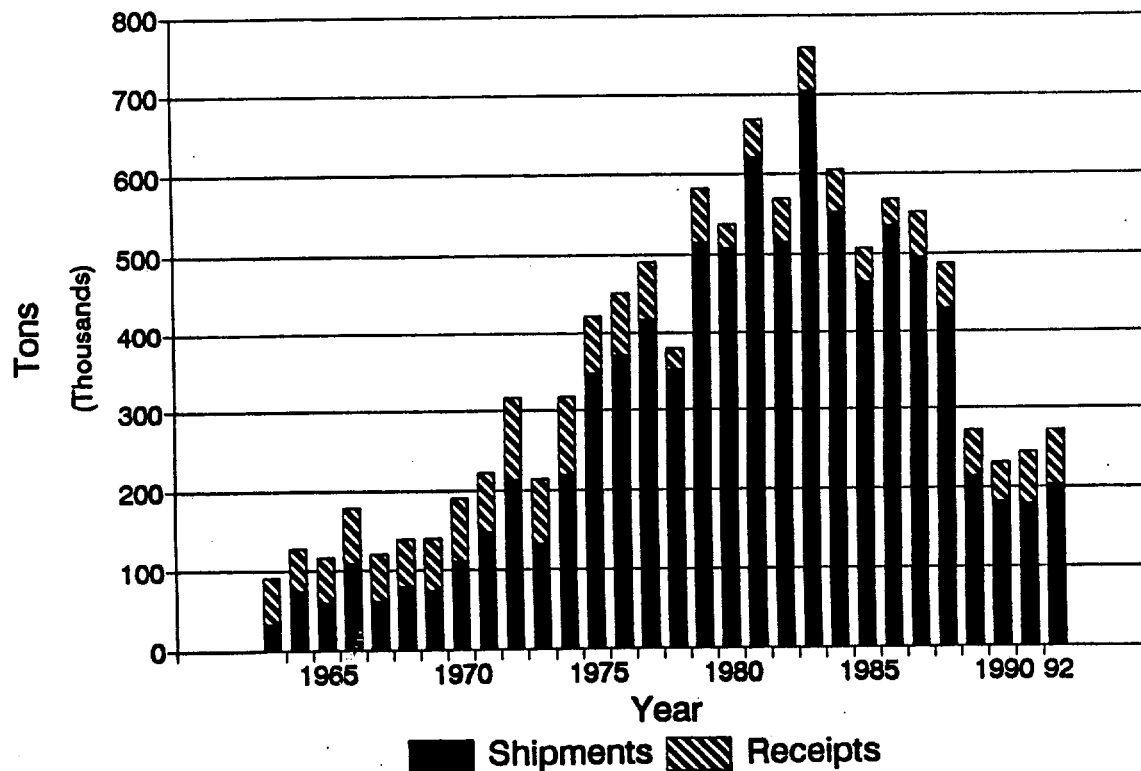


Figure 18

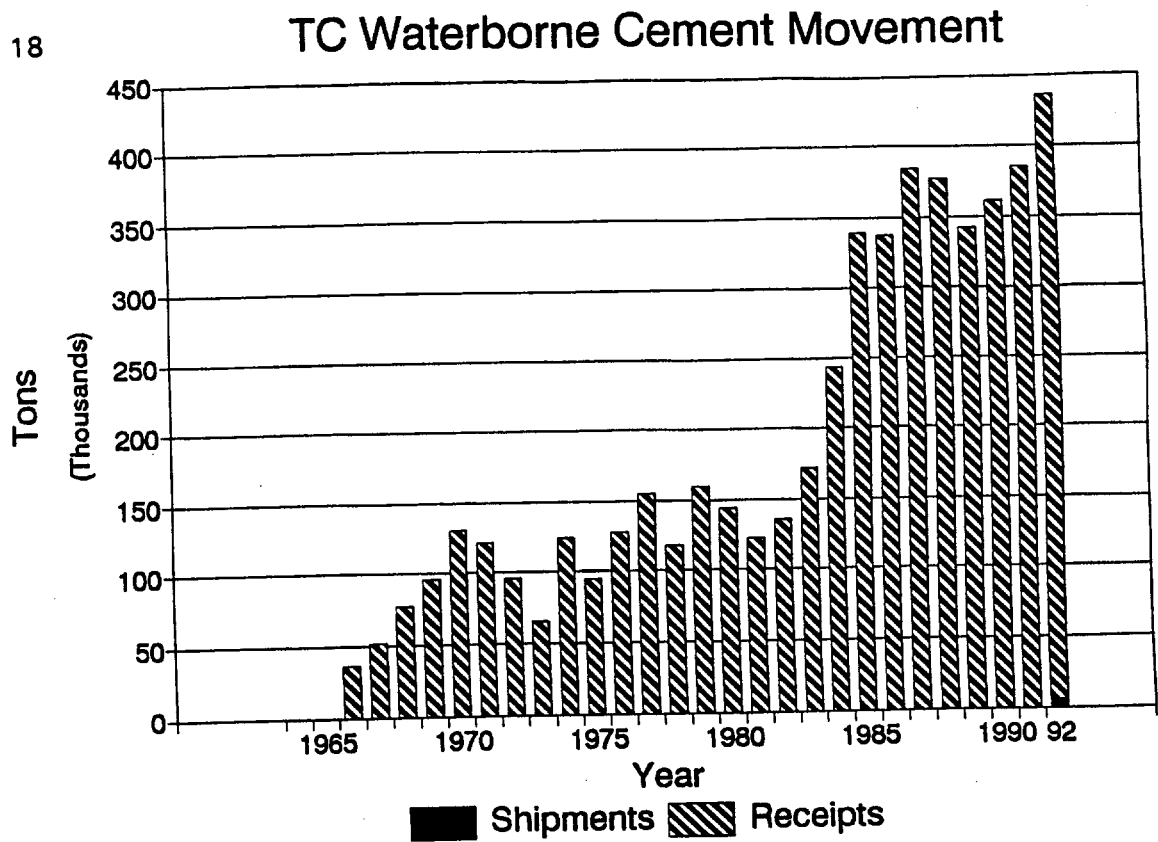
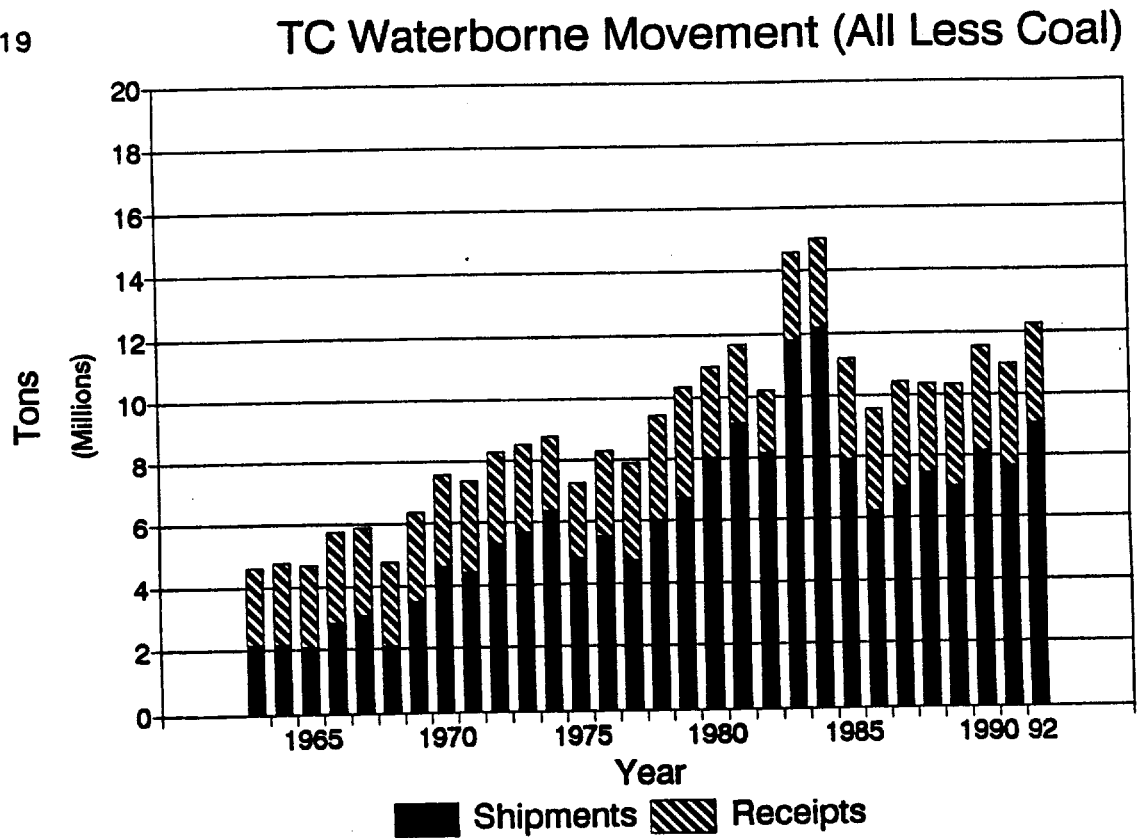


Figure 19





## CONCLUSION

Permanent reductions have occurred in the quantities of specific commodities moved to and from the Twin Cities area on the Upper Mississippi River. These are due both to changes in the source of supply (coal) and to increased competition from railroads after deregulation (wheat). However, other commodities have shown continued growth and reached all time highs in the 90s (corn, cement, chemicals and fertilizer receipts). In fact, ton-miles (as opposed to tons) and the volume of long-distance shipments of Twin Cities waterborne movements appear to have reached an all time high in 1992. Note that if coal is not included (Figure 19), 1992 had the third highest barge tonnage ever. Only volumes in the peak grain shipment years of 1983 and 1984 following the drought in the eastern corn belt were higher.

Rail deregulation and other changes in the economy have had little effect on the competitiveness of the barge industry for the movement of bulk commodities. Commercial navigation on the Mississippi River remains very important to the economy of Minnesota and will remain so for the foreseeable future.

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U.S. Department of the Army Corps of Engineers, New Orleans District, *Waterborne Commerce of the United States, Part 2*. New Orleans, LA. Years 1977-1992.

Figure 20

## Minnesota River Waterborne Movement

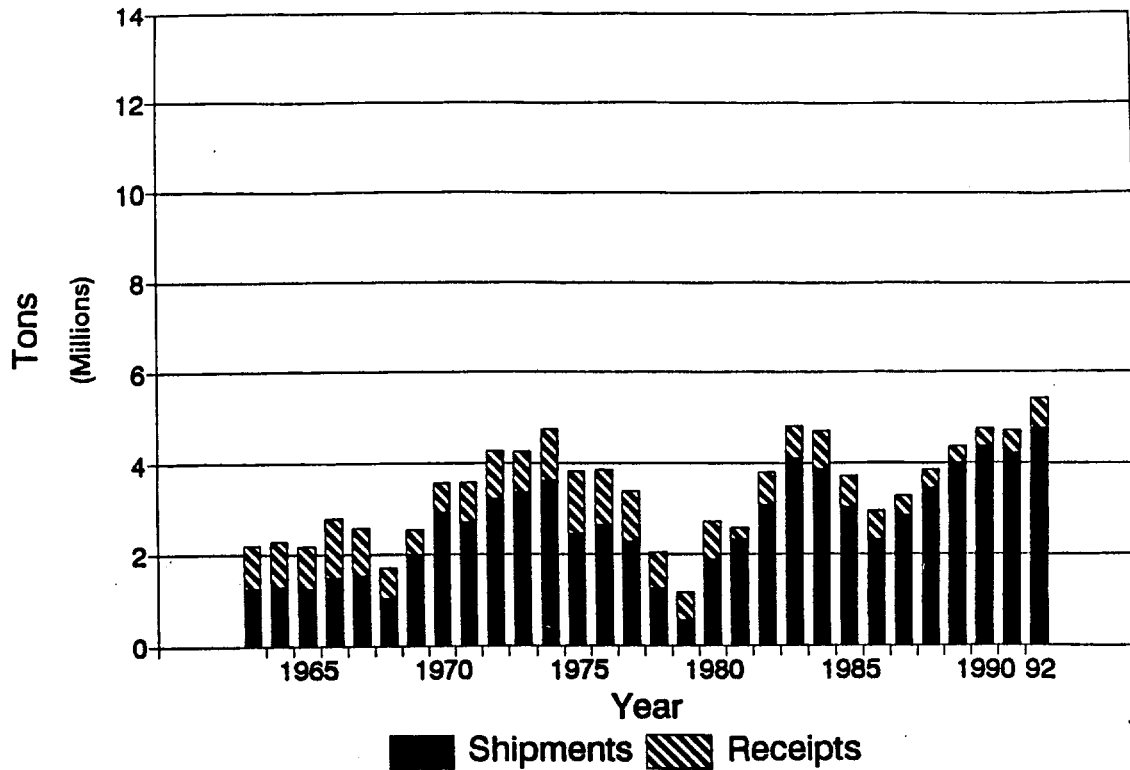


Figure 21

## St. Croix River Waterborne Movement

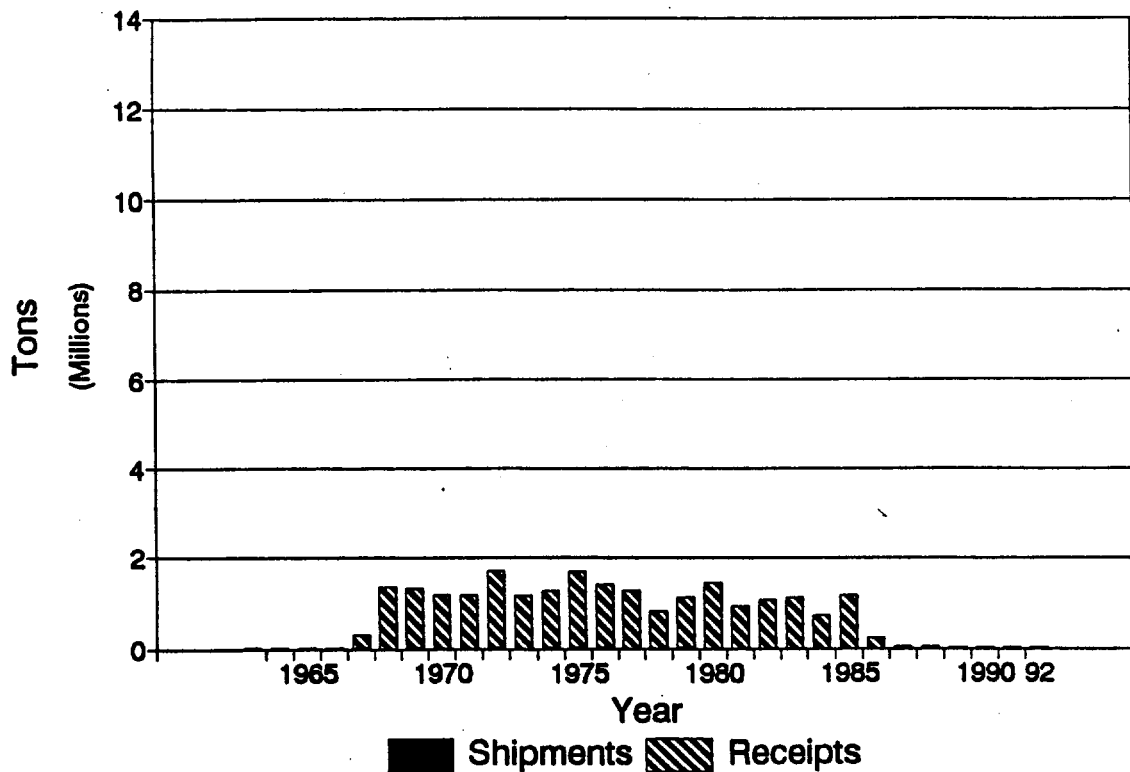


Figure 22

## Minneapolis Waterborne Movement

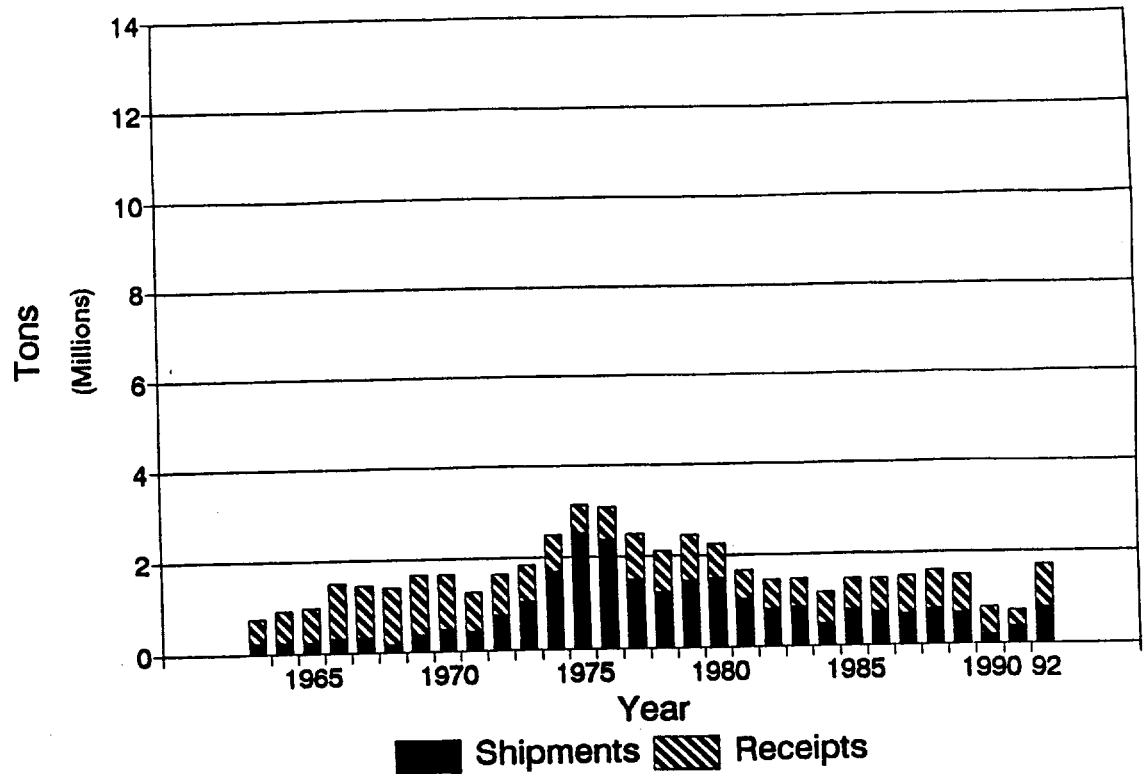
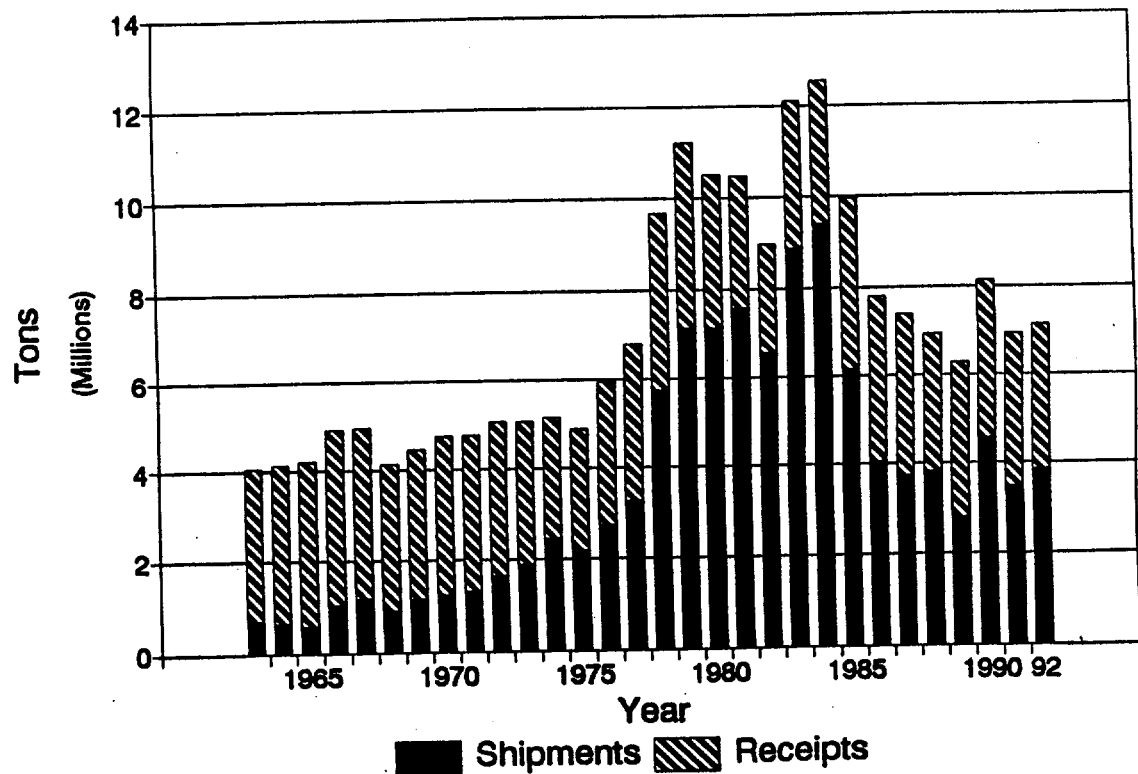


Figure 23

## St. Paul Waterborne Movement



APPENDIX TO

**BARGE MOVEMENTS ON THE UPPER MISSISSIPPI RIVER:  
TRENDS AND PROJECTIONS 1963-2002**

by Jerry Fruin and Dan Halbach

The tables and graphs in this Appendix are based on data  
published in Waterborne Commerce of the United States,  
Part 2, 1963-1992

NOTE: shipments and receipts in lower Pool 2 are not included in this Appendix. This is the river reach below St. Paul (mile 830) to Lock and Dam 2 which has approximately 5 shippers including the Koch refinery and the Shiely gravel pits on Grey Cloud Island.

# EXPLANATION OF THE 1963-92 TWIN CITIES AREA WATERBORNE MOVEMENTS TABLES

## 1. The areas included are:

- a. The Minnesota River from its mouth to mile 21.8 near Shakopee, Minnesota.
- b. The St. Croix River from its mouth to mile 24.5 near Stillwater.
- c. The Minneapolis Upper and Lower Harbors above mile 852.6 on the Mississippi River.
- d. St. Paul includes the Mississippi River above mile 830.0 (Ashland Petroleum) to the mouth of the Minnesota River.

The area between Lock and Dam 2 near Hastings and mile 830 is not included. This range has approximately 5 shippers including the Koch refinery and the Shiely gravel pits at Grey Cloud Island.

The terminals at Red Wing and Winona are not included.

## 2. Commodity or commodity groups included are:

GROUP	WCUS CODE	COMMODITIES
1 Corn		
	0103	Corn
2 Wheat		
	0107	Wheat
3 Soybeans		
	0111	Soybeans
4 Grains, oilseeds and farm crops NEC		
	0102	Barley
	0104	Oats
	0105	Rice
	0106	Sorghum grains
	0119	Oilseeds NEC (sunflowers)
	0122	Hay and fodder
	0129	Field crops NEC
	0191	Misc. farm products
5 Coal and lignite		
	1121	Coal and lignite
6 Cement and concrete		
	3241	Building cement
7 Sand, gravel, crushed rock		
	1442	Sand, gravel, crushed rock
8 Nonmetallic minerals NEC		
	1499	Nonmetallic minerals NEC (salt)

9	Agricultural products (2034-2091)	
	2034	Vegetables and prep
	2041	Wheat flour and semolina
	2042	Prepared animal feeds
	2049	Grain mill products NEC
	2061	Sugar
	2062	Molasses
	2091	Vegetable oils, margarine, shortening
10	Limestone and fertilizer	
	1411	Limestone
	1471	Phosphate rock
	2871	Nitrogenous chemical fertilizers
	2872	Potassic chemical fertilizers
	2873	Phosphatic chemical fertilizers
	2879	Fertilizers and materials NEC
11	Petroleum products (2911-2920)	
	2911	Gasoline
	2912	Jet fuel
	2913	Kerosine
	2914	Distillate fuel oil
	2915	Residual fuel oil
	2916	Lubricating oils and greases
	2917	Naphtha, petroleum solvents
	2918	Asphalt, tar and pitches
	2919	Coke, petroleum coke
12	Chemicals (28xx but not fertilizers)	
	2810	Sodium hydroxide - consistent receipts
	2811	Crude tar, oil, gas products
	2813	Alcohols
	2817	Benzene and toluene
	2819	Basic chemicals NEC
	2891	Miscellaneous chemical products
13	Other	
	0931	Marine shells, unmanufactured
	1061	Manganese ores, concentrates
	1311	Crude petroleum
	2211	Basic textile products
	24xx	Wood and products
	26xx	Wood pulp and products
	33xx	Iron and steel products
	34xx	Fabricated metal products
	4011	Iron and steel scrap

### 3. Notes on product categories:

- Group 4. Note that oat shipments have declined (and will not come back). Receipts in recent years were oats! There were large sunflower seed shipments in early eighties. These may come back. Hay and fodder had only 1 shipment in the past 10 years.
- Group 5. Note decrease in coal movements from almost 5 million tons in 19980 to less than 700,000 tons in 1989. Many of the 1980 movements are local and hence counted twice, once as shipments and once as receipts.
- Group 7. Sand, gravel and crushed rock. Virtually all of these movements originate at Grey Cloud Island. Because Grey Cloud Island is below mile 830.0, so only the receipts are counted in area movements.
- Group 8. Nonmetallic mineral consists primarily of salt.
- Group 9. Ag products. Sugar consisted of receipts in the early 80's but none since. Molasses has had relatively consistent receipts. The sharp decline in 1989 is due to reduced animal feed shipments.
- Group 10. Limestone and fertilizer. The shipments are primarily potash from Canada and did not exist in 1980 and peaked in 1984-85. Limestone receipts have increased.
- Group 11. Generally the only out of area shipment is petroleum coke.
- Group 12. Chemicals. Most important are sodium hydroxide and alcohols. The shipments in 1983 and 84 were code 2811--crude tar, oil and gas products.

Table 1

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	CORN				TOTAL				Mpls	St. Croix	Mn River	St. Croix	Mpls	St. Paul	TOTAL RECEIPTS	Mpls	St. Croix	Mn River	St. Croix	Mpls	TOTAL SHIPMENTS	TOTAL
	Mn River	St. Croix	Mpls	St. Paul	St. Paul	RECEIPTS	St. Paul	Mpls														
1963	0	0	0	0	0	0	0	0	0	0	71351	0	80494	244020	0	80494	0	71351	0	80494	1038065	1038065
1964	0	0	0	0	0	0	0	0	0	0	741803	0	104889	173019	0	104889	0	741803	0	104889	1019711	1019711
1965	0	0	0	0	0	0	0	0	0	0	717714	0	119841	197915	0	119841	0	717714	0	119841	1035570	1035570
1966	0	0	0	0	0	0	0	0	0	0	863711	0	71583	432541	0	863711	0	863711	0	71583	1367845	1367845
1967	0	0	0	0	0	0	0	0	0	0	790900	0	108285	399537	0	790900	0	790900	0	108285	1298622	1298622
1968	0	0	0	0	0	0	0	0	0	0	277857	0	28449	204147	0	277857	0	277857	0	28449	510453	510453
1969	0	0	0	0	0	0	0	0	0	0	1175110	0	126649	550729	0	1175110	0	1175110	0	126649	1852488	1852488
1970	0	0	0	0	0	0	0	0	0	0	1458103	0	113208	449875	0	1458103	0	1458103	0	113208	2021186	2021186
1971	0	0	0	0	0	0	0	0	0	0	1358380	0	67178	371274	0	1358380	0	1358380	0	67178	1798832	1798832
1972	0	0	0	0	0	0	0	0	0	0	1557881	0	90239	380268	0	1557881	0	1557881	0	90239	2028388	2028388
1973	0	0	0	0	0	0	0	0	0	0	2367081	0	165619	953342	0	2367081	0	2367081	0	165619	3486052	3486052
1974	0	0	0	0	0	0	0	0	0	0	1860129	0	87354	1196223	0	1860129	0	1860129	0	87354	3143706	3143706
1975	0	0	0	0	0	0	0	0	0	0	1029678	0	77685	672831	0	1029678	0	1029678	0	77685	1780174	1780174
1976	0	0	0	0	0	0	0	0	0	0	1177703	0	82876	871347	0	1177703	0	1177703	0	82876	2132026	2132026
1977	0	0	0	0	0	0	0	0	0	0	868534	0	35438	582034	0	868534	0	868534	0	35438	1484006	1484006
1978	0	0	0	0	0	0	0	0	0	0	527428	0	145852	1346039	0	527428	0	527428	0	145852	2018319	2018319
1979	0	0	0	0	0	0	0	0	0	0	216506	0	498095	2162761	0	216506	0	216506	0	498095	2878362	2878362
1980	0	0	0	0	0	0	0	0	0	0	839390	0	534875	2104010	0	839390	0	839390	0	534875	3481259	3481259
1981	0	0	0	0	0	0	0	0	0	0	1259676	0	432167	2518649	0	1259676	0	1259676	0	432167	4217356	4217356
1982	0	0	0	0	0	0	0	0	0	0	1372970	0	180268	1273808	0	1372970	0	1372970	0	180268	2827046	2827046
1983	4415	0	0	0	0	4415	0	0	0	0	2081122	0	159519	2258922	4415	2081122	0	2081122	0	159519	4503978	4503978
1984	0	0	0	1546	1546	1546	1546	0	0	0	1910845	0	96633	2686846	1546	1910845	0	1910845	0	96633	4694324	4694324
1985	0	0	0	2965	2965	2965	2965	0	0	0	1217983	0	37726	899386	2965	1217983	0	1217983	0	37726	2155105	2155105
1986	2884	0	0	4448	4448	7332	4448	0	0	0	823462	0	7506	579398	7332	823462	0	823462	0	7506	1410366	1410366
1987	1507	0	0	3125	3125	4632	3125	0	0	0	1220610	0	41010	777536	4632	1220610	0	1220610	0	41010	2039156	2039156
1988	0	0	0	0	0	0	0	0	0	0	1718886	0	92567	1197826	0	1718886	0	1718886	0	92567	3009279	3009279
1989	0	0	1342	0	0	1342	0	0	0	0	2715396	0	70151	1151872	1342	2715396	0	2715396	0	70151	3937419	3937419
1990	2000	1000	0	0	0	3000	0	0	0	0	3038000	0	10000	1752000	3000	3038000	0	3038000	0	10000	4800000	4800000
1991	0	0	1000	2000	2000	3000	2000	0	0	0	2845000	0	83000	1370000	3000	2845000	0	2845000	0	83000	4098000	4098000
1992	0	0	0	8000	8000	8000	8000	0	0	0	3107000	0	309000	1618000	8000	3107000	0	3107000	0	309000	5034000	5034000

Source: Waterborne Commerce of the United States, Part 2.



Table 2

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	SOYBEANS				TOTAL				TOTAL			
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	TOTAL	TOTAL
1963	0	0	0	0	0	197967	0	44320	106398	350685	350685	350685
1964	0	0	0	0	0	267390	0	28320	95590	391300	391300	391300
1965	0	0	0	0	0	235978	0	30555	48436	314969	314969	314969
1966	0	0	0	0	0	241283	0	57412	88174	386869	386869	386869
1967	0	0	0	0	0	338839	0	68204	190289	598432	598432	598432
1968	0	0	0	0	0	273286	0	10613	126851	410850	410850	410850
1969	0	0	0	0	0	314280	0	16234	79715	410209	410209	410209
1970	0	0	0	0	0	782070	0	77077	164829	1023976	1023976	1023976
1971	0	0	0	0	0	542967	0	32868	101173	677108	677108	677108
1972	0	0	0	0	0	490846	0	17248	102289	610483	610483	610483
1973	0	0	0	0	0	388980	0	23018	165522	578500	578500	578500
1974	0	0	0	0	0	527572	0	25018	333533	886123	886123	886123
1975	0	0	0	0	0	225954	0	1416	170078	397448	397448	397448
1976	0	0	0	0	0	341108	0	37123	287149	665380	665380	665380
1977	0	0	0	1583	1583	174718	0	23184	322414	520296	520296	521879
1978	0	0	0	0	0	254562	0	90895	1090647	1416204	1416204	1416204
1979	0	0	0	3027	3027	75279	0	160155	960024	1195458	1195458	1198485
1980	0	0	0	1483	1483	487919	0	128586	1368268	1984773	1984773	1986256
1981	1655	0	0	1336	2991	458585	0	104373	793067	1356025	1356025	1359016
1982	0	0	0	3063	3063	775534	0	171718	987201	1942453	1942453	1945536
1983	0	0	0	0	0	1170776	0	183818	1421147	2785741	2785741	2785741
1984	0	0	0	1591	1591	1039235	0	88994	1066058	2184287	2184287	2195878
1985	0	0	1450	1529	2979	737310	0	43271	554717	1335298	1335298	1338277
1986	1520	0	0	1600	3120	740312	0	32381	796864	1569557	1569557	1572677
1987	1351	0	0	2518	3869	1157767	0	54145	1222483	2434395	2434395	2438284
1988	0	0	0	2440	2440	1181277	0	42909	862495	2086681	2086681	2089121
1989	0	0	0	0	0	573625	0	11725	355847	941197	941197	941197
1990	1000	0	0	0	1000	856000	0	6000	640000	1502000	1502000	1503000
1991	0	0	0	0	0	942000	0	48000	498000	1489000	1489000	1489000
1992	1000	0	0	0	1000	1083000	0	141000	605000	1839000	1839000	1840000

Source: Waterborne Commerce of the United States, Part 2.

Table 3

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	WHEAT			TOTAL RECEIPTS			TOTAL SHIPMENTS			TOTAL
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	
1963	0	0	0	0	131371	0	46280	196089	373760	373760
1964	0	0	0	0	140815	0	50611	161890	353316	353316
1965	0	0	0	0	151715	0	32913	170129	354757	354757
1966	0	0	0	0	204285	0	88879	352824	643988	643988
1967	0	0	0	0	258158	0	76565	332486	865207	865207
1968	0	0	0	0	244158	0	88218	383169	695545	695545
1969	0	0	0	0	331688	0	144204	388435	862327	862327
1970	0	0	0	0	400021	0	184557	374350	958928	958928
1971	0	0	0	0	465993	0	152156	363951	982100	982100
1972	0	0	0	0	623120	0	105458	513161	1241739	1241739
1973	0	0	0	0	432628	0	154304	437217	1024150	1024150
1974	0	0	0	0	1000040	0	226141	547622	1775803	1775803
1975	0	0	0	0	1013515	0	358808	646170	2018593	2018593
1976	0	0	0	0	983770	0	252134	789223	2035127	2035127
1977	0	0	0	520	1014493	0	215191	688171	1897855	1897855
1978	0	0	0	0	459047	0	218222	1184628	1861897	1861897
1979	0	0	0	2789	246819	1311	163081	1330330	1741541	1744330
1980	2780	0	0	3604	495214	0	93135	1014999	1603348	1609732
1981	1318	0	0	3028	527082	0	191894	1411188	2130144	2134490
1982	4496	0	0	0	830945	0	251471	1273290	2355706	2360202
1983	3054	0	0	0	702173	0	146703	1819484	2668360	2671414
1984	0	0	0	2899	791674	0	160530	2130440	3082644	3085543
1985	0	0	0	0	902161	0	79494	1494405	2476060	2476060
1986	0	0	0	1442	673477	0	93360	875497	1642334	1643776
1987	0	0	0	0	428944	0	44502	453089	926535	926535
1988	0	0	0	0	471637	0	74439	638768	1184844	1184844
1989	0	0	0	0	694284	0	61910	455595	1201769	1201769
1990	0	5000	0	0	394000	0	26000	572000	992000	997000
1991	27000	0	14000	24000	523000	0	68000	634000	1225000	1290000
1992	0	0	0	11000	406000	0	80000	475000	963000	974000

Source: Waterborne Commerce of the United States, Part 2.

Table 4

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	FARM CROPS - NEC				TOTAL				TOTAL			
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	TOTAL	TOTAL
1963	0	0	0	0	0	87952	0	19537	36358	143847	143847	143847
1964	0	0	0	0	0	82953	0	3053	22212	108218	108218	108218
1965	0	0	0	0	0	115138	0	3164	26876	145178	145178	145178
1966	0	0	0	0	0	89510	0	14475	54676	158661	158661	158661
1967	0	0	0	0	0	103793	0	19272	63205	186270	186270	186270
1968	0	0	0	0	0	148193	0	23613	48710	220516	220516	220516
1969	0	0	0	0	0	117011	0	51908	35940	204559	204559	204559
1970	0	0	0	0	0	221104	0	54146	76314	351564	351564	351564
1971	0	0	0	0	0	290017	0	69275	147171	506463	506463	506463
1972	0	0	0	0	0	510349	0	153757	150568	814674	814674	814674
1973	0	0	0	0	0	124410	0	50051	83951	258412	258412	258412
1974	0	0	0	0	0	144067	0	27738	71212	243017	243017	243017
1975	0	0	0	0	0	48100	0	29980	55221	133311	133311	133311
1976	0	0	0	0	0	41636	0	40030	21726	103392	103392	103392
1977	0	0	0	0	0	77236	0	64988	110513	252737	252737	252737
1978	0	0	0	0	0	14893	0	87580	197733	300206	300206	300206
1979	0	0	0	0	0	5078	0	37638	121485	184202	184202	184202
1980	0	0	0	0	0	24200	0	26325	210174	260699	260699	260699
1981	700	0	0	0	700	41780	0	60376	18810	288968	288968	288968
1982	0	0	0	0	0	53452	0	26393	66840	146885	146885	146885
1983	0	0	0	0	0	54804	0	10852	46895	112351	112351	112351
1984	4889	0	0	1504	6193	30863	0	11082	184070	225845	232038	232038
1985	0	0	0	0	0	42460	0	1240	38840	82340	82340	82340
1986	0	0	0	0	0	5457	0	6961	35072	47490	47490	47490
1987	0	0	0	0	0	7030	0	21375	31107	59512	59512	59512
1988	0	0	20420	24452	44672	5456	0	8164	6495	20117	64989	64989
1989	2661	0	0	37709	40370	0	0	11253	13808	25062	65432	65432
1990	3000	0	1000	0	4000	21000	0	16000	63000	100000	104000	104000
1991	0	0	3000	6000	9000	78000	0	4000	73000	155000	164000	164000
1992	0	0	2000	37000	39000	99000	0	62000	69000	230000	269000	269000

Source: Waterborne Commerce of the United States, Part 2.

### **Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons**

COAL											
	Mn River	St. Croix	Mpls	St. Paul	TOTAL RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	TOTAL SHIPMENTS	TOTAL
1963	739062	17839	133315	906736	1797052	0	0	0	1415	1415	1798467
1964	806431	715	153590	902520	1863256	0	0	0	0	0	1863256
1965	685939	2796	218608	1025199	1912542	0	0	0	4085	4085	1916627
1966	836175	2608	464240	936344	2341367	0	0	1359	9060	10419	2351786
1967	684004	313087	463110	925550	2405731	0	305	0	0	305	2406036
1968	440377	1343257	492967	559022	2835623	0	0	0	0	0	2835623
1969	248573	1315309	542805	433606	2538293	0	5996	0	0	5996	2544289
1970	375034	1195484	414928	566279	2551725	0	0	0	10872	10872	2562597
1971	543155	1193602	176637	519599	2433293	0	0	0	44925	44925	2478218
1972	723985	1750675	156334	444279	3055253	0	4067	253477	63033	320577	3375830
1973	638577	1143614	103035	306961	2192407	0	0	556424	87066	643490	2835897
1974	756839	1261486	7277	256877	2302479	5896	8286	1304360	108562	1428104	3730583
1975	906050	1667634	26350	248746	2870780	49134	1494	1935331	373203	2359162	5229942
1976	772840	1418151	66495	434915	2692501	30853	1338	1730042	545231	2307264	4999785
1977	822141	1268855	135976	396492	2623464	21917	0	960350	1323003	2305270	4928734
1978	578536	822297	80587	528795	2011215	0	0	537043	1617856	2154899	4166114
1979	512585	1140243	33366	506006	2194180	0	0	436284	2012156	2448440	4642620
1980	508435	1426654	105793	434725	2476607	0	0	482013	1981113	2463126	4839733
1981	59601	935872	89915	397624	1483212	0	0	0	1765709	1765709	3248921
1982	346935	1064305	111597	346914	1873751	0	0	0	2285823	2285823	4159574
1983	212641	1136456	58776	446251	1854124	1540	0	0	2049417	2050957	3905081
1984	244789	724190	3191	327037	1296207	1640	0	0	1552685	1554325	2853532
1985	227254	1189639	10456	530749	1958098	0	0	466395	1565865	2032250	3990348
1986	49036	222113	56614	436572	766335	0	0	416857	428439	845296	1611631
1987	19867	0	63621	212632	296220	0	0	253301	17786	271087	567307
1988	0	21374	59361	202503	283238	0	0	396442	189651	586093	869331
1989	0	0	75961	175617	251478	0	0	360701	77302	438003	689481
1990	2000	0	79000	206000	287000	3000	0	0	941000	944000	1231000
1991			102000	141000	243000	0	0	0	374000	374000	617000
1992	0	0	95000	97000	192000	0	0	0	352000	352000	544000

**Source: Waterborne Commerce of the United States, Part 2.**

Table 6

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	CEMENT			TOTAL			TOTAL		
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	SHIPMENTS
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	36466	36466	0	0	0	36466
1967	0	0	5655	46152	51807	0	0	0	51807
1968	0	0	17091	59913	77004	0	0	0	77004
1969	0	0	25712	70273	95985	0	0	0	95985
1970	0	0	69146	61324	130470	0	0	0	130470
1971	0	0	64146	56982	121128	0	0	0	121128
1972	0	0	71935	24148	96083	0	0	0	96083
1973	0	0	59194	6108	65302	0	0	0	65302
1974	0	0	101853	22759	124612	0	0	0	124612
1975	0	0	94755	0	94755	0	0	0	94755
1976	0	0	128082	0	128082	0	0	0	128082
1977	0	0	155080	0	155080	0	0	0	155080
1978	0	0	115921	1415	117336	0	0	0	117336
1979	0	0	159340	928	160268	0	0	0	160268
1980	0	0	144592	0	144592	0	0	0	144592
1981	0	0	120619	1941	122560	0	0	0	122560
1982	0	0	134695	1500	136195	0	0	0	136195
1983	0	0	171845	0	171845	0	0	0	171845
1984	33844	0	188261	21000	243105	0	0	0	243105
1985	36399	0	200766	102126	339291	0	0	0	339291
1986	16000	0	190651	131286	337937	0	0	0	337937
1987	0	0	246358	138500	384858	0	0	0	384858
1988	0	0	254609	122953	377562	0	0	0	377562
1989	0	0	232813	109186	341999	0	0	0	341999
1990	0	0	173000	189000	362000	0	0	0	362000
1991	0	0	152000	233000	385000	0	0	0	385000
1992	0	0	142000	288000	430000	0	0	6000	436000

Source: Waterborne Commerce of the United States, Part 2.

Table 7

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	SAND, GRAVEL, ROCK				TOTAL		TOTAL				
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	TOTAL
1963	0	0	185149	1088251	1273400	0	0	0	0	0	1273400
1964	0	0	342191	1157839	1500030	0	0	0	0	0	1500030
1965	0	0	335422	1271298	1606720	0	0	0	0	0	1606720
1966	0	0	507368	1318319	1825888	0	0	0	0	0	1825888
1967	0	0	433157	1206736	1639893	0	0	0	0	0	1639893
1968	0	0	527349	1192258	1719607	0	0	0	0	0	1719607
1969	5320	0	501868	1191497	1698683	0	0	0	0	0	1698683
1970	0	0	413651	1266630	1680281	0	0	0	0	0	1680281
1971	0	0	402007	1164347	1566354	0	0	0	0	0	1566354
1972	0	0	461450	1159068	1620518	0	0	0	0	0	1620518
1973	0	0	434167	1247955	1682122	0	0	0	0	0	1682122
1974	0	0	509675	1048389	1558084	0	0	0	0	0	1558084
1975	0	0	267658	915683	1183341	0	0	0	0	0	1183341
1976	0	0	335346	1270283	1605629	0	0	0	0	0	1605629
1977	0	0	468615	1156023	1622638	0	0	0	0	0	1622638
1978	0	0	490801	1428897	1919698	0	0	0	0	0	1919698
1979	0	0	546344	1843190	2389534	0	0	0	0	0	2389534
1980	3021	0	425445	1644970	2073436	0	0	0	0	0	2073436
1981	0	0	325168	1296080	1621246	0	0	0	0	0	1621246
1982	1486	0	308867	1038853	1347006	0	0	0	0	0	1347006
1983	1518	0	336576	1366848	1704742	0	0	0	0	0	1704742
1984	1505	0	420040	1451385	1872830	0	0	0	0	0	1872830
1985	5822	0	386183	1567843	1959848	0	0	0	0	0	1959848
1986	0	0	419630	1738510	2156140	0	0	0	0	0	2156140
1987	4732	0	428580	1891283	2322595	0	0	0	0	0	2322595
1988	0	0	420479	1323686	1744185	0	0	0	0	0	1744185
1989	0	0	450608	1582155	2032763	0	0	0	0	0	2032763
1990	18000	0	264000	1807000	2089000	0	0	0	0	0	2089000
1991	6000	0	10000	1721000	1737000	0	0	0	0	0	1737000
1992	58000	0	632000	1432000	2120000	16000	0	0	0	16000	2136000

Source: Waterborne Commerce of the United States, Part 2.

Table 8

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	SALT			TOTAL				TOTAL			
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	TOTAL
1963	59574	0	628	14416	74618	0	0	0	0	0	74618
1964	61024	0	10005	16717	87746	0	0	0	0	0	87746
1965	81263	0	8138	39854	129255	0	0	0	0	0	129255
1966	103921	0	19266	36036	159223	0	0	0	0	0	159223
1967	126168	0	13336	0	139504	0	0	0	0	0	139504
1968	44596	0	27609	32744	104949	0	0	0	0	0	104949
1969	136914	0	83226	123414	345554	0	0	0	0	0	345554
1970	152761	0	81844	137490	372095	0	0	0	0	0	372095
1971	118768	0	11143	136855	268766	0	0	0	0	0	268766
1972	135833	0	59144	130747	325724	0	0	0	0	0	325724
1973	70190	0	93745	70151	234086	0	0	0	0	0	234086
1974	117137	0	113686	37789	268612	0	0	0	0	0	268612
1975	206779	0	140705	75331	422815	0	0	0	0	0	422815
1976	207640	0	3476	75505	286621	0	0	0	0	0	286621
1977	72536	0	58817	125809	257962	0	0	0	0	0	257962
1978	71142	0	57741	193614	322497	0	0	0	0	0	322497
1979	7022	0	39249	185846	231917	0	0	0	0	0	231917
1980	196821	10803	13350	156422	347396	0	0	0	0	0	347396
1981	0	1600	10524	87982	100106	0	0	0	0	0	100106
1982	61927	0	14507	149843	226077	0	0	0	0	0	226077
1983	107041	0	8952	229699	345862	0	0	0	0	0	345862
1984	116567	0	9392	239557	367516	0	0	0	0	0	367516
1985	39315	0	13920	213645	266880	0	0	0	0	0	266880
1986	137951	0	15869	224025	377845	0	0	0	0	0	377845
1987	84643	0	33156	96251	214050	0	0	0	0	0	214050
1988	106075	0	44037	118186	271298	0	0	0	0	0	271298
1989	56558	0	65042	168423	290023	1684	0	0	1643	3327	293350
1990	77000	0	44000	86000	207000	0	0	3000	0	3000	210000
1991	164000	0	28000	111000	304000	0	0	0	0	0	304000
1992	147000	0	25000	158000	330000	0	0	0	0	0	330000

Source: Waterborne Commerce of the United States, Part 2.

Table 9

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

OTHER AG PRODUCTS											
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	TOTAL
1963	30270	0	700	26800	57770	9699	0	2557	21382	33638	91408
1964	28596	0	1560	25186	55342	33112	0	1100	40508	74721	130063
1965	25319	0	0	32586	57885	20431	0	12573	25870	58874	116759
1966	30966	0	0	37835	68901	27053	0	36884	46926	110673	179574
1967	27267	0	1195	32716	61178	26319	0	19253	15681	61253	122431
1968	23526	0	0	36981	60507	36554	0	23046	19779	79379	139886
1969	17797	0	0	49874	67671	31363	0	14964	27069	73396	141067
1970	21350	0	0	57186	78536	37302	0	15144	59339	111785	190321
1971	22756	0	0	53229	75985	54876	0	13748	78797	147421	223406
1972	35188	0	0	69847	105035	58230	0	45263	111024	212517	317552
1973	27169	0	0	55223	82392	54419	0	38647	39790	132856	215248
1974	32217	0	0	67942	100159	100422	0	25705	93806	219833	320092
1975	27881	0	0	46571	74452	80482	0	108604	158242	347328	421780
1976	26852	0	0	54517	81169	76392	0	150324	143328	370044	451213
1977	31868	0	0	41113	72981	133270	0	149111	136282	418663	491644
1978	6700	0	0	20239	26939	22828	0	118370	211927	353125	380064
1979	18330	0	0	50853	69183	22897	0	141580	348948	513425	582608
1980	3084	0	0	26638	29722	39416	0	184428	283790	507634	537356
1981	2798	0	3483	42098	48369	42312	0	174834	403657	620803	669172
1982	2878	0	3787	49617	56282	64658	0	107024	341629	513311	569593
1983	12904	0	2852	36905	54761	108362	0	130877	464644	704883	759644
1984	18659	0	0	34616	53475	102068	0	37019	414356	553463	606938
1985	13153	0	1458	29210	43821	116705	0	40053	307468	464226	508047
1986	2721	0	0	29875	32596	70642	0	70695	393787	535124	567720
1987	14482	2731	0	40280	57493	53738	0	68731	371668	494137	551630
1988	12054	0	0	46530	58594	78118	0	38705	312168	428991	487575
1989	11582	4200	1573	39797	57152	20764	0	25012	169033	214809	271961
1990	10000	1000	0	39000	50000	41000	0	7000	134000	182000	232000
1991	17000	0	0	49000	66000	36000	0	12000	130000	178000	244000
1992	19000	0	0	51000	70000	37000	0	52000	114000	203000	273000

Source: Waterborne Commerce of the United States, Part 2.



Table 10

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	FERTILIZER			TOTAL			TOTAL			TOTAL		
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	St. Paul	TOTAL
1963	14150	0	0	2073	18223	0	0	0	0	0	0	18223
1964	37921	0	0	1312	39233	0	0	0	0	0	0	39233
1965	17726	0	0	0	17726	0	0	0	0	0	0	17726
1966	34280	0	0	6351	40631	0	0	0	0	0	0	40631
1967	60431	0	4344	42085	108860	0	0	0	0	0	0	108860
1968	63348	0	0	50117	113465	0	0	0	0	0	0	113465
1969	80683	0	0	83336	164021	0	0	0	0	0	0	164021
1970	68774	0	1171	55320	125285	0	0	0	0	0	0	125285
1971	111688	0	2813	98159	212860	0	0	0	0	0	0	212860
1972	94257	0	3985	39025	137267	0	0	0	0	0	0	137267
1973	86917	0	3938	58365	149220	0	0	0	0	0	0	149220
1974	119926	0	8733	28844	157503	0	0	0	0	0	0	157503
1975	108843	0	2502	17283	128638	0	0	0	0	0	0	128638
1976	128350	0	12851	88901	228802	0	0	0	0	0	0	228802
1977	145335	0	10131	118746	274212	0	0	3063	20851	23714	20851	287926
1978	103408	0	14510	203430	321348	0	0	0	21857	21857	21857	343205
1979	79363	0	6243	220282	305868	1583	0	14866	4623	20852	4623	326720
1980	113204	0	8053	87576	208833	0	0	25961	0	25961	0	234794
1981	108385	0	15845	138613	259643	4775	0	39661	29753	74189	29753	332832
1982	220535	0	8967	161401	390803	0	0	41014	208621	247635	208621	638538
1983	310639	0	6063	208882	525614	0	0	185745	455967	641712	455967	1167326
1984	372980	16533	15513	263643	668649	0	0	77261	848468	928635	848468	1597284
1985	309296	4518	6004	308020	625838	2906	0	108381	785394	904775	785394	1530613
1986	397944	17064	3102	302763	720883	0	0	63158	603290	666448	603290	1387341
1987	223449	33702	25610	289739	572700	1505	0	160408	342479	504393	342479	1077093
1988	221757	22563	15070	295875	555285	4639	0	83908	311494	400041	311494	955306
1989	285593	18100	6060	243438	553211	1397	0	93073	254207	348677	254207	901888
1990	254000	6000	11000	323000	594000	0	0	59000	116000	175000	116000	769000
1991	271000	11000	0	260000	542000	0	0	39000	250000	289000	250000	831000
1992	424000	11000	4000	306000	747000	5000	0	87000	425000	517000	425000	1264000

Source: Waterborne Commerce of the United States, Part 2.

Table 11

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	PETROL PRODUCTS			Mpls	TOTAL RECEIPTS			Mn River	St. Croix	Mpls	St. Paul	TOTAL SHIPMENTS		
	Mn River	St. Croix	St. Paul		RECEIPTS	St. Paul	Mpls					St. Paul	SHIPMENTS	TOTAL
1963	22622	0	979966	120382	1122970	0	0	0	0	0	1391	1391	1391	1124361
1964	21618	0	1071283	125689	1218600	0	0	0	0	0	34961	34961	34961	1253561
1965	34951	0	1135936	116458	1287347	0	0	0	0	0	35985	35985	35985	1323332
1966	62591	0	1213872	126720	1403183	0	0	0	0	0	2744	2744	2744	1405927
1967	72673	0	1254499	97150	1424312	0	0	0	0	0	4319	4319	4319	1428631
1968	46624	0	1156733	75256	1278615	0	0	0	0	0	2837	2837	2837	1281452
1969	30463	0	1250184	99282	1379929	0	0	0	0	0	4281	4281	4281	1384210
1970	26890	0	1228304	172864	1429058	0	0	0	0	0	26769	26769	26769	1455827
1971	29660	0	1248451	105981	1384082	0	0	0	0	0	112779	112779	112779	1498871
1972	31294	0	1360334	68596	1460224	0	0	0	0	0	139778	139778	139778	1600002
1973	23219	0	1300342	43848	1367409	0	0	0	0	2860	44840	44840	47700	1415109
1974	44993	0	1045024	44448	1134465	0	0	0	0	0	53904	53904	53904	1188369
1975	48043	0	1138788	58806	1245438	0	0	0	0	0	77892	77892	77892	1323330
1976	21277	0	1062884	90041	1174002	0	0	0	0	0	62051	62051	62051	1236053
1977	25033	0	1270460	103573	1399086	0	0	0	0	9088	80042	80042	89130	1488196
1978	17737	0	1179232	93936	1290907	0	0	0	0	10429	67948	67948	78377	1369284
1979	0	0	1065985	1184101	1184101	0	0	0	0	0	180978	180978	180978	1385079
1980	8634	0	863298	36400	908532	0	0	0	0	0	174218	174218	174218	1082750
1981	0	0	737840	22839	760779	0	0	0	0	11179	429440	429440	440819	1201398
1982	65943	0	546609	2487	615039	0	0	0	0	24920	118232	118232	143152	758191
1983	55894	0	761150	24901	841745	0	0	0	0	12147	349631	349631	361778	1203523
1984	19300	0	580443	42600	642343	0	0	0	0	0	452848	452848	452848	1095191
1985	42297	0	802097	19784	864178	0	0	0	0	1612	471618	471618	479298	1343476
1986	29659	0	677087	0	706746	0	0	0	0	30001	296388	296388	332240	1038986
1987	70678	0	818055	1629	890362	0	0	0	0	1629	516887	516887	518316	1408678
1988	46843	0	808131	32235	887209	0	0	0	0	3870	283143	283143	297013	1184222
1989	6197	0	825764	1764	833725	0	0	0	0	0	257327	257327	257327	1091052
1990	12000	0	750000	18000	780000	0	0	0	0	0	251000	251000	263000	1043000
1991	0	0	682000	0	682000	0	0	0	0	43000	75000	75000	124000	806000
1992	17000	0	596000	0	613000	0	0	0	0	0	104000	104000	104000	717000

Source: Waterborne Commerce of the United States, Part 2.

Table 12

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	CHEMICAL		TOTAL		TOTAL		TOTAL		
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	
1963	3828	0	6334	1825	11987	0	0	0	TOTAL
1964	4219	0	5518	8544	18281	0	0	0	SHIPMENTS
1965	18577	0	3989	17480	40046	0	0	0	TOTAL
1966	23348	0	6947	41030	71225	0	0	0	SHIPMENTS
1967	5802	0	7379	44874	57855	0	0	0	TOTAL
1968	7176	0	7484	37585	52245	0	0	0	SHIPMENTS
1969	1333	0	5421	41338	48082	0	0	0	TOTAL
1970	0	0	7847	65086	72833	0	0	0	SHIPMENTS
1971	0	0	7871	111134	119005	0	0	0	TOTAL
1972	1443	0	6598	104228	112269	0	0	0	SHIPMENTS
1973	0	0	1336	54885	56031	0	0	0	TOTAL
1974	0	0	0	68033	68033	0	0	0	SHIPMENTS
1975	0	0	0	55896	55896	0	0	0	TOTAL
1976	0	0	3043	51788	54832	0	0	0	SHIPMENTS
1977	0	0	0	63381	63381	0	0	0	TOTAL
1978	0	0	12254	73253	85507	0	0	0	SHIPMENTS
1979	0	0	12223	77275	88498	0	0	0	TOTAL
1980	0	0	5288	56766	62055	0	0	0	SHIPMENTS
1981	8403	0	7399	71681	87433	0	0	0	TOTAL
1982	0	0	11575	51825	63400	0	0	0	SHIPMENTS
1983	0	0	2844	52282	55126	0	0	0	TOTAL
1984	0	0	9754	55531	65285	0	0	0	SHIPMENTS
1985	1406	0	8780	100460	110846	0	0	0	TOTAL
1986	0	0	6839	96558	103497	0	0	0	SHIPMENTS
1987	0	0	0	100802	100802	0	0	0	TOTAL
1988	3855	0	0	70283	74138	0	0	0	SHIPMENTS
1989	0	0	0	74500	74500	0	0	0	TOTAL
1990	0	0	2000	91000	93000	0	0	0	SHIPMENTS
1991	1000	0	5000	98000	104000	0	0	0	TOTAL
1992	0	0	6000	118000	124000	0	0	0	SHIPMENTS

Source: Waterborne Commerce of the United States, Part 2.

Table 13

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	ALL OTHER				TOTAL				TOTAL				TOTAL			
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	St. Paul	Mpls	St. Croix	TOTAL		
1963	97422	0	72330	356075	525827	119746	0	53890	76725	250361	76725	53890	0	776188		
1964	63402	0	70233	349250	482885	39247	0	49284	104396	192927	104396	49284	0	675812		
1965	80234	0	85627	114829	280690	34232	0	35168	81072	150472	81072	35168	0	431162		
1966	132059	0	78606	271290	481955	63901	0	41340	53932	159173	53932	41340	0	641128		
1967	57773	0	68989	223808	350570	25758	60	46323	179789	251930	179789	46323	60	602500		
1968	66302	0	100541	146395	313238	49258	0	5310	117574	172142	117574	5310	0	485380		
1969	43271	0	66205	79177	188653	49987	0	9773	67993	127753	67993	9773	0	316406		
1970	28361	0	54586	76569	159516	29973	0	32548	82368	144889	82368	32548	0	304405		
1971	73033	0	90801	74153	237987	14839	0	69586	108158	192583	108158	69586	0	430570		
1972	55032	0	77791	98621	231444	105	0	100048	168203	268356	168203	100048	0	499800		
1973	49896	0	67988	88405	206289	19495	0	51609	80472	151576	80472	51609	0	357865		
1974	62187	0	37430	107646	207263	7205	0	9020	52085	68310	52085	9020	0	275573		
1975	75711	0	60628	228379	364718	23040	0	22282	37184	82506	37184	22282	0	447224		
1976	61769	0	73744	177551	313064	17401	0	80999	43421	141821	43421	80999	0	454885		
1977	17391	0	88119	368616	474126	1489	0	33438	14638	49565	14638	33438	0	523691		
1978	19283	0	74762	306650	400695	1503	0	11689	4598	17770	4598	11689	0	418465		
1979	12663	0	84598	143363	240624	0	0	3700	22782	26482	22782	3700	0	267106		
1980	20526	0	47113	99796	167435	0	0	11333	16046	27379	16046	11333	0	194814		
1981	78334	0	45015	151745	275094	0	0	20277	20566	40843	20566	20277	0	315937		
1982	19889	0	37600	69616	127105	0	0	797	5891	6688	5891	797	0	133793		
1983	32545	0	19105	136427	188077	0	0	0	25871	25871	25871	0	0	213948		
1984	17888	0	19874	166344	204106	0	0	1378	32026	33404	32026	1378	0	237510		
1985	21532	0	16563	141011	179106	0	0	3929	33557	37486	33557	3929	0	216592		
1986	15485	0	43399	100753	159637	0	0	2741	47630	50371	47630	2741	0	210008		
1987	13375	0	49954	76687	140016	6177	0	14119	15063	35359	15063	14119	0	175375		
1988	14983	0	23685	108616	147284	0	0	17500	20449	37949	20449	17500	0	185233		
1989	11531	0	19037	224162	254730	0	0	34677	72449	107126	72449	34677	0	361856		
1990	12000	0	20000	100000	132000	0	0	61000	101000	162000	101000	61000	0	294000		
1991	13000	0	34000	124000	171000	0	0	48000	85000	133000	85000	48000	0	304000		
1992	13000	0	42000	177000	232000	0	0	63000	100000	163000	100000	63000	0	395000		

Source: Waterborne Commerce of the United States, Part 2.

Table 14

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	TOTAL			TOTAL RECEIPTS			TOTAL SHIPMENTS			TOTAL
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	
1963	968928	17839	518838	3376142	4879847	0	247088	685788	2183162	7073009
1964	1023211	715	708766	3532661	5265373	0	237257	632577	2175154	7440527
1965	924009	2796	768242	3637164	5332211	0	234314	590368	2099890	7432101
1966	1325340	2608	1203048	3897643	6428639	0	308752	1040877	2840372	9269011
1967	1033918	313067	1114315	3776410	6237710	365	338902	1185306	3066338	9304048
1968	691849	1343257	1248299	3271748	6555253	0	159249	903167	2091722	8646975
1969	566354	1313309	1324517	3322701	6526981	5986	363432	1152162	3541009	10067890
1970	673170	1195494	1216037	3515186	6598879	0	476680	1244716	4649969	11249948
1971	898080	1193602	861899	3464908	6419270	0	404911	1328228	4460211	10879481
1972	1077012	1730675	905833	3430297	7143817	4067	765490	1628324	5636512	12780328
1973	895968	1143614	807251	3188225	6035258	0	1042532	1892200	6322736	12357984
1974	1133299	1281486	823102	2683303	5921190	8286	1707336	2457947	7818900	13740080
1975	1373307	1687634	653204	2726888	6440833	1494	2534196	2190821	7196414	13637247
1976	1219628	1418151	712878	3214045	6564702	1338	2373628	2763476	7817105	14381807
1977	1114304	1268855	1019311	3542543	6845013	0	1493831	3257748	7041236	13986249
1978	797808	822297	940514	3935525	6496142	0	1210160	5733233	8223654	14719796
1979	829943	1140243	999779	4101024	6870989	1311	1456199	7144087	9169740	16040729
1980	827705	1437457	789019	3375278	6429459	0	1486856	7153194	10525989	16955448
1981	259194	937472	640705	2833972	4771343	0	1034761	7559819	10928790	15700133
1982	728069	1084305	632082	2420861	4843337	0	803805	6589335	10468499	15311836
1983	740451	1136456	632044	3240234	5749185	0	839461	8895350	13854588	19603773
1984	832201	740723	708625	3147296	5428845	0	472907	9387738	13739716	19168561
1985	696474	1194157	665364	3797655	6353950	0	763091	6161050	9966838	16320488
1986	653200	239177	736204	3744639	5373520	0	723660	4056365	7069226	12472746
1987	433884	36433	847106	3670172	4967597	0	659221	3748417	7263409	12271008
1988	406567	43937	868896	3123655	4446055	0	758504	3832489	8051008	12497063
1989	374122	22300	854120	3480751	4731293	0	668502	2809084	7474716	12206009
1990	391000	13000	612000	3591000	4607000	0	189000	4576000	9130000	13737000
1991	499000	11000	350000	3451000	4311000	0	345000	3490000	8063000	12374000
1992	677000	11000	946000	3281000	4917000	0	794000	3868000	9427000	14344000

Source: Waterborne Commerce of the United States, Part 2.

Table 15

## Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	ALL COMMODITIES LESS COAL					TOTAL RECEIPTS					TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	St. Paul	Mpls	St. Croix	SHIPMENTS	TOTAL
1963	227866	0	385523	2469406	3082795	1260286	0	247088	684373	2191747	684373	247088	0	2191747	5274542
1964	216780	0	555196	2630141	3402117	1305320	0	237257	632577	2175154	632577	237257	0	2175154	5577271
1965	258070	0	549634	2611965	3419669	1275208	0	234314	586283	2095805	586283	234314	0	2095805	5515474
1966	387165	0	738808	2961299	4087272	1489743	0	308393	1031817	2829953	1031817	308393	0	2829953	6917225
1967	349914	0	631205	2850860	3831979	1541765	60	338902	1185306	3066033	1185306	338902	0	3066033	6898012
1968	251572	0	755332	2712726	3719630	1029306	0	159249	903167	2091722	903167	159249	0	2091722	5811352
1969	317781	0	781712	2889095	3988588	2019419	0	363432	1152162	3535013	1152162	363432	0	3535013	7523601
1970	298136	0	801109	2948909	4048154	2928573	0	476680	1233844	4639097	1233844	476680	0	4639097	8687251
1971	355905	0	684762	2945310	3985977	2727072	0	404911	1283303	4415286	1283303	404911	0	4415286	8401263
1972	353047	0	749499	2986018	4088564	3238631	0	512013	1565291	5315935	1565291	512013	0	5315935	9404499
1973	257391	0	704216	2881244	3842851	3388004	0	486108	1805134	5679246	1805134	486108	0	5679246	9522097
1974	376460	0	815825	2426426	3618711	3639435	0	402976	2348385	6390796	2348385	402976	0	6390796	10009507
1975	467257	0	624854	2477942	3570053	2420769	0	598865	1817618	4837252	1817618	598865	0	4837252	8407305
1976	446688	0	646383	2779130	3872201	2648010	0	643586	2218245	5509841	2218245	643586	0	5509841	9382042
1977	292163	0	883335	3146051	4321549	2267740	0	533481	1934745	4735966	1934745	533481	0	4735966	9057515
1978	218270	0	859927	3406730	4484927	1280261	0	673117	4115377	6068755	4115377	673117	0	6068755	10553682
1979	117378	0	968413	3593018	4676809	568143	1311	1019915	5131931	6721300	5131931	1019915	0	6721300	11398109
1980	318270	10803	683226	2940553	3952852	1886139	0	1004643	5172081	8062863	5172081	1004643	0	8062863	12015715
1981	199593	1600	550790	2536148	3288131	2334210	0	1034761	5794110	9163081	5794110	1034761	0	9163081	12451212
1982	377154	0	520485	2071947	2969586	3095559	0	803605	4283512	8182676	4283512	803605	0	8182676	11152262
1983	527810	0	573268	2793983	3895061	4118237	0	839461	6845933	11803631	6845933	839461	0	11803631	15698692
1984	587412	16533	705434	2820259	4129638	3877431	0	472907	7835053	12185391	7835053	472907	0	12185391	16315029
1985	469220	4518	654908	3266906	4395552	3022697	0	316706	4595185	7934588	4595185	316706	0	7934588	12330140
1986	604164	17064	678590	3306367	4607185	2319201	0	306803	3627926	6253930	3627926	306803	0	6253930	10861115
1987	414217	36433	783487	3457240	4691377	2875771	0	405920	3730631	7012322	3730631	405920	0	7012322	11703699
1988	408567	22563	810535	2921152	4162817	3460015	0	362062	3642838	7464915	3642838	362062	0	7464915	11627732
1989	374122	22300	778259	3305134	4479815	3997130	0	307801	2731782	7036713	2731782	307801	0	7036713	11516528
1990	389000	13000	533000	3385000	4320000	4362000	0	189000	3635000	8186000	3635000	189000	0	8186000	12506000
1991	499000	11000	248000	3310000	4068000	4228000	0	345000	3116000	7689000	3116000	345000	0	7689000	11757000
1992	677000	11000	853000	3184000	4725000	4765000	0	794000	3516000	9075000	3516000	794000	0	9075000	13800000

Source: Waterborne Commerce of the United States, Part 2.