



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# 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

---

Department of Agricultural and Applied Economics  
University of Minnesota  
College of Agriculture  
St. Paul, Minnesota 55108

---

# 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

This research was sponsored by the University of Minnesota Agricultural Experiment Station, the University of Minnesota Center for Transportation Studies and the Minnesota Department of Transportation.

Staff Papers are published without formal review within the Department of Agricultural and Applied Economics.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

Information on other titles in this series may be obtained from: Waite Library, University of Minnesota, Department of Agricultural and Applied Economics, 1994 Buford Avenue, 232 COB, St. Paul, MN 55108-6040, U.S.A.

# **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

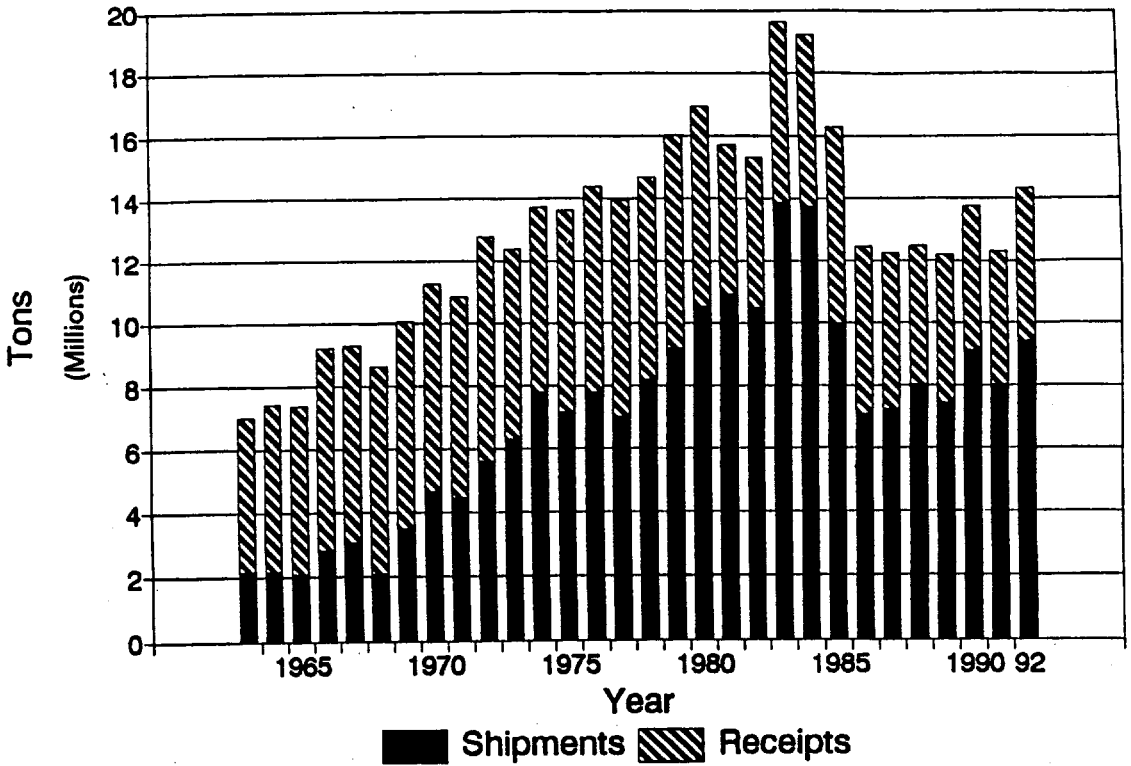
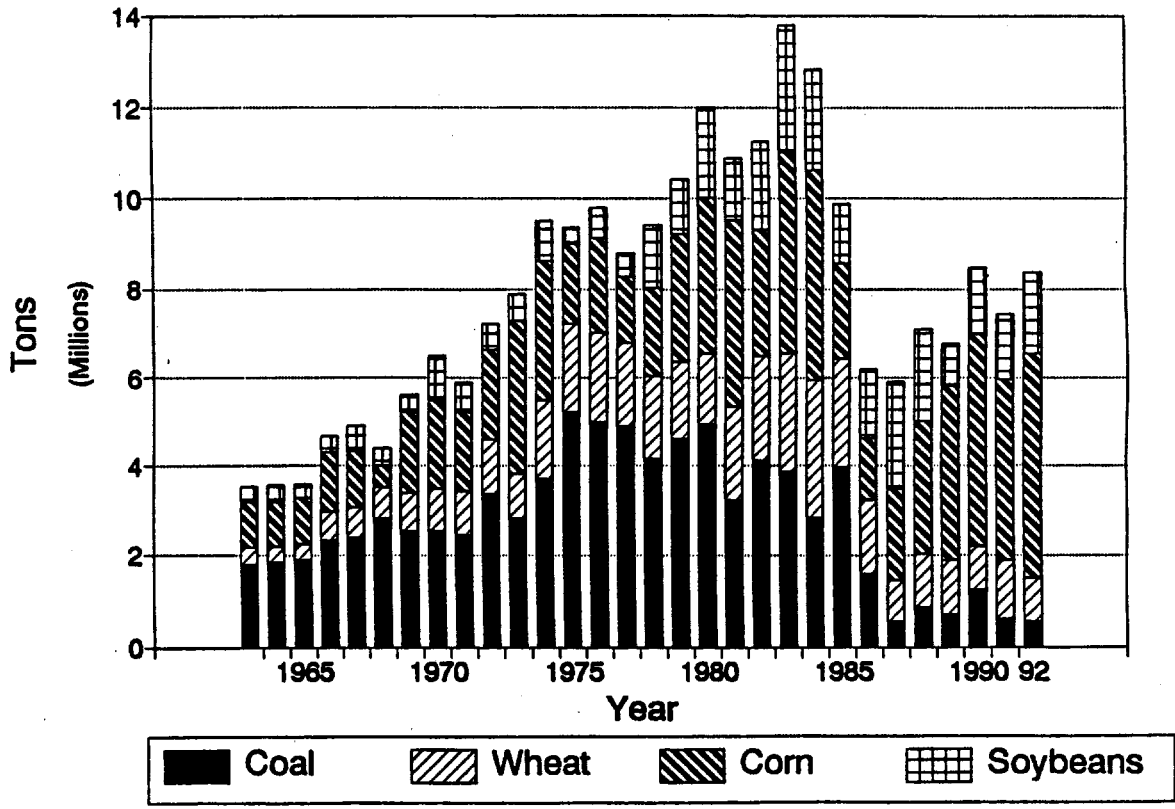


Figure 2

## Twin Cities Waterborne Movement



Source: Waterborne Commerce of the United States.

U of M Center for Transportation Studies

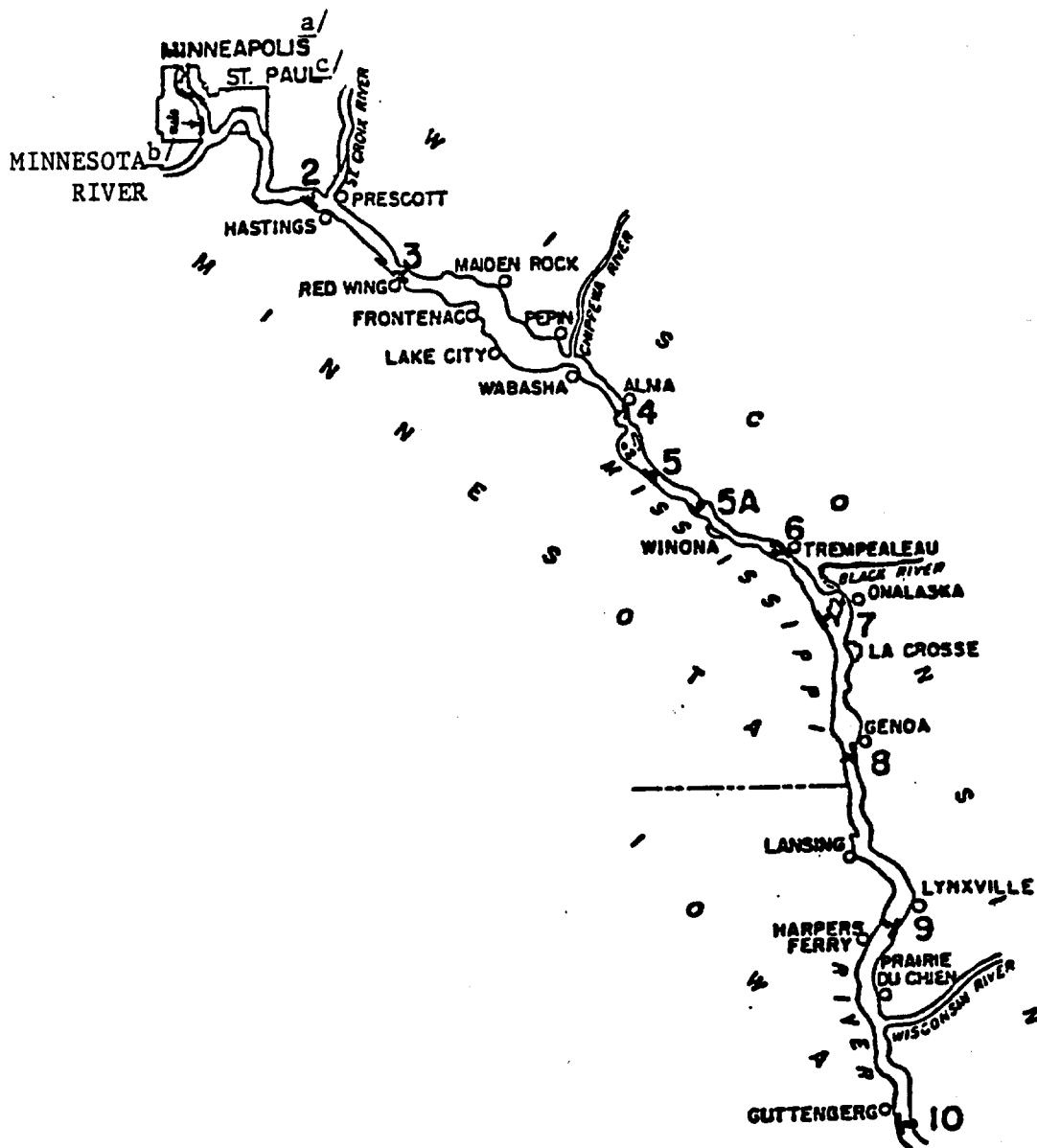
consistent between graphs. The reader should note the specific scale of each graph before making comparisons.

## 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

### Twin Cities Waterborne Movement

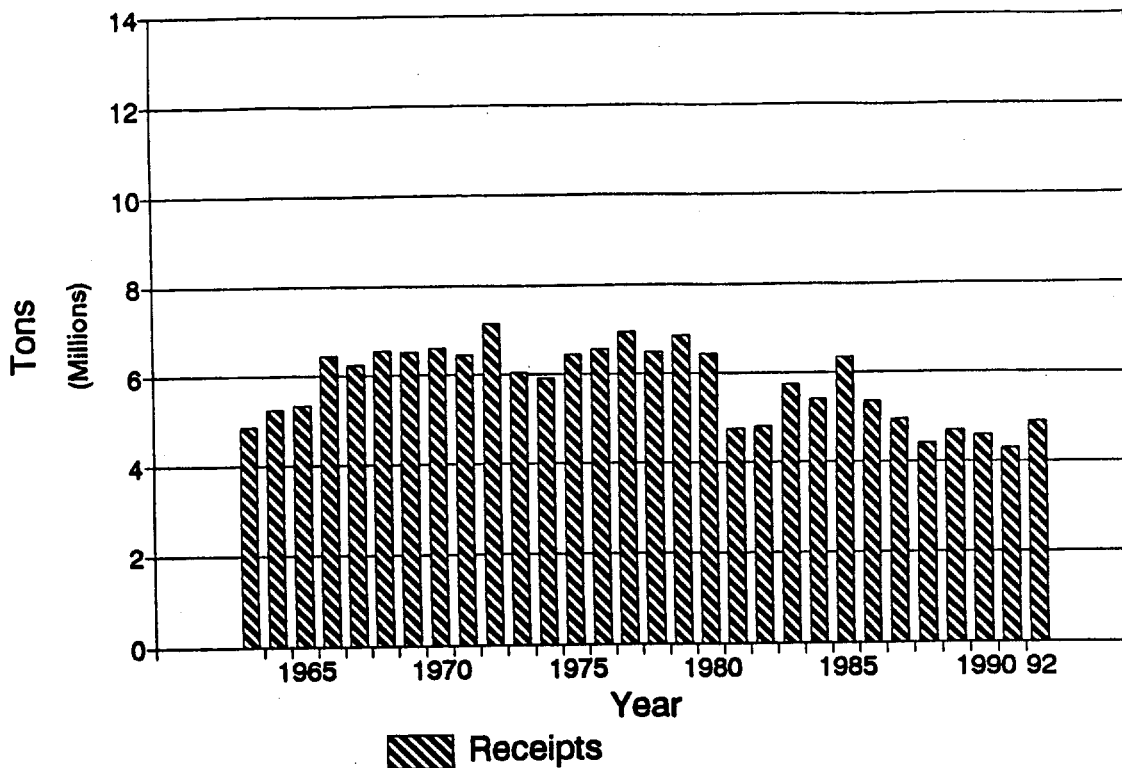
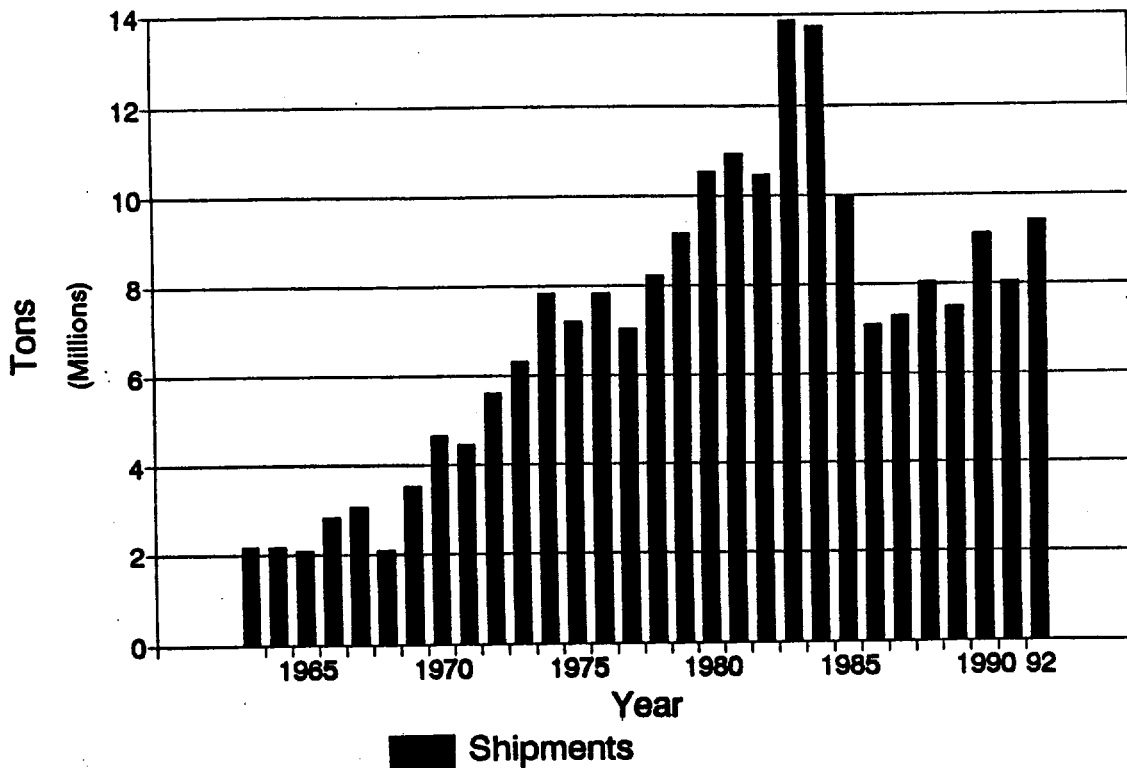


Figure 5

### Twin Cities Waterborne Movement



## 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 be moved 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

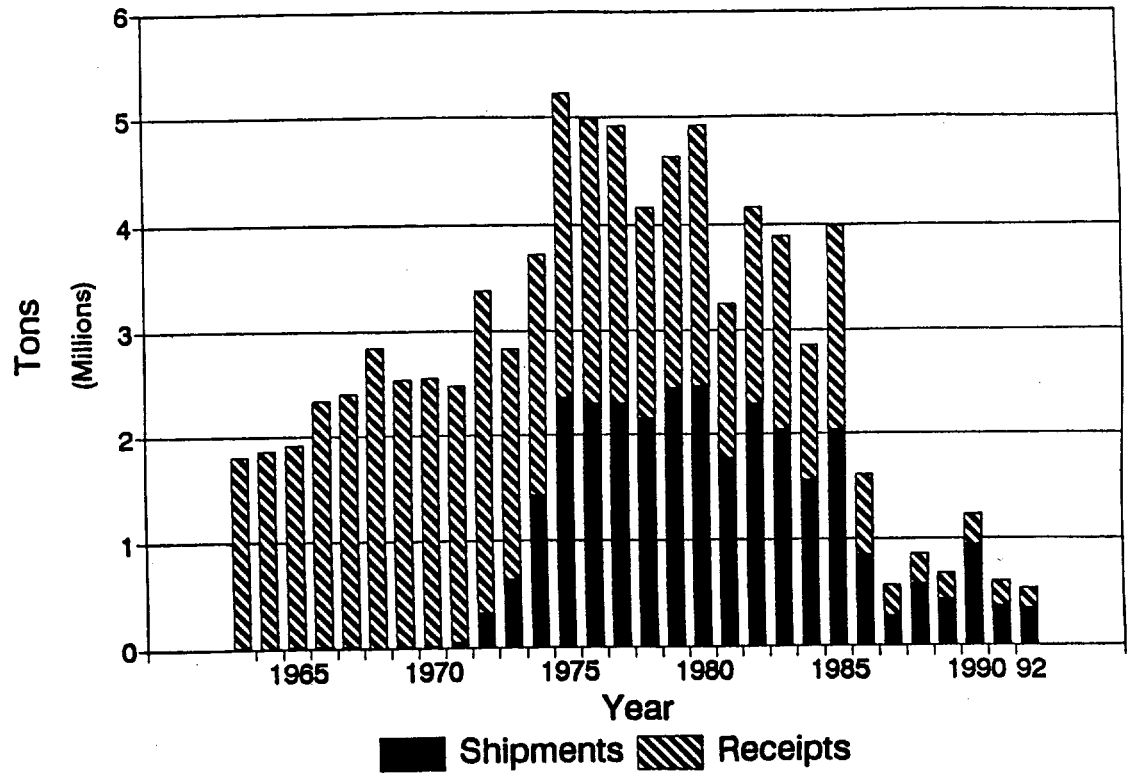
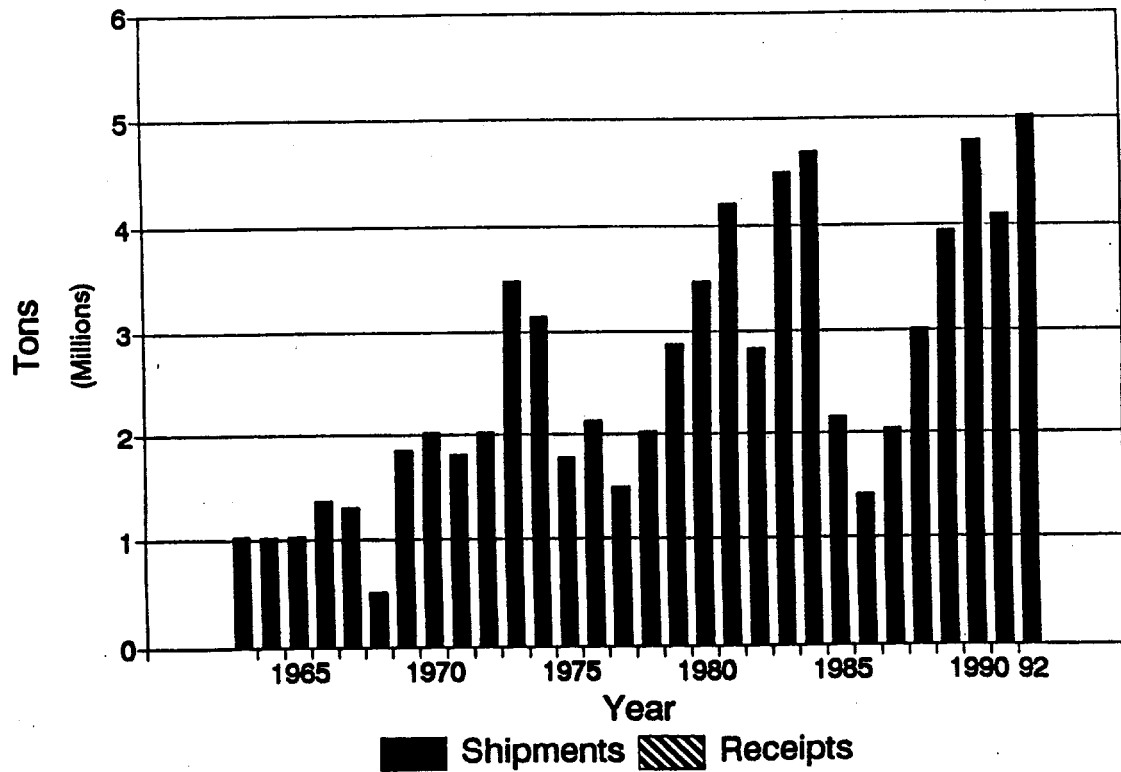


Figure 7

### 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

---

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

Figure 8

### TC Waterborne Wheat Movement

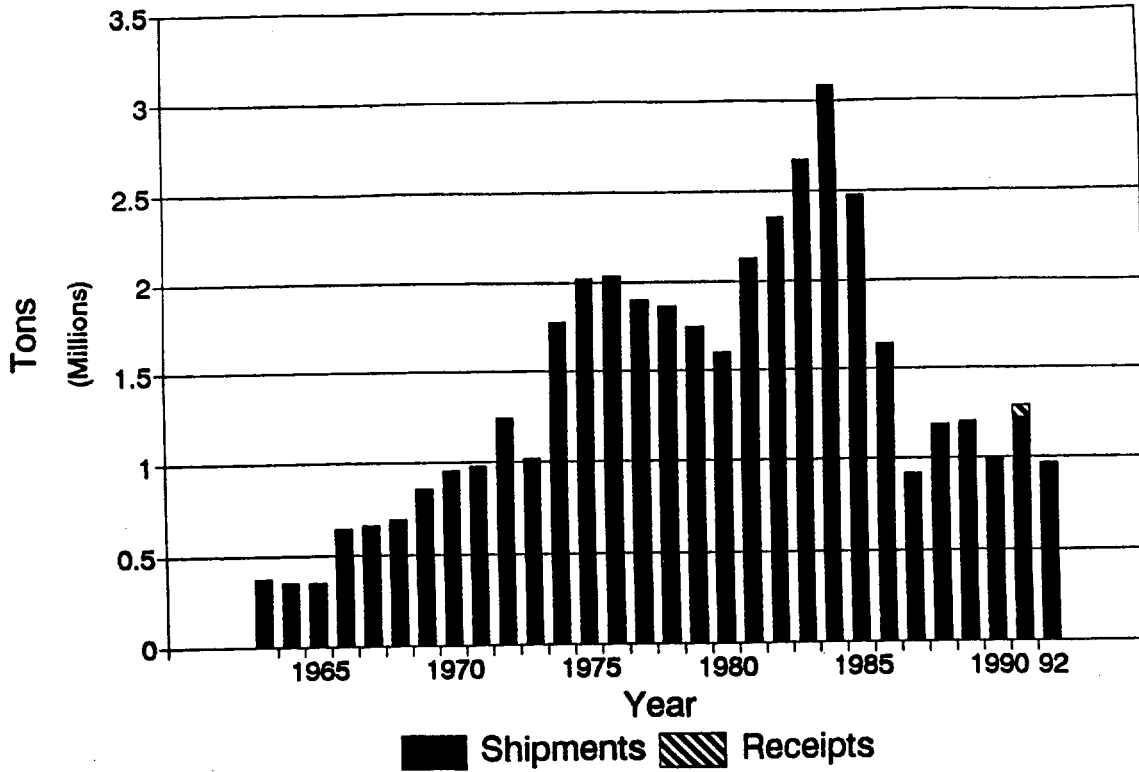
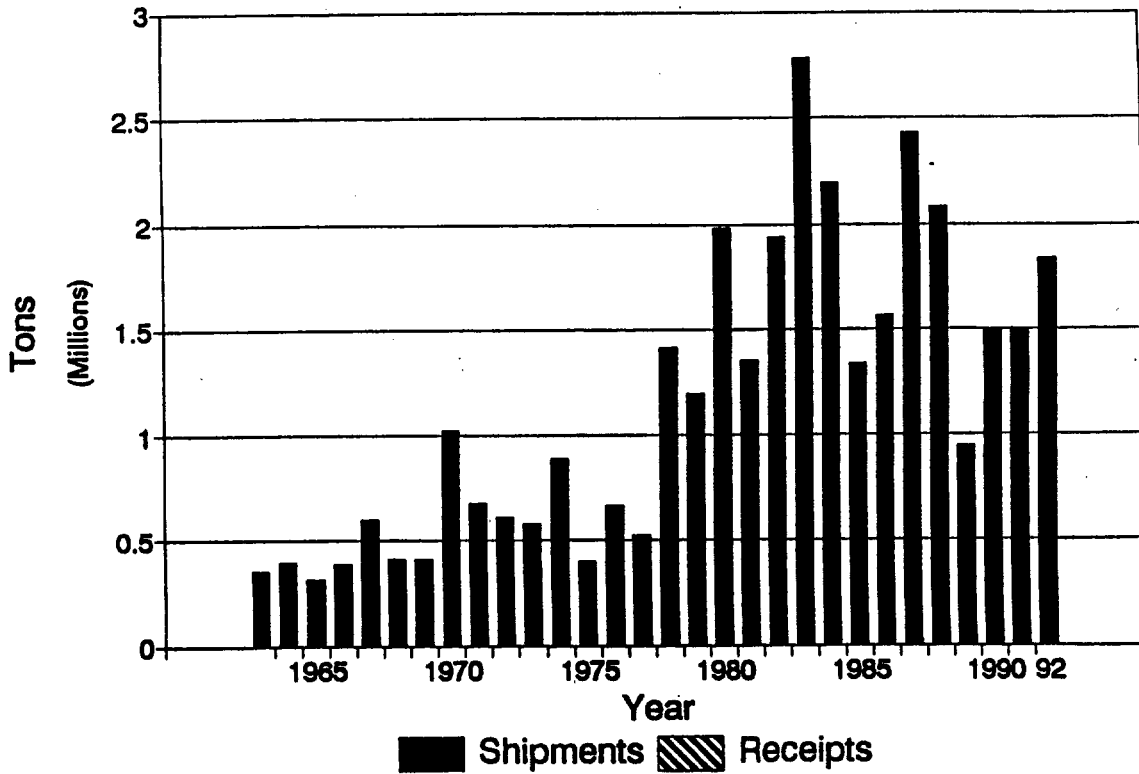


Figure 9

### 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

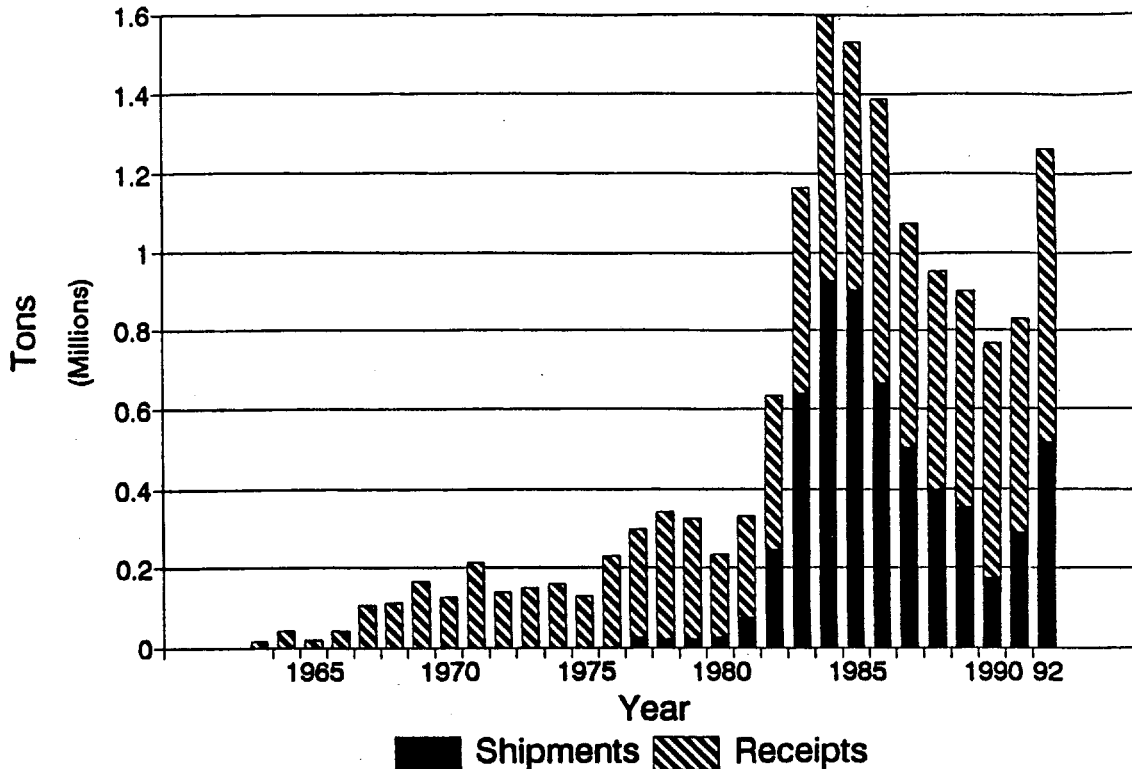
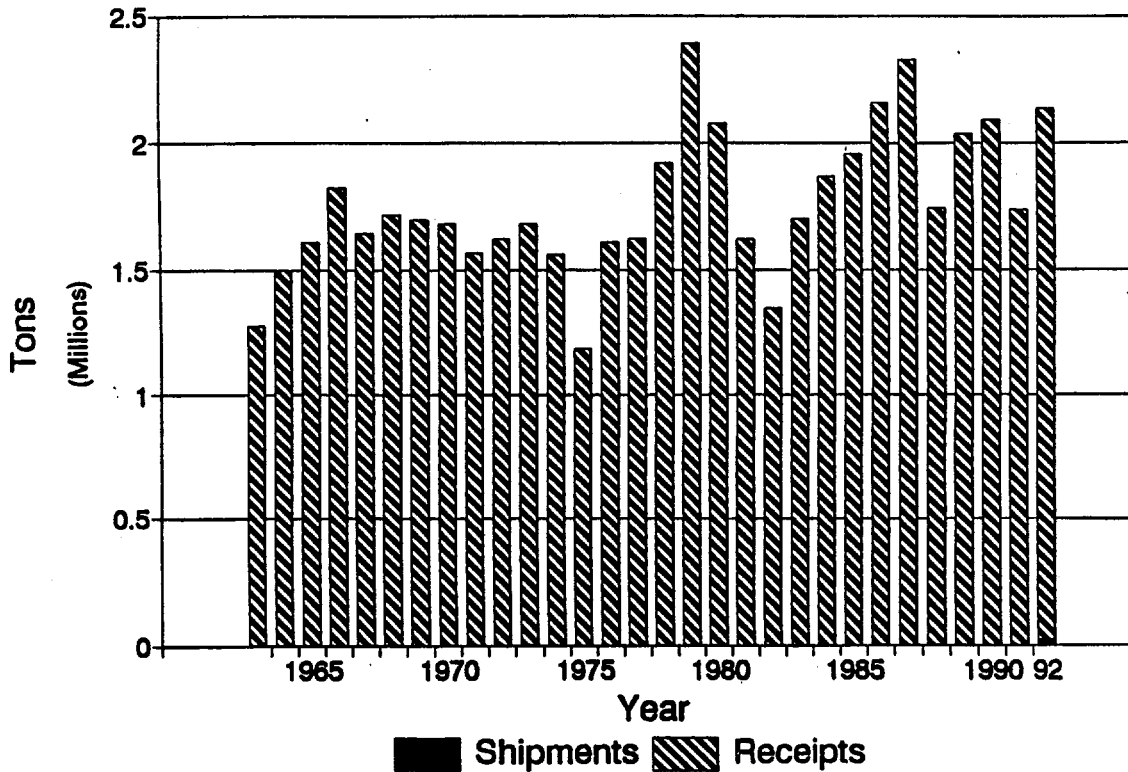


Figure 11

### 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

### TC Waterborne Salt Movement

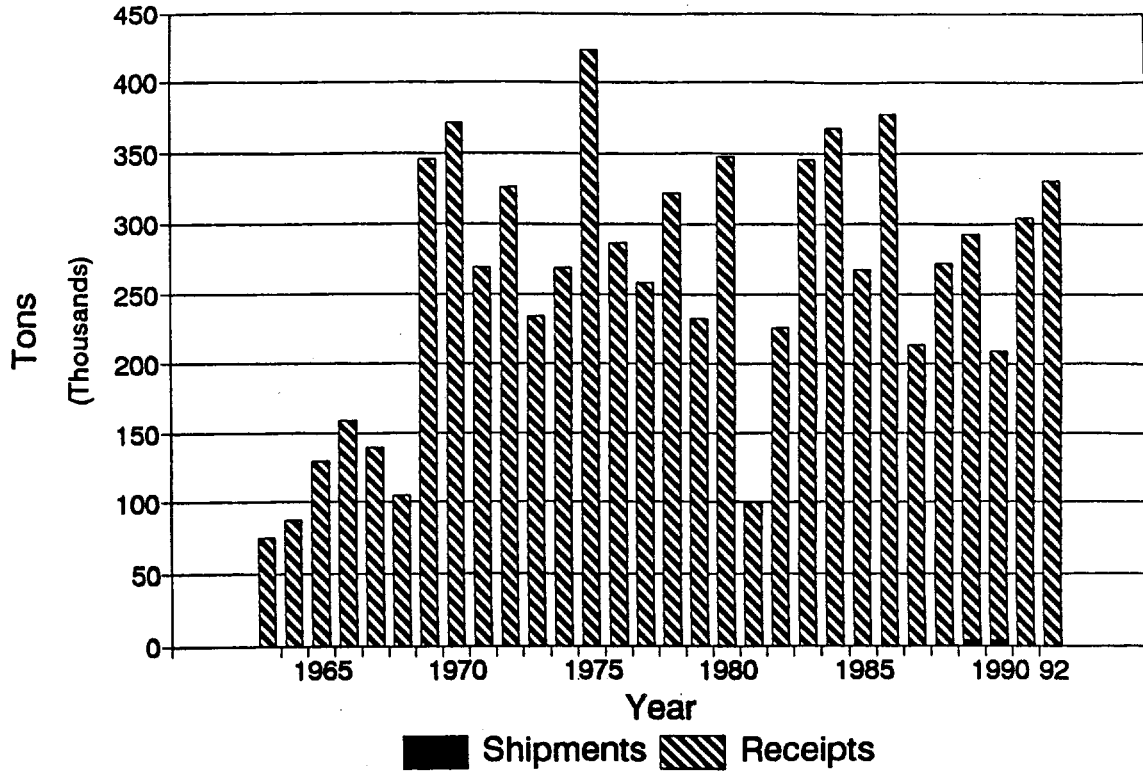
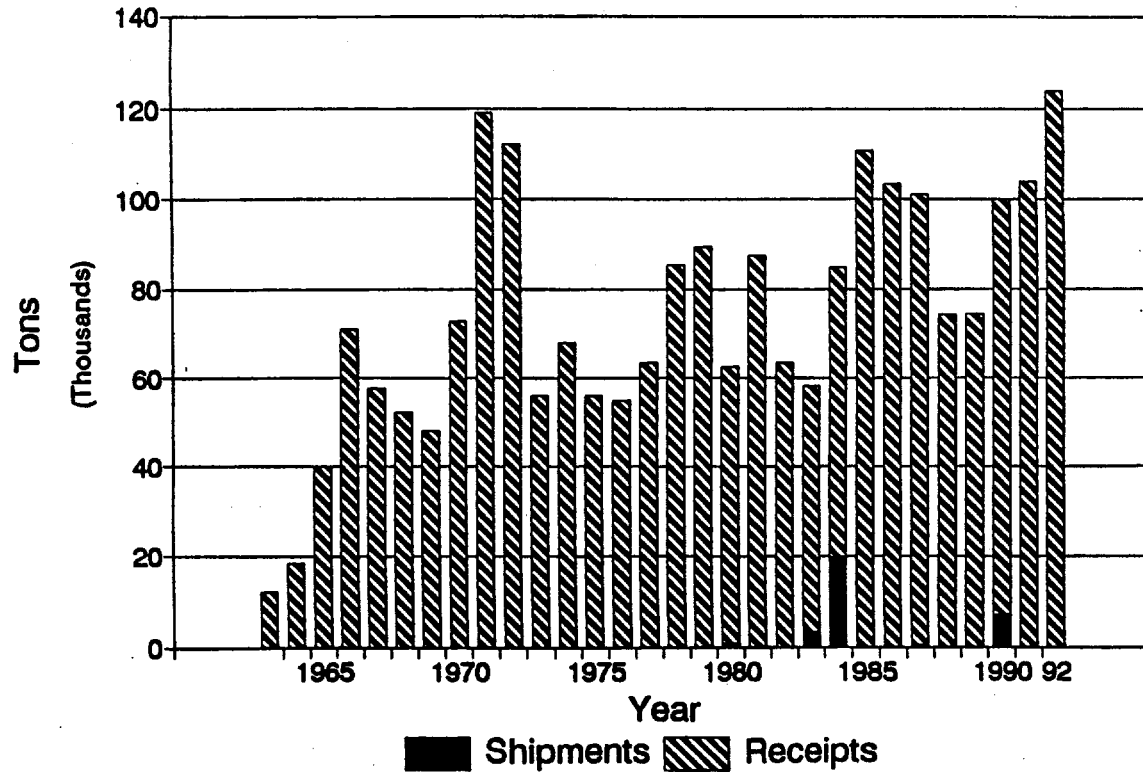


Figure 13

### TC Waterborne Chemical Movement



## **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

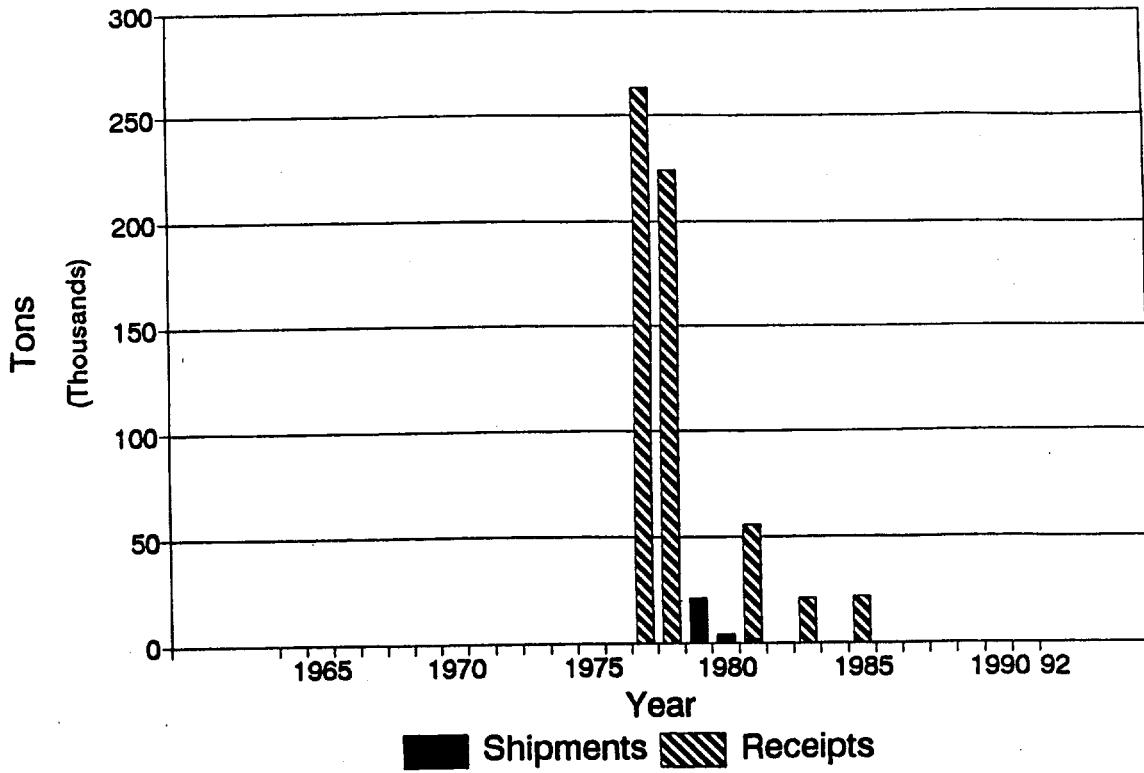
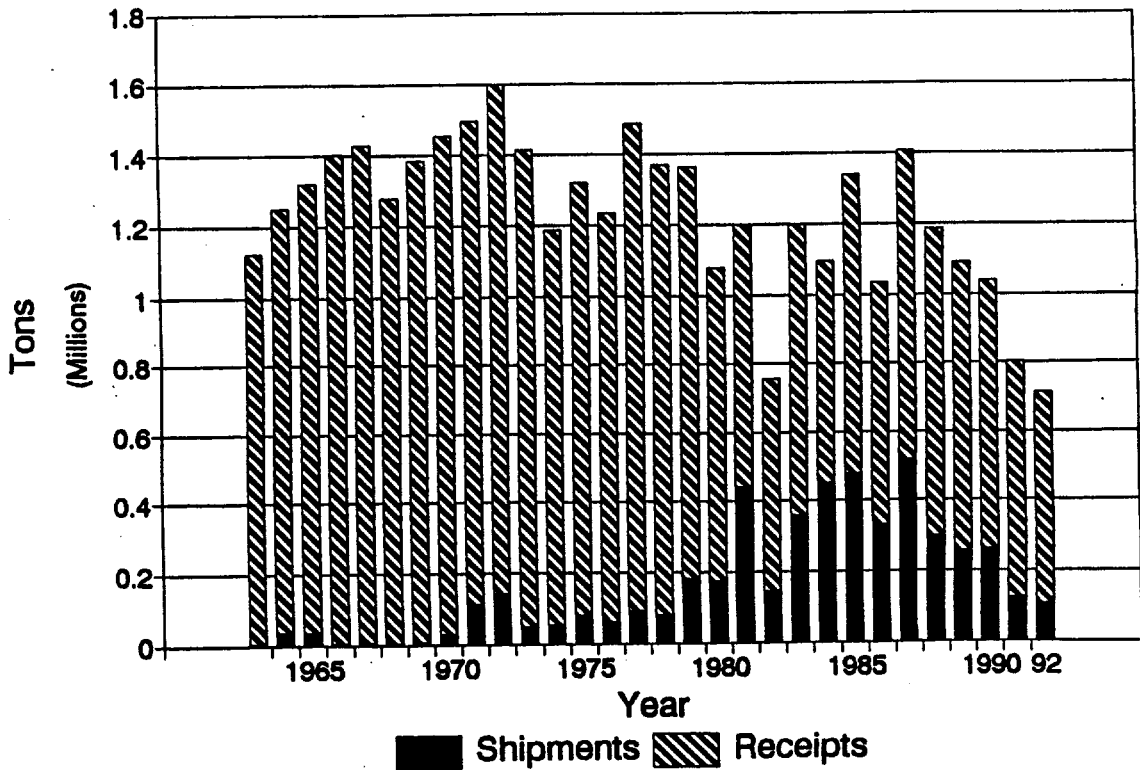


Figure 15

### 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

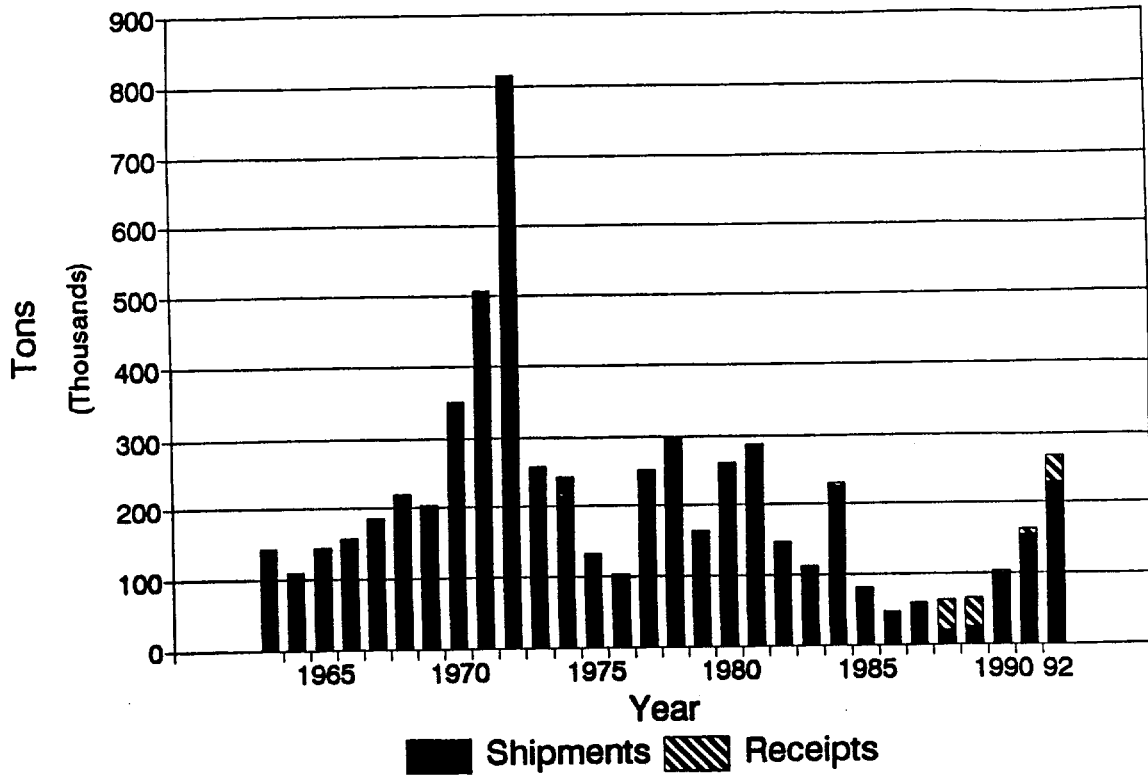


Figure 17

### TC Waterborne Other Ag Prod Movement

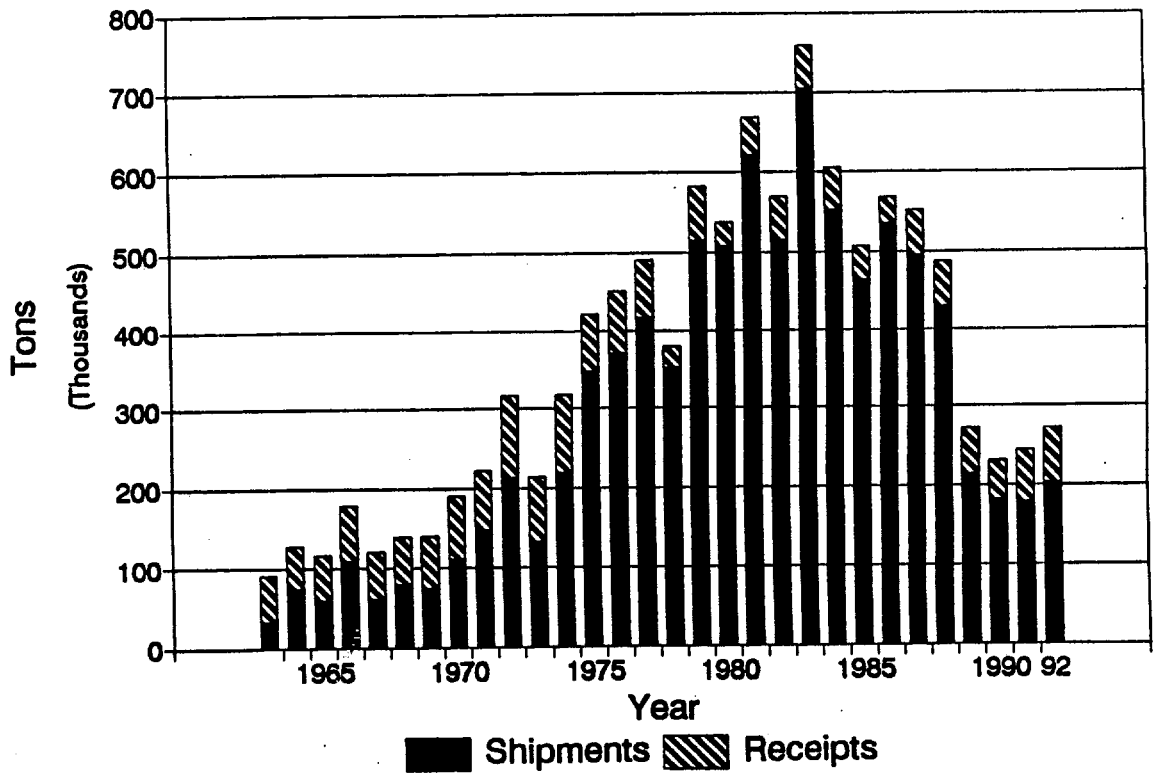


Figure 18

### TC Waterborne Cement Movement

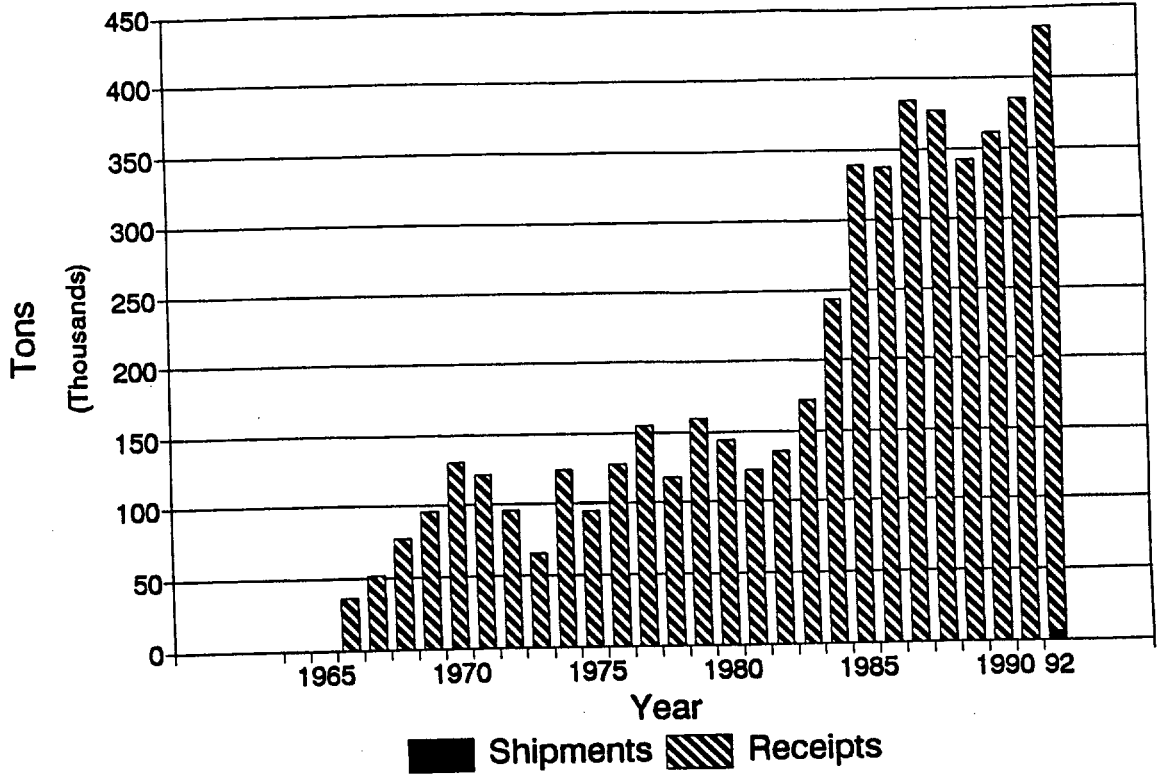
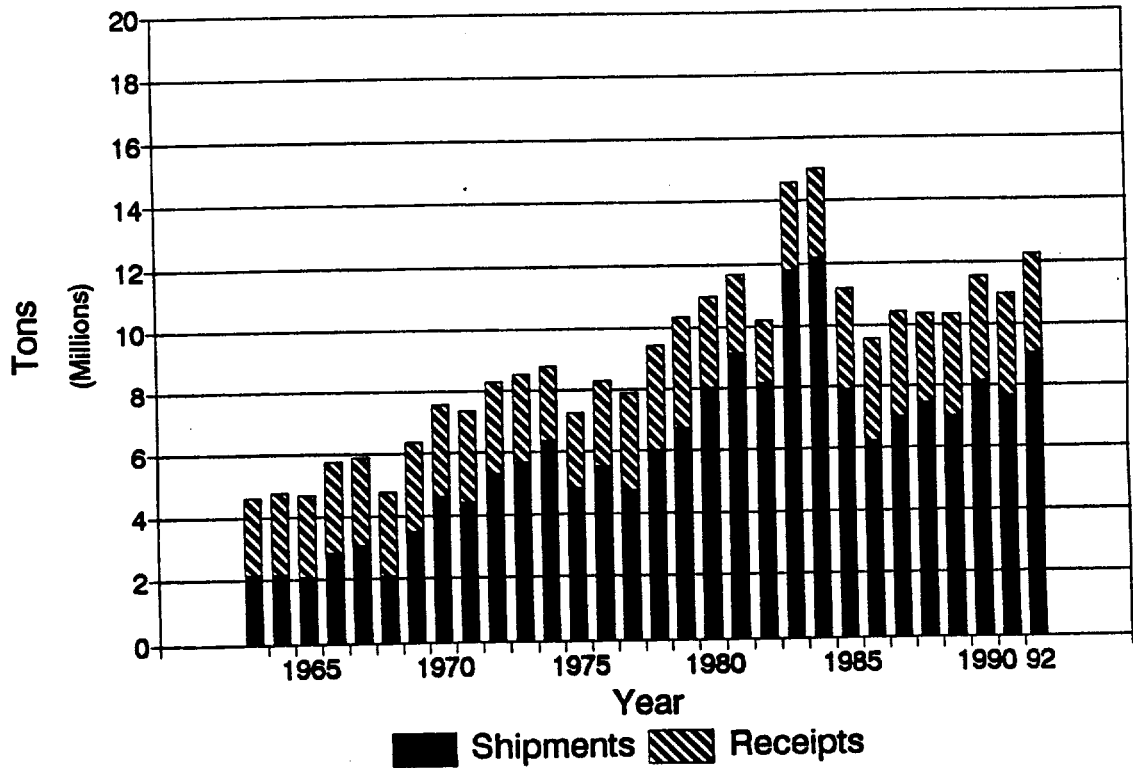


Figure 19

### TC Waterborne Movement (All Less Coal)





## 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.

## BIBLIOGRAPHY

Association of American Railroads. *User Guide for the 1992 ICC Waybill Sample*. Washington, DC, July 1993.

Fruin, Jerry. *Mississippi River Economics Literature Review*. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul. December 1992, 58 pp.

Hill, Robert, Jerry Fruin, and Carol Such. *Bulk Commodity Barge Traffic on St. Paul District Waterways in 1985 Projections and Impacts*. Staff Paper 78-15, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Sept. 1978, 129 pp.

Hill, Robert, Jerry Fruin and Douglas Wilson. *Historical and Projected Volumes of the Twin Cities Waterborne Commerce 1963-1985*. Title V, Report 21. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul. February 1978, 43 pp.

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

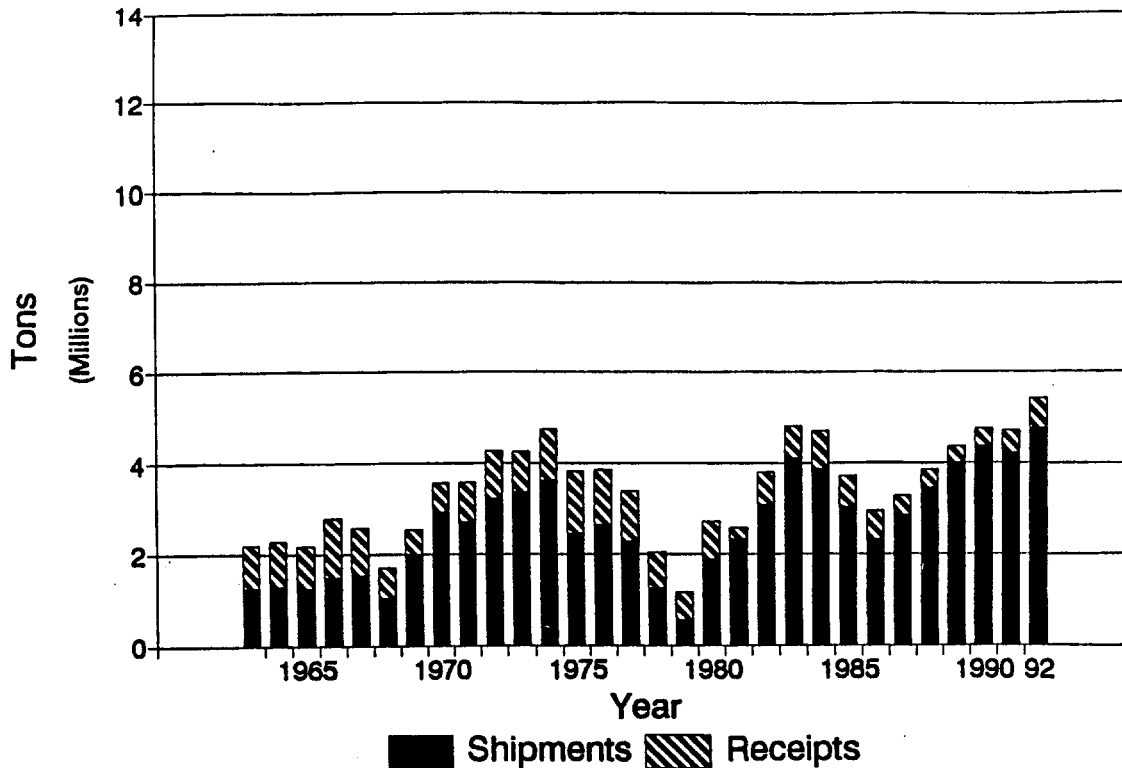


Figure 21

### St. Croix River Waterborne Movement

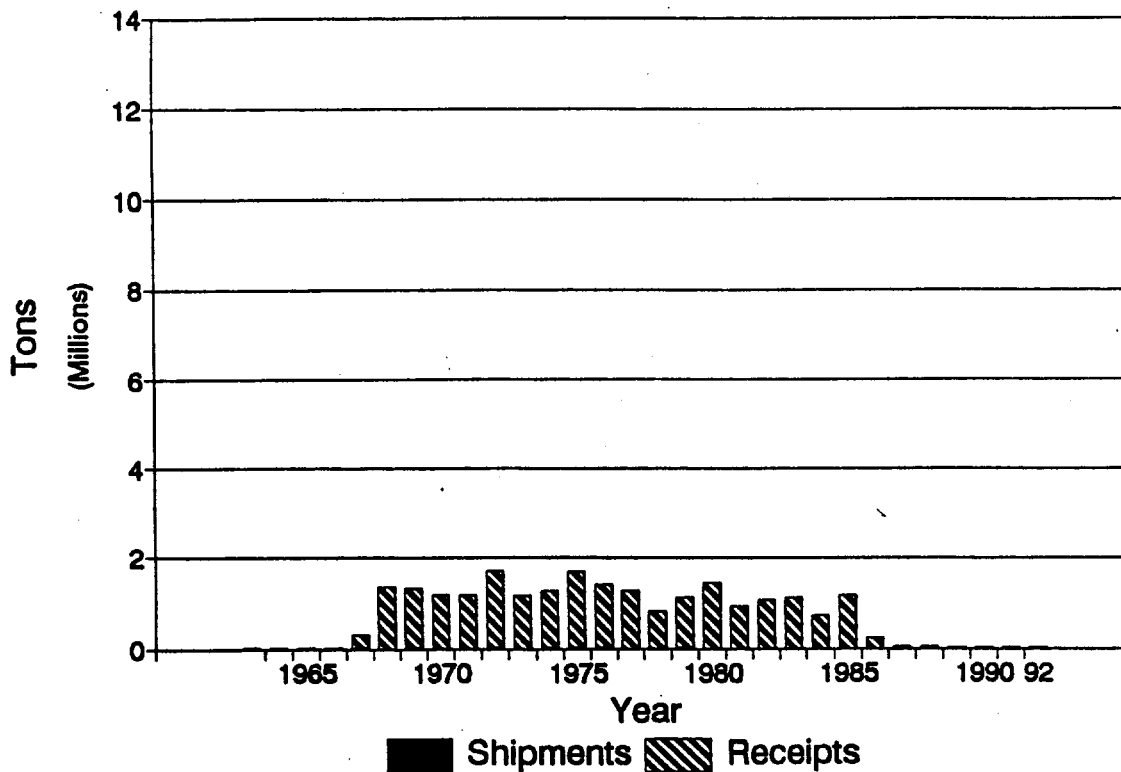


Figure 22

### Minneapolis Waterborne Movement

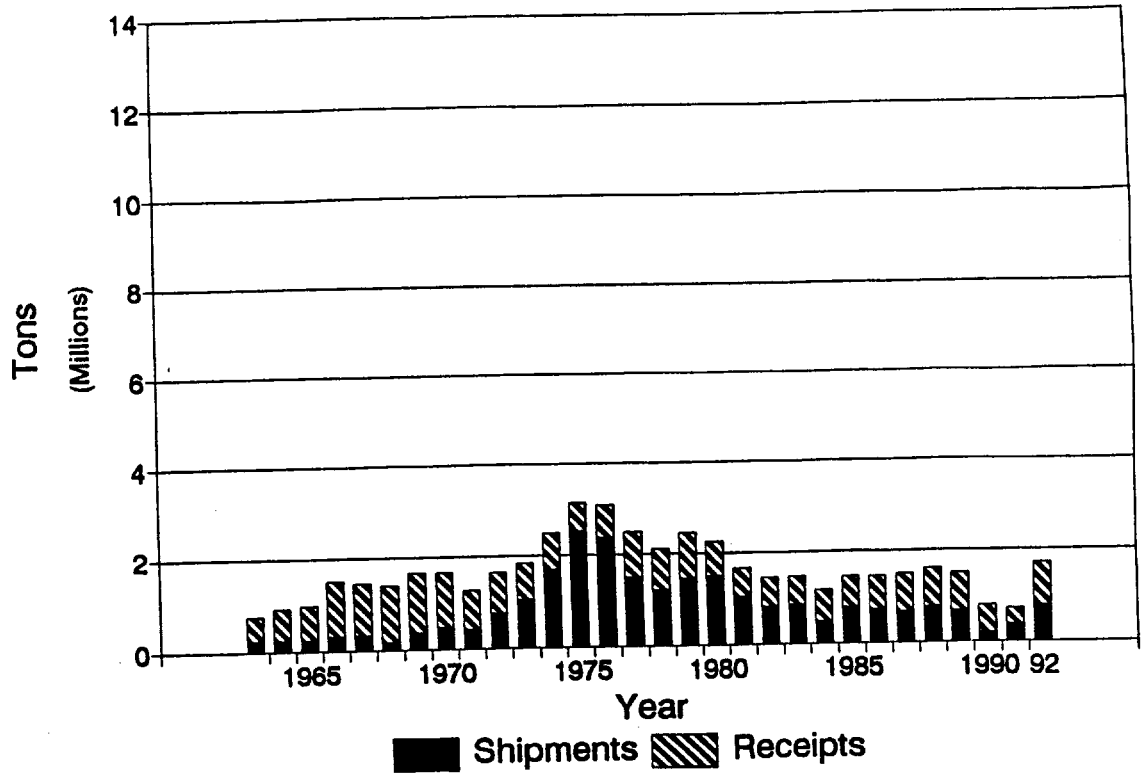
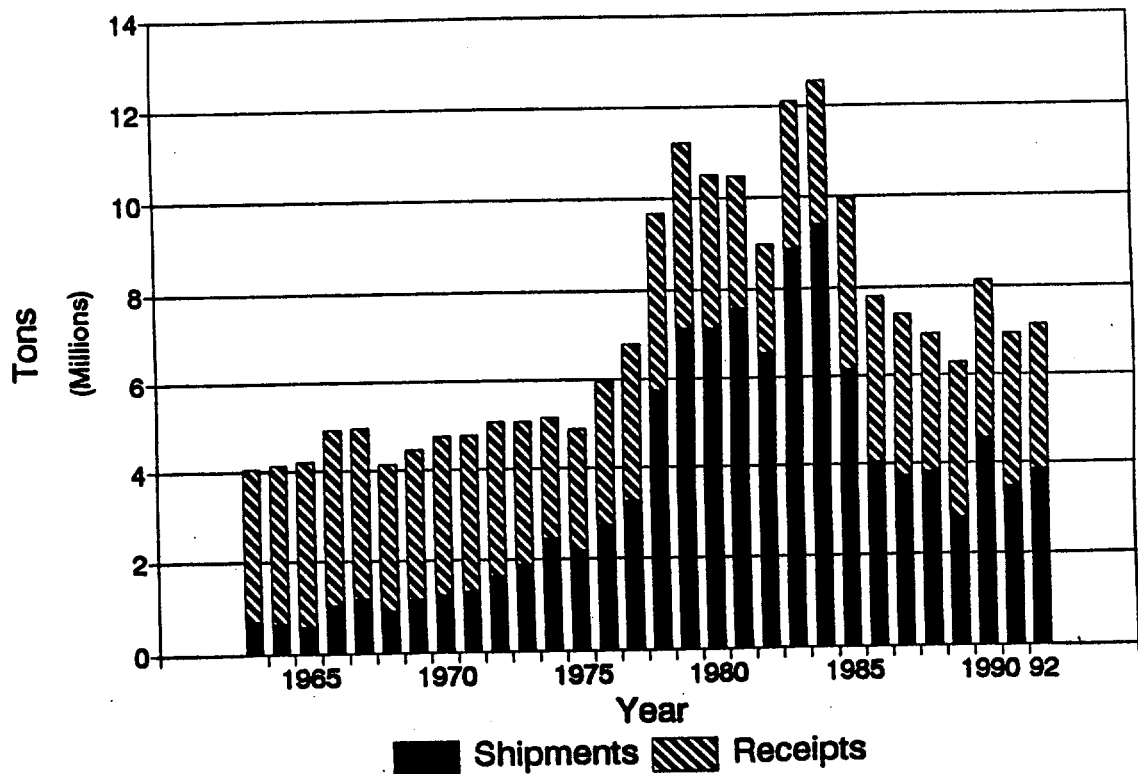


Figure 23

### 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				TOTAL SHIPMENTS	TOTAL
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls		
1963	0	0	0	0	0	71351	0	80494	244020	1038065
1964	0	0	0	0	0	741803	0	104889	173019	1019711
1965	0	0	0	0	0	717714	0	119941	197915	1035570
1966	0	0	0	0	0	863711	0	71583	432541	1367845
1967	0	0	0	0	0	790900	0	108285	399537	1298622
1968	0	0	0	0	0	277857	0	28449	204147	510453
1969	0	0	0	0	0	1175110	0	126649	550729	1852488
1970	0	0	0	0	0	1458103	0	113208	449875	2021186
1971	0	0	0	0	0	1358380	0	67178	371274	1796832
1972	0	0	0	0	0	1557881	0	90239	380268	2028388
1973	0	0	0	0	0	2367081	0	165619	953342	3486052
1974	0	0	0	0	0	1860129	0	87354	1196223	3143706
1975	0	0	0	0	0	1028678	0	77685	672831	1780174
1976	0	0	0	0	0	1177703	0	82876	871347	2132026
1977	0	0	0	0	0	868534	0	35438	582034	1484006
1978	0	0	0	0	0	527428	0	145852	1346039	2019319
1979	0	0	0	0	0	216506	0	498095	2162761	2878362
1980	0	0	2984	0	2984	839390	0	534675	2104010	3478275
1981	0	0	0	5864	5864	1259676	0	432167	2519649	4211492
1982	0	0	0	0	0	1372970	0	180268	1273808	2827046
1983	4415	0	0	0	4415	2081122	0	159519	2258922	4499563
1984	0	0	0	1546	1546	1910845	0	96633	2686846	4694324
1985	0	0	0	2965	2965	1217983	0	37726	899386	2155105
1986	2884	0	0	4448	7332	823462	0	7506	579398	1410366
1987	1507	0	0	3125	4632	1220610	0	41010	777536	2039156
1988	0	0	0	0	0	1718886	0	92567	1197826	3009279
1989	0	0	1342	0	1342	2715396	0	70151	1151872	3937419
1990	2000	1000	0	0	3000	3038000	0	10000	1752000	4800000
1991	0	0	1000	2000	3000	2845000	0	83000	1370000	4098000
1992	0	0	0	8000	8000	3107000	0	309000	1618000	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 SHIPMENTS					TOTAL
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	Mn River	St. Croix	Mpls	St. Paul	SHIPMENTS	
1963	0	0	0	0	0	197967	0	44320	106398	0	0	0	106398	350685	350685	350685
1964	0	0	0	0	0	267390	0	28320	95590	0	0	0	95590	391300	391300	391300
1965	0	0	0	0	0	235978	0	30555	48436	0	0	0	48436	314969	314969	314969
1966	0	0	0	0	0	241283	0	57412	88174	0	0	0	88174	386869	386869	386869
1967	0	0	0	0	0	338839	0	88204	190289	0	0	0	190289	598432	598432	598432
1968	0	0	0	0	0	273286	0	10613	126951	0	0	0	126951	410850	410850	410850
1969	0	0	0	0	0	314280	0	16234	79715	0	0	0	79715	410209	410209	410209
1970	0	0	0	0	0	782070	0	77077	164829	0	0	0	164829	1023976	1023976	1023976
1971	0	0	0	0	0	542967	0	32868	101173	0	0	0	101173	677108	677108	677108
1972	0	0	0	0	0	490846	0	17248	102289	0	0	0	102289	610483	610483	610483
1973	0	0	0	0	0	388960	0	23018	165522	0	0	0	165522	578500	578500	578500
1974	0	0	0	0	0	527572	0	25018	333533	0	0	0	333533	886123	886123	886123
1975	0	0	0	0	0	225954	0	1416	170078	0	0	0	170078	397448	397448	397448
1976	0	0	0	0	0	341108	0	37123	287149	0	0	0	287149	665380	665380	665380
1977	0	0	0	1563	1563	174718	0	23164	322414	0	0	0	322414	520296	520296	521879
1978	0	0	0	0	0	254562	0	90895	1090647	0	0	0	1090647	1416204	1416204	1416204
1979	0	0	0	3027	3027	75279	0	160155	960024	0	0	0	960024	1195458	1195458	1198485
1980	0	0	0	1483	1483	487819	0	128586	1368268	0	0	0	1368268	1984773	1984773	1986256
1981	1655	0	0	1336	2991	458585	0	104373	793067	0	0	0	793067	1356025	1356025	1359016
1982	0	0	0	3063	3063	775534	0	171718	987201	0	0	0	987201	1942453	1942453	1945536
1983	0	0	0	0	0	1170776	0	183818	1421147	0	0	0	1421147	2785741	2785741	2785741
1984	0	0	0	1591	1591	1039235	0	88994	1066058	0	0	0	1066058	2184287	2184287	2195878
1985	0	0	1450	1529	2979	737310	0	43271	554717	0	0	0	554717	1335298	1335298	1338277
1986	1520	0	0	1600	3120	740312	0	32381	796864	0	0	0	796864	1569557	1569557	1572677
1987	1351	0	0	2518	3869	1157767	0	54145	1222483	0	0	0	1222483	2434395	2434395	2438264
1988	0	0	0	2440	2440	1181277	0	42909	862495	0	0	0	862495	2086681	2086681	2089121
1989	0	0	0	0	0	573625	0	11725	355847	0	0	0	355847	941197	941197	941197
1990	1000	0	0	0	1000	856000	0	6000	640000	0	0	0	640000	1502000	1502000	1503000
1991	0	0	0	0	0	942000	0	48000	498000	0	0	0	498000	1489000	1489000	1489000
1992	1000	0	0	0	1000	1093000	0	141000	605000	0	0	0	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

Year	WHEAT				TOTAL RECEIPTS				TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	0	0	0	0	0	0	0	0	13171	0	46280	196089	373760
1964	0	0	0	0	0	0	0	0	140815	0	50611	161880	353316
1965	0	0	0	0	0	0	0	0	151715	0	32913	170129	354757
1966	0	0	0	0	0	0	0	0	204285	0	88879	352824	643988
1967	0	0	0	0	0	0	0	0	258158	0	76565	332486	665207
1968	0	0	0	0	0	0	0	0	244158	0	68218	383169	695545
1969	0	0	0	0	0	0	0	0	331688	0	144204	386435	862327
1970	0	0	0	0	0	0	0	0	400021	0	184557	374350	958928
1971	0	0	0	0	0	0	0	0	465993	0	152156	363951	982100
1972	0	0	0	0	0	0	0	0	623120	0	105458	513161	1241739
1973	0	0	0	0	0	0	0	0	432628	0	154304	437217	1024150
1974	0	0	0	0	0	0	0	0	1000040	0	228141	547622	1775803
1975	0	0	0	0	0	0	0	0	1013515	0	358808	646170	2018593
1976	0	0	0	0	0	0	0	0	983770	0	252134	789223	2035127
1977	0	0	0	520	0	0	0	520	1014493	0	215191	668171	1897855
1978	0	0	0	0	0	0	0	0	459047	0	218222	1184628	1861897
1979	0	0	0	2789	0	0	0	2789	246819	1311	163081	1330330	1741541
1980	2780	0	0	3604	0	0	0	6384	495214	0	93135	1014999	1603348
1981	1318	0	0	3028	0	0	0	4346	527082	0	191884	1411168	2134490
1982	4496	0	0	0	0	0	0	4496	830945	0	251471	1273290	2360202
1983	3054	0	0	0	0	0	0	3054	702173	0	146703	1819484	2671414
1984	0	0	0	2889	0	0	0	2889	791674	0	160530	2130440	3085543
1985	0	0	0	0	0	0	0	0	902161	0	79494	1494405	2476060
1986	0	0	0	1442	0	0	0	1442	673477	0	93360	875497	1643776
1987	0	0	0	0	0	0	0	0	428944	0	44502	453089	926535
1988	0	0	0	0	0	0	0	0	471637	0	74439	638768	1184844
1989	0	0	0	0	0	0	0	0	684284	0	61910	455595	1201769
1990	0	5000	0	0	0	0	0	5000	394000	0	26000	572000	992000
1991	27000	0	14000	24000	0	0	0	65000	523000	0	68000	634000	1225000
1992	0	0	0	11000	0	0	0	11000	406000	0	80000	475000	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 RECEIPTS			Mpls	St. Croix	Mn River	St. Croix	Mpls	St. Paul	TOTAL SHIPMENTS		
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	St. Paul							St. Paul	St. Paul	St. Paul
1963	0	0	0	0	0	0	0	0	87952	0	19537	36358	143847	143847	
1964	0	0	0	0	0	0	0	0	82953	0	3053	22212	108218	108218	
1965	0	0	0	0	0	0	0	0	115138	0	3164	26876	145178	145178	
1966	0	0	0	0	0	0	0	0	86510	0	14475	54676	158661	158661	
1967	0	0	0	0	0	0	0	0	103793	0	19272	63205	186270	186270	
1968	0	0	0	0	0	0	0	0	148193	0	23613	48710	220516	220516	
1969	0	0	0	0	0	0	0	0	117011	0	51908	35940	204559	204559	
1970	0	0	0	0	0	0	0	0	221104	0	54148	76314	351564	351564	
1971	0	0	0	0	0	0	0	0	290017	0	69275	147171	506463	506463	
1972	0	0	0	0	0	0	0	0	510349	0	153757	150568	814674	814674	
1973	0	0	0	0	0	0	0	0	124410	0	50051	83951	258412	258412	
1974	0	0	0	0	0	0	0	0	144067	0	27738	71212	243017	243017	
1975	0	0	0	0	0	0	0	0	48100	0	29980	55221	133311	133311	
1976	0	0	0	0	0	0	0	0	41636	0	40030	21726	103392	103392	
1977	0	0	0	0	0	0	0	0	77236	0	64988	110513	252737	252737	
1978	0	0	0	0	0	0	0	0	14893	0	87580	197733	300206	300206	
1979	0	0	0	0	0	0	0	0	5078	0	37638	121485	164202	164202	
1980	0	0	0	0	0	0	0	0	24200	0	26325	210174	260699	260699	
1981	700	0	0	0	0	0	0	0	41780	0	60376	186810	288966	288966	
1982	0	0	0	0	0	0	0	700	53452	0	26393	66840	146685	146685	
1983	0	0	0	0	0	0	0	0	54804	0	10852	46895	112351	112351	
1984	4899	0	0	0	0	0	0	6193	30863	0	11092	184070	225845	225845	
1985	0	0	0	0	0	0	0	0	42460	0	1240	38840	82340	82340	
1986	0	0	0	0	0	0	0	0	5457	0	6961	35072	47490	47490	
1987	0	0	0	0	0	0	0	0	7030	0	21375	31107	59512	59512	
1988	0	0	20420	0	0	0	0	0	5456	0	8164	6495	20117	64989	
1989	2661	0	0	24452	44672	0	0	0	0	0	11253	13808	25062	65432	
1990	3000	0	1000	37709	40370	4000	0	21000	0	0	16000	63000	100000	104000	
1991	0	0	3000	6000	9000	0	0	76000	0	0	4000	73000	155000	164000	
1992	0	0	2000	37000	39000	0	0	99000	0	0	62000	69000	230000	269000	

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

Table 5

Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

Year	COAL					TOTAL RECEIPTS					TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	TOTAL	Mn River	St. Croix	Mpls	St. Paul	TOTAL	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	739062	17939	133315	906736	1797052	0	0	0	1415	1415	0	0	0	1415	1798467
1964	806431	715	153590	902520	1863256	0	0	0	0	0	0	0	0	0	1863256
1965	665939	2796	218608	1025199	1912542	0	0	0	4085	4085	0	0	0	4085	1916627
1966	938175	2908	484240	936344	2341367	0	0	1359	9060	10419	0	0	0	10419	2351786
1967	684004	313067	483110	925550	2405731	0	305	0	0	305	0	0	0	305	2406036
1968	440377	1343257	492967	559022	2835623	0	0	0	0	0	0	0	0	0	2835623
1969	248573	1313309	542805	433606	2538293	0	5996	0	0	5996	0	0	0	5996	2544289
1970	375034	1195484	414928	596279	2551725	0	0	0	10872	10872	0	0	0	10872	2562597
1971	543155	1199602	176637	519599	2433293	0	0	0	44925	44925	0	0	0	44925	2478218
1972	723965	1730675	156334	444279	3055253	0	4067	0	63033	320577	0	0	0	63033	3375830
1973	638577	1143614	103035	308861	2182407	0	0	0	87066	87066	0	0	0	87066	2835897
1974	756839	1281486	7277	256877	2302479	5896	8286	1304360	109562	1428104	0	0	0	109562	3730583
1975	909050	1887634	26350	248746	2870780	49134	1494	1935331	373203	2359162	0	0	0	373203	5229942
1976	772840	1418151	66495	434915	2892501	30653	1338	1730042	545231	2307264	0	0	0	545231	4999765
1977	822141	1268855	135976	396492	2623464	21917	0	980350	1323003	2305270	0	0	0	1323003	4928734
1978	579536	822297	80587	528795	2011215	0	0	537043	1617856	2154899	0	0	0	1617856	4166114
1979	512565	1140243	33366	508006	2194180	0	0	436284	2012156	2448440	0	0	0	2012156	4642620
1980	508435	1426654	105793	434725	2476907	0	0	482013	1981113	2463126	0	0	0	1981113	4939733
1981	59601	935872	89915	397824	1483212	0	0	0	1765709	1765709	0	0	0	1765709	3248921
1982	348635	1064305	111597	348914	1873751	0	0	0	2285823	2285823	0	0	0	2285823	4159574
1983	212641	1136456	58776	446251	1854124	1540	0	0	2049417	2050857	0	0	0	2049417	3905081
1984	244789	724190	3191	327037	1299207	1640	0	0	1552685	1554325	0	0	0	1552685	2853532
1985	227254	1189639	10456	530749	1959088	0	0	466385	1565865	2032250	0	0	0	1565865	3990348
1986	48036	222113	56614	438572	766335	0	0	416857	428439	845296	0	0	0	428439	1611631
1987	19667	0	63621	212932	296220	0	0	253301	17786	271087	0	0	0	17786	567307
1988	0	21374	59361	202503	283238	0	0	396442	189651	586093	0	0	0	189651	869331
1989	0	0	75961	175617	251478	0	0	360701	77302	438003	0	0	0	77302	689481
1990	2000	0	79000	208000	287000	3000	0	0	841000	944000	0	0	0	841000	1231000
1991	0	0	102000	141000	243000	0	0	0	374000	374000	0	0	0	374000	617000
1992	0	0	95000	97000	192000	0	0	0	352000	352000	0	0	0	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	St. Paul	SHIPMENTS	TOTAL	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	36466	36466	0	0	0	0	0	36466	
1967	0	0	5655	46152	51807	0	0	0	0	0	51807	
1968	0	0	17091	59913	77004	0	0	0	0	0	77004	
1969	0	0	25712	70273	95985	0	0	0	0	0	95985	
1970	0	0	69146	61324	130470	0	0	0	0	0	130470	
1971	0	0	64146	56982	121128	0	0	0	0	0	121128	
1972	0	0	71935	24148	96083	0	0	0	0	0	96083	
1973	0	0	59194	6108	65302	0	0	0	0	0	65302	
1974	0	0	101853	22759	124612	0	0	0	0	0	124612	
1975	0	0	94755	0	94755	0	0	0	0	0	94755	
1976	0	0	128082	0	128082	0	0	0	0	0	128082	
1977	0	0	155080	0	155080	0	0	0	0	0	155080	
1978	0	0	115921	1415	117336	0	0	0	0	0	117336	
1979	0	0	159340	928	160268	0	0	0	0	0	160268	
1980	0	0	144592	0	144592	0	0	0	0	0	144592	
1981	0	0	120619	1941	122560	0	0	0	0	0	122560	
1982	0	0	134695	1500	136195	0	0	0	0	0	136195	
1983	0	0	171845	0	171845	0	0	0	0	0	171845	
1984	33844	0	188261	21000	243105	0	0	0	0	0	243105	
1985	36399	0	200766	102126	339291	0	0	0	0	0	339291	
1986	16000	0	190651	131286	337937	0	0	0	0	0	337937	
1987	0	0	246358	138500	384858	0	0	0	0	0	384858	
1988	0	0	254609	122953	377562	0	0	0	0	0	377562	
1989	0	0	232813	109186	341999	0	0	0	0	0	341999	
1990	0	0	173000	189000	362000	0	0	0	0	0	362000	
1991	0	0	152000	233000	385000	0	0	0	0	0	385000	
1992	0	0	142000	288000	430000	0	0	0	6000	6000	436000	

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

Table 7

Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

Year	SAND, GRAVEL, ROCK			TOTAL RECEIPTS				TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	Mpls	St. Croix	Mn River	St. Paul	Mpls	St. Croix	St. Paul	TOTAL
1963	0	0	185149	1088251	1273400	0	0	0	0	0	0	1273400
1964	0	0	342191	1157839	1500030	0	0	0	0	0	0	1500030
1965	0	0	335422	1271298	1608720	0	0	0	0	0	0	1608720
1966	0	0	507369	1318319	1825688	0	0	0	0	0	0	1825688
1967	0	0	433157	1206736	1639893	0	0	0	0	0	0	1639893
1968	0	0	527349	1192258	1719807	0	0	0	0	0	0	1719807
1969	5320	0	501868	1191497	1698683	0	0	0	0	0	0	1698683
1970	0	0	413851	1266630	1680281	0	0	0	0	0	0	1680281
1971	0	0	402007	1164347	1566354	0	0	0	0	0	0	1566354
1972	0	0	461450	1159068	1620518	0	0	0	0	0	0	1620518
1973	0	0	434167	1247955	1682122	0	0	0	0	0	0	1682122
1974	0	0	508675	1048389	1558064	0	0	0	0	0	0	1558064
1975	0	0	267658	915683	1183341	0	0	0	0	0	0	1183341
1976	0	0	335346	1270283	1605629	0	0	0	0	0	0	1605629
1977	0	0	468615	1156023	1622638	0	0	0	0	0	0	1622638
1978	0	0	490801	1428897	1919698	0	0	0	0	0	0	1919698
1979	0	0	546344	1843190	2368534	0	0	0	0	0	0	2368534
1980	3021	0	425445	1644970	2073436	0	0	0	0	0	0	2073436
1981	0	0	325166	1296080	1621246	0	0	0	0	0	0	1621246
1982	1496	0	308967	1039653	1347006	0	0	0	0	0	0	1347006
1983	1518	0	336576	1366648	1704742	0	0	0	0	0	0	1704742
1984	1505	0	420040	1451385	1872830	0	0	0	0	0	0	1872830
1985	5822	0	386183	1587843	1959848	0	0	0	0	0	0	1959848
1986	0	0	419630	1736510	2156140	0	0	0	0	0	0	2156140
1987	4732	0	426580	1891283	2322595	0	0	0	0	0	0	2322595
1988	0	0	420479	1323686	1744165	0	0	0	0	0	0	1744165
1989	0	0	450608	1562155	2032763	0	0	0	0	0	0	2032763
1990	18000	0	284000	1907000	2089000	0	0	0	0	0	0	2089000
1991	6000	0	10000	1721000	1737000	0	0	0	0	0	0	1737000
1992	58000	0	632000	1432000	2120000	16000	0	0	0	0	0	2136000

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

Table 8

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

	SALT				TOTAL RECEIPTS				TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	59574	0	628	14416	0	0	0	0	0	0	0	0	74618
1964	61024	0	10005	16717	0	0	0	0	0	0	0	0	87746
1965	81263	0	8138	39854	0	0	0	0	0	0	0	0	129255
1966	103921	0	19266	36036	0	0	0	0	0	0	0	0	159223
1967	126168	0	13336	0	0	0	0	0	0	0	0	0	139504
1968	44596	0	27609	32744	0	0	0	0	0	0	0	0	104949
1969	136914	0	83226	123414	0	0	0	0	0	0	0	0	345554
1970	152761	0	81844	137490	0	0	0	0	0	0	0	0	372095
1971	118768	0	11143	136855	0	0	0	0	0	0	0	0	268766
1972	135833	0	59144	130747	0	0	0	0	0	0	0	0	325724
1973	70190	0	93745	70151	0	0	0	0	0	0	0	0	234086
1974	117137	0	113686	37789	0	0	0	0	0	0	0	0	268612
1975	206779	0	140705	75331	0	0	0	0	0	0	0	0	422815
1976	207640	0	3476	75505	0	0	0	0	0	0	0	0	286621
1977	72536	0	58817	125909	0	0	0	0	0	0	0	0	257962
1978	71142	0	57741	193614	0	0	0	0	0	0	0	0	322497
1979	7022	0	39249	185846	0	0	0	0	0	0	0	0	231917
1980	196821	10803	13350	156422	0	0	0	0	0	0	0	0	347396
1981	0	1600	10524	87982	0	0	0	0	0	0	0	0	100106
1982	61927	0	14507	149843	0	0	0	0	0	0	0	0	226077
1983	107041	0	8952	229899	0	0	0	0	0	0	0	0	345882
1984	116567	0	9392	239557	0	0	0	0	0	0	0	0	367516
1985	39315	0	13920	213645	0	0	0	0	0	0	0	0	266880
1986	137951	0	15869	224025	0	0	0	0	0	0	0	0	377845
1987	84643	0	33156	96251	0	0	0	0	0	0	0	0	214050
1988	109075	0	44037	118186	0	0	0	0	0	0	0	0	271298
1989	56558	0	65042	168423	0	0	0	0	0	0	0	0	290023
1990	77000	0	44000	86000	0	0	0	0	0	0	0	0	207000
1991	164000	0	28000	111000	0	0	0	0	0	0	0	0	304000
1992	147000	0	25000	158000	0	0	0	0	0	0	0	0	330000
					1684	0	0	0	0	0	0	0	0
											1643	0	0
										3000	0	0	0
												3327	0
													283350
													210000
													304000
													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			TOTAL RECEIPTS			TOTAL SHIPMENTS			TOTAL	
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul		SHIPMENTS
1963	30270	0	700	28800	57770	9699	0	2557	21382	33638	91408
1964	28596	0	1560	25186	55342	33112	0	1100	40508	74721	130063
1965	25319	0	0	32566	57885	20431	0	12573	25870	58874	116759
1966	30968	0	0	37835	68901	27053	0	36694	46928	110673	179574
1967	27267	0	1195	32716	61178	26319	0	19253	15681	61253	122431
1968	23526	0	0	38881	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	69947	105035	58230	0	45263	111024	212517	317552
1973	27169	0	0	55223	82392	54419	0	38647	39790	132856	215248
1974	32217	0	0	67842	100159	100422	0	25705	93806	219933	320092
1975	27981	0	0	46571	74452	80482	0	108604	158242	347328	421780
1976	26952	0	0	54517	81169	76392	0	150324	143328	370044	451213
1977	31968	0	0	41113	72981	133270	0	149111	136282	418663	491644
1978	6700	0	0	20239	26939	22828	0	118370	211927	353125	380084
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	42088	48369	42312	0	174834	403657	620803	669172
1982	2878	0	3787	49617	58282	64658	0	107024	341629	513311	569593
1983	12904	0	2952	36605	54761	106362	0	130877	464844	704883	759644
1984	18659	0	0	34616	53475	102098	0	37019	414356	553463	606938
1985	13153	0	1458	29210	49821	116705	0	40053	307468	464226	508047
1986	2721	0	0	29975	32596	70842	0	70895	393787	535124	567720
1987	14482	2731	0	40280	57493	53736	0	68731	371668	494137	551630
1988	12054	0	0	46530	58584	78118	0	38705	312168	428991	487575
1989	11562	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

Year	FERTILIZER					TOTAL RECEIPTS					TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	TOTAL	Mn River	St. Croix	Mpls	St. Paul	TOTAL	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	14150	0	0	2073	16223	0	0	0	0	0	0	0	0	0	16223
1964	37921	0	0	1312	39233	0	0	0	0	0	0	0	0	0	39233
1965	17726	0	0	0	17726	0	0	0	0	0	0	0	0	0	17726
1966	34280	0	0	6351	40631	0	0	0	0	0	0	0	0	0	40631
1967	60431	0	4344	42085	106860	0	0	0	0	0	0	0	0	0	106860
1968	63348	0	0	50117	113465	0	0	0	0	0	0	0	0	0	113465
1969	80683	0	0	83336	164021	0	0	0	0	0	0	0	0	0	164021
1970	68774	0	1171	55320	125285	0	0	0	0	0	0	0	0	0	125285
1971	111688	0	2813	98159	212860	0	0	0	0	0	0	0	0	0	212860
1972	94257	0	3985	39025	137267	0	0	0	0	0	0	0	0	0	137267
1973	86917	0	3938	58365	149220	0	0	0	0	0	0	0	0	0	149220
1974	119926	0	8733	28844	157503	0	0	0	0	0	0	0	0	0	157503
1975	108843	0	2502	17293	128638	0	0	0	0	0	0	0	0	0	128638
1976	129350	0	12651	86901	228902	0	0	0	0	0	0	0	0	0	228902
1977	145335	0	10131	118746	274212	0	0	3063	20651	23714	0	0	20651	23714	287926
1978	103408	0	14510	203430	321348	0	0	0	21857	21857	0	0	21857	21857	343205
1979	79363	0	6243	220282	305868	1583	0	14866	4623	20852	0	0	4623	20852	326720
1980	113204	0	8053	87576	208833	4775	0	25961	0	25961	0	0	0	25961	234794
1981	106385	0	15845	136613	259643	0	0	39661	29753	74189	0	0	29753	74189	332832
1982	220535	0	8967	161401	390803	0	0	41014	206621	247635	0	0	206621	247635	638538
1983	310639	0	6083	208882	525614	2906	0	185745	455967	641712	0	0	455967	641712	1167326
1984	372980	16533	15513	263643	668649	0	0	77261	848468	928635	0	0	848468	928635	1597284
1985	309296	4518	6004	308020	625838	0	0	108381	795394	904775	0	0	795394	904775	1530613
1986	397944	17064	3102	302783	720883	0	0	63158	603290	666448	0	0	603290	666448	1387341
1987	223449	33702	25810	289739	572700	1505	0	160408	342479	504393	0	0	342479	504393	1077093
1988	221757	22563	15070	295875	555265	4639	0	83908	311494	400041	0	0	311494	400041	955306
1989	265593	18100	6080	243438	553211	1397	0	93073	254207	348677	0	0	254207	348677	901898
1990	254000	6000	11000	323000	594000	0	0	59000	116000	175000	0	0	116000	175000	769000
1991	271000	11000	0	260000	542000	0	0	39000	250000	289000	0	0	250000	289000	831000
1992	424000	11000	4000	309000	747000	5000	0	87000	425000	517000	0	0	425000	517000	1264000

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

Table 11

Twin Cities Area Waterborne Movements 1963 - 1992 in Short Tons

	PETROL PRODUCTS				TOTAL RECEIPTS				TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	22622	0	120382	979966	0	0	0	1391	0	0	0	1391	1124361
1964	21618	0	125689	1071283	0	0	0	34961	0	0	0	34961	1253561
1965	34951	0	116458	1135938	0	0	0	35985	0	0	0	35985	1323332
1966	62591	0	126720	1213872	0	0	0	2744	0	0	0	2744	1405927
1967	72673	0	97150	1254499	0	0	0	4319	0	0	0	4319	1428631
1968	46624	0	75258	1156733	0	0	0	2837	0	0	0	2837	1281452
1969	30463	0	99282	1250184	0	0	0	4281	0	0	0	4281	1384210
1970	26890	0	172884	1228304	0	0	0	26769	0	0	0	26769	1455827
1971	29660	0	105981	1248451	0	0	0	112779	0	0	0	112779	1498871
1972	31294	0	68596	1360334	0	0	0	139778	0	0	0	139778	1600002
1973	23219	0	43848	1300342	0	0	2860	44840	0	0	0	47700	1415109
1974	44993	0	44448	1045024	0	0	0	53904	0	0	0	53904	1188369
1975	48043	0	58806	1138789	0	0	0	77892	0	0	0	77892	1323330
1976	21277	0	90041	1062994	0	0	0	62051	0	0	0	62051	1236053
1977	25033	0	103573	1270460	0	0	0	80042	0	0	0	89130	1488196
1978	17737	0	93938	1179232	0	0	10429	67948	0	0	0	78377	1369284
1979	0	0	118416	1065985	0	0	0	180978	0	0	0	180978	1365079
1980	8634	0	36400	863298	0	0	0	174218	0	0	0	174218	1082750
1981	0	0	22839	737940	0	0	0	429440	0	0	0	440619	1201398
1982	65943	0	2487	546609	0	0	0	11179	0	0	0	118232	758191
1983	55894	0	24901	761150	0	0	0	24920	0	0	0	143152	1203523
1984	19300	0	42600	580443	0	0	0	12147	0	0	0	349631	1095191
1985	42297	0	19794	802097	0	0	0	452848	0	0	0	452848	1343476
1986	29659	0	0	677087	6088	0	1612	471618	0	0	0	479298	1038986
1987	70678	0	1629	818055	5851	0	0	296388	0	0	0	332240	1408678
1988	46843	0	32235	808131	0	0	0	516887	0	0	0	518316	1184222
1989	6197	0	1764	825764	0	0	0	283143	0	0	0	297013	1091052
1990	12000	0	18000	750000	12000	0	0	257327	0	0	0	257327	1043000
1991	0	0	0	682000	6000	0	43000	75000	0	0	0	124000	806000
1992	17000	0	0	596000	0	0	0	104000	0	0	0	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 RECEIPTS					TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	1997	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	3828	0	6334	1825	11987	0	0	0	0	0
1964	4219	0	5518	8544	18281	0	0	0	0	0
1965	18577	0	3989	17480	40046	0	0	0	0	0
1966	23348	0	6947	41030	71225	0	0	0	0	0
1967	5602	0	7379	44874	57855	0	0	0	0	0
1968	7176	0	7484	37585	52245	0	0	0	0	0
1969	1333	0	5421	41338	48082	0	0	0	0	0
1970	0	0	7847	65086	72833	0	0	0	0	0
1971	0	0	7871	111134	119005	0	0	0	0	0
1972	1443	0	6598	104228	112289	0	0	0	0	0
1973	0	0	1336	54885	56031	0	0	0	0	0
1974	0	0	0	68033	68033	0	0	0	0	0
1975	0	0	0	55896	55896	0	0	0	0	0
1976	0	0	3043	51789	54832	0	0	0	0	0
1977	0	0	0	63381	63381	0	0	0	0	0
1978	0	0	12254	73253	85507	0	0	0	0	0
1979	0	0	12223	77275	88498	0	0	0	0	0
1980	0	0	5289	56766	62055	0	0	0	0	0
1981	8403	0	7399	71661	87433	0	0	0	576	576
1982	0	0	11575	51825	63400	0	0	0	0	0
1983	0	0	2844	52282	55126	0	0	0	0	0
1984	0	0	9754	55531	65285	0	0	0	3372	3372
1985	1406	0	8780	100460	110846	0	0	0	19941	19941
1986	0	0	6839	96558	103497	0	0	0	0	0
1987	0	0	0	100802	100802	0	0	0	0	0
1988	3655	0	0	70283	74138	0	0	0	519	519
1989	0	0	0	74500	74500	0	0	0	0	0
1990	0	0	2000	91000	93000	0	0	0	0	0
1991	1000	0	5000	96000	104000	0	0	1000	6000	7000
1992	0	0	6000	118000	124000	0	0	0	0	0

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

Table 13

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

Year	ALL OTHER					TOTAL					TOTAL SHIPMENTS				
	Mn River	St. Croix	Mpls	St. Paul	RECEIPTS	Mn River	St. Croix	Mpls	St. Paul	TOTAL	Mn River	St. Croix	Mpls	St. Paul	TOTAL
1963	97422	0	72330	356075	525827	119746	0	53890	76725	250361	119746	0	53890	76725	776188
1964	63402	0	70233	349250	482885	39247	0	49284	104396	192927	39247	0	49284	104396	675812
1965	80234	0	85627	114829	280690	34232	0	35168	81072	150472	34232	0	35168	81072	431162
1966	132059	0	78606	271290	481955	63901	0	41340	53932	159173	63901	0	41340	53932	641128
1967	57773	0	68889	223808	350570	25758	60	46323	179789	251930	25758	60	46323	179789	602500
1968	66302	0	100541	146395	313238	49258	0	5310	117574	172142	49258	0	5310	117574	485380
1969	43271	0	66205	79177	188653	49987	0	9773	67993	127753	49987	0	9773	67993	316406
1970	28361	0	54586	76569	159516	29973	0	32548	82368	144889	29973	0	32548	82368	304405
1971	73033	0	90801	74153	237987	14839	0	69586	108158	192583	14839	0	69586	108158	430570
1972	55032	0	77791	98621	231444	105	0	100048	168203	268356	105	0	100048	168203	499800
1973	49896	0	67988	88405	206289	19495	0	51609	80472	151576	19495	0	51609	80472	357865
1974	62187	0	37430	107646	207263	7205	0	9020	52085	68310	7205	0	9020	52085	275573
1975	75711	0	60628	228379	364718	23040	0	22282	37184	82506	23040	0	22282	37184	447224
1976	61769	0	73744	177551	313064	17401	0	80999	43421	141821	17401	0	80999	43421	454885
1977	17391	0	88119	368616	474126	1489	0	33438	14638	49565	1489	0	33438	14638	523691
1978	19283	0	74762	306650	400695	1503	0	11669	4598	17770	1503	0	11669	4598	418465
1979	12663	0	84598	143363	240624	0	0	3700	22782	26482	0	0	3700	22782	267106
1980	20526	0	47113	99796	167435	0	0	11333	16046	27379	0	0	11333	16046	194814
1981	78334	0	45015	151745	275094	0	0	20277	20566	40843	0	0	20277	20566	315937
1982	19889	0	37600	69616	127105	0	0	797	5891	6688	0	0	797	5891	133793
1983	32545	0	19105	136427	188077	0	0	0	25871	25871	0	0	25871	25871	213948
1984	17888	0	19874	166344	204106	0	0	1378	32026	33404	0	0	32026	33404	237510
1985	21532	0	16563	141011	179106	0	0	3929	33557	37486	0	0	33557	37486	216592
1986	15485	0	43399	100753	159637	0	0	2741	47630	50371	0	0	47630	50371	210008
1987	13375	0	49954	76687	140016	6177	0	14119	15063	35359	6177	0	14119	15063	175375
1988	14983	0	23685	108616	147284	0	0	17500	20449	37949	0	0	20449	37949	185233
1989	11531	0	19037	224162	254730	0	0	34677	72449	107126	0	0	72449	107126	361856
1990	12000	0	20000	100000	132000	0	0	61000	101000	162000	0	0	101000	162000	294000
1991	13000	0	34000	124000	171000	0	0	48000	85000	133000	0	0	85000	133000	304000
1992	13000	0	42000	177000	232000	0	0	63000	100000	163000	0	0	100000	163000	395000

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

Table 14

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

	TOTAL RECEIPTS				TOTAL SHIPMENTS				TOTAL	
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul		
1963	968928	17839	518838	3376142	1260286	0	247088	685788	2193162	7073009
1964	1023211	715	708766	3532661	1305320	0	237257	632577	2175154	7440527
1965	924009	2796	768242	3637164	1275208	0	234314	590368	2099890	7432101
1966	1325340	2608	1203048	3897643	1489743	0	308752	1040877	2840372	9269011
1967	1033918	313067	1114315	3776410	1541765	365	338902	1185306	3066338	9304048
1968	691949	1343257	1248299	3271748	1028306	0	159249	903167	2091722	8648975
1969	566354	1313309	1324517	3322701	2019419	5986	363432	1152162	3541009	10067890
1970	673170	1195494	1216037	3515186	2928573	0	476690	1244716	4649969	11249948
1971	898080	1193602	861899	3464909	2727072	0	404911	1328228	4460211	10879481
1972	1077012	1730675	905833	3430297	3238631	4067	765490	1628324	5636512	12780329
1973	895968	1143614	807251	3188225	3398004	0	1042532	1892200	6322736	12357984
1974	1133299	1281486	823102	2683303	3645331	8286	1707336	2457947	7818900	13740080
1975	1373307	1687634	653204	2726888	2468903	1494	2534196	2190821	7196414	13637247
1976	1219628	1418151	712878	3214045	2678663	1338	2373628	2763476	7817105	14381807
1977	1114304	1268855	1019311	3542543	2289657	0	1493831	3257748	7041236	13986249
1978	797808	822297	940514	3935525	1280261	0	1210160	5733233	8223654	14719796
1979	629943	1140243	999779	4101024	568143	1311	1456199	7144087	9169740	16040729
1980	827705	1437457	789019	3375278	1888139	0	1486656	7153194	10525989	16955448
1981	259194	937472	640705	2933972	2334210	0	1034761	7559819	10928790	15700133
1982	729069	1064305	632082	2420861	3095559	0	803805	6589335	10468499	15311836
1983	740451	1136456	632044	3240234	4119777	0	839461	8895350	13854588	19603773
1984	832201	740723	708625	3147296	3879071	0	472907	9387738	13739716	19168561
1985	696474	1194157	665364	3797655	3022687	0	763091	6161050	9966838	16320488
1986	653200	239177	736204	3744939	2319201	0	723660	4056365	7069226	12472746
1987	433884	36433	847106	3670172	2875771	0	859221	3748417	7283409	12271008
1988	406567	43937	669896	3123655	3480015	0	758504	3832489	8051008	12497063
1989	374122	22300	854120	3480751	3967130	0	686502	2809084	7474716	12206009
1990	391000	13000	612000	3591000	4365000	0	189000	4576000	9130000	13737000
1991	499000	11000	350000	3451000	4228000	0	345000	3490000	8063000	12374000
1992	677000	11000	946000	3281000	4765000	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

Year	ALL COMMODITIES LESS COAL				TOTAL RECEIPTS				TOTAL SHIPMENTS				TOTAL
	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	Mn River	St. Croix	Mpls	St. Paul	
1963	227866	0	385523	2469406	1260286	0	247088	684373	2191747	5274542			
1964	216780	0	555196	2630141	1305320	0	237257	632577	2175154	5577271			
1965	258070	0	549634	2611965	1275208	0	234314	586283	2095805	5515474			
1966	387165	0	738808	2961299	1489743	0	308393	1031817	2829953	6917225			
1967	349914	0	631205	2850860	1541765	60	338902	1185306	3066033	6898012			
1968	251572	0	755332	2712726	1029306	0	159249	903167	2091722	5811352			
1969	317781	0	781712	2889095	2019419	0	363432	1152162	3535013	7523601			
1970	298136	0	801109	2948909	2928573	0	476680	1233844	4639097	8687251			
1971	355905	0	684762	2945310	2727072	0	404911	1283303	4415286	8401263			
1972	353047	0	749499	2986018	3238631	0	512013	1565291	5315935	9404499			
1973	257391	0	704216	2881244	3388004	0	486108	1805134	5679246	9522097			
1974	376460	0	815825	2426426	3639435	0	402976	2348385	6390796	10009507			
1975	467257	0	624854	2477942	2420769	0	598865	1817618	4837252	8407305			
1976	446688	0	646383	2779130	2648010	0	643586	2218245	5509841	9382042			
1977	292163	0	883335	3146051	2267740	0	533481	1934745	4735966	9057515			
1978	218270	0	859927	3406730	1280261	0	673117	4115377	6068755	10553682			
1979	117378	0	968413	3593018	568143	1311	1019915	5131931	6721300	11398109			
1980	318270	10803	683226	2940553	1886139	0	1004643	5172081	8062863	12015715			
1981	199593	1600	550790	2536148	2334210	0	1034761	5794110	9163081	12451212			
1982	377154	0	520485	2071947	3095559	0	803605	4283512	8182676	11152262			
1983	527810	0	573268	2793983	4118237	0	839461	6845933	11803631	15698692			
1984	587412	16533	705434	2820259	3877431	0	472907	7835053	12185391	16315029			
1985	469220	4518	654908	3266906	3022697	0	316706	4595185	7934588	12330140			
1986	604164	17064	678590	3306367	2319201	0	306803	3627926	6253930	10861115			
1987	414217	36433	783487	3457240	2875771	0	405920	3730631	7012322	11703699			
1988	408567	22563	810535	2921152	3460015	0	362062	3642638	7464915	11627732			
1989	374122	22300	778259	3305134	3997130	0	307801	2731782	7036713	11516528			
1990	389000	13000	533000	3385000	4362000	0	189000	3635000	8186000	12506000			
1991	499000	11000	248000	3310000	4228000	0	345000	3116000	7689000	11757000			
1992	677000	11000	853000	3184000	4725000	0	794000	3516000	9075000	13800000			

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