



**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.*

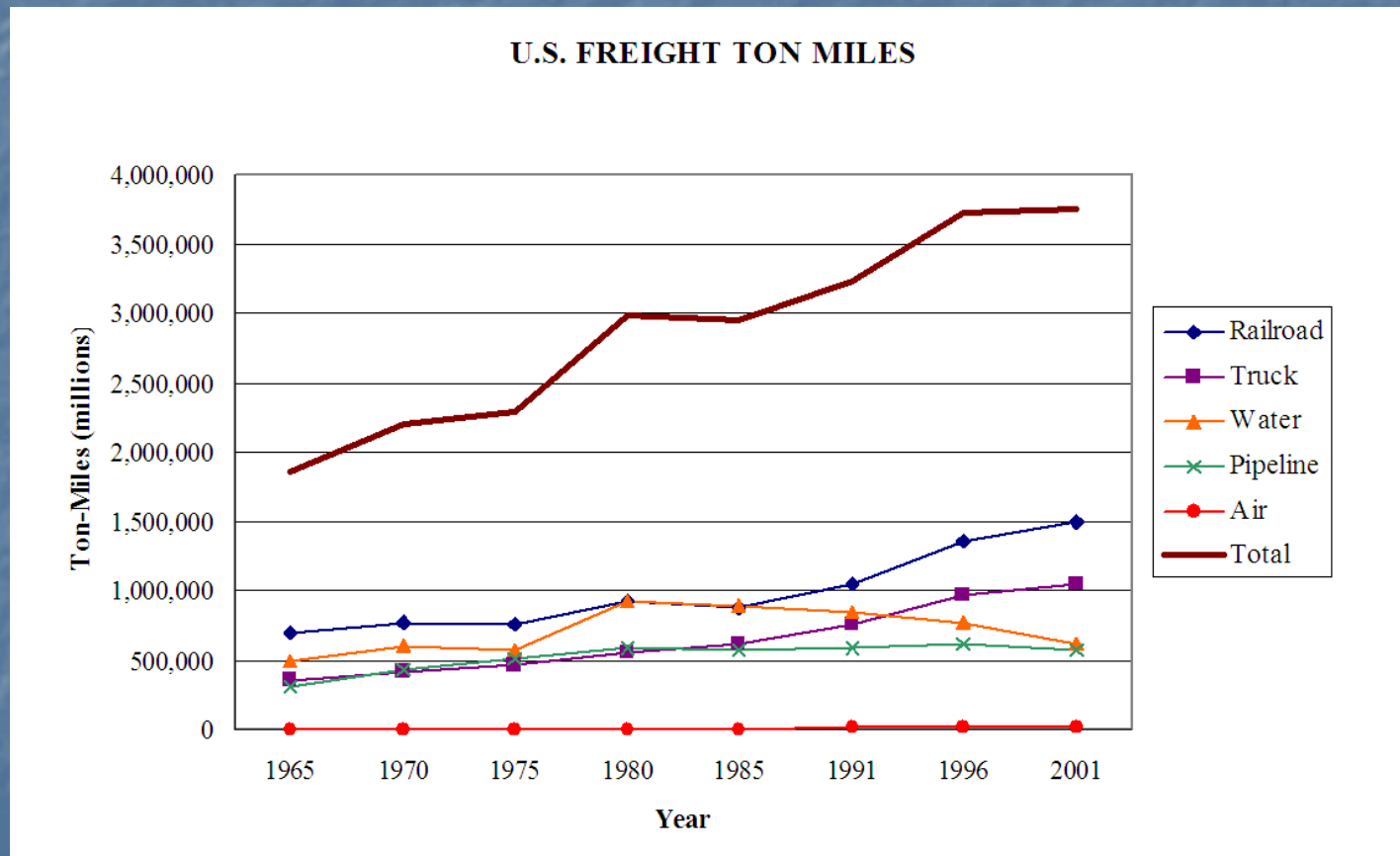
# INLAND WATERWAYS INDUSTRY STRUCTURE

*Kimberly Vachal, Gene Griffin, and Jill Hough  
Upper Great Plains Transportation Institute  
North Dakota State University*

# OVERVIEW

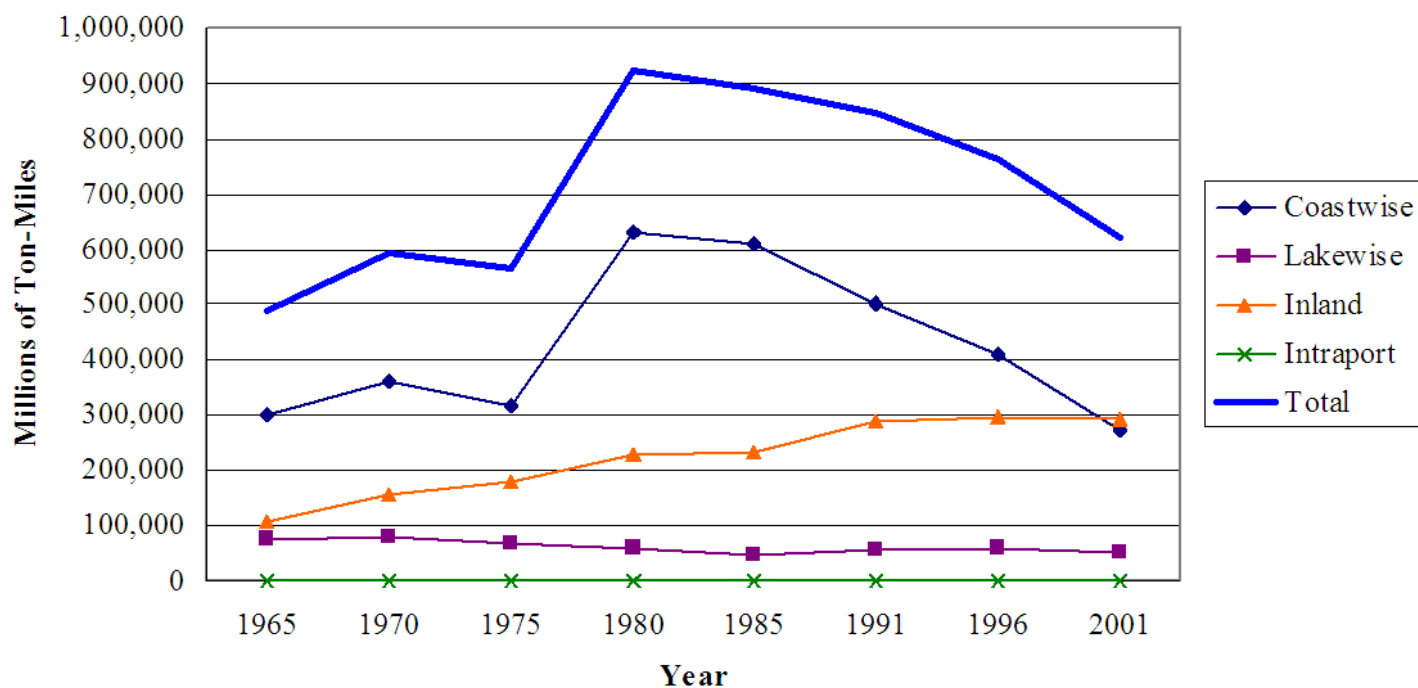
- Waterways in Multimodal Freight System
- U.S. Waterborne Traffic
- Waterborne Traffic and Floating Stock
- Mississippi and Gulf Intercoastal Focus
- Pricing Trends
- Summary

# WATERWAYS IN A MULTIMODAL FREIGHT SYSTEM



# WATERWAYS IN A MULTIMODAL FREIGHT SYSTEM

U.S. WATERWAYS TRAFFIC BY SYSTEM



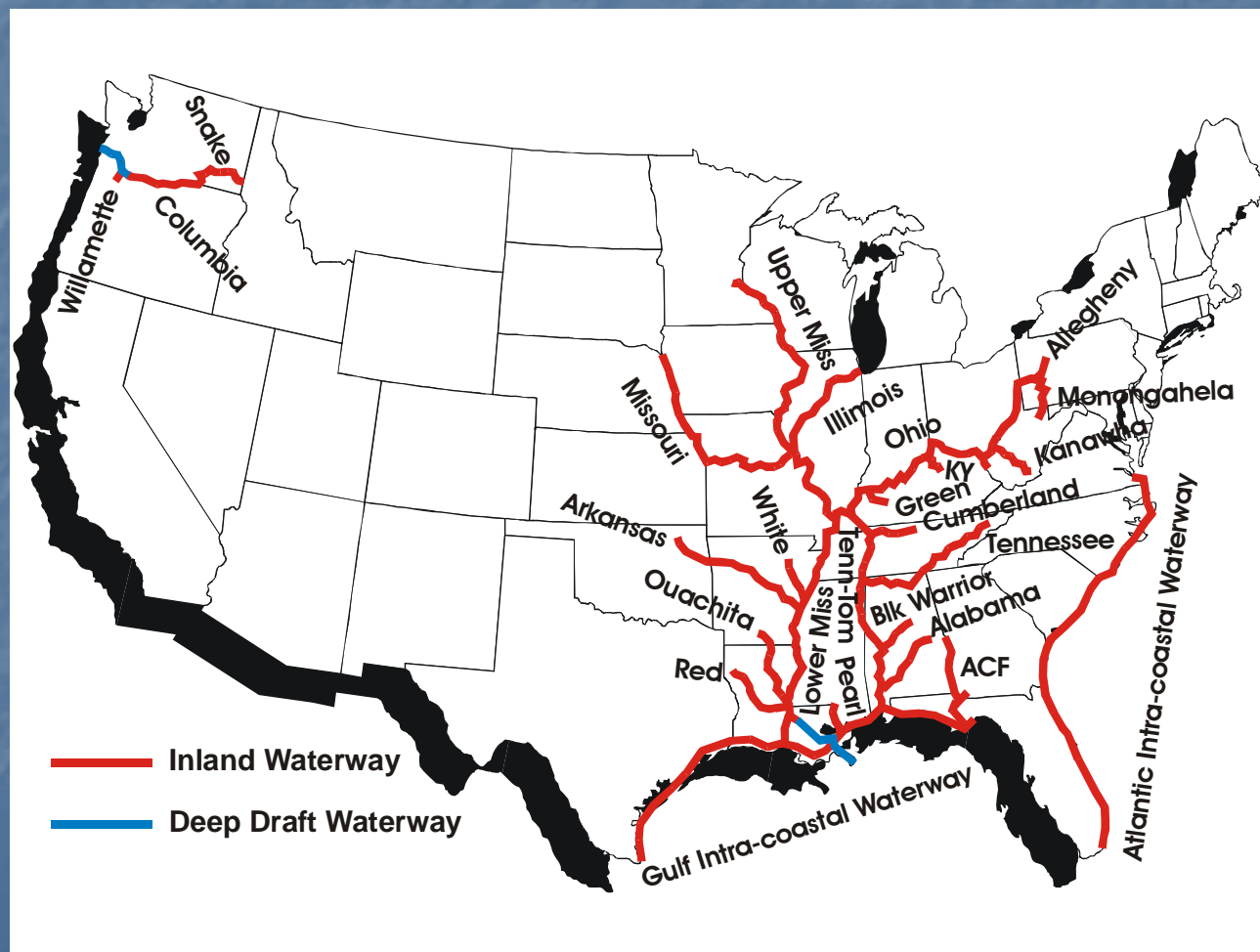


# WATERWAYS IN A MULTIMODAL FREIGHT SYSTEM

- The barge industry, as the trucking industry, is characterized by a largely nationalized infrastructure system with low barriers to firm entry.
- Similar to the airline industry, new entrants can easily identify high traffic corridors and offer similar services.
- Additionally, barge service is a largely undifferentiated product, where for the most part, the technological is well-known and readily available.

....These market characteristics parameters contribute to a high degree of intra-industry competition.

# U.S. WATERWAYS



# MISSISSIPPI RIVER SYSTEM

Table 1. Traffic and Mileage Composition of the Mississippi River System, 2003

Waterway	Miles	Tons	Share
Mississippi River – Minneapolis to Mouth of Passes	1,814	308.2	38.7%
Ohio River	981	228.8	28.7%
Tennessee River	652	49.8	6.3%
Illinois Waterway	981	45.0	5.7%
Monongahela River	129	27.6	3.5%
Columbia-Snake River System	596	23.1	2.9%
Big Sandy River	27	22.6	2.8%
Cumberland River	381	20.6	2.6%
Kanawha River	91	19.4	2.4%
McClellan-Kerr Arkansas River System	462	13.0	1.6%
Atachafalaya River	121	9.8	1.2%
Missouri River	732	8.1	1.0%
Green and Barren Rivers	109	7.9	1.0%
Red River	212	4.2	0.5%
Allegheny River	72	3.3	0.4%
Ouachita and Black Rivers	332	2.2	0.3%

Source: USACE Waterborne Commerce Statistics



# MISSISSIPPI RIVER SYSTEM

Table 2. Commodity Mix on Largest Volume Waterways

Waterway	All Short Tons (million)	Coal	Petroleum and Petroleum Products	Chemi- Cals	Crude Materials	Manufac- tured Goods	Food and Farm	Other
<b>Mississippi River</b>								
1994	314.6	17%	23%	13%	16%	6%	23%	0%
2003	307.4	13%	26%	12%	17%	6%	26%	0%
<b>Ohio River</b>								
1994	236.7	57%	8%	0%	20%	5%	7%	4%
2003	228.3	52%	7%	0%	25%	5%	6%	4%
<b>Tennessee River</b>								
1994	48.7	42%	0%	0%	32%	4%	10%	11%
2003	49.8	38%	0%	0%	34%	6%	10%	13%
<b>Illinois Waterway</b>								
1994	50.9	17%	12%	10%	14%	9%	37%	0%
2003	45.0	9%	14%	10%	17%	10%	40%	0%
<b>Monongahela River</b>								
1994	36.9	88%	4%	0%	7%	0%	0%	2%
2003	27.6	88%	1%	0%	8%	0%	0%	3%

Source: USACE Waterborne Commerce Statistics

# MISSISSIPPI RIVER SYSTEM

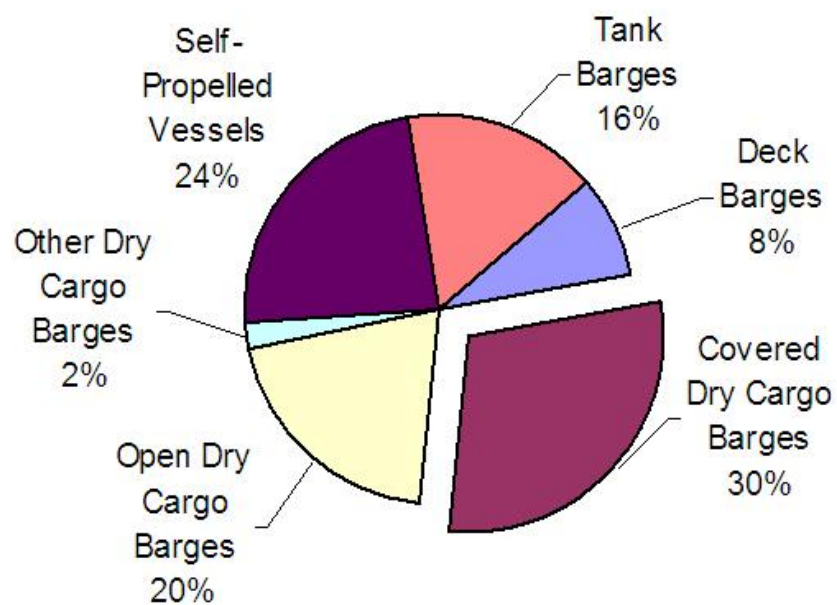
Table 3. Up and Down Stream Traffic Flows for 2003, by Waterway

Waterway	All Short Tons (million)	Coal	Petroleum and Petroleum Products	Chemicals	Crude Materials	Manufactured Goods	Food and Farm	Other	Share
<b>Mississippi River</b>									
Down	192.1	10%	14%	4%	8%	0%	25%	3%	62%
Up	115.3	3%	12%	9%	9%	4%	0%	1%	38%
<b>Ohio River</b>									
Down	114.9	27%	0%	0%	13%	0%	5%	5%	50%
Up	113.4	25%	4%	0%	11%	0%	0%	9%	50%
<b>Tennessee River</b>									
Down	11.0	1%	0%	0%	14%	0%	2%	4%	22%
Up	38.9	37%	0%	0%	20%	4%	7%	10%	78%
<b>Illinois Waterway</b>									
Down	24.5	0%	7%	0%	0%	0%	39%	8%	54%
Up	20.5	8%	7%	8%	14%	0%	0%	8%	46%
<b>Monongahela River</b>									
Down	13.1	43%	0%	0%	3%	0%	0%	1%	47%
Up	14.5	45%	1%	0%	5%	0%	0%	2%	53%

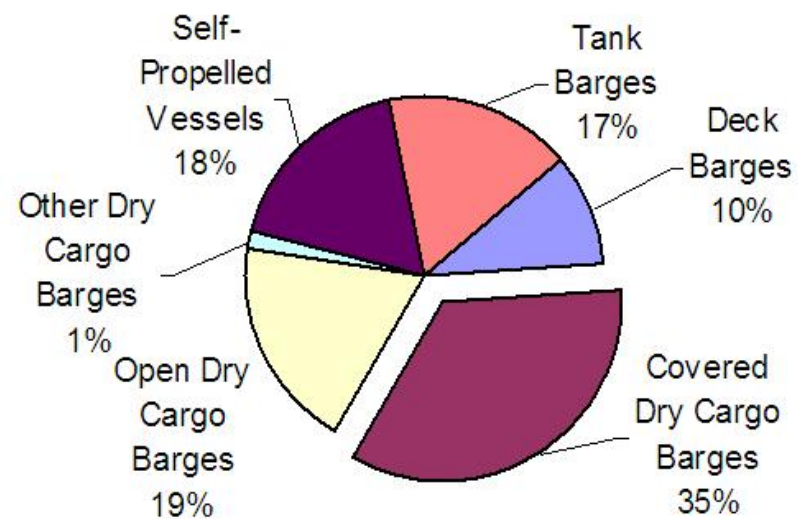
Source: USACE Waterborne Commerce Statistics

# U.S. FLOATING STOCK

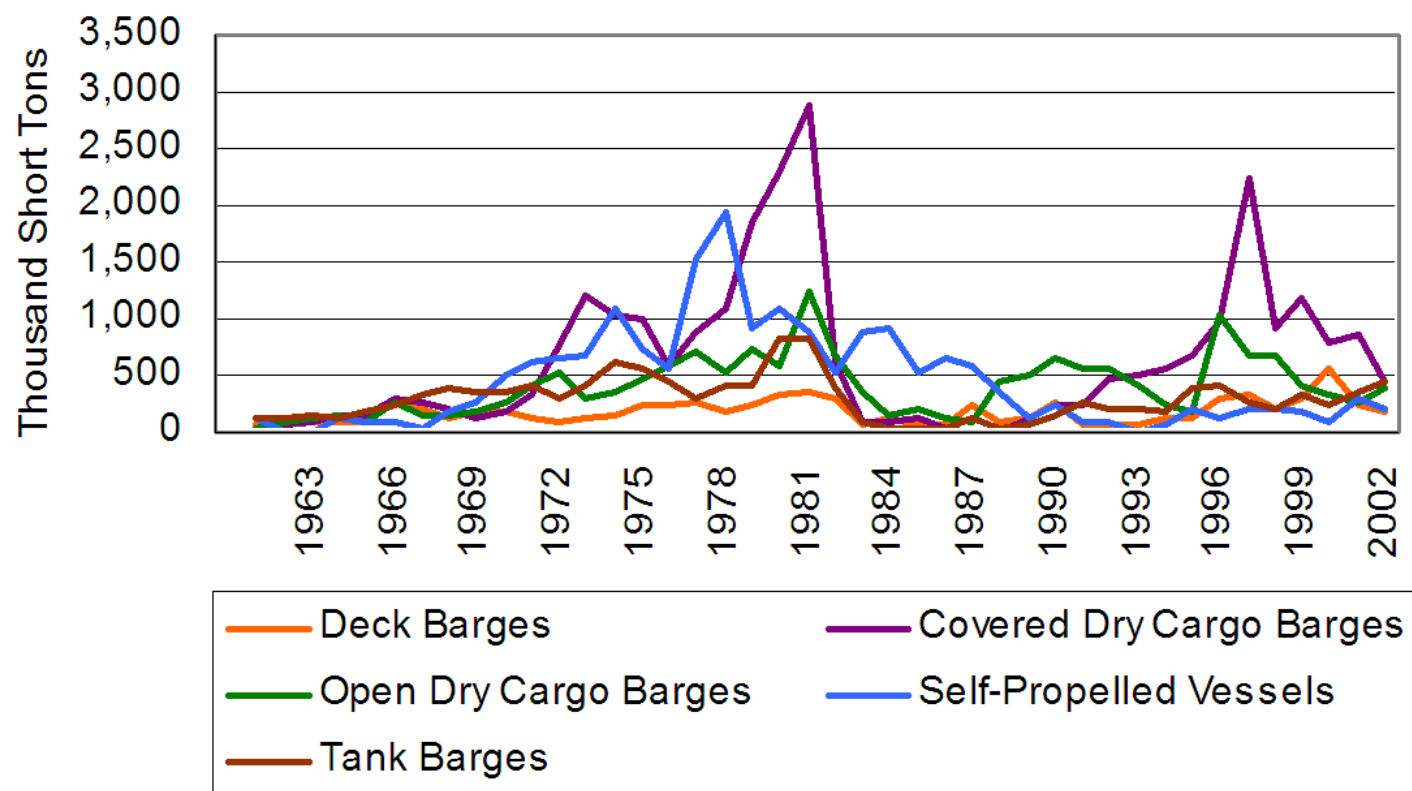
1995



2002



# FLOATING STOCK INVESTMENT





# U.S. STOCK BY RIVER SERIES

Table 4. Series Vessel Number and Capacity, 1995 and 2002

Series	1995		2002		Change in
Vessel Group	Count	Capacity	Count	Capacity	Capacity
Great Lakes					
Deck Barges	160	174,669	98	90,586	-48%
Covered Dry Cargo Barges	7	118,635	57	253,548	114%
Open Dry Cargo Barges	51	73,296	40	69,424	-5%
Other Dry Cargo Barges	7	6,091	5	211	-97%
Self-Propelled Vessels	237	2,079,806	233	1,943,635	-7%
Tank Barges	38	77,162	8	23,182	-70%
Mississippi and GIWW					
Deck Barges	3,054	3,258,422	3,129	3,844,567	18%
Covered Dry Cargo Barges	11,433	18,487,891	13,224	22,048,334	19%
Open Dry Cargo Barges	8,647	12,696,429	7,791	11,787,260	-7%
Other Dry Cargo Barges	804	426,191	386	156,489	-63%
Self-Propelled Vessels	1,473	545,616	1,263	257,484	-53%
Tank Barges	3,182	7,138,425	3,416	7,854,351	10%
Atlantic, Gulf, and Pacific Coasts					
Covered Dry Cargo Barges	194	843,117	268	1,471,381	75%
Open Dry Cargo Barges	538	918,518	762	1,400,687	52%
Other Dry Cargo Barges	1,140	936,098	641	751,684	-20%
Self-Propelled Vessels	1,444	13,177,931	1,945	9,933,061	-25%
Tank Barges	664	3,752,332	644	4,048,330	8%

Source: USACE,NDC, Vessel Data Series

# MARKET CONCENTRATION

Table 5. Market Shares of Freight Floating Stock<sup>1</sup>, Top Ten Firms in 1995 and 2002

Company	1995 (1,000 Short Tons)	Market <sup>2</sup> Share	Company	2002 (1,000 Short Tons)	Market <sup>2</sup> Share
American Commercial Lines LLC	7,224	10%	American Commercial Line	6,951	10%
Midland Enterprises Inc.	3,731	5%	Ingram Barge Co.	6,821	10%
American River Transportation	3,654	5%	American River Transportation	3,656	5%
Ingram Barge Co.	3,146	5%	AEP Memco LLC	2,535	4%
Memco Barge Line Inc.	1,749	3%	Kirby Inland Marine LP	2,129	3%
Alaska Tanker Company LLC	1,373	2%	Alaska Tanker Company LLC	1,373	2%
McDonough Marine Service	1,337	2%	SeaRiver Maritime Inc.	1,294	2%
Polar Tankers Inc.	1,243	2%	Crounse Corporation	1,208	2%
Seariver Maritime Inc.	1,180	2%	Cargill Marine & Terminal Inc.	1,187	2%
Cargill Marine & Terminal Inc.	1,173	2%	Polar Tankers Inc.	1,049	2%

<sup>1</sup>Freight Stock does not include tow boats or vessels with passengers designated as primary cargo.

<sup>2</sup>Market Share: the left column indicates individual company market share, the right column includes market share totals for the top five and ten companies.

Source: USACE, NDC.

# STOCK ON THE MISSISSIPPI AND GIWW SERIES

Table 7. Mississippi River and GIWW Series Fleet Capacity by Vessel Loaded Draft, 1995 and 2002

Draft	Vessel Type	Capacity, in Short Tons		Change
		1995	2002	
9 Feet or Less				
	Deck Barges	1,923,236	1,807,132	-6%
	Covered Dry Cargo Barges	16,861,763	16,664,860	-1%
	Open Dry Cargo Barges	9,588,333	9,514,831	-1%
	Other Dry Cargo Barges	16,511	149,822	807%
	Self-Propelled Vessels	54,321	50,881	-6%
	Tank Barges	3,624,121	4,296,624	19%
	Sub-Total	32,068,285	32,484,150	
	Share of Total	69%	71%	

# CONCENTRATION ON THE MISSISSIPPI AND GIWW SERIES

Table 9. Market Share of Mississippi River and GIWW Series Covered Dry Cargo Barge Fleet Capacity for Top Ten Firms, 9 Foot Draft or Less

Company	1995	Market Share <sup>1</sup>	Company	2002	Market Share <sup>1</sup>
American Commercial Barge Line	21%		American Commercial Lines LLC	30%	
American River Transportation	15%		American River Transportation	15%	
Peavey Barge Lines	5%		Ingram Barge Co.	15%	
Cargill Marine & Terminal Inc.	5%		AEP Memco LLC	6%	
Superior Barge Lines	4%	51%	Cargill Marine & Terminal Inc.	5%	71%
RiverWay Co.	4%		RiverWay Co.	5%	
Ohio River Co.	4%		Vessel Leasing LLC	2%	
ORGulf Transport Co.	3%		Teco Barge Line	2%	
Alter Barge Line Inc.	3%		Alter Barge Line	1%	
National Marine Inc.	3%	68%	S C F Marine	1%	82%
Total Capacity (1,000 Short Tons)	16,862			16,665	

<sup>1</sup>Market Share: the left column indicates individual company market share, the right column includes market share totals for the top five and ten companies.

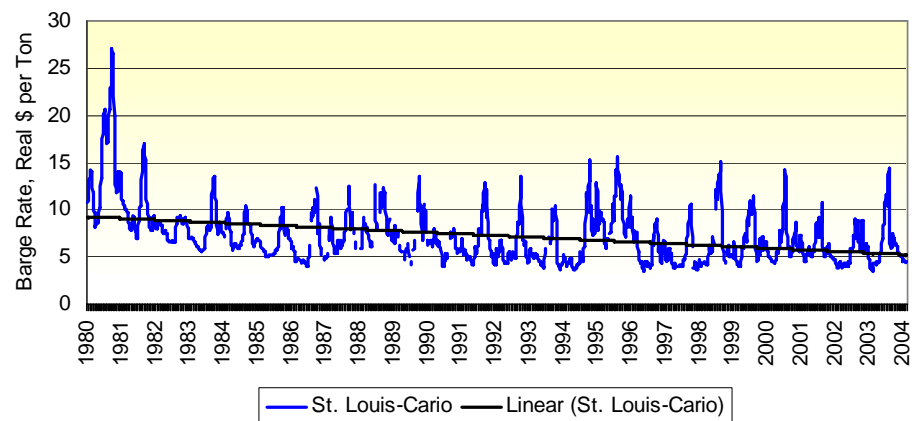
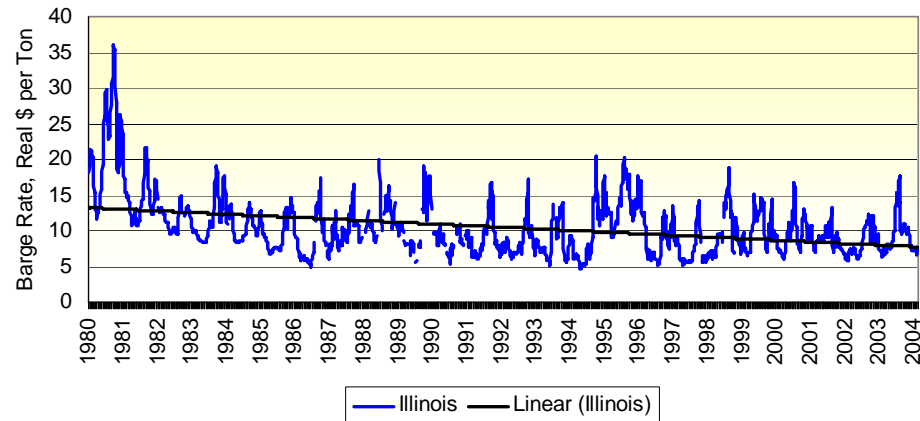
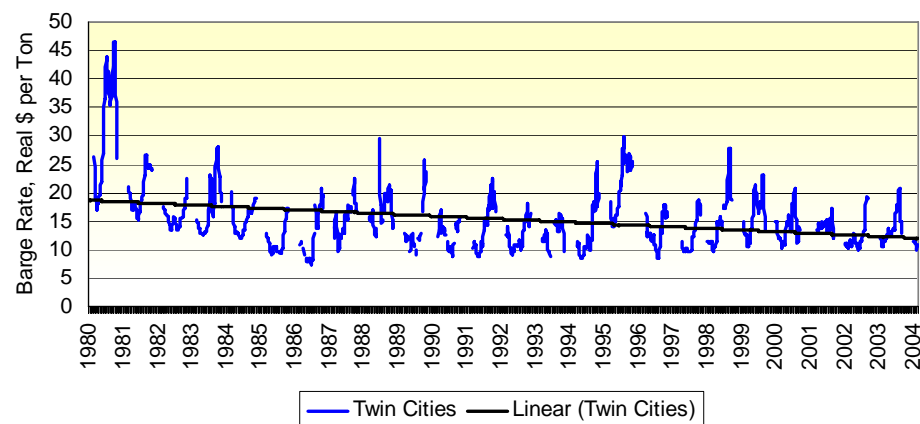
Source: USACE, NDC.



# PRICING TRENDS

Grain Barge  
Rates Trends,  
1980 to 2004

Source: USDA



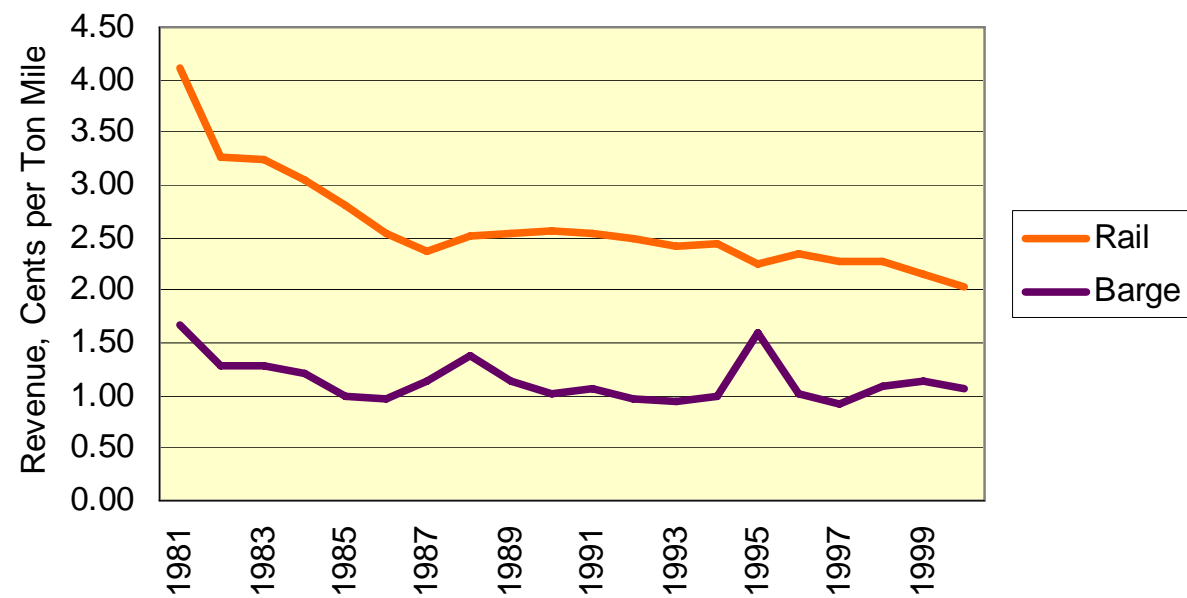
# PRICING TRENDS

Table 11. Empirical Results for Weekly Real Barge Rate Time Trend Model

	Empirical Results	
	$\beta_1$	$R^2$
Twin Cities ( $n=809$ )	-0.09769*	.07
Illinois River ( $n=1,170$ )	-0.14453*	.12
St. Louis-Cario ( $n=1,159$ )	-0.15664*	.13

*\*Significant at the 1 percentile.*

# PRICING TRENDS



# SUMMARY

- The barge industry seems very similar to the truckload industry in structure that lend themselves to thin margins and widely fluctuating rates.
  - Large number of carriers
  - Relatively easy entry and exit
  - Rather homogeneous service services
- Herfindahl-Hirschman Index indicates low levels of industry concentration.
  - Although concentration has increased over time the top five firms still only accounted for 32 percent of the market in 2002.
  - The top ten firms accounted for 41 percent.
  - Intra industry competition for the barge industry appears to be highly competitive on a day-to-day basis with easy entry and exit.
- If rail prices continue to decline in areas where rail and barge compete (like grain), a further erosion of traffic could take place.



# QUESTIONS?

