US Army Corps
of Engineers
Huntington District

Great Lakes and Ohio River Navigation Systems Commerce Report, 2008

U.S. Army Corps of Engineers
Great Lakes and Ohio River Division

Cover Photo: Aerial photo of McAlpine Locks and Dam on the Ohio River.

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PART 1. OVERVIEW

1. Purpose. This *Great Lakes and Ohio River Navigation Systems Commerce Report* offers a ready source of descriptive statistics and information on two important inland navigation systems: the Ohio River System (ORS) and the Great Lakes Navigation System (GLNS). The Great Lakes and Ohio River Division's Navigation Planning Center, located in the Huntington District of the U.S. Army Corps of Engineers, prepared, published, and distributed this 2008 edition. The waterway data provided in this report are made available in response to requests for commercial navigation data from shippers, port authorities, state and local government agencies, regional waterway transportation entities, and others.

The Federal and state governments, port authorities, and carriers share responsibility for the nation's waterway transportation system, and in the case of the GLNS, this shared responsibility extends to the Canadian federal government, provincial governments, shipping lines, ports and the St. Lawrence Seaway Management Corporation (SLSMC). The U.S. Army Corps of Engineers has the responsibility of managing the nation's waterways and harbors, which includes planning, development, maintenance, and operation consistent with its Environmental Operating Principles. The U.S. Coast Guard is tasked with oversight of the safe use of these waters. The two agencies work closely with the towing and shipping lines to fulfill these commitments. The inland waterway transportation industry involves public and private interaction between commercial fleets or towboats, barges, lake vessels, wharves and other waterfront facilities, and the waterway navigation projects built and maintained by the Corps.

2. Organization. The report is organized into four parts: **Part 1** -- Overview, **Part 2 --** The Great Lakes Navigation System (GLNS), **Part 3** -- The Ohio River Navigation System (ORS) and **Part 4** – Other Sources of Waterway Information. The Overview describes both navigation systems and discusses how the Corps, as their steward, plans for their modernization with innovative initiatives. Parts 2 and 3 provide descriptive statistics and information and Part 4 lists waterway data publications for both systems. Parts 2 and 3 are organized in five sections:

Section 1 offers a geographical and physical description of the system, its history and dominant industries and natural resources, and historic commodity traffic.

Section 2 discusses the state of each system, its modernization status, any planned innovative applications and on-going studies.

Section 3 presents information on the impact of each system on the regional economy and year 2003 - 2006 waterborne commerce data for each region.

Section 4 provides 2004-2007 Lock Performance Monitoring System (LPMS) statistics.

Section 5 provides Waterborne Commerce Statistics Center (WCSC) data on state and port commerce for the years 2003-2006.

3. <u>Overview</u>. Traffic on these systems moves through or by twelve U.S. states and the province of Ontario, Canada (see **Figure 1**). Ontario and eight states – Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, and New York – border the GLNS. Pennsylvania, West Virginia, Kentucky, Tennessee, Alabama, Mississippi, Illinois, Indiana, and Ohio are touched by the ORS. All 12 states are within the boundaries of the U.S. Army Corps of Engineers' Great Lakes and Ohio River Division (LRD) and its seven districts. The four river districts – Pittsburgh, PA; Huntington, WV; Louisville, KY; and Nashville, TN -- fulfill the Corps' navigation mission by managing the operation of 60 lock and dam projects on nine navigable rivers and by maintaining channels on these and several other navigable tributaries. The three Great Lakes districts – Buffalo, NY; Detroit, MI; and Chicago, IL – operate three lock and dam projects and maintain three major connecting channels and the main channels into numerous ports. In addition, the Canadian St. Lawrence Seaway Management Corporation (SLSMC) operates and maintains eight locks on the Welland Canal, which allows navigation between Lake Erie and Lake Ontario.

Figure 1
States and Provinces Bordering the GLNS/ORS

The ORS has over 2,600 miles of nine foot draft navigable channel; the GLNS nearly 1,300 miles of 25.5 foot navigable channel. Extensive though these systems are, they are only parts of even larger inland navigation systems. The ORS is part of the Mississippi River System and the GLNS is part of the Great Lakes/St. Lawrence Waterway (GLSLW).[1] Shippers have access to ocean ports through both these larger systems. The GLNS reaches the ocean through its junction with the St. Lawrence River (and the Montreal-Lake Ontario section of the Seaway) at Kingston, Ontario. The ORS reaches the Gulf of Mexico through its junction with the Mississippi River at Cairo, Illinois. Regardless of the system definition, these two North American transportation networks are the most extensive and economically developed inland waterway systems in the world. Only the Suez and Panama Canals, shortcuts linking two oceans, handle similar amounts of traffic.

The United States has over 25,000 miles of inland, intra-coastal, and coastal waterways. The Federal government improves and maintains almost 11,000 miles or about 45 percent of the total channel length. This work includes the installation and maintenance of navigation structures such as locks and dams, river training devices (dikes and revetments, and groins), and dredging.

Open river or open lake navigation is preferred over navigation on channels created by locks and dams. Navigation on improved channels created by locks and dams takes longer due to the time spent transiting any locks, which can also be points of river or channel congestion. The Mississippi River below St. Louis and the Missouri River system are of open river design, and navigation on the Great Lakes is open lake navigation, with the exception of transits of the St. Marys River and the Welland Canal. Other major channels like the Arkansas, Illinois and Ohio rivers consist of a system of slack water pools created by a series of locks and dams. The dams in these rivers help maintain a more constant depth to permit navigation during dry seasons, while the locks are the means by which river traffic is passed from one level of water to the other created by the dam. On the Atlantic and Gulf Intra-coastal waterways, strong winds and tidal currents often require locks and dams to maintain pools and fresh water integrity. On the GLNS, locks on the St. Marys River and the Welland Canal are used to traverse water falls.

Industries utilizing the waterways include the steel, electric power, chemical, petroleum products, aluminum, chemical, paper and agricultural products industries. In 2006, almost 1.1 billion tons of domestic waterborne commerce moved on the U.S. waterway system. Almost 70 percent of this tonnage consisted of lake and inland waterway commerce; origins and destinations within the inland waterway. From 1986 to 2006, internal domestic traffic on the waterways increased from 560 million tons to 628 million tons, an annual growth rate of 1.2 percent.

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[1]/ The GLSLW stretches from the Head-of-the-Lakes in Lake Superior to Father Point, Quebec where the St. Lawrence River meets the Gulf of St. Lawrence. The Great Lakes/St. Lawrence Seaway system is a subsystem between Head-of-the-Lakes and Montreal, the downstream terminus of the St. Lawrence Seaway.

Petroleum, the nation's largest bulk import commodity, and petroleum products accounted for about 35 percent of domestic waterborne commerce and coal accounted for 23 percent. Iron ore and scrap accounted for 6 percent and grain, the nation's largest export commodity, amounted to almost 5 percent of domestic waterborne commerce.

4. <u>Modernization Process</u>. The Corps of Engineers' Great Lakes and Ohio River Division (LRD) strives to accommodate national needs for an efficient and reliable navigation system. The Corps partners with the navigation industry to operate existing projects to their highest level of efficiency and to plan for tomorrow's needs. The Corps works to assure that all technologies applicable to the modernization of the waterways are adequately evaluated in the interest of achieving modernization at the lowest practicable cost. Open, two-way communication is essential to meet this challenge. The Corps strives to employ state-of-the-art techniques in analyzing the feasibility of navigation modernization proposals. This modernization process involves four steps:

1. An initial *reconnaissance study* identifies issues, concerns, and opportunities in order to determine the federal interest in constructing navigation improvements.

2. If a federal interest is identified, the District Engineer will recommend that a *feasibility study* be initiated. This study allows the Corps to more fully examine nonstructural and structural alternatives and to identify a preferred option.

3. Feasibility is established when an improvement plan is found that provides more benefit (transportation savings) than the improvement will cost, appropriately addresses environmental concerns, and is acceptable to users. The feasibility study is necessary, but alone is not sufficient for *a congressional authorization* of the improvement alternative.

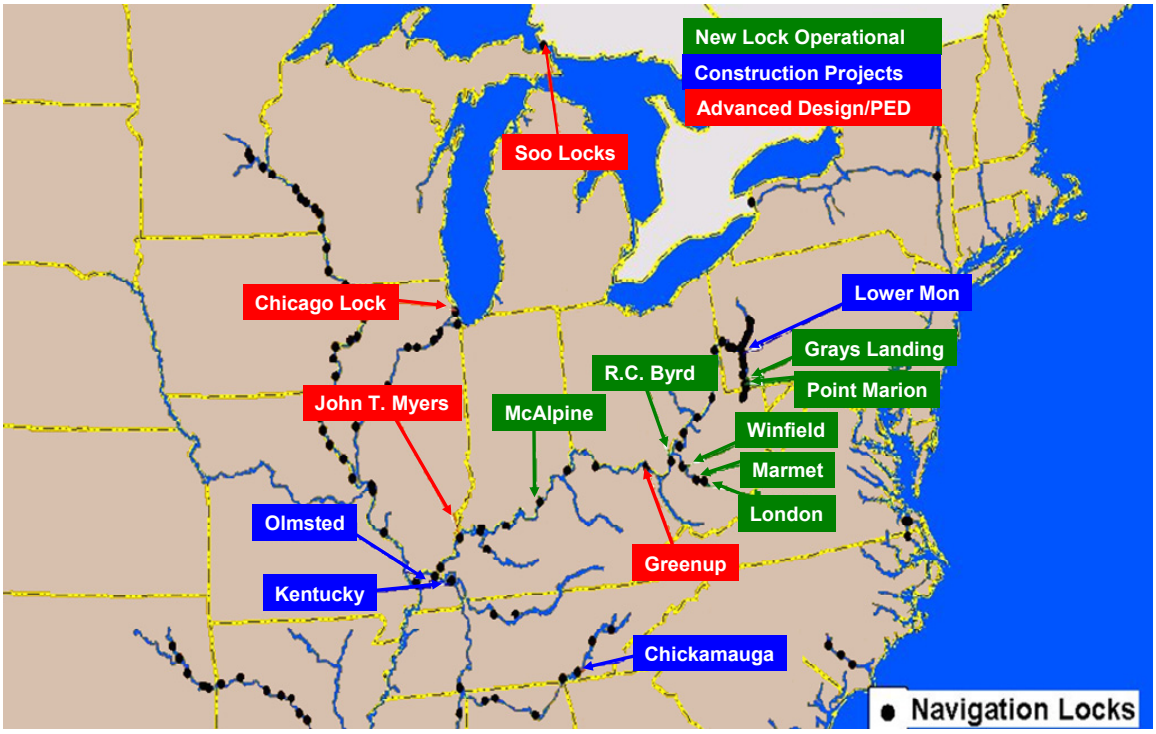
4. From feasibility, the process moves into the *preconstruction engineering and design* (PED) phase. Following *authorization*, funding is *appropriated for construction*. During this final step of the modernization process, plans and specifications for construction are prepared.

A project is programmed for modernization if it falls into any one of these steps, including the transitory phase of awaiting authorization or appropriation. **Figure 2** shows the status for the more recent LRD projects programmed for modernization.

The modernization of the GLNS/ORS represents investment that will be repaid many times over. Modernization eradicates hazardous conditions and eliminates costly delays. Freight savings are just the beginning, as the economic effects of federal construction diffuse to a wide variety of producers of equipment, materials, energy forms, technical services and skills. Areas of high unemployment find relief through increased job openings.

The multiplier effect of this spending translates into increased incomes which generates local re-spending, creating additional income for retail stores, professional services and public agencies. Other spin-offs of GLNS/ORS improvement projects include greater supplies of hydroelectric power, increased municipal water sources, and improvements to roads, bridges and other facilities. Investment in waterway projects is good public policy.

Figure 2
LRD Modernization Projects



5. <u>Innovation Initiatives</u>. In response to our Industry partners' desires of achieving modernization at the lowest practicable cost, a Regional Navigation Design Team (RNDT) composed of the LRD Chief of Technical Engineering Division, Engineering Division Chiefs or their representatives from each of the districts in the Mississippi Valley Division (MVD) and LRD, and the Chief of the LRD Navigation Planning Center was formed in 1994 to assure that all technologies applicable to modernization of all rivers within LRD and MVD are adequately and efficiently evaluated. The goal of the team is to better share information on innovative design between districts, communicate better with industry regarding design, and to challenge existing design criteria and support engineers in promoting good design ideas. In the long run, the team plans to change the way the Corps designs and constructs navigation structures. To this end, team accomplishments to date include but are not limited to:

- Writing EP 1110-1-20 describing the first generation of innovation
- Producing design and construction cost savings

- Impacting the "Innovation in Navigation Program (INP)"[2] and subsequent research and development efforts
- Preparing a "Centralized Casting Facility" white paper as well as influencing new technical guidance documents
- Building a culture of innovation that enables the Corps to respond better to navigation customer needs
- Using shared physical hydraulic models between MVD and LRD to develop and test new types of filling and emptying (F&E) systems for navigation locks
- Developing "new tools" to guide management of existing assets and predict when system expenditures should be made (This was developed and utilized for the Ohio River Mainstem Systems Study)

Design innovations are being pursued to reduce costs and achieve earlier use of new locks. Innovative construction techniques can reduce construction costs and undesirable environmental impacts, expedite traffic movement during construction, shorten construction periods and ease project operations. Innovations under consideration broadly fall into four categories. These are:

i) Innovations to reduce/eliminate cofferdam size. Initiatives include:

- Underwater pile foundation preparation for anchoring structural shells
- Offsite casting yards to construct various components of lock walls, approach walls, gate piers and sills as hollow shells
- Float-in components to the construction site
- Lift-in components with a large floating crane
- In the wet construction with tremie concrete and floating approach walls
- Drilled shaft technology to construct large diameter, reinforced concrete shafts that can be used to support approach walls, floating wall pylons, and to form thin lock walls
- Approach walls formed of long span beams constructed in the wet
- Thin lock walls constructed entirely in the wet using closely spaced drilled shafts faced with pre-cast concrete panels
- Float-in miter gate monoliths that involves the construction of an entire miter gate monolith as a floating structure

ii) Innovations that reduce the cost of lock walls. Initiatives include:

- Extensions of existing lock chambers

[2/] The INP is an R&D program involving Corps-wide navigation experts as well as the influence of the Engineering Research and Development Center (ERDC). Much of the INP effort is focused on in-the-wet construction innovation.

- Replacement of much of the structural concrete in lock walls with roller compacted concrete (RCC) in combination with either pre-cast panels or cast in place concrete at the chamber face
- Use of existing components to simplify construction of new walls
- Incorporation of temporary cofferdam walls into the permanent wall
- Use of floating approach walls where appropriate
- Use of pre-cast approach wall components

iii) Innovative filling and emptying systems. Initiatives include:

- Central culvert system to accommodate innovative lock walls
- Looped intake/discharge culverts as preferred alternative to sill-mounted butterfly valves

iv) Innovation in lock operating systems. Initiatives include:

- Hydraulic operating systems with direct connect cylinders to miter gates and electronically controlled sensing
- Central lock operating station

6. <u>Conclusion</u>. The Great Lakes and Ohio River Division is at the forefront of cost reduction initiatives for inland navigation projects; initiatives that blend economics with functionality. Currently, there are various innovative designs and/or construction initiatives being applied or considered throughout LRD. Project specific applications of innovations, for both navigation systems, are presented in Parts 2 and 3 of this report.

PART 2. THE GREAT LAKES NAVIGATION SYSTEM

1. General.

a. Geography and Physical Description. The Great Lakes/St. Lawrence Seaway system has two distinct subsystems -- the Great Lakes Navigation System (GLNS) and the St. Lawrence Seaway.[3] Discussions that follow focus only on the GLNS. The GLNS is situated in the Great Lakes Basin (GLB), a 297,000 square mile area. The GLB is defined to include an area that extends upstream to the point of origin (headwaters) of all streams and rivers flowing into the Great Lakes. The designation Great Lakes, or Lakes, pertains to five major lakes: lakes Superior, Michigan, Huron, Erie and Ontario. The smaller Lake St. Clair is considered part of the St. Clair-Detroit River System connecting channel (see **Figure 3**). The GLB drainage area encompasses parts of eight U.S. states and two Canadian provinces. Containing an estimated 5,435 cubic miles of freshwater, the GLB is the largest repository of freshwater in the world.

Figure 3
Great Lakes Basin

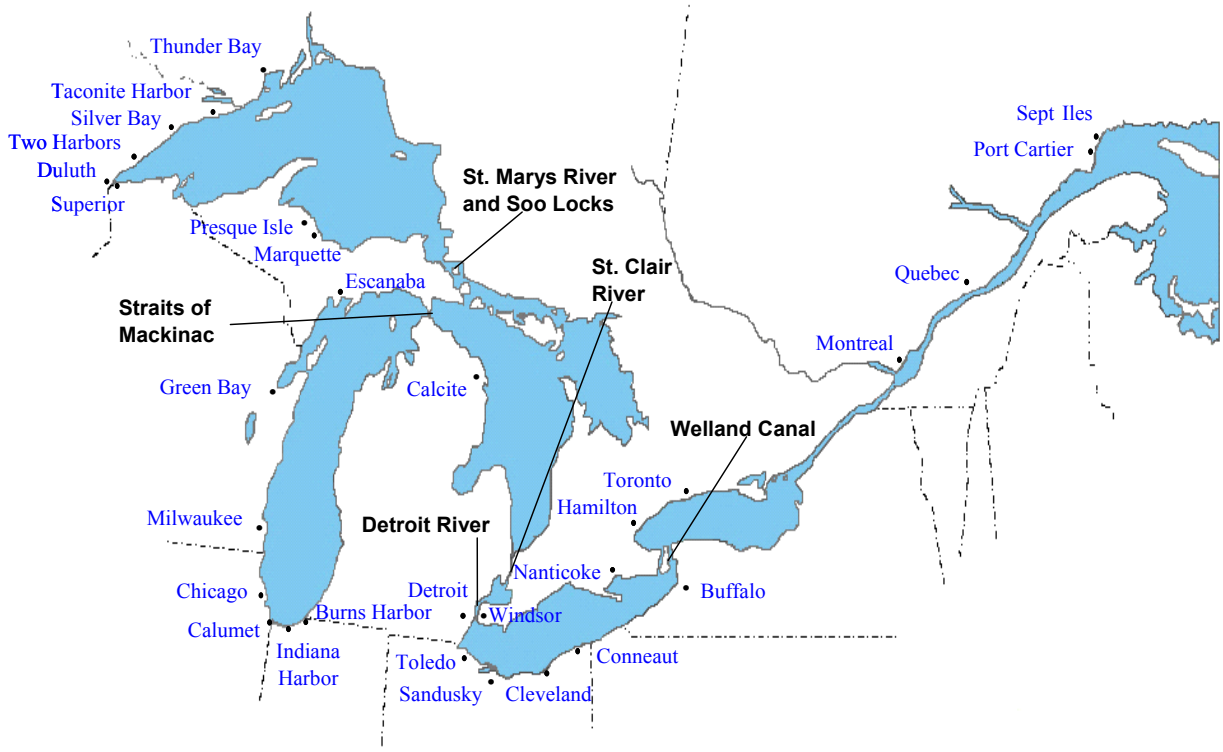
U.S. Army Corps of Engineers, Detroit District

The GLNS comprises the five Great Lakes and their navigable connecting channels – the St. Marys River, the Straits of Mackinac, the St. Clair/Detroit River System, and the Welland Canal (see **Figure 4**). The Great Lakes cover 95,170 square miles of water surface, about 61,000 in the

[3]/ The Great Lakes/St. Lawrence Seaway encompasses the GLNS and the St. Lawrence River to Montreal, Quebec. This river reach, the Montreal-Lake Ontario section of the Seaway, is not considered part of the GLNS.

U.S. and 34,000 in Canada, and defines a 10,000-mile coastline, which is longer than the entire U.S. Atlantic seaboard. Dozens of ports line the banks of the Great Lakes and are an integral part of this waterway system. Eight U.S. states (Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania and New York) and the Canadian province of Ontario border the GLNS.

Figure 4
Great Lakes Connecting Channels and Ports



The GLNS connects with the Atlantic Ocean through the St. Lawrence Seaway and with the Ohio River System (ORS) through the Cal Sag and Chicago Sanitary Ship Canal at Chicago. Ships moving on this vast inland system are self-propelled vessels capable of drafting up to 45 feet, though connecting channel depths limit safe draft to between 25.5 to 27.5 feet.

The two dominant commercial navigation vessels on the GLNS are Class X lakers and Class VII bulk carriers. Class X lakers are 950-1,099 feet in length. These vessels are self-unloaders that principally transport iron ore from the Minnesota and Michigan ports to the integrated steel mills, and trans-shipment ports situated on lakes Michigan and Erie (including the Detroit River). The Class X lakers are increasingly used to move western coal from Superior, WI to electric utilities across the Great Lakes. They are, as a group, the largest and most efficient ships operating on the Great Lakes. Class VII sized vessels are 700-730 feet in length and are the

largest vessel capable of using the locks on the Seaway.[4] These vessels are primarily used to ship wheat down from Thunder Bay, Ontario and, on the return trip, transport iron ore from the St. Lawrence River ports to Canadian and U.S. steel mills.

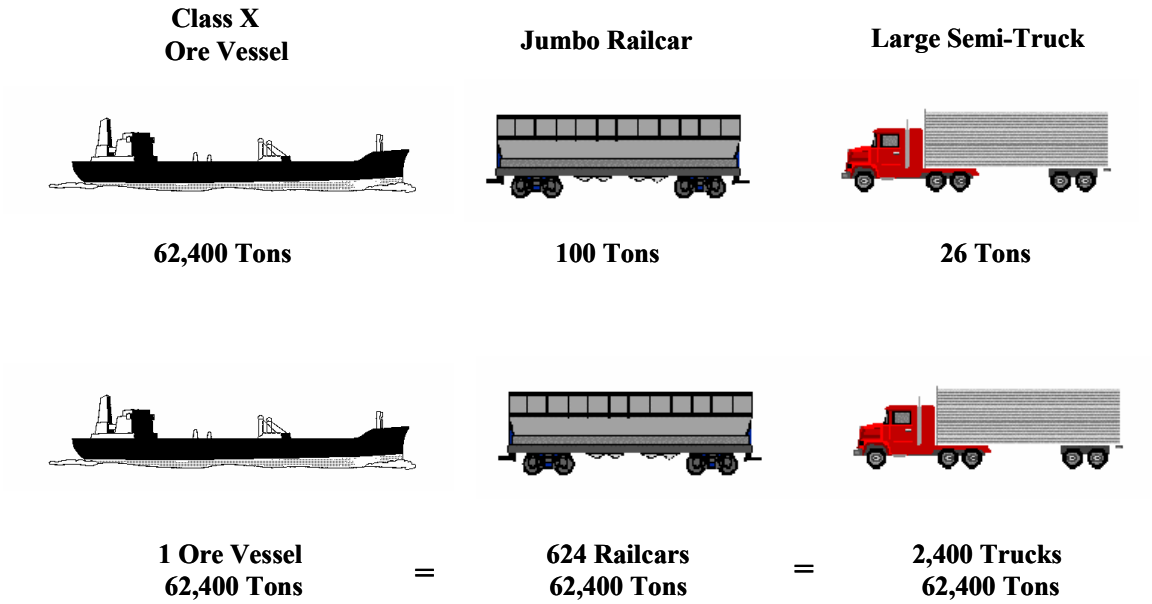
The vessels, waterways, and ports of the GLNS system provide consistently safe and reliable service, while still keeping transportation costs competitive for the industrial and agricultural heart of North America. Studies also indicate that marine transport uses less fuel and has lower emissions than either rail or truck for equivalent cargoes and distances.[5] The large cargo capacity relative to engine size and the operating characteristics of Great Lakes and Seaway vessels make them models of fuel efficiency. A laker, for instance, uses about one gallon of fuel per one ton of iron ore per round trip. A study by the Great Lakes Commission found that vessel transportation on the GLNS system uses considerably less fuel, produces fewer emissions, and is less prone to pollution causing spills than if the same cargoes were transported by either truck or rail. **Figure 5** compares the carrying capacity of lakers and railcars, and large semi-tractor trailers. The figure shows that a typical Great Lake Class X laker carrying 62,400 tons is the equivalent of 625 railcars (6.25 unit trains) and 2,400 trucks.

Photo 1: Two Lakers passing on the St. Clair River, Michigan.

[4]/ The St. Lawrence Seaway runs from Long Point on Lake Erie to Montreal, Quebec at St. Lambert's lock. There are two canalized sections: the Welland Canal, which by-passes Niagara Falls, and the Montreal-Lake Ontario section, which by-passes numerous rapids in the St. Lawrence River.

[5]/ *Environmental Advantages of Inland Barge Transportation*, USDOT Maritime Administration, 1994; *Great Lakes and St Lawrence River Commerce: Safety, Energy and Environmental Implications of Modal Shifts*, Great Lakes Commission, 1993; *Environmental Efficiency of Marine Transportation*, Marine Policy & Programs Directorate, Transport Canada, 1993.

Figure 5
Modal Carrying Capacity



b. History. Commercial navigation on the Great Lakes was first reported in 1678 when La Salle built a small, 10-ton sailing vessel to transport supplies from what is now Kingston, Ontario to a site on the Niagara River. The first wave of major commercial navigation upon the Great Lakes began with the opening of the Northwest Territory in 1787. By the early 1800s, about two-dozen communities had been established along the shores of lakes Ontario and Erie. Grain and furs were the basic commodities transported out of the region. In 1797, the first of a series of locks that eventually culminated in the Soo Locks was constructed on the Canadian side of the St. Marys River, the connection between lakes Superior and Huron. This made the entire upper Great Lakes, the four lakes upstream of Niagara Falls, navigable to canoes and bateaux of the fur trade.

The opening of the Erie Canal in 1825, connecting the Hudson River with Lake Erie, initiated the second stage of commercial navigation on the lakes. The canal's four foot depth and 40-foot width enabled mule-drawn canal boats to transport as much as 30 tons of freight. The opening of the Erie Canal initiated the commercial grain trade on the lakes. With much less expensive water transportation across New York State, it was possible for grain grown as far west as Illinois to be efficiently transported to eastern markets. Chicago, with its proximity to the fertile, productive soils of the tall-grass prairie of central Illinois, became the leading grain shipping port on the lakes. Buffalo became the major grain receiving port and eventually the world's largest grain milling center.

Until the opening of the first Welland Canal across the Niagara Peninsula of southern Ontario in 1829, commercial navigation across the lakes was restricted to the Great Lakes Basin. With the exception of the Erie Canal, there was no access to the Atlantic Ocean because of the presence of Niagara Falls on the Niagara River and a series of falls and rapids on the St. Lawrence River.

Once the Welland Canal opened, boats originating on the Great Lakes could proceed into Lake Ontario and then into the St. Lawrence River. By 1850, a nine-foot channel had been established from the Atlantic Ocean to Lake Ontario. By that date, the second Welland Canal had been completed (in 1844) and all but Lake Superior was accessible to commercial navigation by ships.

Construction of a canal to bypass the falls on the St. Marys River between Lakes Huron and Superior had to await the need for commercial access to Lake Superior. That need developed with the discovery in 1844 and subsequent development of substantial iron ore deposits in the Upper Peninsula of Michigan. By 1855, a canal had been built to bypass the St. Marys Falls, and Lake Superior became accessible to commercial navigation. A nine-foot channel was available from the Atlantic Ocean to the "Head of the Lakes" (western end of Lake Superior).

In the second half of the 19th century, railroads gained preeminence over water carriage in the region. By 1905, largely as a result of Canadian investment in canals, a 14-foot channel was available from the Atlantic Ocean into Lake Superior. This marked the reemergence of water transportation across the lakes and brought to an end the dominance of rail transportation established a half-century earlier. Now, relatively large (for the time) freighters could move bulk commodities across the basin cheaper than could rail.

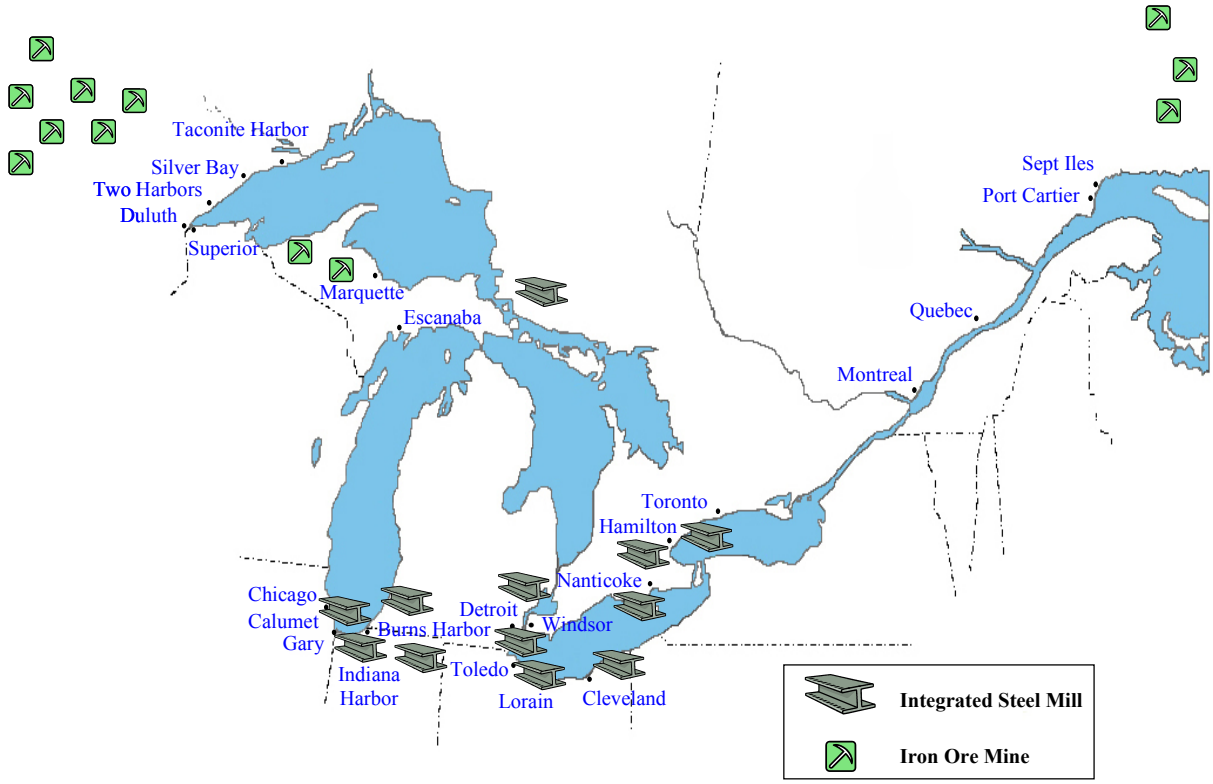
Probably the most important single construction project affecting commercial navigation on the Great Lakes was the construction of the new Welland Canal in 1932. Its design was farsighted in that it was designed to pass boats larger than any that existed on the Great Lakes at that time. It was not until the completion of the St. Lawrence portion of the Seaway in 1959, more than a quarter century after completion of the new Welland Canal, in which boats as long as 730 feet, as broad as 75 feet, drafting as much as 25 feet, began to appear on the lakes. These Seaway-size boats are capable of carrying 25,000 tons or more of cargo per trip.

c. <u>Industries and Natural Resources</u>. Great Lakes trade is dominated by the steel industry, which relies on lake vessels to move iron ore from Lake Superior and lower St. Lawrence River terminals to steel mills on lakes Ontario, Erie and Michigan. Iron ore, originating on Lake Superior, is primarily mined in the Arrowhead region of northeastern Minnesota referred to as the Mesabi Iron Range and the Marquette Iron Range in Michigan's Upper Peninsula. Lesser but substantial amounts of iron ore are mined in Canada in the vicinity of the Quebec-Labrador boundary. Iron ore has long been the backbone for Great Lakes shipping. **Figure 6** displays the location of GLNS iron ore mines and lakeside steel mills. The movement of iron ore from U.S. ports on Lake Superior to steel mills along Lake Michigan, the Detroit River, Lake Erie and Lake Ontario is the largest commodity flow on the Great Lakes.

In recent years, a downturn in the North American steel industry had curtailed iron ore movements. This trend reversed itself in 2003 and 2004. The U.S. iron ore mining industry will never be what it was in 1979, but rising demand for quality iron ore has stopped its shrinking slide and brightened the outlook for iron ore production. The opening of a previously closed mine in 2004 added 6.1 million tons of iron ore production. Iron ore demand is booming in North America. China's appetite for high quality ore is one key factor. Other contributing factors include a healthier domestic steel industry, booming steel production, soaring prices for scrap, a weakening American dollar and rising demand world-wide for high quality iron ore.

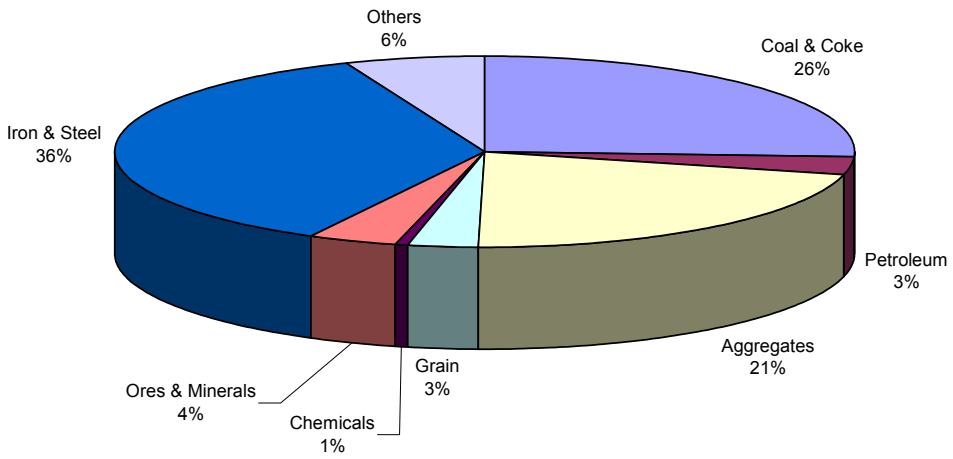
U.S. iron ore mines supply approximately two-thirds of the iron units needed to make pig iron in U.S. blast furnaces. The other one-third comes from Canadian mines, imports, and recycled scrap. Domestic steel production has rebounded from the bankruptcies in 2001 and 2002 that shut down 12 million tons of blast furnace capacity. Consolidation in the steel industry has led to the re-start of blast furnaces and another 20 million tons of annual steelmaking capacity.

Figure 6
Great Lake Iron Ore Mines and Lakeside Steel Mills



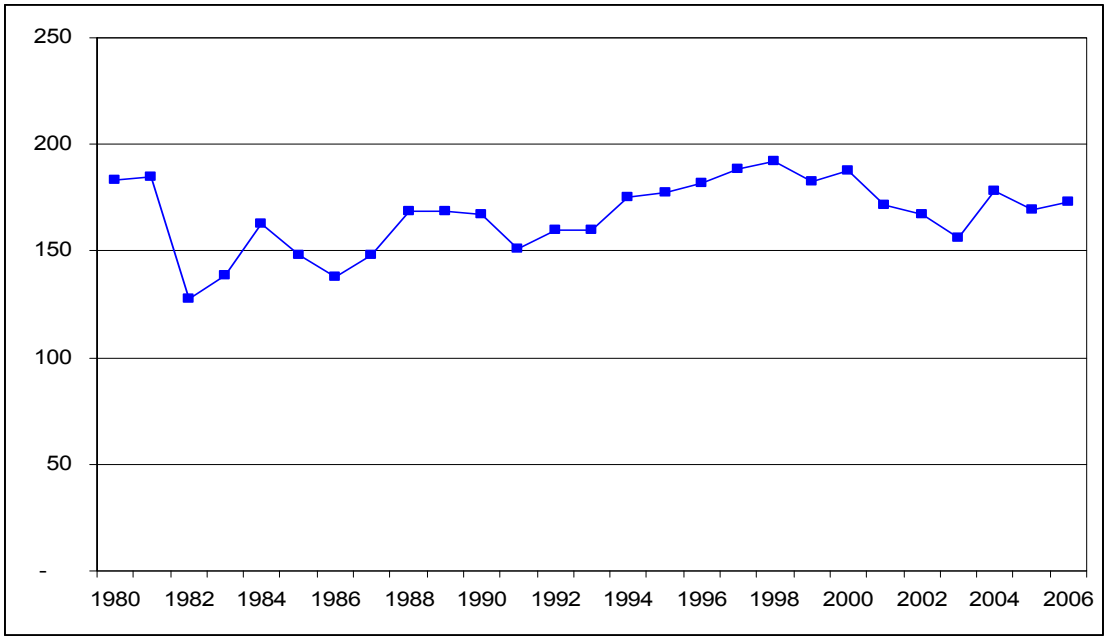
d. <u>Historic Traffic</u>. The principal commodities transported on the Great Lakes (see **Figure 7**) are iron ore, coal, limestone and grain. The largest commodity flow is the movement of iron ore from U.S. ports on Lake Superior to steel mills on Lake Michigan, the Detroit River, Lake Erie and Lake Ontario. The second largest flow is stone moving from U.S. ports on Lake Huron and Lake Erie, primarily to iron ore processing mills on Lake Superior, to steel mills, and to construction material yards in major metropolitan areas. Downbound flows of coal are the third largest commodity flow; Powder River Basin coals moving from Lake Superior to lakeside electric utility plant in both the U.S. and Canada dominate this flow. Quebec/Labrador iron ores moving up the St. Lawrence River to steel mills primarily on lakes Ontario and Erie is another dominant flow.

Figure 7
GLNS Commodity Traffic Share – 2006



In the past 26 years, the most dramatic change in U.S. GLNS traffic occurred between 1980 and 1982. Traffic declined by 64 million tons in this two year period; the drop coinciding with a recession-induced downsizing of the U.S. steel industry, primarily affecting integrated mills on Lake Erie and in the Ohio and Monongahela river valleys. Some recovery occurred over the next two years. **Figure 8** shows GLNS traffic between 1980 and 2006.

Figure 8
U.S. Great Lakes Navigation System Traffic, 1980-2006
(Thousand Tons)



Source: Waterborne Commerce Statistics Center

Table 1 shows historic Great Lakes bulk traffic since 1990. Overall growth of 0.2 percent annually is observed. In the 2000s, overall traffic has decreased by 0.8 percent annually although coal and petroleum products have exhibited growth.

Table 1
Historic Great Lakes Bulk Commodity Traffic (Million Tons[6])

Commodity	1990	2000	2003	2004	2005	2006	Growth Rate 90-00	Growth Rate 00-06	Growth Rate 90-06
Coal	39.4	43.3	41.5	43.1	44.8	44.9	1.0%	0.4%	0.8%
Petroleum	6.4	4.6	4.7	5.1	4.6	5.1	-3.2%	0.9%	-1.5%
Aggregates	29.3	38.4	34.3	41.0	37.0	37.2	2.7%	-0.3%	1.5%
Grain	6.1	7.5	4.8	4.8	5.1	5.1	2.2%	-3.8%	-1.0%
Chemicals	2.7	1.9	1.6	1.6	1.1	1.0	-3.5%	-6.2%	-6.0%
Ores & Mineral	4.8	8.2	7.0	7.1	6.7	6.6	5.5%	-2.1%	2.0%
Iron & Steel	70.9	72.9	53.2	64.8	59.4	62.5	0.3%	-1.5%	-0.8%
Other	7.6	10.5	9.4	10.9	10.8	10.6	3.4%	0.1%	2.1%
Total	**167.1**	**187.5**	**156.5**	**178.4**	**169.4**	**173.0**	**1.2%**	**-0.8%**	**0.2%**

Source: Waterborne Commerce Statistics Center

[6]/ Short tons not metric. Multiply by .907 to get metric tons.

2. Waterway Improvements.

a. State of the GLNS. A system of locks, lakes and connecting channels, the GLNS combines remarkable natural resources with one of the world's great engineering feats to form a transportation network linking the middle of North America to the global marketplace. There are four operational commercial cargo locks in the GLNS.[7] Two locks on the St. Marys River – Poe and MacArthur are known collectively as Soo Locks. Chicago Harbor Lock, used mostly for recreational traffic is located at the junction of the Chicago River and Lake Michigan. Black Rock Lock in Buffalo, NY is located on the Black Rock Channel which connects the Niagara River and the New York State Barge Canal. **Table 2** displays general lock characteristics of the GLNS locks.

Table 2
GLNS General Lock Characteristics

				--- in feet ---					
River/ Project	Chamber	River Mile	Year Open	Length	Width	Sill Depth	Lift	Status	Owner/ Operator
St. Marys River									
Poe	Main	47.0	1963	1220	110	32.0	22.0	Operational	Corps/Corps
MacArthur	Main	47.0	1943	800	80	31.0	22.0	Operational	Corps/Corps
Davis	Main	47.0	1914	1350	80	23.0	22.0	Operational	Corps/Corps
Sabin	Main	47.0	1919	1350	80	23.0	22.0	Closed	Corps/Corps
Canadian	Main	47.0	1998	252	49	10.0	22.0	Operational	Canada
Chicago Harbor Channel									
Chicago Harbor Lock	Main	327.2	1939	600	80	22.4	4.0	Operational	Corps/Contractor
Black Rock Canal									
Black Rock Lock	Main	4.0	1914	650	70	21.6	5.0	Operational	Corps/Corps

All five of the Great Lakes are deep enough such that, once on open lake waters, natural depths and rainfall variations do not affect vessel drafts, and winter ice conditions regularly leave open water in all save Lake Erie. Constraints to navigation are presented by the connecting channels and locks, and by approach channels to harbors. Connecting channels are maintained to allow a minimum of 25.5 feet of safe draft.[8] **Table 3** provides descriptive characteristics of the GLNS connecting channels. Vessel loadings beyond 25.5 feet are beneficial to lake operators and are frequently accommodated; however, in low water years, channel depths may support only the minimum drafts.

[7]/ The Canadian government operates a small lock at Sault Ste. Marie for use by passenger and recreational vessels.
[8]/ A 27' deep channel is required to allow for a 25.5' draft and a safe under keel clearance of 1.5'.

Table 3
Great Lakes Navigation System Channels

Channel	Controlling Depth (feet)	Length (miles)	General Channel Width (feet)	Fall (feet)	Restrictive Width (feet)
St. Marys River	27.0	63-75	300-1,500	22	76,105[1/]
Straits of Mackinac	30.0	1	1,250	0	NA
St. Clair River	27.0	46	700-1,400	5	600[2/]
Lake St. Clair	27.5	17	700-800	0	NA
Detroit River	27.5	32	300-1,260	3	600
Welland Canal	27.0	27	193-350	326	78[3/]

[1/] 76 feet for MacArthur Lock,105 feet for Poe Lock.
[2/] width restrictions at the Blue Water Bridge
[3/] a 3.0 mile section of the reach between Locks 7 and 8 is restricted to one-way navigation
Source: *General Description of Great Lakes/St. Lawrence Seaway Physical Description,* submitted to the Department of the Army, North Central Division, Chicago, IL by ARCTEC, Inc., September 1981 as updated by the U.S. Army Corps of Engineers, Detroit District.

In addition, the climate within the basin places a significant constraint on navigation across the lakes. Seasonal climatic change in the mid-latitudes produces ice in the winter. Ice on the Great Lakes, principally ice at the Soo Locks and in the connecting channels between the lakes, limits the extent of the navigation season to March 15 through January 15.

b. Modernization Status. Chicago Harbor Lock and Soo Locks on the Great Lakes are currently under preconstruction engineering and design (PED). Plans and specifications for the first construction contract will be initiated when construction funds become available. The proposed new Soo Lock will be constructed in the foot prints of the existing Sabin and Davis locks. It is expected to take at least five years to complete.

In 1999, Congress provided a broad-range authority to review the feasibility of improving commercial navigation on the Great Lakes/St. Lawrence Seaway navigation system, including locks, dams, harbors, ports, channels and other related features. The first phase of the review was a reconnaissance study completed in the summer of 2002. The reconnaissance study recognized a Federal interest in improving navigation on the Great Lakes/St. Lawrence Seaway and recommends moving into a more detailed, feasibility level of analysis.

c. Application of Innovations.

1. Chicago Harbor Lock (Chicago Harbor Channel). The Metropolitan Sanitary District of Greater Chicago completed construction of the Chicago Harbor Lock in 1938. Operation and maintenance was turned over to the U.S. Army Corps of Engineers-Chicago District in 1984. Chicago Harbor Lock is the 2nd busiest lock in the country with approximately 40,000 vessels per year, 2nd only to Chittenden Lock, Seattle.

Photo2: Aerial view of Chicago Harbor Lock with Lake Michigan in the foreground and Chicago River winding through downtown Chicago in the background

In 1998, the innovative installation of an emergency dewatering system consisting of stop log slots and sills was completed. Stop log slots were added by local cofferdam and precast concrete sills were placed "in-the-wet" to allow the lock to remain operational (see photos 3 and 4 below).

In 2007, the construction of new lock control house was completed. The control house was relocated to the center of the lock wall and elevated 40 feet above the water surface improving the operator's ability to see and control the entire lock chamber. This was done without impacting the integrity of the existing lock wall by selecting small diameter, drilled-in-place battered micropiles as foundation and locating them within the open cells of the existing lock walls, anchoring the new structure deep in the surrounding bedrock.

Future work at the Chicago Lock, includes replacement of all sector gates and the operating & electrical systems.

2. Soo Locks (St. Marys River). Detroit (LRE) and Huntington (LRH) districts are working together on the Soo Locks Replacement Lock Project. The districts' team is designing a lock to replace the existing Davis and Sabin locks, which are currently out of service, with a single 1200' x 110' lock. Through-the-sill intakes and a chamber culvert system are proposed, which is similar to the system that has been successfully used at the existing projects for many years. This system is being modeled by the Corps of Engineer's Waterway Experiment Station (WES). **Figure 9** shows a conventional lock filling/emptying system with valves and culverts. There is essentially no sedimentation or debris problem at these projects. The design

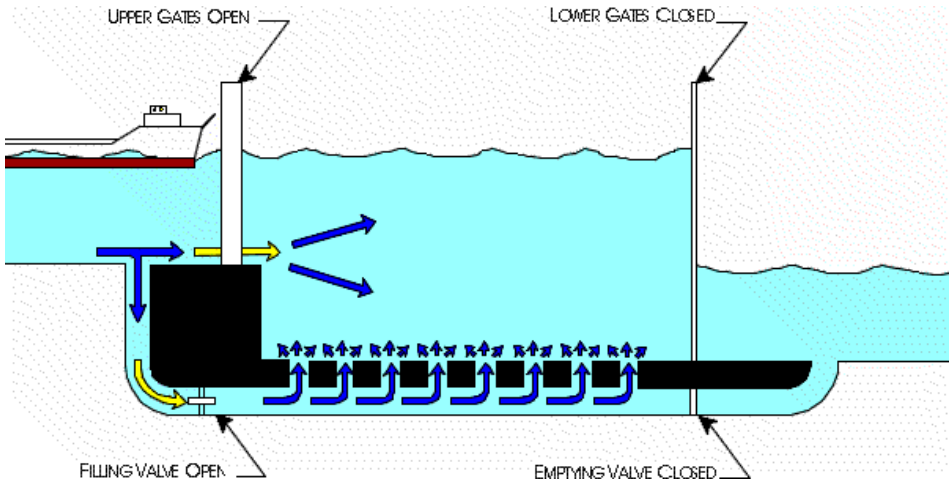
includes use of face-mounted filling and emptying valves on the upstream and downstream seals that can be removed as modules for maintenance.

New guide wall sections are being designed for both the upstream and downstream approaches. These will include designated vessel landing areas which will be more substantial to absorb the ship impacts. The project also includes deepening of the upstream and downstream channel by removing overburden and bedrock.

Photo 3: Prefabricated slot being lowered into local cofferdam

Photo 4: Precast concrete sill being lowered "in-the-wet" down to lock floor for installation and grouting.

Figure 9
Schematic Lock Empty/Fill System



Because of the deeper draft required, LRH is investigating use of rock anchors to overcome stability problems. It should be noted that the Pittsburgh District (LRP) is considering a similar design for the new land wall of the Charleroi Locks (LD 4 replacement locks) on the Monongahela River. The district is investigating emergency closure for the 110 foot lock consisting of bulkheads and means to place the bulkheads under flowing water.

d. Ongoing GLNS Studies.

1. Great Lakes Navigation System Reconnaissance Report. Initiated in 2000 and completed in 2003, the Great Lakes Navigation System Reconnaissance Report was used to determine the requirements to maintain the integrity, environmental sustainability, and future commercial navigation, of the system, for the next fifty years. A USACE Headquarters-mandated Supplemental Reconnaissance maintains the philosophy of an earlier bi-national report, prepared by the Corps of Engineers, Transport Canada, Environment Canada and the U.S. Fish and Wildlife Service, which recommended that expansion of the system not proceed. The Supplemental report, with a draft expected in May 2009, provides more detail on the St. Lawrence Seaway, existing infrastructure, federally maintained ports, channel maintenance issues and requirements. The report also defines Federal interest in support for commercial navigation before recommending any feasibility efforts.

Photo 5: Vessel transiting the Poe Lock

2. Great Lakes Fishery and Ecosystem Restoration Program. Recognizing that the Great Lakes comprise a nationally and internationally significant fishery and ecosystem, Congress approved the Great Lakes Fishery and Ecosystem Restoration Program in Section 506 of the Water Resources Development Act (WRDA) of 2000. This legislation provides the Corps with programmatic authority to support the restoration of the Great Lakes fishery and ecosystem in cooperation with other Federal, State and local agencies, and the Great Lakes Fishery Commission. The program as legislated consists of 3 parts: a Support Plan, Projects, and an Evaluation Program.

Federal funding was first received in FY02 and used with a non-Federal cost share from the Great Lakes Fishery Commission to contract for extensive coordination with Great Lakes fishery organizations and others interested in creating the Support Plan. This document defines how the Corps would support the management of Great Lakes fisheries, and has been developed in cooperation with the signatories to the '*Joint Strategic Plan for Management of the Great Lakes Fisheries'* (a bi-national group of fishery resource agencies and tribal governments) and other affected interests. The Support Plan was reviewed by HQUSACE, the Assistant Secretary of the Army for Civil Works (ASA(CW)), and the Office of Management and Budget (OMB) in 2006. Although OMB determined this program was not eligible for inclusion in the President's Budget, Congress has provided funding each year.

The second parts of Section 506 authorizes the Corps to plan, design and construct projects that support the restoration of the fishery, ecosystem and beneficial uses of the Great Lakes. During FY09 we anticipate starting construction on one or two projects, and completing feasibility studies on four others. In total, work is currently being done on about a dozen studies. The authority further directs the Corps to develop a program to evaluate the success of these projects in meeting fishery and ecosystem restoration goals. As projects are constructed, efforts in this area will ramp up.

Photo 6: Soo Locks on the St. Marys River

e. <u>Stakeholders – Industry, Agencies and Others</u>. The Great Lakes are an international water body shared by Canada and the United States. Thus, decisions, which for most inland waterways are made at the federal level in the United States, on the Great Lakes may have to be considered at the international level. Additionally, the federal government of each country has to interact with its constituents – states and provinces. Government agencies, industry groups and port authorities collectively work to improve the reliability and efficiency of the GLNS.

Photo 7: *The Detroit River with two 1000-foot ore boats passing*

The International Joint Commission (IJC) was established by the U.S. and Canadian governments to address boundary disputes and to regulate the Great Lakes. Historically, the principal area of concern for the IJC has been regulation of water volumes and levels in the lakes. Two of the Great Lakes, Superior and Ontario, are regulated to affect the level of their water surfaces. In both cases, the regulation does not ensure full control of the levels of the lake because the major factors that affect the supply of water to the Great Lakes – over-lake precipitation, evaporation and runoff – can neither be controlled nor can they be accurately predicted over the long term. The impact of regulation upon water levels of Lake Superior has been small compared to the natural factors that affect its water level. Upon various occasions, the regulation of Lake Ontario has had a significant effect on its water level.

The Great Lakes Commission (GLC) is a bi-national agency that promotes the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the GLB. Since its establishment 45 years ago, the GLC has been a pioneer in applying principles of sustainability to the development, use and conservation of GLB resources. Commission activities are directed at realizing its vision of a strong and growing economy, a healthy environment, and a high quality of life for all citizens.

The U.S. Department of Transportation's Saint Lawrence Seaway Development Corporation (SLSDC) is a wholly owned government corporation created to construct, operate and maintain that part of the St. Lawrence Seaway between the Port of Montreal, Quebec and Lake Erie, within the territorial limits of the United States. The mission of the Corporation is to serve the U.S. inter-modal and international transportation system by improving the operation and

maintenance of a safe, reliable, efficient and environmentally responsible deep-draft waterway in cooperation with its Canadian counterpart, the St. Lawrence Seaway Management Corporation. The SLSDC also encourages the development of trade through the Great Lakes Seaway system, which contributes to the comprehensive economic and environmental development of the Great Lakes region.

The St. Lawrence Seaway Management Corporation (SLSMC) is a not-for-profit corporation responsible for the safe and efficient movement of marine traffic through the Canadian Seaway facilities, which consist of 13 of the 15 locks between Montreal and Lake Erie. The Corporation plays a pivotal role in ensuring the waterway remains a safe and well-managed system, which it shares with its American counterpart, the Saint Lawrence Seaway Development Corporation.

3. Regional Commerce.

a. Waterway Impact on Regional Economy. The GLNS has an enormous economic impact on the North American economy. It generates over $3 billion annually and up to 17,000 jobs in Canada, and adds another $2 billion and some 50,000 jobs to the U.S. economy. For individual ports in the system, trade has been a catalyst for billions of dollars in capital investment and industrial growth. The base economies of many GLNS ports, and the entire Midwest, were defined by cost effective access to raw materials provided by the waterway. The GLNS and St. Lawrence Seaway have provided U.S. and Canadian farmers of the Great Plains with an economical route to the world market for roughly 14 million metric tons a year of wheat, corn, soybeans and other products[9].

Maritime commerce on the GLNS involves two general trade communities: traffic moved on the Seaway, much of which is overseas import/export trade, and inter-lake domestic trades contained within the Great Lakes. The two universes are largely distinct, though they do both service the steel industry. Lakers hauling iron ore and "salties" specializing in steel both service the Great Lakes' steel industry.

The GLNS is a multi-modal system. Seamless movements of goods and commodities flow from ship to rail and truck and from rail and truck to ship in well-synchronized trade patterns. Some of the most successful GLNS trades rely on multimodal connections, such as low-sulfur coal railed to Great Lakes loading ports from Wyoming and Montana for shipment by self-unloading vessels throughout the Lakes and grain railed from the Canadian Prairie Provinces to Thunder Bay for direct export by ocean freighters.

[9]/ *2001/02 Great Lakes/St. Lawrence Seaway System Directory*. Published in cooperation with the St. Lawrence Seaway Management Corporation and the St Lawrence Seaway Development Corporation.

Photo 8: Ashtabula Harbor, a large commercial harbor maintained and constructed by the Buffalo District, on Lake Erie

It is no coincidence that the major rail and highway hubs of the mid-continent - such as Chicago, Toronto, Detroit and Toledo - are major GLNS ports as well. More than 40 provincial and interstate highways and nearly 30 rail lines link the 65 major and regional ports of the system with consumers and industries all over North America.

b. <u>Great Lakes Basin Economy</u>. The principal commodities transported on the Great Lakes are iron ore, coal, limestone and grain. Iron ore is primarily mined at the head of the Lakes in the Arrowhead region of northeastern Minnesota referred to as the Mesabi Iron Range and in the Marquette Iron Range in Michigan's Upper Peninsula. Lesser but substantial amounts of iron ore are mined in eastern Canada in the vicinity of the Quebec-Labrador boundary. Steel companies on lakes Michigan, Erie and Ontario are the predominate shippers of iron ore. Coal moving on the Great Lakes is principally mined in two regions – the Appalachian region of the eastern U.S. and the Powder River Basin of Wyoming and Montana in the western U.S. Coal produced in Appalachia is railed to harbors on Lake Erie for shipment to electric utilities with plants on the lakes in both Canada and the U.S. Limestone, or stone, is principally mined in the northern part of Michigan's Lower Peninsula and the eastern tip of Michigan's Upper Peninsula and is used in iron ore processing plants to make iron pellets and in construction activities. Grain (especially wheat, but including corn, soybeans and other grains and oilseeds) is produced extensively across the American Midwest and on the Great Plains of the U.S. and Canada. Though not a major commodity on the Great Lakes, potash is produced in the prairie province of Saskatchewan. Steel products also move in relatively smaller quantities, often brought-in by ocean-going vessels commonly referred to as salties.

Tables 4 - 7 display 2003 - 2006 total Great Lakes traffic by lake and by commodity. **Tables 8 - 11** display 2003 and 2006 Great Lakes traffic by country. As the table shows, Great Lakes traffic is dominated by US/US traffic. **Figure 10** shows historic U.S. traffic on the Great Lakes has generally increased since 1991.

Table 4
2003 Great Lakes Navigation System Traffic by Lake and by Commodity

Lake	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Superior	19,480,009	201,123	3,297,315	2,917,169	314,286	551,323	39,836,928	1,979,511	68,577,664
Huron	23,847,995	1,733,123	22,993,456	3,363,147	1,006,292	5,171,674	42,160,486	6,353,964	106,630,137
Michigan	9,269,209	4,823,921	14,467,144	1,176,224	2,447,092	3,303,417	27,622,162	6,124,384	69,233,553
Erie	24,264,379	1,499,199	13,326,905	4,615,604	525,143	2,781,382	22,356,806	3,343,405	72,712,823
Ontario	4,605,764	730,083	868,966	4,064,577	316,482	1,200,282	7,904,897	2,462,620	22,153,671
Great Lakes	**41,494,564**	**4,690,652**	**34,288,901**	**4,823,361**	**1,576,359**	**7,010,108**	**53,179,737**	**9,420,531**	**156,484,213**

Source: WCSC

Table 5
2004 Great Lakes Navigation System Traffic by Lake and by Commodity

Lake	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Superior	20,366,777	198,284	4,498,781	2,593,951	410,629	605,724	47,417,170	2,016,173	78,107,489
Huron	24,931,903	1,921,772	29,560,916	3,216,491	1,332,045	5,280,567	50,624,549	6,735,428	123,603,671
Michigan	10,635,167	5,464,477	16,035,589	1,323,833	2,314,194	4,105,918	31,623,642	6,969,815	78,472,635
Erie	23,093,838	1,963,580	14,165,267	4,457,873	613,381	2,761,990	28,843,188	4,472,357	80,371,474
Ontario	4,576,146	1,025,507	1,616,696	3,945,225	328,653	1,261,043	9,732,745	3,307,099	25,793,114
Great Lakes	**43,094,976**	**5,069,159**	**41,005,218**	**4,841,282**	**1,627,555**	**7,081,253**	**64,795,180**	**10,919,650**	**178,434,273**

Source: WCSC

Table 6
2005 Great Lakes Navigation System Traffic by Lake and by Commodity

Lake	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Superior	22,044,151	148,750	3,488,484	3,063,741	328,394	585,876	43,995,357	2,396,006	76,050,759
Huron	27,646,347	1,812,330	26,802,750	3,910,889	719,924	5,082,744	46,592,397	6,004,452	118,571,833
Michigan	11,119,916	5,658,917	15,328,765	1,407,998	1,792,706	3,730,489	27,910,674	6,254,351	73,203,816
Erie	24,921,114	1,460,346	13,284,431	4,885,044	427,362	2,725,835	26,236,845	4,595,431	78,536,408
Ontario	3,886,730	750,577	1,661,189	4,283,510	236,523	1,084,462	9,561,851	3,590,349	25,055,191
Great Lakes	**4,772,865**	**4,593,240**	**36,966,444**	**5,145,027**	**1,078,254**	**6,666,459**	**59,410,889**	**10,777,335**	**129,410,513**

Source: WCSC

Table 7
2006 Great Lakes Navigation System Traffic by Lake and by Commodity

Lake	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Superior	23,198,464	203,943	4,109,410	2,158,280	279,976	810,666	45,142,067	2,210,911	78,113,717
Huron	27,870,690	2,351,735	27,203,728	3,168,569	636,627	5,013,653	48,978,192	6,001,514	121,224,708
Michigan	10,376,719	5,494,732	16,836,965	1,266,935	1,988,252	3,911,019	31,539,785	6,194,163	77,608,570
Erie	24,636,785	2,425,315	13,430,134	5,055,795	444,861	2,784,148	27,535,922	4,052,885	80,365,845
Ontario	3,946,422	1,596,033	1,949,381	4,440,177	314,654	1,367,759	10,793,925	3,066,165	27,474,516
Great Lakes	**44,896,400**	**5,067,162**	**37,157,190**	**5,143,762**	**989,831**	**6,631,877**	**62,534,558**	**10,592,403**	**173,013,183**

Source: WCSC

Table 8
2003 Great Lakes Navigation System Traffic by Country

Lake	US/US	US/CN	US/Overseas	Total
Superior	51,459,101	15,229,779	1,888,784	68,577,664
Huron	70,728,386	33,020,912	2,880,839	106,630,137
Michigan	60,548,554	7,696,357	988,642	69,233,553
Erie	29,486,747	4,181,594	39,044,482	72,712,823
Ontario	1,295	17,786,465	4,365,911	22,153,671

Source: WCSC Data.

Table 9
2004 Great Lakes Navigation System Traffic by Country

Lake	US/US	US/CN	US/Overseas	Total
Superior	59,127,848	17,233,392	1,746,249	78,107,489
Huron	82,368,804	37,825,973	3,408,894	123,603,671
Michigan	66,810,896	9,999,094	1,662,645	78,472,635
Erie	6,245,879	40,147,814	5,310,781	51,704,474
Ontario	12,767	20,469,567	5,310,781	25,793,115

Source: WCSC Data.

Table 10
2005 Great Lakes Navigation System Traffic by Country

Lake	US/US	US/CN	US/Overseas	Total
Superior	54,931,659	19,138,529	1,980,571	76,050,759
Huron	76,849,810	38,483,836	23,074,187	138,407,833
Michigan	63,148,073	8,798,127	1,257,616	73,203,816
Erie	32,808,816	40,965,699	4,761,893	78,536,408
Ontario	3,333	20,274,710	4,777,148	25,055,191

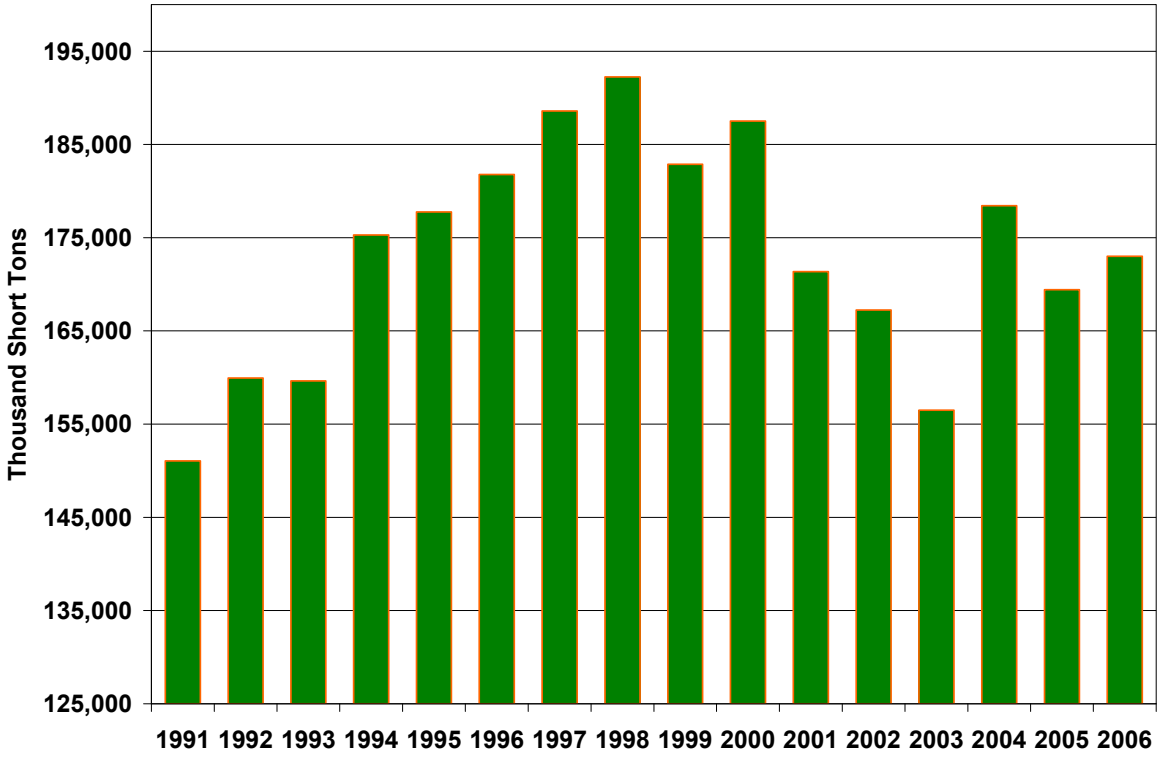
Source: WCSC Data.

Table 11
2006 Great Lakes Navigation System Traffic by Country

Lake	US/US	US/CN	US/Overseas	Total
Superior	58,682,314	17,244,122	2,187,281	78,113,717
Huron	78,259,868	38,450,189	4,514,751	121,224,808
Michigan	65,822,020	9,465,436	2,321,115	77,608,571
Erie	30,862,925	42,060,723	7,442,197	80,365,845
Ontario	29,238	19,988,413	7,456,865	27,474,516

Source: WCSC Data.

Figure 10
Historic U.S. Traffic Only on the Great Lakes



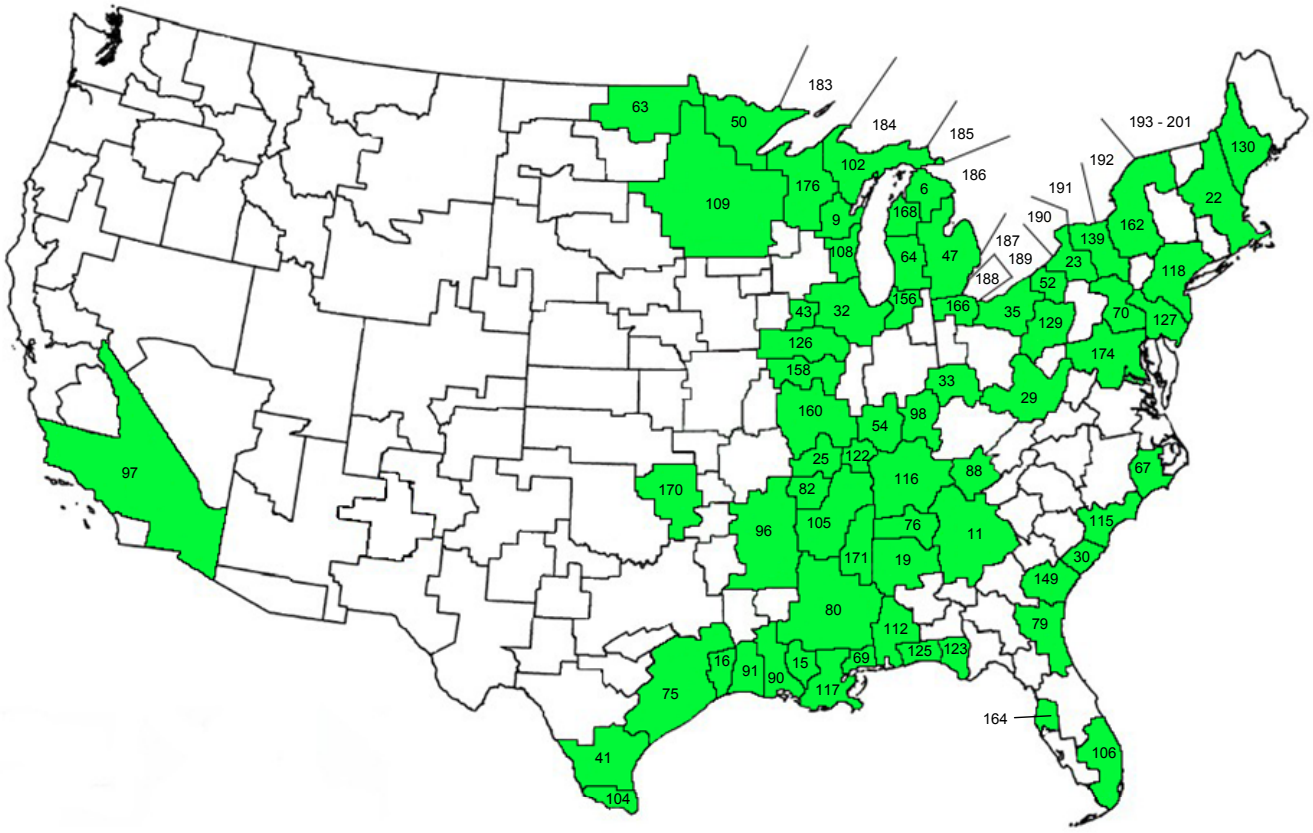
Source: USACE WCSC data.

A Bureau of Economic Analysis (BEA) economic area consists of a standard metropolitan statistical area (SMSA), which serves as a center of economic activity for its surrounding counties. **Figure 11** shows the BEA economic areas that either shipped or received Great Lakes Basin (GLB) commerce in 2003 - 2006. Only 38 percent of the BEA economic areas are within the GLB indicating commerce extends well beyond basin boundaries. **Tables 12** through **19** show the distribution by commodity group of 2003 through 2006 GLB commerce to BEA economic areas.

In 2006, three BEA economic areas accounted for almost 60.1 percent of all GLB shipments. The largest-shipping BEA economic areas were Duluth, Alpena, MI and Cleveland with 61.9, 24.8, and 18.3 million tons, respectively. Iron ore and steel comprised almost 36 percent of this tonnage with 26 percent coal, and 22 percent aggregates.

In 2006, the major receiving BEA economic areas of GLB traffic are Chicago, Cleveland, and Detroit with 43.2, 27.0, and 32.1 million tons, respectively. About 36 percent of this tonnage consisted of iron ore and steel. These three BEA economic areas accounted for almost 59 percent of GLB commerce received.

Figure 11
BEA Economic Areas Shipping or Receiving GLNS Commerce[1/]



[1/]U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 12
2003 Shipments by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	45	0	12,468	0	0	0	5,715	1,066	19,294
9 Appleton-Oshkosh-Neenah WI	0	0	2	0	0	0	0	7	9
15 Baton Rouge-Pierre Part LA	369	155	0	0	75	14	58	0	671
16 Beaumont-Port Arthur TX	0	656	0	0	0	19	0	0	675
19 Birmingham-Hoover-Cullman AL	0	0	0	0	0	0	0	5	5
22 Boston-Worcester-Manchester MA-NH	0	0	0	0	1	0	3	14	19
23 Buffalo-Niagara-Cattaraugus NY	0	0	0	0	0	0	0	8	8
29 Charleston WV	0	0	45	0	0	0	11	3	59
32 Chicago-Naperville-Michigan City IL-IN-WI	3,105	1,802	108	198	114	10	1,065	542	6,944
33 Cincinnati-Middletown-Wilmington OH-KY-IN	0	0	0	0	0	0	0	10	10
35 Cleveland-Akron-Elyria OH	13,067	3	1,203	11	6	1,090	1,645	179	17,206
41 Corpus Christi-Kingsville TX	0	71	0	0	0	1,082	0	0	1,153
43 Davenport-Moline-Rock Island IA-IL	0	0	0	0	0	0	1	0	1
47 Detroit-Warren-Flint MI	103	799	497	0	77	116	121	77	1,790
50 Duluth MN-WI	17,802	0	54	2,868	0	146	32,737	72	53,679
52 Erie PA	0	0	0	0	0	0	0	1	1
54 Evansville IN-KY	0	0	25	0	0	0	0	0	25
63 Grand Forks ND-MN	0	0	0	0	0	0	0	2	2
64 Grand Rapids-Muskegon-Holland MI	14	0	184	0	7	0	17	10	231
67 Greenville NC	0	0	0	0	37	0	0	0	37
69 Gulfport-Biloxi-Pascagoula MS	0	137	0	0	0	0	0	0	137
75 Houston-Baytown-Huntsville TX	53	468	0	0	542	0	1	0	1,064
76 Huntsville-Decatur AL	4	0	0	0	0	0	119	0	123
80 Jackson-Yazoo City MS	0	0	0	0	0	0	2	0	2
88 Knoxville-Sevierville-La Follette TN	0	0	0	0	0	0	0	3	3
90 Lafayette-Acadiana LA	0	0	0	0	0	3	0	0	3
91 Lake Charles-Jennings LA	0	36	0	0	20	0	0	136	192
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	3	0	3
97 Los Angeles-Long Beach-Riverside CA	0	0	0	0	0	0	0	0	1
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	1	0	0	0	0	2	0	3
102 Marinette WI-MI	36	2	7,844	0	0	38	3,649	20	11,588
105 Memphis TN-MS-AR	0	0	0	0	2	0	0	0	2
106 Miami-Fort Lauderdale-Miami Beach FL	0	0	0	0	0	0	0	0	0
108 Milwaukee-Racine-Waukesha WI	12	0	156	277	0	1	0	19	466
112 Mobile-Daphne-Fairhope AL	0	0	0	0	6	0	15	0	21
116 Nashville-Davidson--Murfreesboro--Columbia TN	0	0	98	0	0	0	7	0	105
117 New Orleans-Metairie-Bogalusa LA	334	431	3	0	35	5	148	0	955
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	197	0	0	19	0	0	0	215
122 Paducah KY-IL	0	0	0	0	0	0	1	0	1
126 Peoria-Canton IL	0	0	0	0	0	0	0	3	3
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	60	0	0	72	0	0	50	181
129 Pittsburgh-New Castle PA	23	0	0	0	0	0	3	0	26
146 San Jose-San Francisco-Oakland CA	0	0	0	0	0	0	0	4	5
149 Savannah-Hinesville-Fort Stewart GA	0	0	0	0	120	125	0	0	245
152 Seattle-Tacoma-Olympia WA	0	102	0	0	0	0	0	8	111
156 South Bend-Mishawaka IN-MI	0	0	0	0	0	0	0	4	4
160 St. Louis-St. Charles-Farmington MO-IL	6	5	0	0	0	0	35	51	96
162 Syracuse-Auburn NY	0	0	0	5	0	0	0	0	5
164 Tampa-St. Petersburg-Clearwater FL	0	0	0	0	52	0	0	0	52
166 Toledo-Fremont OH	3,493	153	3,024	1,176	52	0	0	0	7,897
168 Traverse City MI	0	1	0	0	621	182	0	47	851
170 Tulsa-Bartlesville OK	0	6	0	0	0	0	0	0	6
173 Virginia Beach-Norfolk-Newport News VA-NC	14	46	0	0	0	0	0	20	81
Other	1,372	39,338	16,685	319	1,278	6,079	11,617	9,039	85,727
Total	39,853	44,469	42,397	4,855	3,137	8,909	56,974	11,399	211,993

Source: WCSC Data.

[1/] A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties. U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 13
2004 Shipments by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	0	0	15,414	0	0	0	6,119	3,137	24,671
8 Anchorage AK	0	0	0	0	0	0	0	23	23
9 Appleton-Oshkosh-Neenah WI	0	0	0	0	0	0	121	5	126
11 Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	1	0	1
15 Baton Rouge-Pierre Part LA	0	139	0	0	48	91	52	0	330
16 Beaumont-Port Arthur TX	0	507	0	0	13	9	0	0	529
19 Birmingham-Hoover-Cullman AL	0	0	0	0	0	0	3	2	5
22 Boston-Worcester-Manchester MA-NH	0	48	0	0	0	0	2	12	62
23 Buffalo-Niagara-Cattaraugus NY	76	4	0	0	0	0	0	1	81
25 Cape Girardeau-Jackson MO-IL	0	0	0	3	0	0	0	0	3
29 Charleston WV	9	0	28	0	0	0	12	6	56
32 Chicago-Naperville-Michigan City IL-IN-WI	4,244	1,980	137	437	27	5	1,338	949	9,116
33 Cincinnati-Middletown-Wilmington OH-KY-IN	0	0	0	0	0	0	11	3	14
35 Cleveland-Akron-Elyria OH	12,985	3	824	22	11	1,595	2,822	223	18,486
40 Columbus-Marion-Chillicothe OH	5	0	0	0	0	0	0	0	5
41 Corpus Christi-Kingsville TX	0	69	0	0	6	118	0	0	193
43 Davenport-Moline-Rock Island IA-IL	0	0	0	0	0	0	0	3	3
47 Detroit-Warren-Flint MI	45	709	509	0	36	56	39	27	1,420
50 Duluth MN-WI	18,422	0	26	2,406	27	320	38,942	161	60,303
54 Evansville IN-KY	0	3	62	0	0	0	0	0	65
63 Grand Forks ND-MN	0	1	1	0	0	0	0	1	2
64 Grand Rapids-Muskegon-Holland MI	0	0	202	0	0	0	38	10	250
69 Gulfport-Biloxi-Pascagoula MS	0	497	0	0	0	0	0	0	497
75 Houston-Baytown-Huntsville TX	0	359	0	0	689	0	8	4	1,059
76 Huntsville-Decatur AL	15	0	0	19	0	0	101	13	148
80 Jackson-Yazoo City MS	0	0	0	3	0	1	0	0	4
82 Jonesboro AR	0	0	0	0	0	0	12	3	15
88 Knoxville-Sevierville-La Follette TN	0	0	0	0	0	0	11	3	14
89 La Crosse WI-MN	0	0	0	0	0	0	1	0	1
90 Lafayette-Acadiana LA	0	0	0	0	0	1	0	0	1
91 Lake Charles-Jennings LA	0	45	0	0	13	0	0	108	166
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	3	0	3
97 Los Angeles-Long Beach-Riverside CA	0	24	0	0	0	0	0	0	25
98 Louisville-Elizabethtown-Scottsburg KY-IN	8	0	0	0	0	0	0	2	9
102 Marinette WI-MI	10	12	9,717	0	0	25	5,401	38	15,203
104 McAllen-Edinburg-Pharr TX	0	0	0	0	0	0	3	0	3
105 Memphis TN-MS-AR	0	6	0	1	0	0	15	0	21
106 Miami-Fort Lauderdale-Miami Beach FL	0	0	0	0	0	0	0	17	17
108 Milwaukee-Racine-Waukesha WI	0	0	130	238	0	0	0	1	369
112 Mobile-Daphne-Fairhope AL	0	0	0	0	0	0	24	7	31
116 Nashville-Davidson--Murfreesboro--Columbia TN	0	0	149	0	0	0	11	0	160
117 New Orleans-Metairie-Bogalusa LA	1,196	269	0	0	8	68	167	0	1,707
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	161	0	0	41	0	0	0	202
122 Paducah KY-IL	0	0	0	0	0	0	19	0	19
126 Peoria-Canton IL	0	0	0	0	0	0	0	2	2
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	77	0	0	256	0	0	27	360
129 Pittsburgh-New Castle PA	8	9	0	0	0	0	1	0	19
146 San Jose-San Francisco-Oakland CA	0	0	0	0	0	1	0	4	5
149 Savannah-Hinesville-Fort Stewart GA	0	0	0	0	95	148	0	0	244
152 Seattle-Tacoma-Olympia WA	0	63	0	0	0	0	0	10	74
160 St. Louis-St. Charles-Farmington MO-IL	24	36	0	9	0	31	38	62	201
162 Syracuse-Auburn NY	0	0	2	0	4	0	0	0	6
164 Tampa-St. Petersburg-Clearwater FL	0	0	0	0	66	0	3	0	69
166 Toledo-Fremont OH	2,704	416	3,214	1,429	20	0	30	27	7,841
168 Traverse City MI	0	15	0	0	668	168	0	0	851
170 Tulsa-Bartlesville OK	0	7	0	0	0	0	0	0	7
173 Virginia Beach-Norfolk-Newport News VA-NC	0	92	0	0	0	0	0	15	108
Other	1,636	40,369	19,876	321	1,920	6,269	12,836	7,162	90,388
Total	41,387	45,918	50,291	4,889	3,948	8,908	68,184	12,070	235,595

Source: WCSC Data.

[1/] A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties. U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 14
2005 Shipments by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	19	0	13,607	0	0	25	8,656	3,504	25,811
11 Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	1	0	1
15 Baton Rouge-Pierre Part LA	39	0	0	0	20	36	33	0	129
19 Birmingham-Hoover-Cullman AL	0	0	0	0	0	0	6	0	6
23 Buffalo-Niagara-Cattaraugus NY	218	0	0	0	0	0	9	0	227
25 Cape Girardeau-Jackson MO-IL	0	0	0	15	0	0	0	0	15
29 Charleston WV	9	0	34	0	0	0	6	0	49
32 Chicago-Naperville-Michigan City IL-IN-WI	7,116	2,541	1,876	569	80	8	984	1,019	14,193
33 Cincinnati-Middletown-Wilmington OH-KY-IN	0	0	0	0	0	0	3	6	9
35 Cleveland-Akron-Elyria OH	12,648	107	1,074	0	0	1,565	2,649	177	18,219
40 Columbus-Marion-Chillicothe OH	13	0	0	0	0	0	0	0	13
47 Detroit-Warren-Flint MI	137	686	540	0	35	96	147	53	1,693
50 Duluth MN-WI	19,692	0	0	2,934	0	188	35,215	374	58,403
52 Erie PA	0	0	22	0	0	0	0	0	22
54 Evansville IN-KY	0	0	89	0	0	0	0	0	89
63 Grand Forks ND-MN	0	0	1	0	0	0	0	1	2
64 Grand Rapids-Muskegon-Holland MI	0	0	133	0	0	0	18	34	185
69 Gulfport-Biloxi-Pascagoula MS	0	0	0	0	2	0	0	0	2
75 Houston-Baytown-Huntsville TX	0	0	0	0	24	0	5	2	32
76 Huntsville-Decatur AL	2	1	0	20	0	0	154	9	186
80 Jackson-Yazoo City MS	0	0	0	19	0	0	2	0	21
82 Jonesboro AR	0	0	0	0	0	0	1	0	1
88 Knoxville-Sevierville-La Follette TN	0	0	0	0	0	0	5	0	5
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	5	0	5
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	0	8	0	0	0	0	0	8
102 Marinette WI-MI	0	0	10,174	0	0	45	4,047	20	14,286
104 McAllen-Edinburg-Pharr TX	0	0	0	0	0	0	2	0	2
105 Memphis TN-MS-AR	0	11	0	0	0	0	9	11	31
106 Miami-Fort Lauderdale-Miami Beach FL	0	0	0	0	0	0	0	0	0
108 Milwaukee-Racine-Waukesha WI	10	0	117	297	0	0	5	7	436
109 Minneapolis-St. Paul-St. Cloud MN-WI	0	0	0	0	0	0	2	0	2
112 Mobile-Daphne-Fairhope AL	0	0	0	0	0	0	14	2	15
113 Monroe-Bastrop LA	0	0	0	4	0	0	0	0	4
116 Nashville-Davidson--Murfreesboro--Columbia TN	0	0	74	0	0	0	9	1	84
117 New Orleans-Metairie-Bogalusa LA	534	10	0	0	16	57	176	2	794
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	3	0	0	0	0	0	0	3
122 Paducah KY-IL	6	0	0	0	0	0	0	0	6
126 Peoria-Canton IL	0	0	0	2	0	0	3	9	13
129 Pittsburgh-New Castle PA	14	0	0	0	0	0	14	0	29
156 South Bend-Mishawaka IN-MI	0	0	0	0	0	0	0	3	3
160 St. Louis-St. Charles-Farmington MO-IL	0	23	0	2	0	13	32	40	110
162 Syracuse-Auburn NY	0	0	0	0	0	0	0	0	0
166 Toledo-Fremont OH	3,197	283	3,479	982	95	0	0	0	8,035
168 Traverse City MI	0	0	0	0	394	0	0	0	394
170 Tulsa-Bartlesville OK	0	12	0	0	0	0	0	0	12
171 Tupelo MS	0	0	0	0	0	0	2	0	2
Other	1,119	930	5,762	302	410	4,634	7,199	4,595	24,951
Total	44,773	4,608	36,988	5,145	1,077	6,666	59,411	9,868	168,536

Source: WCSC Data.

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Table 15
2006 Shipments by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	0	0	14,063	0	0	0	7,006	3,766	24,835
9 Appleton-Oshkosh-Neenah WI	0	0	24	0	0	0	0	5	29
15 Baton Rouge-Pierre Part LA	4	0	2	1	34	26	45	4	116
16 Beaumont-Port Arthur TX	0	6	0	0	0	0	0	0	6
19 Birmingham-Hoover-Cullman AL	0	0	0	0	0	0	0	2	2
23 Buffalo-Niagara-Cattaraugus NY	385	4	0	0	0	0	0	1	390
29 Charleston WV	101	0	32	0	0	0	46	0	179
32 Chicago-Naperville-Michigan City IL-IN-WI	6,459	2,701	2,396	488	44	9	680	1,163	13,940
35 Cleveland-Akron-Elyria OH	11,866	35	1,449	12	0	1,391	3,359	142	18,254
41 Corpus Christi-Kingsville TX	0	0	0	0	17	0	0	0	17
43 Davenport-Moline-Rock Island IA-IL	0	0	0	0	0	0	2	2	3
47 Detroit-Warren-Flint MI	328	899	521	0	21	66	81	26	1,943
50 Duluth MN-WI	21,273	0	0	2,059	0	386	37,801	361	61,879
52 Erie PA	0	0	0	0	0	0	0	1	1
54 Evansville IN-KY	0	0	146	0	0	0	0	0	147
63 Grand Forks ND-MN	0	0	1	0	0	0	0	2	3
64 Grand Rapids-Muskegon-Holland MI	0	0	103	0	0	0	14	26	143
75 Houston-Baytown-Huntsville TX	0	49	0	0	60	0	11	3	123
76 Huntsville-Decatur AL	0	0	0	27	0	0	106	28	161
80 Jackson-Yazoo City MS	0	0	0	1	0	0	0	0	1
82 Jonesboro AR	0	0	0	0	0	0	4	24	28
90 Lafayette-Acadiana LA	0	1	0	0	0	0	0	10	11
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	0	10	0	0	0	0	0	10
102 Marinette WI-MI	0	4	9,830	0	0	0	4,655	72	14,560
105 Memphis TN-MS-AR	2	14	0	0	0	0	2	2	20
108 Milwaukee-Racine-Waukesha WI	0	0	15	523	0	0	0	12	550
109 Minneapolis-St. Paul-St. Cloud MN-WI	0	0	0	0	0	0	11	0	11
112 Mobile-Daphne-Fairhope AL	0	0	0	0	0	0	9	7	16
116 Nashville-Davidson--Murfreesboro--Columbia TN	0	0	90	0	0	0	6	0	95
117 New Orleans-Metairie-Bogalusa LA	696	0	0	0	21	42	131	17	907
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	21	0	0	0	0	0	0	21
122 Paducah KY-IL	2	0	0	0	0	0	0	0	2
126 Peoria-Canton IL	2	0	0	0	0	0	1	2	4
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	0	0	0	0	0	0	0	0
129 Pittsburgh-New Castle PA	0	0	0	0	0	0	39	15	55
156 South Bend-Mishawaka IN-MI	0	0	2	0	0	0	0	0	2
160 St. Louis-St. Charles-Farmington MO-IL	1	2	0	0	0	0	22	18	43
162 Syracuse-Auburn NY	0	0	0	0	0	0	0	0	0
166 Toledo-Fremont OH	2,818	492	3,918	1,870	44	4	28	48	9,221
168 Traverse City MI	0	0	0	0	396	0	0	0	396
170 Tulsa-Bartlesville OK	0	3	0	0	0	0	0	0	3
171 Tupelo MS	0	0	0	0	0	0	0	0	0
176 Wausau-Merrill WI	0	0	0	0	0	0	0	0	0
Other	1,444	848	6,486	164	352	4,720	8,659	3,894	26,567
Total	45,380	5,082	39,085	5,144	990	6,644	62,717	9,654	174,696

Source: WCSC Data.

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Table 16
2003 Receipts by Bureau of Economic Analysis Area – Lakes [1/]

	BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
4	Albany-Schenectady-Amsterdam NY	0	0	259	0	0	25	0	0	285
6	Alpena MI	1,907	0	84	0	0	0	0	56	2,046
9	Appleton-Oshkosh-Neenah WI	763	43	623	0	22	161	45	418	2,075
11	Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	5	0	5
15	Baton Rouge-Pierre Part LA	15	77	0	0	31	0	168	32	323
16	Beaumont-Port Arthur TX	0	1,004	334	0	14	0	0	3	1,354
19	Birmingham-Hoover-Cullman AL	0	0	0	0	0	0	1	0	1
22	Boston-Worcester-Manchester MA-NH	0	5,036	1	1	11	244	0	76	5,369
23	Buffalo-Niagara-Cattaraugus NY	142	169	410	337	0	224	0	137	1,419
25	Cape Girardeau-Jackson MO-IL	0	0	0	0	0	0	8	0	8
29	Charleston WV	0	0	2	0	0	0	6	0	8
30	Charleston-North Charleston SC	0	0	243	0	0	0	0	14	257
32	Chicago-Naperville-Michigan City IL-IN-WI	799	535	4,553	15	307	867	24,181	1,281	32,538
35	Cleveland-Akron-Elyria OH	135	285	9,578	36	51	943	13,208	1,136	25,373
41	Corpus Christi-Kingsville TX	0	13	0	0	0	0	4	1	18
47	Detroit-Warren-Flint MI	9,697	1,076	6,836	0	196	1,441	6,850	2,579	28,674
50	Duluth MN-WI	1,376	21	2,122	0	39	250	134	512	4,453
52	Erie PA	14	0	893	0	0	126	0	0	1,033
63	Grand Forks ND-MN	0	0	0	0	0	0	0	1	1
64	Grand Rapids-Muskegon-Holland MI	1,597	0	1,507	0	0	399	0	462	3,966
69	Gulfport-Biloxi-Pascagoula MS	0	5	0	0	0	0	0	0	5
75	Houston-Baytown-Huntsville TX	0	1,028	0	0	303	0	120	7	1,459
76	Huntsville-Decatur AL	0	1	0	3	0	0	61	0	66
79	Jacksonville FL	0	163	1,706	0	0	0	0	11	1,880
80	Jackson-Yazoo City MS	0	0	0	0	0	0	4	0	4
82	Jonesboro AR	0	0	0	0	0	1	126	2	129
91	Lake Charles-Jennings LA	0	179	0	0	0	0	0	0	180
96	Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	13	0	13
97	Los Angeles-Long Beach-Riverside CA	0	356	5	0	1	0	0	43	406
98	Louisville-Elizabethtown-Scottsburg KY-IN	0	0	0	0	0	0	24	0	24
102	Marinette WI-MI	501	88	1,376	0	0	143	132	119	2,359
104	McAllen-Edinburg-Pharr TX	0	0	0	0	0	0	80	9	89
105	Memphis TN-MS-AR	0	0	0	1	0	0	44	0	45
106	Miami-Fort Lauderdale-Miami Beach FL	0	190	0	4	20	1	0	82	298
108	Milwaukee-Racine-Waukesha WI	1,009	143	53	0	8	742	117	1,080	3,152
109	Minneapolis-St. Paul-St. Cloud MN-WI	0	0	0	0	72	0	1	24	97
112	Mobile-Daphne-Fairhope AL	0	0	192	0	0	0	0	81	273
117	New Orleans-Metairie-Bogalusa LA	0	218	204	57	27	31	1,464	24	2,025
118	New York-Newark-Bridgeport NY-NJ-CT-PA	0	1,975	581	0	1	15	0	7	2,578
121	Orlando-The Villages FL	0	17	245	0	0	0	0	185	446
122	Paducah KY-IL	0	2	0	0	3	0	17	0	21
123	Panama City-Lynn Haven FL	0	0	64	0	0	0	11	0	75
126	Peoria-Canton IL	0	0	0	0	0	0	12	2	14
127	Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	6,125	331	0	81	0	0	197	6,734
139	Rochester-Batavia-Seneca Falls NY	0	0	0	0	0	0	0	88	88
146	San Jose-San Francisco-Oakland CA	0	0	2	0	1	0	0	17	20
148	Sarasota-Bradenton-Venice FL	0	0	113	0	0	0	0	11	123
149	Savannah-Hinesville-Fort Stewart GA	0	90	429	0	4	0	22	158	704
152	Seattle-Tacoma-Olympia WA	0	0	0	0	0	0	0	0	0
153	Shreveport-Bossier City-Minden LA	0	0	0	0	0	0	1	0	1
156	South Bend-Mishawaka IN-MI	0	0	423	0	0	0	0	311	734
158	Springfield IL	0	14	0	0	0	0	0	0	14
160	St. Louis-St. Charles-Farmington MO-IL	0	0	0	0	0	0	21	1	22
162	Syracuse-Auburn NY	0	284	0	5	37	202	0	307	835
164	Tampa-St. Petersburg-Clearwater FL	0	8	1,505	0	0	0	0	53	1,566
166	Toledo-Fremont OH	27	300	699	183	178	416	2,918	223	4,944
168	Traverse City MI	334	203	140	0	82	133	3	169	1,065
170	Tulsa-Bartlesville OK	6	9	0	0	0	0	120	0	135
171	Tupelo MS	0	0	0	0	0	0	3	0	3
173	Virginia Beach-Norfolk-Newport News VA-NC	0	151	33	0	1	0	0	92	277
176	Wausau-Merrill WI	178	0	0	0	0	0	0	0	178
	Other	21,353	24,661	6,851	4,212	1,647	2,543	7,049	1,391	69,706
	Total	39,853	44,469	42,397	4,855	3,137	8,909	56,974	11,399	211,993

Source: WCSC Data.

[1/] A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties. U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 17
2004 Receipts by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
4 Albany-Schenectady-Amsterdam NY	0	0	487	0	2	74	0	0	563
6 Alpena MI	2,277	0	53	0	0	4	10	198	2,542
8 Anchorage AK	0	0	2	0	0	0	0	7	9
9 Appleton-Oshkosh-Neenah WI	838	25	681	0	20	251	34	494	2,344
11 Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	2	0	2
15 Baton Rouge-Pierre Part LA	0	6	0	1	24	4	114	0	150
16 Beaumont-Port Arthur TX	0	132	207	0	57	0	0	0	396
22 Boston-Worcester-Manchester MA-NH	0	3,960	0	1	17	266	11	85	4,341
23 Buffalo-Niagara-Cattaraugus NY	503	202	366	159	0	115	0	167	1,512
25 Cape Girardeau-Jackson MO-IL	0	0	0	0	0	0	8	2	9
30 Charleston-North Charleston SC	0	0	303	0	0	0	51	0	354
32 Chicago-Naperville-Michigan City IL-IN-WI	1,353	577	5,338	59	403	1,434	27,675	1,309	38,148
35 Cleveland-Akron-Elyria OH	586	421	10,000	38	35	598	16,797	1,403	29,877
43 Davenport-Moline-Rock Island IA-IL	0	7	0	0	0	0	0	0	7
47 Detroit-Warren-Flint MI	11,099	703	8,523	0	164	1,042	8,540	2,217	32,289
50 Duluth MN-WI	1,568	0	3,354	0	32	260	133	423	5,769
52 Erie PA	11	0	1,046	0	0	42	0	0	1,100
59 Fort Smith AR-OK	0	0	0	0	0	0	2	0	2
63 Grand Forks ND-MN	0	0	1	0	0	0	0	1	2
64 Grand Rapids-Muskegon-Holland MI	1,574	0	2,200	0	0	300	0	526	4,601
67 Greenville NC	0	0	0	0	0	0	23	0	23
69 Gulfport-Biloxi-Pascagoula MS	0	8	0	0	19	0	0	0	27
75 Houston-Baytown-Huntsville TX	0	457	0	0	324	0	109	4	894
76 Huntsville-Decatur AL	0	0	0	6	0	0	47	0	53
79 Jacksonville FL	43	70	1,866	0	0	73	0	86	2,138
82 Jonesboro AR	0	0	0	0	0	0	109	0	109
91 Lake Charles-Jennings LA	0	0	0	0	0	0	0	6	6
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	31	0	31
97 Los Angeles-Long Beach-Riverside CA	0	327	4	0	1	0	0	33	366
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	0	0	0	0	0	22	0	22
102 Marinette WI-MI	731	73	1,886	0	0	190	136	86	3,102
104 McAllen-Edinburg-Pharr TX	0	0	0	0	0	0	3	16	18
105 Memphis TN-MS-AR	0	0	0	16	0	0	26	0	42
106 Miami-Fort Lauderdale-Miami Beach FL	24	223	0	6	8	1	1	103	367
108 Milwaukee-Racine-Waukesha WI	937	191	25	0	1	812	127	1,075	3,169
109 Minneapolis-St. Paul-St. Cloud MN-WI	7	0	0	0	2	2	0	114	124
112 Mobile-Daphne-Fairhope AL	0	256	96	0	0	0	0	42	394
117 New Orleans-Metairie-Bogalusa LA	0	458	239	151	93	69	1,861	263	3,133
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	2,859	616	0	78	149	0	34	3,736
121 Orlando-The Villages FL	0	26	239	0	0	0	0	165	431
122 Paducah KY-IL	6	0	0	0	0	0	19	72	97
123 Panama City-Lynn Haven FL	0	0	59	0	0	0	11	0	70
125 Pensacola-Ferry Pass-Brent FL	0	0	0	0	0	0	0	0	0
126 Peoria-Canton IL	0	0	0	0	0	0	4	17	21
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	7,005	334	0	149	16	0	90	7,594
129 Pittsburgh-New Castle PA	0	0	0	0	0	0	0	3	3
131 Portland-Vancouver-Beaverton OR-WA	0	27	0	0	0	0	0	0	27
139 Rochester-Batavia-Seneca Falls NY	0	0	0	0	0	0	0	113	113
146 San Jose-San Francisco-Oakland CA	0	76	5	0	0	0	0	19	100
148 Sarasota-Bradenton-Venice FL	0	147	187	0	0	0	0	34	369
149 Savannah-Hinesville-Fort Stewart GA	6	39	632	0	2	0	0	101	780
152 Seattle-Tacoma-Olympia WA	0	0	0	0	0	0	0	3	3
156 South Bend-Mishawaka IN-MI	0	0	472	0	0	0	0	277	748
160 St. Louis-St. Charles-Farmington MO-IL	0	0	0	0	0	0	12	4	17
162 Syracuse-Auburn NY	0	464	0	0	41	200	0	375	1,080
164 Tampa-St. Petersburg-Clearwater FL	0	10	1,205	0	24	93	0	0	1,331
166 Toledo-Fremont OH	87	196	815	159	281	388	3,030	247	5,204
168 Traverse City MI	369	258	136	0	0	37	0	33	833
170 Tulsa-Bartlesville OK	0	9	0	0	0	0	90	0	99
173 Virginia Beach-Norfolk-Newport News VA-NC	1	175	0	0	21	70	0	51	317
176 Wausau-Merrill WI	210	0	0	0	0	0	0	0	210
Other	19,155	26,531	8,913	4,294	2,149	2,419	9,146	1,772	74,378
Total	41,387	45,918	50,291	4,889	3,948	8,908	68,184	12,070	235,595

Source: WCSC Data.

[1/] A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties. U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 18
2005 Receipts by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	2,849	0	105	0	0	34	15	164	3,167
9 Appleton-Oshkosh-Neenah WI	1,277	15	676	0	27	308	47	401	2,751
11 Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	0	25	25
15 Baton Rouge-Pierre Part LA	0	0	0	5	0	0	1	0	6
16 Beaumont-Port Arthur TX	0	7	0	0	0	0	0	0	7
22 Boston-Worcester-Manchester MA-NH	0	0	0	0	0	0	0	0	0
23 Buffalo-Niagara-Cattaraugus NY	275	194	344	373	0	30	0	156	1,372
25 Cape Girardeau-Jackson MO-IL	0	0	0	0	0	0	0	50	50
30 Charleston-North Charleston SC	0	0	0	0	0	0	0	1	1
32 Chicago-Naperville-Michigan City IL-IN-WI	3,308	1,366	6,185	109	340	1,193	24,272	1,162	37,936
35 Cleveland-Akron-Elyria OH	583	293	9,156	49	27	863	13,638	1,315	25,924
41 Corpus Christi-Kingsville TX	0	0	0	0	0	0	1	0	1
43 Davenport-Moline-Rock Island IA-IL	0	0	0	0	0	0	5	0	5
47 Detroit-Warren-Flint MI	11,922	817	8,087	0	137	1,099	8,622	1,993	32,678
50 Duluth MN-WI	1,457	0	2,628	0	20	337	100	599	5,141
52 Erie PA	14	0	1,022	0	0	30	0	0	1,066
63 Grand Forks ND-MN	0	0	0	0	0	0	0	1	2
64 Grand Rapids-Muskegon-Holland MI	1,506	0	1,593	0	3	260	6	611	3,978
75 Houston-Baytown-Huntsville TX	0	2	0	0	40	0	47	7	97
76 Huntsville-Decatur AL	0	0	0	5	0	0	50	0	54
82 Jonesboro AR	0	0	0	0	0	0	2	0	2
89 La Crosse WI-MN	0	0	0	0	0	0	0	8	8
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	8	0	8
97 Los Angeles-Long Beach-Riverside CA	0	0	0	0	0	0	0	0	0
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	0	0	0	0	0	10	0	10
102 Marinette WI-MI	621	53	1,667	0	0	182	139	94	2,755
104 McAllen-Edinburg-Pharr TX	0	0	0	0	0	0	0	1	1
105 Memphis TN-MS-AR	0	6	0	16	0	0	52	0	73
108 Milwaukee-Racine-Waukesha WI	1,258	189	34	20	0	911	135	1,251	3,797
109 Minneapolis-St. Paul-St. Cloud MN-WI	0	0	0	0	2	5	0	92	98
112 Mobile-Daphne-Fairhope AL	0	0	0	0	0	0	2	0	2
117 New Orleans-Metairie-Bogalusa LA	9	0	0	124	0	0	4	63	200
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	0	0	0	1	0	0	0	1
122 Paducah KY-IL	0	5	0	0	0	0	6	70	81
123 Panama City-Lynn Haven FL	0	0	0	0	0	0	6	0	6
126 Peoria-Canton IL	0	0	0	0	0	0	16	18	34
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	0	0	0	0	0	0	0	0
131 Portland-Vancouver-Beaverton OR-WA	0	0	0	0	0	0	0	0	0
137 Richmond VA	0	0	0	0	0	0	0	0	0
139 Rochester-Batavia-Seneca Falls NY	0	0	0	0	0	0	0	144	144
156 South Bend-Mishawaka IN-MI	0	0	295	0	0	0	0	233	528
160 St. Louis-St. Charles-Farmington MO-IL	0	35	0	0	0	0	8	0	43
162 Syracuse-Auburn NY	0	271	0	0	10	204	0	360	844
166 Toledo-Fremont OH	22	130	839	139	142	306	3,967	396	5,942
168 Traverse City MI	397	133	267	0	0	85	0	23	905
170 Tulsa-Bartlesville OK	0	9	0	0	2	0	28	22	60
173 Virginia Beach-Norfolk-Newport News VA-NC	0	0	0	0	0	0	0	0	0
174 Washington-Baltimore-Northern Virginia DC-MD-\	0	0	0	0	0	0	0	0	0
176 Wausau-Merrill WI	327	0	0	0	0	0	0	0	327
Other	18,948	1,083	4,089	4,306	328	819	8,225	608	38,406
Total	44,773	4,608	36,988	5,145	1,077	6,666	59,411	9,868	168,536

Source: WCSC Data.

[1/]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties. U.S BEAs are the 2004 definitions provided by U.S. Department of Commerce, Bureau of Economic Analysis available at http://www.bea.gov/bea/ARTICLES/2004/11November/1104Econ-Areas.pdf. Canadian BEAs are defined by the USACE, LRD Navigation Planning Center for convenience of analysis only.

Table 19
2006 Receipts by Bureau of Economic Analysis Area – Lakes [1/]

BEA	Coal & Coke	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	All Other	Total Tonnage
6 Alpena MI	2,781	15	126	0	0	65	29	211	3,227
9 Appleton-Oshkosh-Neenah WI	1,066	83	701	0	5	380	60	448	2,744
11 Atlanta-Sandy Springs-Gainesville GA-AL	0	0	0	0	0	0	6	16	22
16 Beaumont-Port Arthur TX	0	1	0	0	0	0	0	0	1
22 Boston-Worcester-Manchester MA-NH	0	0	0	0	0	0	0	0	0
23 Buffalo-Niagara-Cattaraugus NY	194	155	315	385	0	0	0	124	1,172
25 Cape Girardeau-Jackson MO-IL	0	17	0	0	0	0	2	55	73
30 Charleston-North Charleston SC	0	11	0	0	0	0	0	0	11
32 Chicago-Naperville-Michigan City IL-IN-WI	3,629	989	7,843	31	379	1,270	27,653	1,436	43,229
35 Cleveland-Akron-Elyria OH	758	324	9,518	0	23	706	14,577	1,124	27,029
47 Detroit-Warren-Flint MI	12,019	659	7,563	0	92	955	9,060	1,738	32,084
50 Duluth MN-WI	1,768	0	3,096	0	32	399	108	476	5,879
52 Erie PA	0	0	1,064	0	0	29	0	0	1,093
63 Grand Forks ND-MN	0	0	1	0	0	0	0	2	3
64 Grand Rapids-Muskegon-Holland MI	1,816	0	1,223	0	0	300	0	550	3,889
72 Hartford-West Hartford-Willimantic CT	0	0	15	0	0	0	0	0	15
75 Houston-Baytown-Huntsville TX	0	15	0	0	27	0	47	0	90
76 Huntsville-Decatur AL	0	0	0	3	0	0	33	0	36
82 Jonesboro AR	0	0	0	0	0	0	15	0	15
90 Lafayette-Acadiana LA	0	0	0	0	0	0	1	0	1
96 Little Rock-North Little Rock-Pine Bluff AR	0	0	0	0	0	0	1	0	1
97 Los Angeles-Long Beach-Riverside CA	0	0	0	0	9	0	0	0	9
98 Louisville-Elizabethtown-Scottsburg KY-IN	0	0	0	0	0	0	6	0	6
102 Marinette WI-MI	623	55	1,536	0	0	127	273	116	2,730
105 Memphis TN-MS-AR	0	21	0	0	0	0	53	0	74
106 Miami-Fort Lauderdale-Miami Beach FL	0	0	0	0	0	0	0	0	0
108 Milwaukee-Racine-Waukesha WI	1,205	183	113	0	0	845	202	1,260	3,808
109 Minneapolis-St. Paul-St. Cloud MN-WI	0	0	0	0	0	0	0	28	28
112 Mobile-Daphne-Fairhope AL	0	0	0	0	0	0	2	0	2
116 Nashville-Davidson--Murfreesboro--Columbia TN	0	0	0	0	0	0	1	0	1
117 New Orleans-Metairie-Bogalusa LA	0	0	0	35	0	0	18	54	108
118 New York-Newark-Bridgeport NY-NJ-CT-PA	0	0	0	0	0	0	0	0	0
122 Paducah KY-IL	0	2	0	0	0	0	0	81	82
123 Panama City-Lynn Haven FL	0	0	0	0	0	0	4	0	4
126 Peoria-Canton IL	0	0	0	0	0	0	0	11	11
127 Philadelphia-Camden-Vineland PA-NJ-DE-MD	0	20	0	0	0	0	0	0	20
137 Richmond VA	0	0	0	0	0	0	0	0	0
139 Rochester-Batavia-Seneca Falls NY	0	0	0	0	0	0	0	164	164
152 Seattle-Tacoma-Olympia WA	0	0	15	0	0	0	0	0	15
156 South Bend-Mishawaka IN-MI	0	0	254	0	0	44	0	242	540
160 St. Louis-St. Charles-Farmington MO-IL	0	0	0	0	0	0	1	74	75
162 Syracuse-Auburn NY	0	239	0	0	0	185	0	365	790
166 Toledo-Fremont OH	51	147	1,044	121	125	341	3,883	415	6,129
168 Traverse City MI	447	161	202	0	0	83	0	43	936
170 Tulsa-Bartlesville OK	0	17	0	0	0	0	11	5	33
171 Tupelo MS	0	0	0	0	0	0	3	0	3
173 Virginia Beach-Norfolk-Newport News VA-NC	0	9	0	0	0	0	0	0	9
174 Washington-Baltimore-Northern Virginia DC-MD-\	0	9	0	0	0	0	0	9	18
176 Wausau-Merrill WI	231	0	0	0	0	0	0	0	231
Other	18,794	1,949	4,457	4,568	297	916	6,668	607	38,256
Total	45,380	5,082	39,085	5,144	990	6,644	62,717	9,654	174,696

Source: WCSC Data.

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4. Project Statistics.

a. Project Traffic. Iron ore is the largest tonnage moved through the locks of the GLNS. Coal and grains are two other prominent commodities shipped on the lakes. Soo Locks moved over 65 million tons in 2004 and 82 million tons in 2006 (see **Tables 20-24**). Total project traffic since 1998 is presented in **Table 25**. Chicago and Black Rock locks average only around 161 to 293 thousand tons of commercial cargo annually. **Tables 26 through 30** show lock commodity traffic by direction.

Table 20
2003 Lock Traffic by Commodity
(Kilotons)

Project	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks									
Poe	13,518	265	68	34,977	67	3,110	0	0	52,005
MacArthur	3,202	403	57	4,615	612	4,438	2	0	13,329
Davis	5	6	0	32	0	0	0	0	43
Total	16,725	674	125	39,624	679	7,548	2	0	65,377
Chicago Lock	0	10	0	45	0	0	13	0	68
Black Rock Lock	109	211	0	0	0	0	0	0	320

Source: US Army Corps of Engineers, Lock Performance Monitoring System.

Table 21
2004 Lock Traffic by Commodity
(Kilotons)

Project	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks									
Poe	15,539	149	196	44,614	227	3,339	0	0	64,064
MacArthur	3,325	105	558	7,203	449	5,984	3	0	17,627
Davis	0	22	0	3	0	0	0	0	25
Total	18,864	276	754	51,820	676	9,323	3	0	81,716
Chicago Lock	0	24	1	32	0	0	2	27	86
Black Rock Lock	193	192	0	0	0	0	0	0	385

Source: US Army Corps of Engineers, Lock Performance Monitoring System.

Table 22
2005 Lock Traffic by Commodity
(Kilotons)

Project	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks									
Poe	18,451	210	156	41,629	336	3,818	0	0	64,600
MacArthur	3,329	91	468	6,777	545	6,029	24	0	17,263
Davis	0	4	0	0	0	0	0	0	4
Total	21,780	305	624	48,406	881	9,847	24	0	81,867
Chicago Lock	0	47	5	18	0	0	0	51	121
Black Rock Lock	31	179	0	0	0	0	0	0	210

Source: US Army Corps of Engineers, Lock Performance Monitoring System.

Table 23
2006 Lock Traffic by Commodity
(Kilotons)

Project	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks									
Poe	17,927	213	194	42,870	422	3,468	0	0	65,094
MacArthur	3,993	110	332	6,188	598	5,947	23	2	17,193
Davis	0	0	0	0	0	0	0	0	0
Total	21,920	323	526	49,058	1,020	9,415	23	2	82,287
Chicago Lock	0	20	0	18	0	0	0	60	98
Black Rock Lock	58	188	0	0	0	0	0	0	246

Source: US Army Corps of Engineers, Lock Performance Monitoring System.

Table 24
2007 Lock Traffic by Commodity
(Kilotons)

Project	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks									
Poe	15,193	221	214	37,618	331	4,264	8	0	57,849
MacArthur	3,382	115	291	7,901	638	5,476	44	0	17,847
Davis	0	0	0	0	0	0	0	0	0
Total	18,575	336	505	45,519	969	9,740	52	0	75,696
Chicago Lock	3	42	0	20	0	0	2	73	140
Black Rock Lock	0	130	0	0	0	0	0	0	130

Source: US Army Corps of Engineers, Lock Performance Monitoring System.

Table 25
Historic Total Traffic by Project
(Kilotons)

Project	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Growth Rate 1998 - 2007
Soo Locks											
Poe	65,610	66,373	67,750	60,433	64,912	52,005	64,064	64,599	65,094	57,850	-1.25%
MacArthur	21,829	16,044	17,174	15,947	17,238	13,330	17,627	17,263	17,193	17,846	-1.99%
Davis	0	0	6	8	7	42	25	4	0	0	0.00%
Total	87,439	82,417	84,930	76,388	82,157	65,377	81,716	81,866	82,287	75,696	-1.43%
Chicago Lock	293	316	147	192	147	69	86	121	98	139	-7.19%
Black Rock Lock	296	286	303	248	507	319	385	211	247	130	-7.90%

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

Table 26
2003 Lock Traffic by Commodity by Direction
(Kilotons)

Project	Direction	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks										
Poe	Up	1,681	174	8	6,301	63	222	-	-	8,449
	Down	11,837	91	60	28,676	4	2,888	-	-	43,555
MacArthur	Up	2,448	336	29	3,104	65	4,174	-	-	10,157
	Down	753	67	28	1,511	547	264	2	-	3,173
Davis	Up	5	-	-	19	-	-	-	-	24
	Down	-	6	-	12	-	-	-	-	18
	Total	16,724	674	125	39,623	679	7,548	2	-	65,376
Chicago Lock	Up	-	4	-	4	-	-	6	-	14
	Down	-	6	-	42	-	-	7	-	55
	Total	-	10	-	46	-	-	13	-	69
Black Rock Lock	Up	-	-	-	-	-	-	-	-	-
	Down	109	211	-	-	-	-	-	-	319
	Total	109	211	-	-	-	-	-	-	319

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.
Totals may not equal the sum of the commodities due to rounding.

Table 27
2004 Lock Traffic by Commodity by Direction
(Kilotons)

Project	Direction	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks										
Poe	Up	1,559	122	-	4,355	204	16	-	-	6,257
	Down	13,980	26	196	40,260	23	3,323	-	-	57,808
MacArthur	Up	680	86	20	1,404	425	-	2	-	2,616
	Down	2,645	19	538	5,799	24	5,984	1	-	15,011
Davis	Up	-	22	-	3	-	-	-	-	25
	Down	-	-	-	-	-	-	-	-	-
	Total	18,864	275	754	51,821	676	9,323	3	-	81,717
Chicago Lock	Up	-	11	1	2	-	-	2	2	17
	Down	-	14	-	30	-	-	1	25	69
	Total	-	25	1	32	-	-	3	27	86
Black Rock Lock	Up	-	4	-	-	-	-	-	-	4
	Down	193	188	-	-	-	-	-	-	381
	Total	193	192	-	-	-	-	-	-	385

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.
Totals may not equal the sum of the commodities due to rounding.

Table 28
2005 Lock Traffic by Commodity by Direction
(Kilotons)

Project	Direction	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks										
Poe	Up	2,216	177	7	3,558	273	-	-	-	6,232
	Down	16,235	33	149	38,071	63	3,818	-	-	58,367
MacArthur	Up	696	66	29	1,275	491	9	24	-	2,591
	Down	2,633	26	438	5,502	54	6,019	-	-	14,672
Davis	Up	-	-	-	-	-	-	-	-	-
	Down	-	4	-	-	-	-	-	-	4
	Total	21,780	306	623	48,406	881	9,846	24	-	81,866
Chicago Lock	Up	-	14	5	-	-	-	-	-	19
	Down	-	33	-	18	-	-	-	51	102
	Total	-	47	5	18	-	-	-	51	121
Black Rock Lock	Up	-	-	-	-	-	-	-	-	-
	Down	31	179	-	-	-	-	-	-	211
	Total	31	179	-	-	-	-	-	-	211

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.
Totals may not equal the sum of the commodities due to rounding.

Table 29
2006 Lock Traffic by Commodity by Direction
(Kilotons)

Project	Direction	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks										
Poe	Up	1,762	161	6	3,842	320	28	-	-	6,120
	Down	16,165	52	188	39,028	102	3,440	-	-	58,974
MacArthur	Up	949	86	8	1,325	526	29	17	2	2,942
	Down	3,045	24	324	4,863	72	5,918	6	-	14,251
Davis	Up	-	-	-	-	-	-	-	-	-
	Down	-	-	-	-	-	-	-	-	-
	Total	21,921	323	526	49,058	1,020	9,415	23	2	82,287
Chicago Lock	Up	-	10	-	-	-	-	-	-	10
	Down	-	10	-	18	-	-	-	60	88
	Total	-	20	-	18	-	-	-	60	98
Black Rock Lock	Up	-	-	-	-	-	-	-	-	-
	Down	58	188	-	-	-	-	-	-	248
	Total	58	188	-	-	-	-	-	-	248

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.
Totals may not equal the sum of the commodities due to rounding.

Table 30
2007 Lock Traffic by Commodity by Direction
(Kilotons)

Project	Direction	Coal	Petrol	Chem	Crude Materials	Manufactured Goods	Food Farm Products	Equipment & Machinery	Other	Total
Soo Locks										
Poe	Up	1,224	123	18	3,415	194	-	8	-	4,981
	Down	13,970	99	196	34,203	137	4,264	-	-	52,869
MacArthur	Up	755	92	-	1,026	444	6	40	-	2,364
	Down	2,627	23	291	6,875	194	5,469	4	-	15,482
Davis	Up	-	-	-	-	-	-	-	-	-
	Down	-	-	-	-	-	-	-	-	-
	Total	18,576	337	505	45,519	969	9,739	52	-	75,696
Chicago Lock	Up	3	4	-	-	-	-	2	-	9
	Down	-	37	-	20	-	-	-	73	131
	Total	3	41	-	20	-	-	2	73	140
Black Rock Lock	Up	-	6	-	-	-	-	-	-	6
	Down	-	124	-	-	-	-	-	-	124
	Total	-	130	-	-	-	-	-	-	130

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.
Totals may not equal the sum of the commodities due to rounding.

b. <u>Project Performance</u>. Tables 31 through **35** show Great Lake lock performance characteristics, where available, for 2003 through 2007. **Table 36** shows the historic number of commercial vessels (cargo and passenger) at each project and **Table 37** shows historic average lock delays.

Table 31
2003 Lock Performance Characteristics

Project	Cargo Vessels	Cargo Tons (000s)	Average Tons/Vessel	Average Time/Vessel (min)			Commercial Lockages*
				Delay	Process	Total	
Soo Locks [1/]							
Poe	2,409	51,897	21,543	12.9	50.1	63.0	2,764
MacArthur	1,284	13,330	10,381	4.6	32.5	37.1	2,472
Davis	24	42	1,758	5.5	31.8	37.3	68
Total	3,717	65,268	17,559	7.7	38.1	45.8	5,304
Chicago Lock	38	69	1,804	4.1	10.4	14.5	6,502
Black Rock Lock	67	319	4,768	0.8	19.4	20.2	255

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

* Cargo only for Soo Locks; Cargo and Passengers for Chicago and Black Rock Locks

Table 32
2004 Lock Performance Characteristics

Project	Cargo Vessels	Cargo Tons (000s)	Average Tons/Vessel	Average Time/Vessel (min)			Commercial Lockages*
				Delay	Process	Total	
Soo Locks [1/]							
Poe	2,716	63,957	23,548	13.4	51.6	65.0	3,071
MacArthur	1,468	17,627	12,008	4.4	34.4	38.8	2,660
Davis	10	25	2,542	3.8	31.1	34.9	64
Total	4,194	81,610	19,459	7.2	39.0	46.2	5,795
Chicago Lock	50	86	1,722	4.1	10.3	14.4	6,628
Black Rock Lock	88	385	4,375	1.5	19.4	20.9	256

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

* Cargo only for Soo Locks; Cargo and Passengers for Chicago and Black Rock Locks

Table 33
2005 Lock Performance Characteristics

Project	Cargo Vessels	Cargo Tons (000s)	Average Tons/Vessel	Average Time/Vessel (min)			Commercial Lockages*
				Delay	Process	Total	
Soo Locks [1/]							
Poe	2,877	64,542	22,434	13.6	51.3	64.9	3,223
MacArthur	1,429	17,263	12,080	4.5	34.2	38.7	2,695
Davis	1	4	4,120	5.3	27.0	32.3	4
Total	4,307	81,809	18,994	7.8	37.5	45.3	5,922
Chicago Lock	44	121	2,757	4.2	9.9	14.1	7,463
Black Rock Lock	37	211	5,695	0.5	16.3	16.8	264

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

* Cargo only for Soo Locks; Cargo and Passengers for Chicago and Black Rock Locks

Table 34
2006 Lock Performance Characteristics

Project	Cargo Vessels	Cargo Tons (000s)	Average Tons/Vessel	Average Time/Vessel (min)			Commercial Lockages*
				Delay	Process	Total	
Soo Locks [1/]							
Poe	2,896	64,883	22,404	13.6	51.9	65.5	3,228
MacArthur	1,508	17,193	11,401	5.2	36.0	41.2	2,792
Davis	-	-	NA	-	-	-	-
Total	4,404	82,076	18,637	6.3	29.3	35.6	6,020
Chicago Lock	55	98	1,779	4.1	9.7	13.8	7,557
Black Rock Lock	56	247	4,406	0.7	17.9	18.6	330

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

* Cargo only for Soo Locks; Cargo and Passengers for Chicago and Black Rock Locks

Table 35
2007 Lock Performance Characteristics

Project	Cargo Vessels	Cargo Tons (000s)	Average Tons/Vessel	Average Time/Vessel (min)			Commercial Lockages*
				Delay	Process	Total	
Soo Locks [1/]							
Poe	2,746	57,634	20,988	14.2	51.9	66.1	3,079
MacArthur	1,668	17,846	10,699	4.5	37.8	42.3	2,862
Davis	-	-	NA	-	-	-	-
Total	4,414	75,480	17,100	6.2	29.9	36.1	5,941
Chicago Lock	65	139	2,145	4.0	9.8	13.8	7,560
Black Rock Lock	34	130	3,827	0.7	16.9	17.6	269

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

* Cargo only for Soo Locks; Cargo and Passengers for Chicago and Black Rock Locks

Table 36
Historic Number of Commercial Vessels

Project	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Soo Locks [1/]													
Poe	3,683	4,003	3,922	3,816	3,688	3,568	3,474	3,730	2,917	3,216	3,378	3,354	3,180
MacArthur	4,040	4,605	4,440	4,227	3,303	3,126	3,441	3,520	2,892	2,997	3,042	3,026	3,101
Davis	1,150	16	816	-	444	35	27	23	76	78	4	5	-
Total	8,873	8,624	9,178	8,043	7,435	6,729	6,942	7,273	5,885	6,291	6,424	6,385	6,281
Chicago Lock [2/]	14,321	10,978	12,003	13,860	13,950	12,085	11,445	12,188	9,893	10,137	11,425	11,174	11,188
Black Rock Lock [2/]	507	537	326	372	505	398	373	462	260	256	265	332	274

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

[2/] Commercial Passengers and Commercial Cargo

Table 37
Historic Average Lock Delays
(minutes)

Project	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Soo Locks [1/]													
Poe	9	10.2	10.2	7.8	12	NA	13.0	15.0	12.9	13.4	13.6	13.5	14.2
MacArthur	6	7.2	6	6	6.6	NA	4.0	6.0	4.6	4.4	4.5	5.2	4.5
Davis	3.6	4.8	2.4	0	2.4	NA	2.0	4.0	5.5	3.8	5.3	0.8	0.0
Chicago Lock	5.4	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.1	4.1	4.2	4.1	4.0
Black Rock Lock	2.4	2.4	2.4	4.8	1.8	42.0	0.6	1.4	0.8	1.5	0.5	0.7	0.7

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

c. <u>Recreational Traffic and Passenger Trips</u>. Great Lakes navigation locks have always entertained thousands of recreation boaters and cruise passengers. The cruise industry on the Great Lakes is experiencing a recent resurgence. The resurgence results from the formation of new coalitions, resources and entrepreneurs to capitalize on an area that is expected to experience continued growth in tourism. The Great Lakes offer a new destination for seasoned

ship travelers and a perceived safer alternative to overseas cruises. **Tables 38** and **39** show historic recreational traffic and passenger trips, respectively, at GLNS navigation locks.

Table 38
Historic Recreational Traffic
(Number of Vessels)

Project	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Soo Locks [1/]													
Poe	500	682	295	195	87	73	454	434	68	85	104	97	110
MacArthur	1,220	1,430	672	660	413	314	1,405	1,021	469	449	605	319	454
Davis	762	-	237	-	135	2	29	24	5	3	-	1	-
Total	2,482	2,112	1,204	855	635	389	1,888	1,479	542	537	709	417	564
Chicago Lock	44,396	38,790	35,058	36,457	36,547	38,717	35,986	37,289	49,477	46,204	43,403	35,784	40,767
Black Rock Lock	6,332	6,016	5,050	4,341	3,330	2,571	1,969	1,737	1,451	1,365	1,746	1,272	1,378

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

Table 39
Historic Passenger Trips
(Trips / Passengers)

Project	Trips/Passengers	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Soo Locks [1/]											
Poe	Trips			397	395	458	398	404	386	372	378
	Passengers			NA	NA	NA	21,646	22,382	21,562	21,612	20,127
	Passengers/trip			NA	NA	NA	54	55	56	58	53
MacArthur	Trips			1,481	1,477	1,479	1,325	1,271	1,330	1,277	1,249
	Passengers			NA	NA	NA	72,338	64,300	71,611	69,426	70,987
	Passengers/trip			NA	NA	NA	55	51	54	54	57
Davis	Trips			16	16	18	44	66	2	5	-
	Passengers			NA	NA	NA	2,159	3,712	86	309	-
	Passengers/trip			NA	NA	NA	49	56	43	62	NA
Total	Trips			1,894	1,888	1,955	1,767	1,741	1,718	1,654	1,627
	Passengers			NA	NA	NA	96,143	90,394	93,259	91,347	91,114
	Passengers/trip			NA	NA	NA	54	52	54	55	56
	Trips	13,105	12,871	11,975	9,559	10,522	9,662	9,834	11,066	10,832	10,892
	Passengers	880,618	825,777	838,317	677,337	695,261	616,251	606,262	728,567	687,569	774,947
Chicago Lock	Passengers/trip	67	64	70	71	66	64	62	66	63	71
	Trips			250	206	231	142	142	176	203	196
	Passengers			21,457	20,527	23,728	12,206	13,027	16,614	17,563	20,931
Black Rock Lock	Passengers/trip			86	100	103	86	92	94	87	107

Source: US Army Corps of Engineers, Lock Performance Monitoring System and Detroit District's Soo Area Office Data.

[1/] Data covers shipping year; March 15 of current year through January 15 of next year

5. State and Port Commerce.

a. State-to-State. State-to-state movements from 2003 through 2006 for GLB traffic are summarized in **Tables 40 – 51**. In 2006, Michigan, Minnesota, Ohio and Wisconsin each shipped over 27 million tons of cargo. Predominant commodities include iron ore, coal, aggregates and steel. Major receivers of Great Lakes traffic in 2006 include Michigan, Ohio and Indiana (see **Table 51**).

b. Port Statistics. GLB port statistics are shown for thirteen principal U.S. Great Lakes ports in **Tables 52 - 59**. **Tables 52 - 55** show port statistics for 2003 - 2006 by commodity. **Tables 56 – 59** show shipments and receipts at these principal ports. Duluth-Superior is the largest shipping port of Great Lakes traffic with Indiana Harbor the largest receiving port.

Table 40
Great Lakes Navigation System State to State Tonnage, 2003

Receiving State	Shipping State/Country																																				
	AL	AR	CA	FL	GA	IA	IL	IN	KY	LA	MA	MD	ME	MI	MN	MO	MS	NC	NJ	NY	OH	OK	PA	PR	TN	TX	VA	VI	WA	WI	WV	Other	Subtotal U.S.	Canada	Overseas	Total
AL	-	-	-	-	-	-	-	67.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**67.2**	-	-	**67.2**
AR	-	-	-	-	-	-	-	137.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**137.2**	-	-	**137.2**
IL	-	-	-	-	-	-	38.7	568.3	-	-	-	-	-	1,758.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.6	-	-	**2,406.4**	-	-	**2,406.4**
IN	143.3	-	-	-	-	-	128.4	159.7	35.7	996.2	-	-	-	7,065.7	11,730.4	84.8	-	-	-	-	202.9	-	-	-	109.8	-	-	-	-	6,408.3	-	-	**27,065.3**	-	-	**27,065.3**
KY	-	-	-	-	-	-	-	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11.7**	-	-	**11.7**
LA	-	-	-	-	-	-	-	177.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**177.2**	-	-	**177.2**
MI	-	-	-	-	-	-	1,588.5	936.7	-	-	-	-	-	13,230.7	1,428.0	-	-	-	-	-	3,660.3	-	-	-	-	-	-	-	-	11,802.4	-	-	**32,646.7**	-	-	**32,646.7**
MN	-	-	-	-	-	-	-	96.6	-	-	-	-	-	1,687.9	28.7	-	-	-	-	-	131.1	-	-	-	-	-	-	-	-	1,282.1	-	-	**3,226.3**	-	-	**3,226.3**
NY	-	-	-	-	-	-	-	-	-	-	-	-	-	558.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**558.6**	-	-	**558.6**
OH	-	-	-	-	-	-	53.4	141.2	-	-	-	-	-	7,808.0	7,364.3	-	-	-	-	-	5,321.5	-	-	-	-	-	-	-	-	782.3	-	-	**21,470.8**	-	-	**21,470.8**
OK	-	-	-	-	-	-	-	134.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**134.9**	-	-	**134.9**
PA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249.1	-	-	-	-	-	-	-	-	-	-	-	**249.1**	-	-	**249.1**
TN	-	-	-	-	-	-	-	52.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52.7**	-	-	**52.7**
TX	-	-	-	-	-	-	-	171.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**171.9**	-	-	**171.9**
WI	-	-	-	-	-	-	1,108.6	158.4	-	-	-	-	-	2,533.0	-	-	-	-	-	-	757.3	-	-	-	-	-	-	-	-	171.3	-	-	**4,728.7**	-	-	**4,728.7**
Other	5.5	3.2	5.3	52.7	245.3	1.2	600.8	638.5	-	951.3	48.9	796.9	120.8	4,458.3	9,198.4	1.4	138.3	37.4	383.4	84.8	15,497.6	5.6	27.1	2.2	-	2,892.2	80.7	1.2	166.8	3,990.2	66.8	75.5	**40,578.2**	76,343.6	1,967.2	**118,888.9**
Total	**148.8**	**3.2**	**5.3**	**52.7**	**245.3**	**1.2**	**3,518.5**	**3,452.3**	**35.7**	**1,947.5**	**48.9**	**796.9**	**120.8**	**39,101.1**	**29,749.7**	**86.2**	**138.3**	**37.4**	**383.4**	**84.8**	**25,819.9**	**5.6**	**27.1**	**2.2**	**109.8**	**2,892.2**	**80.7**	**1.2**	**166.8**	**24,477.2**	**66.8**	**75.5**	**133,682.9**	**76,343.6**	**1,967.2**	**211,993.6**

Source: WCSC Data

Table 41
Great Lakes Navigation System State to State Tonnage, 2004

Receiving State	Shipping State/Country																																					
	AK	AL	AR	CA	CT	DE	FL	GA	IA	IL	IN	KY	LA	MA	MD	ME	MI	MN	MO	MS	NC	NJ	NY	OH	OK	PA	PR	TN	TX	VA	VI	WA	WI	WV	Other	Subtotal U.S.	Canada	Overseas	Total
AL	-	-	-	-	-	-	-	-	-	-	51.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**51.7**	-	-	**51.7**
AR	-	-	-	-	-	-	-	-	-	-	139.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**139.8**	-	-	**139.8**
IL	-	-	-	-	-	-	-	-	-	17.4	932.5	-	-	-	-	-	1,264.5	-	-	-	-	-	-	70.6	-	-	-	-	-	-	-	34.4	-	-	**2,319.5**	-	-	**2,319.5**
IN	-	183.8	18.4	-	-	-	-	-	-	200.7	259.9	88.4	1,518.6	-	-	-	9,243.8	11,418.1	193.9	-	-	-	-	295.8	-	-	-	196.3	19.6	-	-	7,587.4	-	-	**31,224.8**	-	-	**31,224.8**
LA	-	-	-	-	-	-	-	-	-	-	285.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75.8	-	-	**361.2**	-	-	**361.2**
MI	-	-	-	-	-	-	-	-	-	1,899.3	1,000.9	-	-	-	-	-	15,989.7	2,312.0	-	-	-	-	-	3,909.2	-	-	-	-	-	-	-	13,252.2	-	-	**38,363.2**	-	-	**38,363.2**
MN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,755.1	2.5	-	-	-	-	-	47.0	-	-	-	-	-	-	-	1,432.3	-	-	**4,236.9**	-	-	**4,236.9**
NY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	532.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**532.3**	-	-	**532.3**
OH	-	-	-	-	-	-	-	-	-	-	179.2	-	-	-	-	-	8,504.1	9,699.2	-	-	-	-	-	6,488.2	-	-	-	-	-	-	-	1,197.3	-	-	**26,067.9**	-	-	**26,067.9**
OK	-	-	-	-	-	-	-	-	-	-	99.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**99.3**	-	-	**99.3**
PA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	298.6	-	-	-	-	-	-	-	-	-	-	**298.6**	-	-	**298.6**
TN	-	-	-	-	-	-	-	-	-	-	45.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**45.1**	-	-	**45.1**
TX	-	-	-	-	-	-	-	-	-	-	155.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**155.8**	-	-	**155.8**
WI	-	-	-	-	-	-	-	-	-	1,129.2	-	-	-	-	-	-	2,896.5	-	-	-	-	-	-	880.9	-	-	-	-	-	-	-	115.9	-	-	**5,022.5**	-	-	**5,022.5**
Other	23.5	-	-	29.5	28.9	34.6	85.7	243.5	3.5	1,608.8	1,145.3	-	688.6	62.3	195.5	124.6	6,660.7	9,028.5	-	498.4	0.2	388.1	282.8	15,225.4	7.1	80.4	3.0	-	1,764.7	107.7	13.6	73.7	4,674.0	37.3	57.9	**43,177.7**	80,603.2	2,896.1	**126,676.9**
Total	**23.5**	**183.8**	**18.4**	**29.5**	**28.9**	**34.6**	**85.7**	**243.5**	**3.5**	**4,855.4**	**4,294.9**	**88.4**	**2,207.2**	**62.3**	**195.5**	**124.6**	**47,846.7**	**32,460.2**	**193.9**	**498.4**	**0.2**	**388.1**	**282.8**	**27,215.7**	**7.1**	**80.4**	**3.0**	**196.3**	**1,784.3**	**107.7**	**13.6**	**73.7**	**28,369.1**	**37.3**	**57.9**	**152,096.2**	**80,603.2**	**2,896.1**	**235,595.4**

Source: WCSC Data

Table 42
Great Lakes Navigation System State to State Tonnage, 2005

Receiving State	Shipping State/Country																								
	AL	AR	FL	IL	IN	KY	LA	MI	MN	MO	MS	NJ	NY	OH	OK	PA	PR	TN	TX	WI	WV	Other	Subtotal U.S.	Canada	Overseas	Total
AL	-	-	-	-	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**56.0**	-	-	**56.0**
IL	-	-	-	5,309.1	817.6	-	-	1,690.9	-	-	-	-	-	-	-	-	-	-	-	44.9	-	-	**7,862.5**	-	-	**7,862.5**
IN	207.2	-	-	289.7	172.2	-	942.4	7,304.1	10,945.6	-	-	-	-	391.3	-	-	-	121.4	7.0	5,915.0	-	-	**26,296.0**	-	-	**26,296.0**
LA	-	-	-	-	169.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.8	-	-	**206.3**	-	-	**206.3**
MI	-	-	-	1,708.9	873.0	-	-	14,920.1	1,592.8	-	-	-	-	4,790.9	-	-	-	-	-	13,919.6	-	-	**37,805.3**	-	-	**37,805.3**
MN	-	-	-	-	-	-	-	2,106.4	37.8	-	-	-	-	90.0	-	-	-	-	-	1,188.2	-	-	**3,422.5**	-	-	**3,422.5**
MO	-	-	-	-	50.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**50.5**	-	-	**50.5**
NY	-	-	-	-	-	-	-	472.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**472.1**	-	-	**472.1**
OH	-	-	-	58.4	115.2	-	-	6,456.5	8,972.7	-	-	-	-	6,061.5	-	-	-	-	-	872.6	-	-	**22,536.8**	-	-	**22,536.8**
OK	-	-	-	-	59.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**59.6**	-	-	**59.6**
TN	-	-	-	-	99.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**99.9**	-	-	**99.9**
TX	-	-	-	-	63.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**63.8**	-	-	**63.8**
WI	-	-	-	1,489.1	194.4	-	-	2,988.3	-	-	-	-	-	1,286.1	-	-	-	-	-	607.7	-	-	**6,565.7**	-	-	**6,565.7**
Other	-	6.0	0.1	1,704.0	1,027.0	58.0	-	7,714.8	3,851.9	124.7	8.5	3.3	226.8	13,863.9	12.2	35.6	4.3	-	26.2	10,896.0	42.8	60.8	**39,666.9**	21,033.4	2,338.8	**63,039.2**
Total	**207.2**	**6.0**	**0.1**	**10,559.1**	**3,698.6**	**58.0**	**942.4**	**43,653.4**	**25,400.8**	**124.7**	**8.5**	**3.3**	**226.8**	**26,483.8**	**12.2**	**35.6**	**4.3**	**121.4**	**33.2**	**33,480.8**	**42.8**	**60.8**	**145,164.0**	**21,033.4**	**2,338.8**	**168,536.2**

Source: WCSC Data

Table 43
Great Lakes Navigation System State to State Tonnage, 2006

Receiving State	Shipping State/Country																								
	AL	AR	IA	IL	IN	KY	LA	MI	MN	MO	MS	NJ	NY	OH	OK	PA	PR	TN	TX	WI	WV	Other	Subtotal U.S.	Canada	Overseas	Total
AL	-	-	-	-	37.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**37.4**	-	-	**37.4**
IL	-	-	-	5,779.6	466.5	-	-	2,212.3	-	-	-	-	-	-	-	-	-	-	-	5.7	-	-	**8,464.2**	-	-	**8,464.2**
IN	171.4	22.5	-	119.9	147.4	106.3	1,028.4	8,447.3	13,109.2	42.7	-	-	-	170.1	-	15.4	-	120.2	25.9	5,900.0	-	-	**29,426.7**	-	-	**29,426.7**
LA	-	-	-	-	82.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**82.7**	-	-	**82.7**
MI	-	-	-	1,988.3	820.6	-	-	13,847.1	1,631.0	-	-	-	-	4,592.4	-	-	-	-	-	14,825.4	-	-	**37,704.9**	-	-	**37,704.9**
MN	-	-	-	-	-	-	-	2,369.9	48.5	-	-	-	-	88.6	-	-	-	-	-	-	-	-	**2,507.0**	-	-	**2,507.0**
MO	-	-	-	-	156.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**156.1**	-	-	**156.1**
NY	-	-	-	-	-	-	-	482.9	-	-	-	-	-	68.6	-	-	-	-	-	342.4	-	-	**894.0**	-	-	**894.0**
OH	-	-	-	178.9	128.9	-	-	4,971.2	8,873.4	-	-	-	-	7,527.3	-	-	-	-	-	1,416.9	-	-	**23,096.6**	-	-	**23,096.6**
OK	-	-	-	-	32.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**32.9**	-	-	**32.9**
PA	-	-	-	-	-	-	-	725.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**725.2**	-	-	**725.2**
TN	-	-	-	-	97.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**97.3**	-	-	**97.3**
TX	-	-	-	-	63.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**63.8**	-	-	**63.8**
WI	-	-	-	1,531.2	346.2	-	-	3,418.0	-	-	-	-	-	939.1	-	-	-	-	-	434.0	-	-	**6,668.5**	-	-	**6,668.5**
Other	6.8	-	3.2	1,662.7	431.9	-	5.2	6,171.5	3,524.6	-	0.5	11.0	400.3	14,305.1	2.9	1.0	4.3	0.7	120.6	12,404.1	133.4	102.7	**39,292.6**	21,841.1	3,605.0	**64,738.7**
Total	**178.2**	**22.5**	**3.2**	**11,260.6**	**2,811.8**	**106.3**	**1,033.7**	**42,645.5**	**27,186.6**	**42.7**	**0.5**	**11.0**	**400.3**	**27,691.3**	**2.9**	**16.3**	**4.3**	**120.9**	**146.5**	**35,328.6**	**133.4**	**102.7**	**149,249.8**	**21,841.1**	**3,605.0**	**174,695.9**

Source: WCSC Data

Table 44
Great Lakes Navigation System State Commodity Shipments 2003

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	4,392	-	-	-	5,514	-	134,258	4,646	148,810
Arkansas	-	-	-	-	-	-	3,210	-	3,210
California	-	116	-	78	69	685	-	4,302	5,250
Florida	-	1	52,204	-	-	-	-	451	52,656
Georgia	-	-	23	-	120,330	124,661	-	322	245,336
Iowa	-	-	-	-	-	-	1,249	-	1,249
Illinois	2,692,546	390,068	77,910	-	32,286	-	38,994	286,687	3,518,491
Indiana	412,135	1,413,664	41,598	197,763	81,291	10,107	1,031,590	264,111	3,452,259
Kentucky	-	-	14,204	-	-	-	18,196	3,076	35,476
Louisiana	702,496	744,966	2,812	-	134,902	21,847	201,117	139,336	1,947,476
Maine	-	-	-	-	268	-	-	120,547	120,815
Maryland	796,477	-	-	-	-	-	-	379	796,856
Massachusetts	-	8	-	-	1,248	20	33,151	14,432	48,859
Michigan	198,471	819,570	22,448,469	9,424	706,084	335,031	10,798,418	3,785,645	39,101,112
Minnesota	6,486,748	329	19,707	1,021,290	-	125,401	22,023,067	73,137	29,749,679
Missouri	6,028	4,600	-	-	-	-	30,989	44,621	86,238
Mississippi	-	136,739	-	-	-	-	1,525	-	138,264
North Carolina	-	-	-	-	37,364	-	-	-	37,364
New Jersey	-	256,949	-	-	90,792	47	12	35,622	383,422
New York	-	71,562	-	4,906	19	-	-	8,347	84,834
Ohio	16,579,225	158,358	4,909,950	1,187,219	58,267	1,089,863	1,646,680	190,358	25,819,920
Oklahoma	-	5,590	-	-	-	-	-	-	5,590
Pennsylvania	1,502	-	-	-	24	-	1,451	24,111	27,088
Puerto Rico	-	-	-	-	379	-	-	1,839	2,218
Tennessee	-	-	98,209	-	1,534	-	7,240	2,837	109,820
Texas	53,402	1,195,645	-	-	541,792	1,100,509	773	39	2,892,160
Virgin Islands	-	-	-	-	1,025	-	-	135	1,160
Virginia	14,330	46,288	4	-	30	292	-	19,776	80,720
Washington	-	158,374	-	127	49	-	-	8,237	166,787
Wisconsin	11,327,401	41,048	193,327	2,123,892	-	21,830	10,722,605	47,097	24,477,200
West Virginia	21,704	-	45,118	-	-	-	-	-	66,822
Other	-	-	75,473	-	-	-	-	-	75,473
Canada	555,989	38,841,254	14,320,649	270,652	1,256,251	5,826,824	9,259,614	6,012,356	76,343,589
Foreign	-	184,317	149,597	39,158	14,998	252,376	1,019,840	306,875	1,967,161
Total	**39,852,846**	**44,469,446**	**42,449,254**	**4,854,509**	**3,084,516**	**8,909,493**	**56,973,979**	**11,399,321**	**211,993,364**

Table 45
Great Lakes Navigation System State Commodity Shipments 2004

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alaska	-	-	-	-	-	-	-	23,457	23,457
Alabama	15,188	-	-	19,408	-	-	127,385	21,807	183,788
Arkansas	-	-	-	-	-	-	15,301	3,138	18,439
California	-	24,224	-	247	77	1,130	-	3,808	29,486
Connecticut	-	28,874	-	-	-	-	-	-	28,874
Delaware	-	34,607	-	-	-	-	-	-	34,607
Florida	-	-	-	-	66,315	-	2,800	16,618	85,733
Georgia	-	-	-	-	94,980	148,369	-	162	243,511
Iowa	-	-	-	-	-	-	-	3,464	3,464
Illinois	3,855,531	651,431	73,529	50,719	13,951	3,507	95,234	111,513	4,855,415
Indiana	388,329	1,331,493	78,774	385,851	13,016	1,674	1,257,088	838,658	4,294,883
Kentucky	7,772	-	45,628	-	-	-	27,239	7,742	88,381
Louisiana	1,196,195	452,445	-	2,817	68,588	160,436	218,792	107,932	2,207,205
Maine	13	-	-	-	784	-	16	123,813	124,626
Maryland	195,461	-	-	-	-	-	-	-	195,461
Massachusetts	-	48,099	-	-	399	-	1,882	11,896	62,276
Michigan	148,861	736,078	28,330,335	-	703,760	254,424	13,833,807	3,839,435	47,846,700
Minnesota	5,072,895	536	688	634,164	26,796	319,962	26,242,816	162,371	32,460,228
Missouri	24,145	35,591	-	12,148	-	31,452	28,184	62,425	193,945
Mississippi	-	497,257	-	-	-	1,184	-	-	498,441
New Jersey	-	106,983	-	10	278,098	-	-	3,022	388,113
New York	75,564	156,901	1,800	6	44,170	-	-	4,356	282,797
North Carolina	-	-	-	-	107	-	-	95	202
Ohio	15,694,308	420,395	4,904,311	1,451,408	31,887	1,595,325	2,863,502	254,526	27,215,662
Oklahoma	-	7,147	-	-	-	-	-	-	7,147
Pennsylvania	8,303	9,368	-	-	34,206	-	1,415	27,083	80,375
Puerto Rico	-	-	-	-	239	-	-	2,778	3,017
Tennessee	-	5,638	149,015	884	-	-	37,567	3,207	196,311
Texas	-	935,544	-	-	707,435	127,001	10,425	3,937	1,784,342
Virgin Islands	-	-	-	-	13,646	-	-	-	13,646
Virginia	-	92,386	-	-	-	-	-	15,274	107,660
Washington	-	63,408	-	22	88	-	-	10,140	73,658
Wisconsin	13,348,720	3,898	161,520	2,010,205	-	-	12,823,417	21,345	28,369,105
West Virginia	9,050	-	28,249	-	-	-	-	-	37,299
Other	-	-	57,920	-	-	-	-	-	57,920
Canada	1,330,713	40,276,052	16,459,443	321,446	1,801,896	6,211,519	8,383,085	5,819,029	80,603,183
Foreign	15,599	-	-	-	47,359	52,298	2,214,203	566,592	2,896,051
Total	**41,386,647**	**45,918,355**	**50,291,212**	**4,889,335**	**3,947,797**	**8,908,281**	**68,184,158**	**12,069,623**	**235,595,408**

Table 46
Great Lakes Navigation System State Commodity Shipments 2005

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	1,618	1,302	-	20,130	-	-	173,298	10,839	207,187
Arkansas	-	-	-	-	-	-	6,032	-	6,032
Florida	-	-	-	-	-	-	-	69	69
Illinois	6,802,989	1,198,162	1,845,449	123,179	61,546	3,014	212,941	311,865	10,559,145
Indiana	318,965	1,343,238	76,197	447,245	18,419	4,846	774,319	715,406	3,698,635
Kentucky	-	-	51,494	-	-	-	6,456	-	57,950
Louisiana	573,149	9,774	-	19,508	36,773	93,163	208,517	1,560	942,444
Michigan	250,142	686,288	25,506,223	-	428,545	165,824	12,977,841	3,638,520	43,653,383
Minnesota	85,981	477	544	686,563	-	167,876	24,242,635	216,676	25,400,752
Missouri	-	23,346	-	16,554	-	12,752	31,949	40,090	124,691
Mississippi	-	-	-	3,793	1,544	-	3,200	-	8,537
New Jersey	-	3,243	-	-	19	-	-	-	3,262
New York	218,138	19	-	33	5	-	8,615	33	226,843
Ohio	15,858,291	391,263	4,741,545	981,667	95,336	1,564,524	2,666,982	184,154	26,483,762
Oklahoma	-	12,200	-	-	-	-	-	-	12,200
Pennsylvania	14,093	-	21,532	-	-	-	-	-	35,625
Puerto Rico	-	-	-	-	-	-	-	4,298	4,298
Tennessee	-	11,288	74,325	-	-	-	23,532	12,285	121,430
Texas	-	-	-	-	24,368	-	7,017	1,813	33,198
Wisconsin	19,615,854	9,487	117,295	2,544,642	-	20,387	10,979,298	193,885	33,480,848
West Virginia	8,907	-	33,941	-	-	-	-	-	42,848
Other	-	-	60,820	-	-	-	-	-	60,820
Canada	982,031	917,925	4,453,453	301,713	362,327	4,509,929	5,565,554	3,940,497	21,033,429
Foreign	42,707	-	5,217	-	47,911	124,144	1,522,703	596,105	2,338,787
Total	**44,772,865**	**4,608,012**	**36,988,035**	**5,145,027**	**1,076,793**	**6,666,459**	**59,410,889**	**9,868,095**	**168,536,175**

Table 47
Great Lakes Navigation System State Commodity Shipments 2006

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	-	-	-	26,950	-	-	114,671	36,587	178,208
Arkansas	-	-	-	-	-	-	1,600	20,903	22,503
Iowa	-	-	-	-	-	-	1,683	1,558	3,241
Illinois	6,271,587	1,719,870	2,342,972	374,760	44,367	9,398	135,569	362,039	11,260,562
Indiana	188,742	981,160	180,080	113,131	-	-	546,012	802,638	2,811,763
Kentucky	1,500	-	58,949	-	-	-	45,877	-	106,326
Louisiana	700,021	1,400	-	2,310	54,954	67,390	176,091	31,503	1,033,669
Michigan	357,083	908,553	25,233,987	-	417,263	80,078	11,714,131	3,934,388	42,645,483
Minnesota	62,776	481	776	448,021	-	385,714	26,075,180	213,690	27,186,638
Missouri	1,400	1,735	-	-	-	-	21,995	17,600	42,730
Mississippi	-	-	-	-	-	-	-	479	479
New Jersey	-	11,037	-	-	-	-	-	-	11,037
New York	385,230	14,189	-	-	4	-	1	859	400,283
Ohio	14,684,250	529,171	5,540,229	1,881,233	44,322	1,394,963	3,425,649	191,444	27,691,261
Oklahoma	-	2,850	-	-	-	-	-	-	2,850
Pennsylvania	-	-	-	-	-	-	-	16,349	16,349
Puerto Rico	-	-	-	-	-	-	-	4,308	4,308
Tennessee	1,548	14,392	89,808	-	-	-	9,935	5,174	120,857
Texas	-	55,742	-	-	76,666	-	11,069	3,041	146,518
Wisconsin	21,210,014	2,389	53,568	2,133,535	-	-	11,739,692	189,427	35,328,625
West Virginia	101,021	-	32,342	-	-	-	-	-	133,363
Other	-	-	63,403	-	-	-	39,306	-	102,709
Canada	1,279,714	838,768	5,489,083	148,780	314,261	4,437,106	5,987,629	3,345,731	21,841,072
Foreign	135,274	19	-	15,042	37,907	269,565	2,671,338	475,893	3,605,038
Total	**45,380,160**	**5,081,756**	**39,085,197**	**5,143,762**	**989,744**	**6,644,214**	**62,717,428**	**9,653,611**	**174,695,872**

Table 48
Great Lakes Navigation System State Commodity Receipts 2003

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	-	1,400	192,298	2,919	-	-	62,882	80,676	340,175
Arkansas	-	-	-	-	-	1,485	135,696	1,518	138,699
California	-	391,308	6,701	425	2,060	357	399	60,229	461,479
Connecticut	-	1,307,512	-	-	-	9,773	-	-	1,317,285
Delaware	-	918,630	-	-	-	-	-	3,730	922,360
Florida	-	378,460	3,390,018	3,612	20,456	1,201	12,463	341,574	4,147,784
Georgia	-	90,309	672,116	56	4,469	-	22,047	158,049	947,046
Hawaii	-	-	-	-	-	-	-	2	2
Illinois	19,745	280,023	932,723	15,349	126,216	659,917	528,192	883,295	3,445,460
Indiana	778,811	269,297	3,621,428	-	183,968	207,454	23,715,515	400,660	29,177,133
Kentucky	-	1,607	-	-	-	-	10,050	-	11,657
Louisiana	15,337	474,275	276,761	57,013	66,281	30,865	1,639,194	55,695	2,615,421
Maine	-	8,442,320	-	-	436	133,867	129	135,325	8,712,077
Maryland	-	306,093	1,251,349	-	38,287	124,524	1,975,765	861	3,696,879
Massachusetts	-	6,065,040	214,242	468	14,163	24,216	226	75,829	6,394,184
Michigan	14,645,851	1,650,485	11,060,163	9,424	278,013	2,306,194	6,905,106	3,736,128	40,591,364
Minnesota	1,357,750	21,666	1,495,847	0	110,532	249,516	135,540	379,149	3,750,000
Missouri	-	-	-	-	-	-	7,706	-	7,706
Mississippi	-	5,181	-	-	-	-	7,288	-	12,469
New Hampshire	-	989,875	776,302	-	-	10,956	-	3,976	1,781,109
New Jersey	-	2,206,249	587,102	728	19,540	4,538	739	65,980	2,884,876
New York	430,000	7,454,182	2,098,658	341,960	37,913	515,459	54	609,675	11,487,901
North Carolina	-	8,635	230,014	11,972	75,743	-	1	180	326,545
Ohio	162,100	587,035	10,303,823	219,418	228,123	1,359,314	16,132,228	1,360,288	30,352,329
Oklahoma	5,997	8,823	-	-	-	-	120,105	-	134,925
Pennsylvania	14,225	4,355,076	959,040	12	65,250	125,845	240	193,530	5,713,218
Puerto Rico	-	190,414	28	15,032	12,648	-	21	259,314	477,457
Rhode Island	-	873,812	-	46	3,999	244,152	-	37	1,122,046
South Carolina	-	23,396	243,238	-	167	20	302,054	42,300	611,175
Tennessee	-	-	-	1,473	-	-	51,249	-	52,722
Texas	1,484	2,044,846	333,709	-	317,026	-	208,650	19,417	2,925,132
Virgin Islands	-	-	-	1	9	-	-	1,416	1,426
Virginia	-	1,800,756	221,330	43	47,315	-	467	176,039	2,245,950
Washington	-	-	-	-	-	-	-	69	69
Wisconsin	1,842,804	227,132	1,314,844	-	29,708	960,029	255,893	1,677,052	6,307,462
West Virginia	-	-	1,510	-	-	-	-	-	1,510
Other	-	-	13,750	-	-	-	-	-	13,750
Canada	20,554,717	3,095,609	2,200,056	2,373,965	1,454,398	1,863,459	4,488,173	584,889	36,615,266
Foreign	24,025	-	-	1,800,593	-	76,352	255,907	92,439	2,249,316
Total	**39,852,846**	**44,469,446**	**42,397,050**	**4,854,509**	**3,136,720**	**8,909,493**	**56,973,979**	**11,399,321**	**211,993,364**

Table 49
Great Lakes State Navigation System Commodity Receipts 2004

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	-	255,797	96,144	5,863	-	-	47,394	42,343	447,541
Alaska	-	-	2,499	-	-	-	-	6,599	9,098
Arkansas	-	-	-	-	-	-	139,821	-	139,821
California	-	519,281	8,925	248	1,440	103	381	51,585	581,963
Connecticut	-	731,690	-	-	52,376	17,202	-	25,465	826,733
Delaware	-	1,382,488	-	-	-	-	-	4,929	1,387,417
Florida	66,796	476,549	3,161,091	5,569	32,337	166,699	12,098	380,295	4,301,434
Georgia	5,963	38,640	1,027,720	81	2,024	233	262	109,439	1,184,362
Iowa	-	6,800	-	-	-	-	-	-	6,800
Illinois	54,282	197,921	1,167,800	-	238,464	1,128,294	952,138	780,754	4,519,653
Indiana	1,298,847	378,978	4,198,253	58,658	165,025	305,797	26,781,663	620,287	33,807,508
Kentucky	6,019	-	-	-	-	-	1,431	-	7,450
Louisiana	-	541,877	239,024	152,265	185,837	72,986	1,976,056	268,587	3,436,632
Massachusetts	180,162	6,613,256	222,447	926	14,422	95,776	16,171	103,358	7,246,518
Maine	-	8,143,559	-	94	27,784	232,566	14,845	236,100	8,654,948
Maryland	-	140,671	1,518,228	-	83,616	67,156	1,604,985	36,332	3,450,988
Michigan	16,625,742	1,463,055	13,954,586	-	164,463	1,693,384	8,600,775	3,467,552	45,969,557
Minnesota	1,486,549	536	2,542,309	-	33,277	261,636	133,072	393,109	4,850,488
Mississippi	-	7,525	-	-	19,388	-	-	-	26,913
Missouri	-	-	-	-	-	-	7,687	3,051	10,738
North Carolina	-	17,273	333,039	-	82,955	-	22,902	2	456,171
New Hampshire	-	952,211	715,296	-	13,500	223,827	-	-	1,904,834
New Jersey	60	2,627,267	1,062,250	395	99,168	185,695	61	61,710	4,036,606
New York	993,451	9,174,228	2,303,095	158,653	60,198	389,332	88	805,965	13,885,010
Ohio	673,237	618,091	10,850,081	197,016	315,724	986,278	19,827,108	1,651,476	35,119,011
Oklahoma	-	8,809	-	-	-	-	90,486	-	99,295
Oregon	-	27,029	-	-	-	-	-	-	27,029
Pennsylvania	11,491	5,162,564	1,046,329	-	81,277	42,154	280	88,331	6,432,426
Puerto Rico	2,429	421,626	-	42,017	6,393	22	46	264,230	736,763
Rhode Island	-	486,578	-	-	2,667	265,511	-	-	754,756
South Carolina	-	38,664	303,620	-	8,666	-	86,012	1,859	438,821
Tennessee	-	-	-	15,667	-	-	29,447	-	45,114
Texas	-	588,537	207,103	-	381,044	-	111,145	19,972	1,307,801
Virgin Islands	231	-	-	-	15	-	-	1,408	1,654
Virginia	584	1,435,841	286,727	32	54,820	69,592	12	61,959	1,909,567
Washington	-	-	-	-	-	-	-	2,847	2,847
Wisconsin	1,944,271	231,872	1,551,100	-	21,758	1,121,500	260,729	1,728,483	6,859,713
Other	-	-	8,924	-	-	-	-	-	8,924
Canada	18,003,843	3,193,932	3,484,622	2,654,856	1,799,159	1,369,043	7,439,593	649,021	38,594,069
Foreign	32,690	35,210	-	1,596,995	-	213,495	27,470	202,575	2,108,435
Total	**41,386,647**	**45,918,355**	**50,291,212**	**4,889,335**	**3,947,797**	**8,908,281**	**68,184,158**	**12,069,623**	**235,595,408**

Table 50
Great Lakes State Navigation System Commodity Receipts 2005

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	-	-	-	4,846	-	-	51,151	-	55,997
Arkansas	-	-	-	-	-	-	7,558	-	7,558
California	-	-	-	1	9	-	-	90	100
Florida	-	-	-	-	-	-	5,558	-	5,558
Georgia	-	-	-	-	-	-	-	36	36
Iowa	-	-	-	-	-	-	4,733	-	4,733
Illinois	2,602,507	1,037,519	2,859,621	49,148	161,514	803,495	853,076	887,577	9,254,457
Indiana	705,835	363,925	3,325,411	59,985	178,682	389,937	23,463,122	361,876	28,848,773
Kentucky	-	4,775	-	-	-	-	-	-	4,775
Louisiana	9,454	-	-	128,512	-	-	5,477	62,970	206,413
Massachusetts	-	-	-	-	-	-	-	40	40
Maryland	-	-	-	-	-	-	6	321	327
Michigan	17,790,830	1,217,358	12,263,584	-	139,712	1,703,926	8,642,664	3,143,915	44,901,989
Minnesota	1,277,764	477	1,881,864	-	9,351	194,902	99,746	435,414	3,899,518
Missouri	-	-	-	-	-	-	-	50,472	50,472
New Jersey	-	-	-	-	796	2	40	214	1,052
New York	418,604	464,851	344,263	372,860	9,613	234,381	-	659,701	2,504,273
Ohio	604,999	425,730	10,011,297	188,145	168,820	1,168,847	17,605,149	1,711,930	31,884,917
Oklahoma	-	8,519	-	-	1,507	-	27,687	21,850	59,563
Oregon	-	-	-	-	-	-	-	15	15
Pennsylvania	14,203	-	1,021,891	-	-	29,565	-	153	1,065,812
Puerto Rico	-	-	-	8,515	-	-	-	687	9,202
South Carolina	-	17	-	-	85	-	-	690	792
Tennessee	-	5,516	-	15,859	-	-	53,281	25,289	99,945
Texas	-	8,991	-	-	40,406	-	48,489	8,788	106,674
Virginia	-	-	-	-	88	-	-	118	206
Virgin Islands	-	-	-	-	-	-	-	19	19
Wisconsin	2,812,693	213,544	1,468,738	19,594	38,641	1,421,866	320,797	1,944,799	8,240,672
Other	-	-	800	-	-	-	-	-	800
Canada	18,510,850	851,005	3,810,566	2,231,175	327,564	626,392	8,222,355	303,537	34,883,444
Foreign	25,126	5,785	-	2,066,387	-	93,146	-	247,599	2,438,043
Total	**44,772,865**	**4,608,012**	**36,988,035**	**5,145,027**	**1,076,788**	**6,666,459**	**59,410,889**	**9,868,100**	**168,536,175**

Table 51
Great Lakes State Navigation System Commodity Receipts 2006

	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Alabama	-	-	-	2,898	-	-	34,507	-	37,405
Arkansas	-	-	-	-	-	-	9,024	-	9,024
California	-	-	-	-	9,194	-	-	112	9,306
Connecticut	-	-	14,830	-	-	-	-	-	14,830
Delaware	-	135,161	-	-	-	-	-	-	135,161
Florida	-	-	-	-	-	-	3,777	2	3,779
Georgia	-	-	-	-	-	-	-	36	36
Illinois	2,771,816	733,338	3,484,533	1,585	155,545	885,036	816,716	1,263,038	10,111,607
Indiana	856,835	255,833	4,388,452	29,260	223,226	384,501	26,802,476	264,803	33,205,386
Kentucky	-	1,645	-	-	-	-	-	-	1,645
Louisiana	-	-	-	35,490	-	-	19,233	54,351	109,074
Massachusetts	-	-	-	-	-	-	-	7	7
Maryland	-	9,117	-	-	6	-	4	8,746	17,873
Maine	-	9,625	-	-	-	-	-	-	9,625
Michigan	18,042,493	1,115,580	11,111,641	-	91,715	1,636,793	9,153,118	2,945,044	44,096,384
Minnesota	1,555,049	485	2,279,886	-	32,061	164,646	41,020	217,857	4,291,004
Missouri	-	16,824	-	-	-	-	10,311	128,952	156,087
Mississippi	-	-	-	-	-	-	2,863	-	2,863
New Jersey	-	-	-	-	114	-	-	130	244
New York	193,576	393,859	314,654	384,858	34	185,266	64	652,801	2,125,112
Ohio	808,933	472,835	10,639,694	121,385	147,868	1,046,915	18,460,434	1,539,932	33,237,996
Oklahoma	-	16,824	-	-	-	-	11,201	4,880	32,905
Pennsylvania	-	-	1,063,800	-	-	29,482	-	107	1,093,389
South Carolina	-	10,915	-	-	109	-	13	364	11,401
Tennessee	-	21,030	-	-	-	-	60,408	15,825	97,263
Texas	-	16,314	-	-	27,164	-	47,305	340	91,123
Virgin Islands	-	-	-	-	-	-	-	56	56
Virginia	-	9,236	-	-	189	-	-	57	9,482
Washington	-	-	15,428	-	-	-	-	-	15,428
Wisconsin	2,498,841	275,598	1,683,302	-	5,471	1,494,724	538,056	2,029,409	8,525,401
Other	-	-	1,590	-	-	-	39,306	-	40,896
Canada	18,611,621	1,528,952	4,043,899	1,557,055	297,048	625,837	6,437,765	250,076	33,352,253
Foreign	40,996	58,585	43,488	3,011,231	-	191,014	229,827	276,686	3,851,827
Total	**45,380,160**	**5,081,756**	**39,085,197**	**5,143,762**	**989,744**	**6,644,214**	**62,717,428**	**9,653,611**	**174,695,872**

Table 52
Commodities at Principal U.S. Great Lakes Ports, 2003

Port	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Duluth-Superior, MN-WI	17,874,151	21,337	2,099,442	2,868,132	38,835	395,262	14,462,760	583,460	**38,343,379**
Indiana Harbor, IN	719,357	1,397,901	1,192,342	-	120,555	105,784	10,284,181	312,433	**14,132,553**
Cleveland, OH	56,112	288,365	5,110,858	-	9,793	732,813	5,323,283	1,099,570	**12,620,794**
Lorain, OH	-	-	859,200	-	29,649	42,775	1,078,575	143,349	**2,153,548**
Toledo, OH	3,519,341	453,508	745,813	1,359,079	229,458	416,080	2,918,292	222,747	**9,864,318**
Two Harbors, MN	-	-	-	-	-	-	13,032,598	-	**13,032,598**
Ashtabula, OH	5,293,716	-	704,220	-	17,490	382,972	4,028,544	-	**10,426,942**
Presque Isle, MI	1,729,667	-	73,673	-	-	-	6,972,336	-	**8,775,676**
Gary, IN	243,881	68,948	206,114	24,500	28,251	15,744	8,225,674	197,226	**9,010,338**
Burns Harbor, IN	227,708	93,099	983,757	173,263	116,453	96,033	6,223,736	155,112	**8,069,161**
Taconite Harbor, MN	812,051	-	-	-	-	-	40,346	-	**852,397**
Calcite, MI	20,881	18,285	6,741,302	-	-	51,500	48,273	-	**6,880,241**
Stoneport, MI	-	-	6,437,198	-	-	-	-	7,519	**6,444,717**

Table 53
Commodities at Principal U.S. Great Lakes Ports, 2004

Port	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Duluth-Superior, MN-WI	18,504,239	0	3,357,213	2,406,298	31,612	576,155	19,933,440	583,662	**45,392,619**
Indiana Harbor, IN	1,018,714	1,444,554	1,712,215	0	19,096	71,455	13,071,705	890,552	**18,228,291**
Cleveland, OH	78,647	423,292	5,012,092	0	17,446	1,153,948	7,880,050	1,209,136	**15,774,611**
Lorain, OH	92,929	0	1,060,359	12,546	10,054	12,215	1,655,204	163,942	**3,007,249**
Toledo, OH	2,791,671	611,794	846,050	1,588,478	301,016	388,133	3,060,358	274,062	**9,861,562**
Two Harbors, MN	0	0	0	0	26,794	3,769	13,629,640	0	**13,660,203**
Ashtabula, OH	5,625,431	0	639,120	0	19,095	208,258	4,254,762	191,810	**10,938,476**
Presque Isle, MI	1,964,778	0	30,300	0	0	0	8,139,254	0	**10,134,332**
Gary, IN	384,409	12,388	173,483	9,315	30,961	59,163	7,674,891	186,513	**8,531,123**
Burns Harbor, IN	284,053	150,268	925,156	435,194	127,984	176,853	7,270,008	432,224	**9,801,740**
Taconite Harbor, MN	937,601	0	0	0	0	0	84,315	0	**1,021,916**
Calcite, MI	0	41,824	8,812,946	0	0	39,363	50,735	4,299	**8,949,167**
Stoneport, MI	0	0	7,753,812	0	0	0	0	0	**7,753,812**

Table 54
Commodities at Principal U.S. Great Lakes Ports, 2005

Port	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Duluth-Superior, MN-WI	19,781,631	0	2,539,644	2,934,342	19,730	525,465	17,947,949	973,110	**44,721,871**
Two Harbors, MN	0	0	30,174	0	0	0	12,722,895	0	**12,753,069**
Indiana Harbor, IN	534,970	1,346,666	1,092,368	0	45,057	111,810	10,384,271	605,015	**14,120,157**
Cleveland, OH	62,513	387,742	4,558,555	0	5,328	1,163,763	6,344,200	1,118,865	**13,640,966**
Toledo, OH	3,201,645	413,030	848,304	1,120,821	237,411	306,313	3,967,125	409,533	**10,504,182**
Presque Isle, MI	2,250,349	0	85,173	0	0	0	8,647,281	0	**10,982,803**
Ashtabula, OH	5,709,752	0	653,704	0	10,183	328,481	2,679,324	332,634	**9,714,078**
Gary, IN	193,145	0	147,243	1,595	0	39,416	6,824,130	97,902	**7,303,431**
Burns Harbor, IN	296,685	210,834	1,067,855	505,635	152,044	186,242	7,015,925	376,297	**9,811,517**
Calcite, MI	0	20,001	7,170,490	0	0	45,543	50,816	945	**7,287,795**
Stoneport, MI	0	0	6,785,289	0	0	0	0	0	**6,785,289**
Lorain, OH	147,890	0	1,242,748	0	11,234	46,415	1,492,841	113,779	**3,054,907**
Taconite Harbor, MN	713,546	0	0	0	0	0	0	0	**713,546**

Table 55
Commodities at Principal U.S. Great Lakes Ports, 2006

Port	Coal & Coke	Petroleum	Aggregates	Grain	Chemicals	Ores & Minerals	Iron & Steel	Others	Total
Duluth-Superior, MN-WI	21,551,117	0	3,252,520	2,058,772	32,061	747,117	19,044,116	775,052	**47,460,755**
Two Harbors, MN	0	0	30,670	0	0	37,734	14,388,008	61,526	**14,517,938**
Indiana Harbor, IN	713,828	1,015,273	1,743,429	0	0	114,796	12,184,590	516,879	**16,288,795**
Cleveland, OH	89,495	344,773	5,072,974	0	488	988,009	7,979,899	1,257,539	**15,733,177**
Toledo, OH	2,850,131	639,159	1,008,042	1,991,047	169,687	344,845	3,910,607	463,208	**11,376,726**
Presque Isle, MI	2,079,745	0	84,119	0	0	0	6,909,681	0	**9,073,545**
Ashtabula, OH	4,974,935	0	525,127	0	3,939	342,326	995,380	120,610	**6,962,317**
Gary, IN	161,516	27,550	266,285	0	0	58,904	8,444,604	212,517	**9,171,376**
Burns Harbor, IN	170,233	117,732	1,130,041	142,391	223,226	180,449	6,863,642	383,005	**9,210,719**
Calcite, MI	0	40,957	7,089,864	0	0	0	96,431	285	**7,227,537**
Stoneport, MI	0	0	7,599,348	0	0	0	0	0	**7,599,348**
Lorain, OH	348,911	0	1,243,374	0	18,076	34,703	2,031,925	80,473	**3,757,462**
Taconite Harbor, MN	990,587	0	0	0	0	0	0	0	**990,587**

Photo9: Laker approaching the Blue Water Bridge at the mouth of the St. Clair River

Table 56
Shipments and Receipts at Principal U.S. Great Lakes Ports, 2003

Port	Receipt	Shipment	Intraport	Total
Duluth-Superior, MN-WI	3,022,041	35,302,108	19,230	**38,343,379**
Indiana Harbor, IN	11,996,903	2,014,037	121,613	**14,132,553**
Cleveland, OH	10,351,670	667,898	1,601,226	**12,620,794**
Lorain, OH	2,010,199	143,349	-	**2,153,548**
Toledo, OH	4,921,528	4,942,790	-	**9,864,318**
Two Harbors, MN	62,434	12,970,164	-	**13,032,598**
Ashtabula, OH	5,126,841	5,300,101	-	**10,426,942**
Presque Isle, MI	1,778,982	6,996,694	-	**8,775,676**
Gary, IN	8,597,080	413,258	-	**9,010,338**
Burns Harbor, IN	7,177,767	891,394	-	**8,069,161**
Taconite Harbor, MN	812,051	-	40,346	**852,397**
Calcite, MI	78,143	6,802,098	-	**6,880,241**
Stoneport, MI	138,513	6,306,204	-	**6,444,717**

Source: WCSC

Table 57
Shipments and Receipts at Principal U.S. Great Lakes Ports, 2004

Port	Receipt	Shipment	Intraport	Total
Duluth-Superior, MN-WI	4,287,849	41,058,020	46,750	**45,392,619**
Indiana Harbor, IN	15,561,951	2,566,116	100,224	**18,228,291**
Cleveland, OH	11,855,643	889,584	3,029,384	**15,774,611**
Lorain, OH	2,843,307	163,942	0	**3,007,249**
Toledo, OH	5,203,587	4,657,975	0	**9,861,562**
Two Harbors, MN	0	13,660,205	0	**13,660,205**
Ashtabula, OH	5,560,262	5,378,214	0	**10,938,476**
Presque Isle, MI	1,995,078	8,139,254	0	**10,134,332**
Gary, IN	8,038,441	492,682		**8,531,123**
Burns Harbor, IN	8,685,694	1,114,637	1,409	**9,801,740**
Taconite Harbor, MN	0	937,601	84,315	**1,021,916**
Calcite, MI	113,980	8,835,187	0	**8,949,167**
Stoneport, MI	191,862	7,561,950	0	**7,753,812**

Source: WCSC

Table 58
Shipments and Receipts at Principal U.S. Great Lakes Ports, 2005

Port	Receipt	Shipment	Intraport	Total
Duluth-Superior, MN-WI	3,649,629	40,893,162	179,080	**44,721,871**
Two Harbors, MN	42,008	12,711,061	0	**12,753,069**
Indiana Harbor, IN	11,990,486	2,042,558	87,113	**14,120,157**
Cleveland, OH	9,832,816	1,241,813	2,566,337	**13,640,966**
Toledo, OH	4,548,267	5,955,915	0	**10,504,182**
Presque Isle, MI	2,316,695	8,666,108	0	**10,982,803**
Ashtabula, OH	4,309,057	5,405,021	0	**9,714,078**
Gary, IN	6,980,849	322,582	0	**7,303,431**
Burns Harbor, IN	8,674,108	1,137,409	0	**9,811,517**
Calcite, MI	40,551	7,247,244	0	**7,287,795**
Stoneport, MI	173,493	6,611,796	0	**6,785,289**
Lorain, OH	2,866,743	188,164	0	**3,054,907**
Taconite Harbor, MN	713,546	0	0	**713,546**

Source: WCSC

Table 59
Shipments and Receipts at Principal U.S. Great Lakes Ports, 2006

Port	Receipt	Shipment	Intraport	Total
Duluth-Superior, MN-WI	4,500,636	42,910,179	49,940	**47,460,755**
Two Harbors, MN	75,901	14,442,037	0	**14,517,938**
Indiana Harbor, IN	14,689,988	1,555,429	43,378	**16,288,795**
Cleveland, OH	11,342,747	959,764	3,430,666	**15,733,177**
Toledo, OH	6,052,911	5,323,815	0	**11,376,726**
Presque Isle, MI	2,163,864	6,909,681	0	**9,073,545**
Ashtabula, OH	2,293,198	4,669,119	0	**6,962,317**
Gary, IN	8,846,309	325,067	0	**9,171,376**
Burns Harbor, IN	8,453,458	757,261	0	**9,210,719**
Calcite, MI	48,696	7,178,841	0	**7,227,537**
Stoneport, MI	171,193	7,428,155	0	**7,599,348**
Lorain, OH	3,630,487	126,975	0	**3,757,462**
Taconite Harbor, MN	990,587	0	0	**990,587**

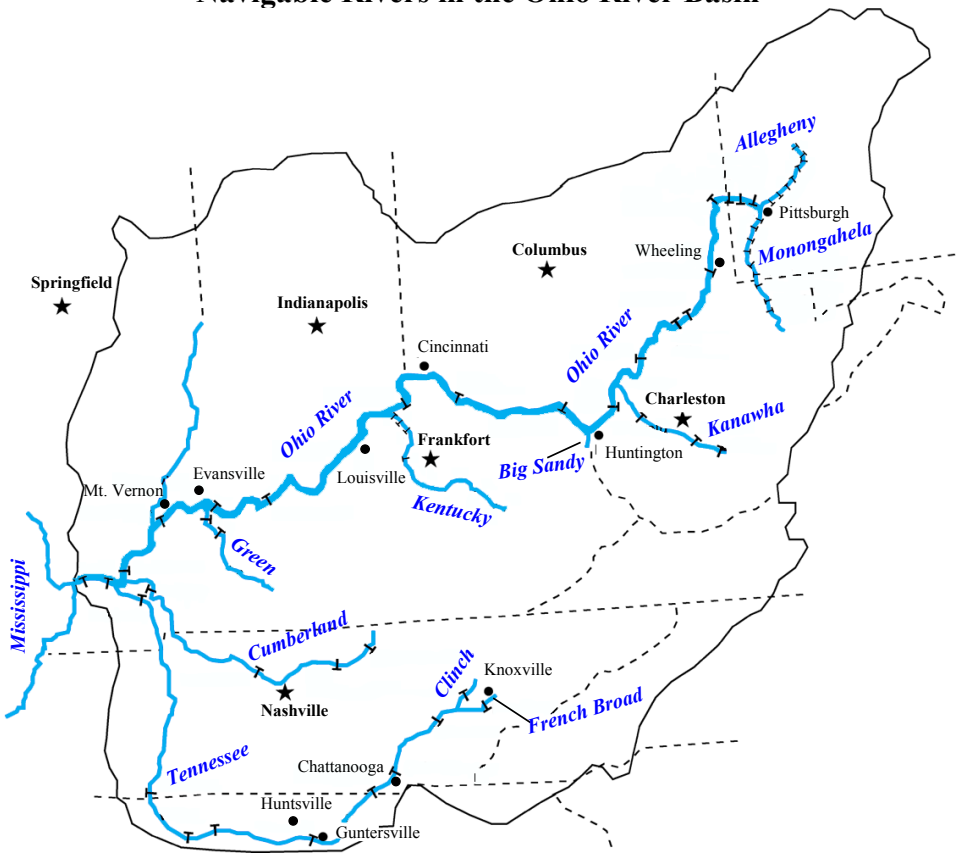
Source: WCSC

PART 3. THE OHIO RIVER NAVIGATION SYSTEM

1. General.

a. Geography and Physical Description. The Ohio River Navigation System (ORS) is situated in the Ohio River Basin (ORB), which is a 204,000 square mile area drained by the Ohio River and its tributaries. The drainage area encompasses all or portions of fourteen states, including Alabama, Georgia, Kentucky, Indiana, Illinois, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. **Figure 12** displays the navigable rivers of the ORS. The topography of the basin varies from rugged mountains to flat plains, with the Appalachian Mountains dominating the eastern portion. West of these mountains and south of the Ohio River, the landscape contains considerable local relief that gradually modifies to rolling plains through most of Kentucky and Tennessee. North of the Ohio River, broad valleys with only minor relief extend from southwestern and central Ohio through central Indiana into southern Illinois.

Figure 12
Navigable Rivers in the Ohio River Basin



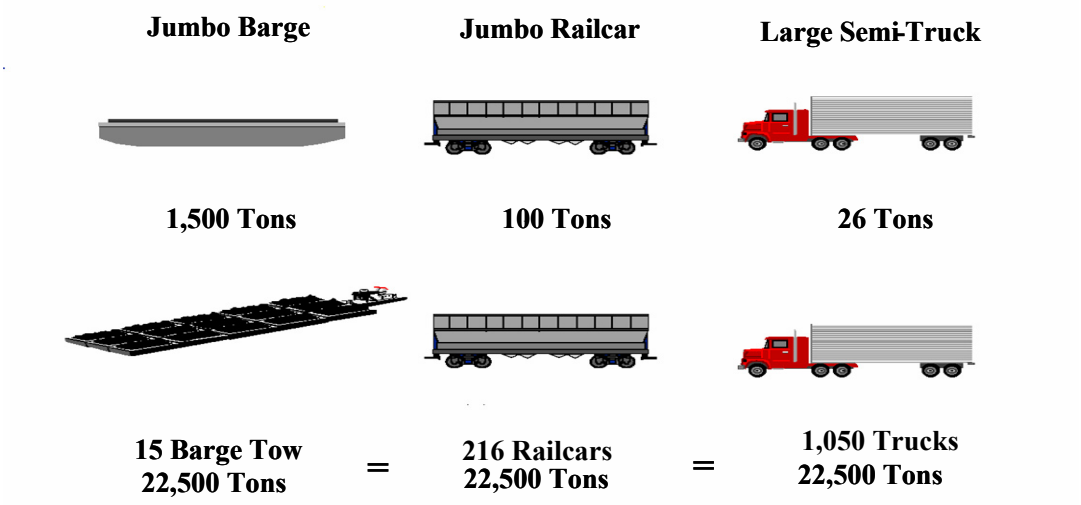
The Ohio River forms the southern boundary of the state of Ohio and is the main artery of the Ohio River Navigation System (ORS). The ORS is a major portion of the nation's inland navigation system, providing for commercial navigation in the eastern one-third of the country. The ORS consists of more than 2,600 miles of commercially navigable waterways. It includes the Ohio River and the navigable portions of the Allegheny, Monongahela, Kanawha, Big Sandy, Green, Tennessee, Cumberland and Kentucky rivers. The Ohio River serves as a collector of system traffic for distribution to points within and outside the Ohio basin, while the tributary streams serve major mining areas and industrial concentrations within the Basin. Through interconnections with the Mississippi River and its tributaries, ORS traffic has access to mid-western states and deep-draft ports on the Great Lakes and Gulf Coast. Year-round navigation on the Ohio River is provided by a system of 20 locks and dams and annual maintenance dredging.

Tows moving on the ORS system are configured to operate as efficiently as possible along each waterway segment. Lock size and channel dimensions are critical in limiting the most efficient tow configuration. Currently, the Ohio River fleet consists mostly of jumbo barges. A typical Ohio River tow is a 4,500 horsepower towboat moving 15 barges, while tows for tributaries are smaller, due to channel and lock restrictions.

Barge transportation is an energy efficient mode for carrying large quantities of bulk commodities. A typical barge can carry as much coal or grain as 15 rail cars for about the same energy per ton-mile. On certain river segments, river efficiency is much greater than rail due to the back haul opportunities barging provides. **Figure 13** compares the average carrying capacity for jumbo barges, railcars, and large semi-tractor trailers. The figure shows that a typical Ohio River tow carrying 22,500 tons is the equivalent of 216 railcars (2.25 unit trains) and 1,050 trucks.

Figure 13

Modal Carrying Capacity



b. History. The ORS was constructed to maintain navigation during the low water season when water transportation historically came to a halt. Federal involvement in improving the Ohio River for commercial navigation began in 1824, when Congress directed the Corps to find a method of removing sandbars and snags. In 1906, the Rivers and Harbors Board recommended construction of 54 locks and dams providing a nine-foot channel the entire length of the Ohio River. This plan, which called for 600-foot long lock chambers, was completed by the Corps between 1910 and 1929.

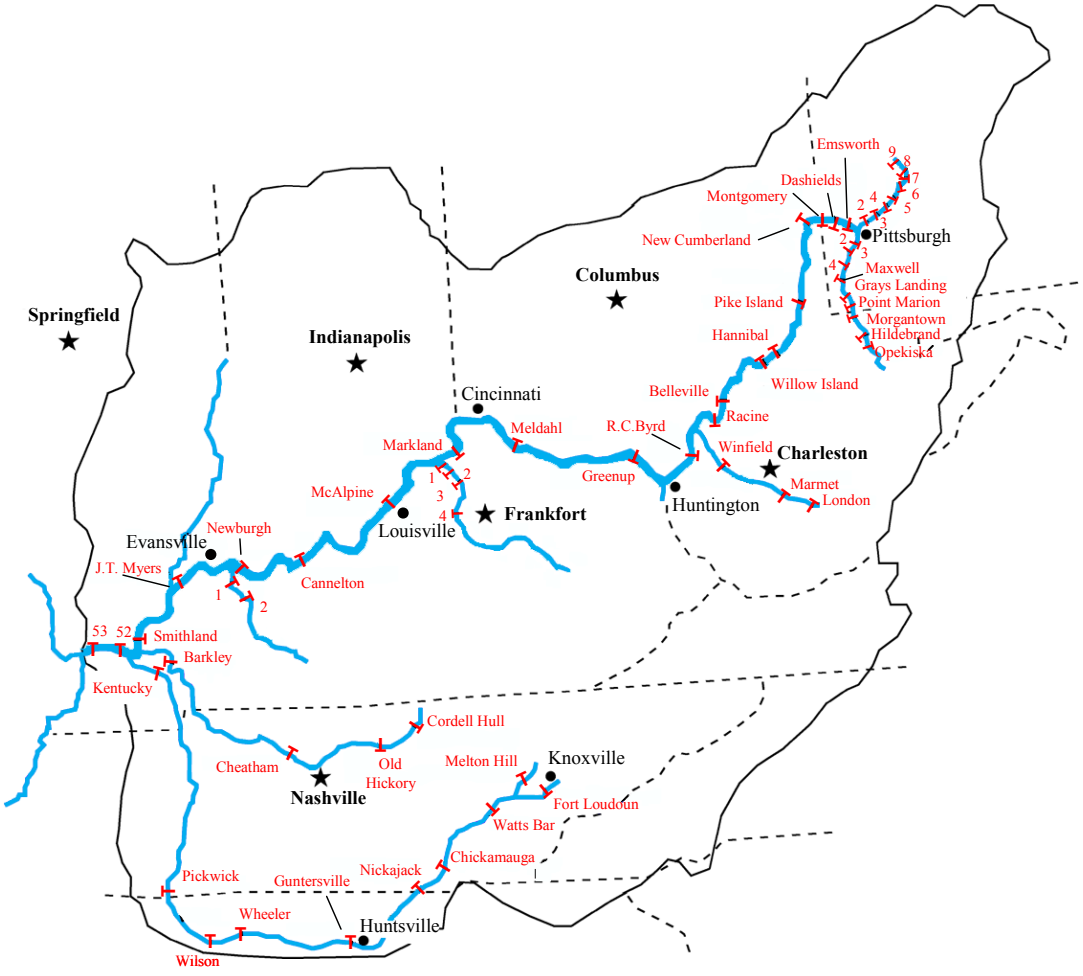
Once canalization was completed, the waterway spurred economic growth and assisted the rapid nationwide mobilization during World War II. Sustained post-war expansion of the national economy increased the use of all types of commodities carried on the river. This rapid growth in traffic exceeded the government's ability to increase lock capacity and by the 1950s serious delay problems had become obvious. The original 600-foot lock chambers built during the days of steamboats and small wooden barges were obsolete and could not handle modern tows (flotillas of bigger, steel barges pushed by diesel powered boats) in a single lockage.

Diesel towboats and newer, larger barges brought increased efficiency to the movement of the energy, construction, and food products demanded by a world newly re-constructed following WW II. These efficiencies, however, could not be fully realized because the Ohio River navigation system remained a system designed to accommodate the transportation technology of the previous century. Lock chambers were small, typically a main chamber 600 by 110 feet and an auxiliary of 360 by 56 feet, and because wicket dams were low-lift structures, the projects were relatively close together. As a result, plans were formulated in the 1950s to modernize the navigation system. The plans developed called for the replacement of earlier low-lift structures with fewer high-lift locks. The modernized structures provide higher-lift dams with longer pool-reaches between projects and larger lock dimensions. The modernization program envisioned 19 modern high-lift projects and began in 1954 with construction of Greenup Locks and Dam with a 30-foot lift, a 1200 by 110-foot main chamber, and a 600 by 110-foot auxiliary chamber.

The Ohio River modernization program continues today with the construction of Olmsted Locks and Dam on the lower Ohio River and McAlpine Locks and Dam located near Louisville, Kentucky. The new Olmsted Lock and Dam project at river mile 964.4 will replace old Locks and Dam 52 and Locks and Dam 53 and provide twin 1200 by 110-foot locks and a new dam with submersible gates to allow tow passage over the dam during higher flow conditions. With completion of Olmsted, the Ohio River mainstem will be reduced from 20 to 19 projects. The Water Resources Development Act of 1990 authorized improvement of McAlpine Locks and Dam at river mile 606.8. This project replaced the old 600-foot auxiliary lock with a new 1200-foot chamber -- providing this site with twin 1200 by 110-foot locks. The last vestiges of the turn-of-the-century system are at Emsworth, Dashields, and Montgomery locks and dams. These three Upper Ohio River projects have the old 600-foot main chamber and 360-foot auxiliary.

The mainstem Ohio River is currently a large canalized river consisting of 20 pools formed by 20 lock and dam structures. The existing system of tributary reservoirs provides storage for many purposes, one of which is to maintain low flow during periods of drought. The Ohio River and most of its navigable tributaries are maintained at a minimum depth of nine feet by a system of locks and dams and channel improvements. **Figure 14** displays ORS locks and dams.

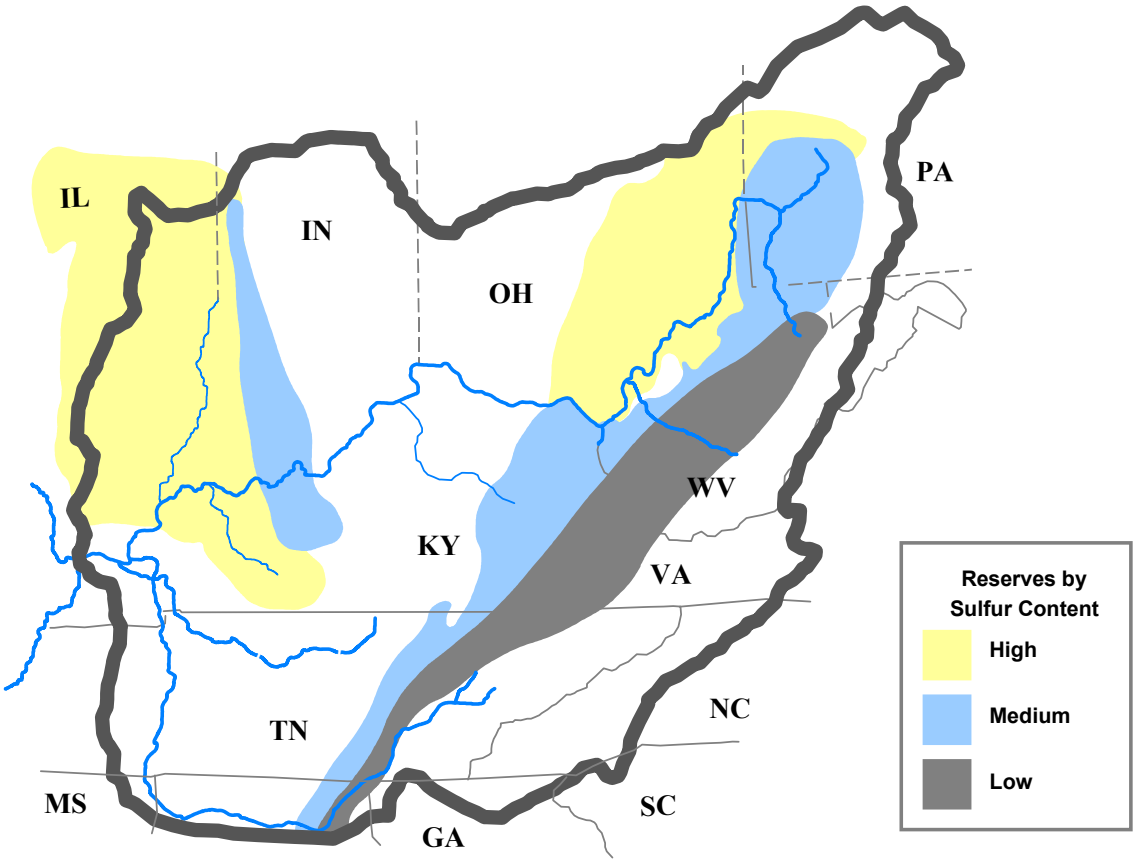
Figure 14
Locks and Dams of the ORS



c. <u>Industries and Natural Resources</u>. Coal is the most transported commodity on the ORS. There are two major coal fields within the ORB: the Appalachian Region and the Illinois Basin. **Figure 15** shows the location of these reserves. The Ohio, Monongahela, Kanawha, Big Sandy, and Tennessee rivers are principal coal routes for Appalachian coal. These waterways provide a natural advantage to waterside Appalachian coal mines. In 2007, the Appalachian region produced 377.8 million tons of coal; about 33 percent of total U.S.

coal produced that year. The Appalachian region contains over 16 percent of the nation's highly prized low sulfur coal.

Figure 15
Ohio River Basin Coal Reserves

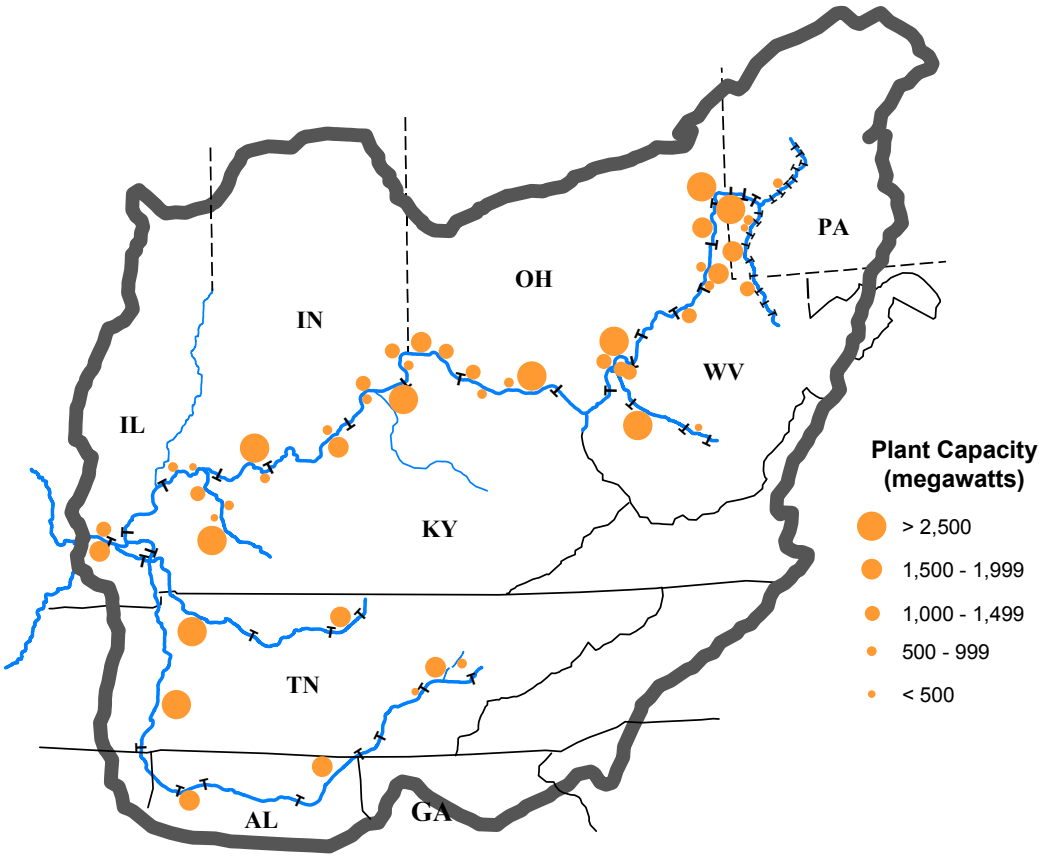


Almost 37 percent of Appalachian coal is shipped by waterway, 41 percent by rail, 16 percent by truck, and 6 percent by conveyor/slurry. Illinois Basin coal also transits the ORS and supplies many of the coal-consuming cement, steel, and power plants situated along the ORS. **Figure 16** displays the location and relative size of ORS waterside power plants.

The Clean Air Act of 1990 stimulated increased production of low-sulfur coals in the Powder River Basin (PRB) of Wyoming and in the central Appalachian region of West Virginia and Kentucky and dampened production in the Illinois basin coal region. Waterway flows reflect these changes. Docks handling PRB and central Appalachian coals showed strong growth in the 1990s, while those handling Illinois basin coals generally showed declines.

Photo 10: Down-bound 15 barge tow on the Cumberland River.

Figure 16
ORS Waterside Electric Power Plants



Changes in ORS traffic levels tend to reflect general economic cycles. The Ohio River mainstem has experienced relatively steady growth in traffic since the mid-1960s with some decline during the recession of the early 1980s, the 1991 recession, the 2002 recession and the 2008-2009 recession.

d. Historic Traffic. Traffic on the Ohio River and its navigable tributaries decreased slightly to 270.8 million tons in 2006, after reaching an all time high of 280.1 million tons in 2005. Commercial navigation on the Ohio River and its tributaries accounted for over 39 percent of the domestic waterway freight tonnage in 2005. ORS traffic has access to the entire inland navigation system, the Great Lakes, and most U.S. coastal ports and overseas markets. Waterborne commerce on the ORS reflects the basin's energy and farm oriented economy. Two-thirds of Ohio River traffic consists of bulk forms of energy fuels: coal, crude oil, and petroleum products. Other major commodities transported include sand, gravel, chemicals, and grain. Historic ORS traffic by river, from 1997 to 2006, is presented in **Table 60**. System historic traffic, by commodity group, is presented in **Table 61**. Traffic in 2006 reached 270.8 million tons; over the past ten years, traffic has been as high as 280.1 million tons in 2005 and as low as 261.3 million tons in 2003.

Photo 11: Electric utility on the Monongahela River

Table 60
Historic Ohio River System Traffic by River (1997-2006)
(Million Tons)

Waterway	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Annual Rate 1997-2006
Ohio River	241.3	242.0	240.8	236.5	242.5	243.1	228.8	239.0	249.2	242.0	0.0%
Kanawha River	24.8	23.0	21.3	21.8	22.2	19.2	19.8	19.4	20.0	21.0	-1.6%
Monongahela River	37.2	36.7	37.7	36.7	38.1	38.2	27.6	26.7	28.2	28.0	-2.8%
Allegheny River	3.9	3.8	4.0	3.8	3.0	2.8	3.3	3.7	3.0	2.9	-2.9%
Green/Barren Rivers	7.3	5.9	4.0	4.1	7.8	10.4	7.9	8.5	10.5	10.7	3.9%
Cumberland River	23.5	22.6	24.0	22.7	23.2	22.6	20.6	22.3	23.4	25.3	0.7%
Tennessee River	48.4	50.5	50.3	49.6	47.9	43.9	49.8	53.3	53.2	54.0	1.1%
Barkley Canal	11.3	14.5	14.8	13.5	14.4	9.5	15.0	17.7	17.8	18.8	5.2%
Big Sandy River	18.2	19.7	20.9	23.2	24.2	25.1	22.6	24.4	27.0	20.3	1.1%
Little Kanawha River	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.1	0.0%
Kentucky River	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-100.0%
Clinch River	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Hiwassee River	0.7	0.8	0.5	0.1	0.4	0.4	0.4	0.4	0.4	0.4	-5.4%
Ohio River System [1/]	271.5	274.6	274.9	271.7	279.9	279.1	259.8	269.9	280.1	270.8	0.0%

Source WCSC Data

[1/] Ohio River System totals are adjusted to prevent double entry; they are not the sum of the above waterway totals.

Photo 12: Bridge construction at McAlpine Locks, mile 606.8, on the Ohio River

Table 61
Historic Ohio River System Traffic by Commodity (1997-2006)
(Million Tons)

Commodity	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Annual Rate 1997-2006
Coal & Coke	159.3	156.9	150.8	146.1	157.1	158.8	140.9	145.3	155.9	148.4	-0.7%
Petroleum	12.9	20.3	20.7	20.4	20.5	20.2	17.2	17.4	19.6	19.4	4.2%
Aggregates	45.3	49.0	49.1	47.0	46.7	45.3	47.4	48.1	48.1	48.7	0.7%
Grains	11.1	14.1	15.4	15.7	18.2	17.1	14.1	16.6	14.6	15.0	3.1%
Chemicals	10.3	10.2	10.2	10.8	10.6	10.5	11.5	11.6	10.8	10.5	0.2%
Ores & Minerals	6.8	6.0	6.7	6.9	6.9	6.4	7.5	7.6	6.8	6.0	-1.2%
Iron & Steel	9.6	10.5	12.5	14.5	11.0	12.5	14.3	15.3	14.2	14.6	4.3%
Other	16.3	7.6	9.6	10.3	8.9	8.4	8.2	9.7	10.0	8.2	-6.6%
Total Traffic [1/]	271.5	274.6	274.9	271.7	279.9	279.1	259.8	269.9	280.1	270.8	0.0%

Source: WCSC Data

[1/] Totals may not equal the sum of the commodities due to rounding.

2. Waterway Improvements.

a. State of the ORS. A system of 60 locks and dams (see **Table 62**), over 2,800 miles of navigable channel, and navigation aids provided by the federal government comprise the Ohio River System's navigation infrastructure. Shippers and terminal operators manage the loading docks and terminals on the basin's rivers and waterway carriers operate towboats, barges, and maintenance facilities. Government expenditures go primarily to operate and maintain the locks and dams. Some of the locks no longer satisfy today's operating standards or tow sizes.

In general, this equates to locks which are too small, slow to fill and empty, costly to operate, and expensive to maintain. Older locks are also closed for maintenance more frequently than are modern locks, which impose delay costs on the shippers that utilize the waterway system.

Lock capacities correlate with lock sizes and many of the smaller locks have become congested due to increased traffic. This congestion produces delays, adds to industry's costs, and reduces transportation savings. Kanawha River congestion was relieved with the 1997 opening of a new larger Winfield Lock and in 2008 with the opening of the new, larger Marmet lock. The replacement locks of Winfield and Marmet have reduced average tow delays by 75 percent, from over two hours to less than 30 minutes. By contrast, in 2007, Smithland L&D on the lower Ohio River with its twin 1200' long chambers processed 73.7 million tons with an average delay of 20 minutes.

Table 62
Lock and Dam Specifications

River/		Operational			Rehabilitated			Lock Size	
Project	@Mile	Main	Aux.	Dam	Main	Aux.	Dam	Main	Aux
Ohio River									
Emsworth	6.2	1921	1921	1922	1984	1984	1984	600x110	360x56
Dashields	13.3	1929	1929	1929	1990	1990	1990	600x110	360x56
Montgomery	31.7	1936	1936	1936	1989	1989	1989	600x110	360x56
N. Cumberland	54.4	1959	1959	1961				1200x110	600x110
Pike Island	84.2	1965	1965	1965				1200x110	600x110
Hannibal	126.4	1972	1972	1975				1200x110	600x110
Willow Island	162.4	1972	1972	1973				1200x110	600x110
Belleville	203.9	1968	1968	1969				1200x110	600x110
Racine	237.5	1967	1967	1970				1200x110	600x110
R.C. Byrd	279.2	1993	1993	1937			2000	1200x110	600x110
Greenup	341.0	1959	1959	1962				1200x110	600x110
Meldahl	436.2	1962	1962	1964				1200x110	600x110
Markland	531.5	1959	1959	1964				1200x110	600x110
McAlpine	606.8	1961	1961	1964		1965		1200x110	600x110
Cannelton	720.7	1971	1971	1971				1200x110	600x110
Newburgh	776.1	1975	1975	1975				1200x110	600x110
J.T. Myers	846.0	1975	1975	1975				1200x110	600x110
Smithland	918.5	1979	1979	1979				1200x110	1200x110
L&D No. 52	938.9	1969	1928	1929	1983	1983	1984	1200x110	600x110
L&D No. 53	962.6	1980	1929	1929	1983	1982	1984	1200x110	600x110
Kanawha River									
London	82.8	1933	1933	1934				360x56	360x56
Marmet	67.8	2008	1934	1934				800x110	2(360x56)
Winfield	31.1	1998	1935	1937				800x110	2(360x56)
Monongahela River									
Opekiska	115.4	1964		1967				600x84	
Hildebrand	108.0	1959		1960				600x84	
Morgantown	102.0	1950		1950				600x84	
Point Marion	90.8	1993		1994				720x84	
L/D 7 [1/]	85.0	1925		1926				360x56	
Grays Landing	82.0	1993		1995				720x84	
Maxwell	61.2	1964	1964	1965				720x84	720x84
No. 4	41.5	1932	1932	1933	1964	1964	1967	720x84	360x56
No. 3	23.8	1906	1906	1907	1981	1981	1979	720x84	360x56
Braddock [2/]	11.2	1905	1905	1906	1953	1953		720x110	360x56

[1/] L&D 7 ceased operations July 30, 1995

[2/] Mon No.2 was renamed Braddock in 2004

Table 62 (cont'd.)
Lock and Dam Specifications

River/		Operational			Rehabilitated			Lock Size	
Project	@Mile	Main	Aux.	Dam	Main	Aux.	Dam	Main	Aux
Allegheny River									
No. 9	62.2	1938		1938				360x56	
No. 8	52.6	1931		1931		1937		360x56	
No. 7	54.7	1930		1931				360x56	
No. 6	36.3	1928		1928				360x56	
No. 5	30.4	1927		1927				360x56	
No. 4	24.2	1934		1934				360x56	
No. 3	14.5	1934		1934				360x56	
No. 2	6.7	1934		1934				360x56	
Green River									
No. 2	63.1	1956		1957				600x84	
No. 1	6.7	1956		1957			1970	600x84	
Cumberland River									
Cordell Hull	313.5	1973		1974				400x84	
Old Hickory	216.2	1954		1957				400x84	
Cheatham	148.7	1952		1954				800x110	
Barkley	30.6	1964		1966				800x110	
Tennessee River									
Fort Loudoun	602.3	1943		1943				360x60	
Watts Bar	529.3	1941		1944				360x60	
Chickamauga	471.0	1939		1940				360x60	
Nickajack	424.7	1967		1968				600x110	
Guntersville	349.0	1965	1937	1939				600x110	360x60
Gen. Wheeler	274.9	1963	1934	1937		1962		600x110	400x60
Wilson [1/]	259.4		1927			1961			300x60
Wilson [1/]	259.4	1959	1927	1925		1967		600x110	292x60
Pickwick	206.7	1984	1937	1938				1000x110	600x110
Kentucky	22.4	1942		1944				600x110	
Clinch River									
Melton Hill	23.1	1963		1963				400x75	
Kentucky River									
No. 5-14 [2/]									
No. 4	65.0	1844		1844				145x38	
No. 3	42.0	1844		1844				145x38	
No. 2	31.0	1839		1839				145x38	
No. 1	4.0	1839		1839				145x38	

[1/] Two auxiliary locks in series to form a single, dual lift lock.

[2/] Federal Govt. no longer operates.

The Corps' waterway management program for the ORS is designed to ensure that the basin's waterways will be capable of meeting both current and future traffic demands in a safe, reliable, and efficient manner. The upkeep of ORS navigation structures involves maintenance, rehabilitation, and replacement. Maintenance includes periodic minor repair as well as emergency repairs and is funded through the operations and maintenance budget. Rehabilitation involves improving the reliability or operational efficiency of an existing structure and is funded under the construction budget. Replacement involves congressional approval and authorization for construction.

b. <u>Modernization Status</u>. Recently constructed new locks are operational at Winfield (1997) and Marmet (2008) on the Kanawha and R.C. Byrd (1993) and McAlpine (2009) on the Ohio. On the Kanawha, a major rehabilitation at London that included extending the river chamber was completed in 2003. On the upper Monongahela, Grays Landing replaced an outdated lock and dam structure (L&D 7) and Point Marion (formerly known as L&D 8) was fitted with a larger chamber. Current construction on the lower Monongahela will provide twin 720' x 84' chambers at L&D 4. Work is in progress on the Ohio constructing twin 1200' x 110' locks at Olmsted and a navigation dam. Construction on the Tennessee has begun at Chickamauga and Kentucky Locks. The Olmsted Locks and Dam project on the Ohio River is in the construction phase. At Olmsted, the new lock structures were completed in 2002 and construction is underway on the dam. Dam completion is scheduled for 2016. Greenup Locks and J.T. Myers Locks on the Ohio are currently under advanced engineering and design. Refer to **Figure 2** on page 5.

Photo 13: Chickamauga Lock at mile 471.0 on the Tennessee River

c. Application of Innovations.

1. Winfield Lock & Dam (Kanawha River). Construction of the new 800' x 110' lock at Winfield, formerly the site of one of the most congested locks in the inland navigation system, began in 1990 and the new lock became operational in the fall of 1997. This project was a pioneer, using two innovative, cost effective features that are now under active consideration for other projects. These are hydraulic operators for the new tainter gate and long span prefabricated beams for the upper approach wall.

Photo 14: The new Winfield Lock at mile 31.1 on the Kanawha River

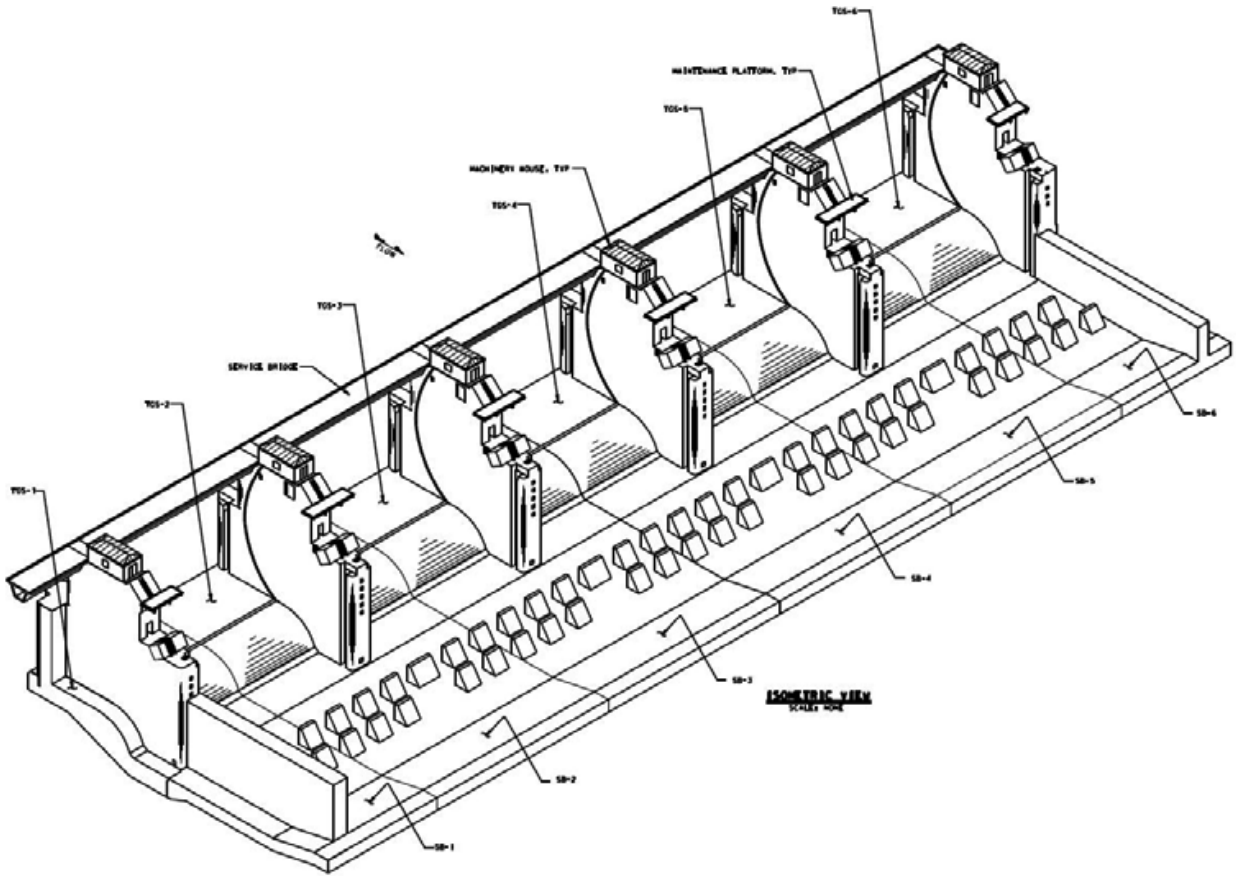
2. Olmsted Locks and Dam. The Olmsted Locks and Dam Project provides for a structure near Ohio River Mile 964.4 that would replace the existing Locks & Dams 52 and 53. The completed structure will consist of twin 110' by 1,200' locks adjacent to the Illinois bank, five tainter gates, a 1,400' navigable pass, and a fixed weir extending to the Kentucky bank. During low flow conditions, an upper pool having an elevation of 300 feet (ORD) at the dam would extend upstream to the Smithland Locks and Dam, a distance of 47 miles. Open river conditions will exist from the dam site to the mouth of the Ohio River, a distance of approximately 17 miles.

The Lock structures and the fixed weir have been constructed. The Dam contract was recently commenced and will place the 2,352 foot long Dam between these two structures. The dam is comprised of tainter gates 110 feet wide by 37 feet high which are operated by hydraulic cylinders, a navigable pass consisting of 140 boat operated wickets that are centered-hinged (horse-type), 9'-8"-wide flat plate gates at 10-foot centers. Also included in this contract are two boat abutments, tainter gate stilling basins, navigable pass paving

blocks, and 455,000 tons of riprap. The District studied several alternatives before concluding that this dam configuration was the best one for this application.

Photo 15: Olmsted Locks at mile 964.6 on the Ohio River

In regards to the best way to construct the Dam, the Feasibility Report method of constructing the project features was construction inside multiple conventional cellular cofferdams which could be dewatered. This was the method which was utilized to construct the locks, but alternate methods to construct the dam were investigated beginning with the Mobile Cofferdam concept considered in the GDM. These studies culminated in a Method of Construction Study which was included in the Dam Feature Design Memorandum. This Method of Construction Study examined both in-the-dry construction methods using cellular cofferdams and in-the-wet construction using the heavy-lift construction techniques employed on some coastal and marine construction projects. The estimated first costs for the in-the-wet construction method was determined to be $64 million less than the in-the-dry construction method. The shortest reasonable time for construction duration for in-the-wet was estimated to be less than half of that for in-the-dry. The in-the-wet method was also deemed to be more desirable from an environmental viewpoint. The in-the-wet method was therefore selected as the construction method for the Olmsted Dam. Under the in-the-wet, heavy lift-in construction method, sections of the dam known as shells will be prefabricated on shore in a precast yard (PCY), carried out into the river and set in place. The dam will consist of Sill Shells, Stilling Basin Shells, Lower Pier Shells, Training Wall Shells and Navigable Pass Shells.



Isometric of completed Tainter Gate Section

Once a shell is complete in the PCY it will have to be moved to a skid way so that it can be lowered to the river. To do this, a lifting frame is attached to the shell. The shell is than lifted by a large overhead gantry crane and rolled to the inclined skid way. At the skid way the shell is placed on a roller mounted, wedge shaped cradle that is secured by winches. The winches are used to lower the cradle, shell and lifting frame into the water. Once in the water, the shell and frame will be lifted from the cradle by a large catamaran barge equipped with winches. The catamaran barge and shell will then be moved to the dam by a towboat. Once in proper position, the shell will be lowered into the river onto a previously prepared foundation of piles and bedding stone. Once each shell is set in place, the void between the prepared pile foundation and the underside of the shell will be filled with tremie concrete. The tremie concrete will be dropped through pipes in the lift frame legs. Once the base shells are complete, the lower pier shells will be placed in similar fashion. This sequence will continue until the tainter gate portion of the dam is raised above the water line. The upper pier will then be formed and cast in place. After the shell work of the gated portion of the dam, the navigable pass will be constructed by the same method.

To complete the tainter gate portion of the dam the gates must be installed. These large steel gates will be fabricated offsite and transported to Olmsted for installation. The gates will be on a barge, the barge moved into the gate bay, the maintenance bulkheads will be installed and the water level adjusted so the gate can be attached to the trunnion girder.

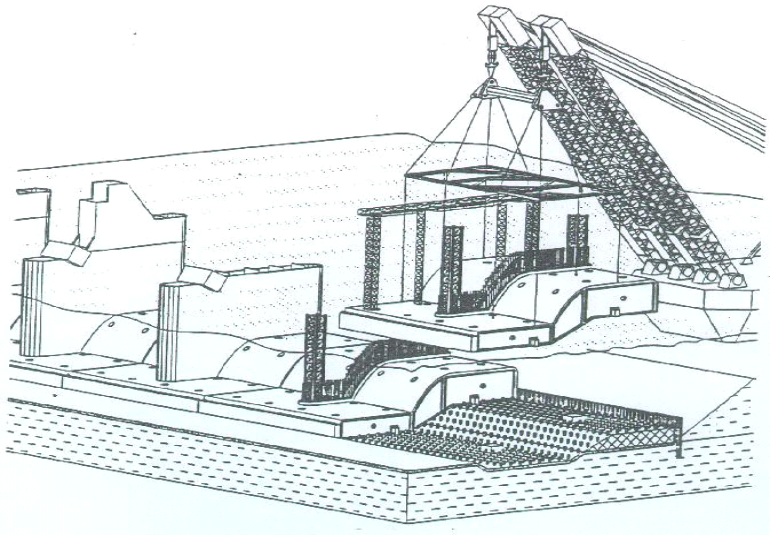


Photo 16: Artist rendering of the construction of Olmsted Dam

3. Monongahela River Locks and Dams 2, 3 and 4 (Lower Mon Project)

The Lower Mon project is located between river miles 11.2 and 41.5, above the mouth of the Monongahela River at the "Point" in Pittsburgh. The project includes replacement of the fixed crest dam at Braddock Locks and Dam (formerly L/D 2), with a new gated dam which was completed in 2004; construction of new larger locks (twin 84x720 foot) at Charleroi (formerly L/D 4); removal of Lock and Dam 3; dredging existing Pool 3 to ensure an authorized 9 foot deep navigation channel; and the relocation/adjustment of various shoreside facilities affected by the project. The Lower Mon project was authorized for construction by Section 101 of the Water Recourses Development Act of 1992 (Public Law 102-580) at an October 1991 price level of $556M. This project, as authorized, is cost shared 50/50 with the Inland Waterways Trust Fund (IWTF).

The original project was to be completed in FY2004. Project funding shortfalls is one of the two primary reasons the project schedule was extended until FY2016 and the estimated project cost has escalated to over $1B at an October 2007 price level. FY08 funding shortfalls and the projected FY09 funding level are expected to push project completion until 2018 or 2019. Furthermore, uncertainty of the IWTF beyond FY09 will further increase the project schedule into the 2020's and will increase the demands on already limited Operations and Maintenance appropriations on the Monongahela River.

Work projected for FY2009, with consideration given to IWTF shortfalls, may include continuation of ongoing construction at Charleroi River Wall, Victory Hollow

disposal site, and bulkhead storage area; the Charleroi river chamber design efforts; fabrication contracts; and relocations of shoreside facilities.

The Lower Monongahela River has multiple high risk facilities that at any time could cause unscheduled closures, halting Monongahela River Navigation. These facilities include the existing DSAC 1 Dam at L/D 3, the existing highly unreliable locks at L/D 3, and only one operational but highly unreliable lock chamber at Charleroi. Other facilities adversely affected by a navigation facility failure include electrical power generation plants, the largest underground coal mine and coking facility in the United States, and multiple industrial and municipal water intakes.

Photo 17: Float in concrete segment 1 of Braddock dam passing Pittsburgh

4. McAlpine Locks & Dam (Ohio River). This project added a second 1200' lock in place of the existing 600' lock. Innovations associated with this project include roller compacted concrete walls, wrap around filling and emptying system with in-chamber culverts, a shortened guide wall and reduced cofferdam length. Construction began in 1996 and was completed during the winter of 2009. During construction, the McAlpine project was reduced to a single chamber project because the new 1200' lock was constructed in the foot-print of the auxiliary 600' chamber. There was a complete river closure to navigation from August 9-19, 2004 when the existing main chamber was closed for emergency repairs. Diver inspections earlier in the summer discovered cracks in the lock gates. The cracks were caused by metal fatigue and the repairs involved steel plating and welding. The Corps used twice as many workers as it normally does for such repairs. The additional labor and the advance notice by the Corps, coupled with arrangements between industry and its customers,

helped to minimize the cost impact of the lock closure. The new 1200 foot chamber finished prove-out testing on 4 February 2009. After final installation of remaining navigation aids (lights, signs etc.) in February 2009 the lock was placed into service. Only minor site work remains and the lock contract will be complete 20 Apr 2009. The McAlpine Lock dedication ceremony was held on May 27, 2009.

5. Kentucky Lock (Lower Cumberland and Tennessee Rivers). The project, as authorized for construction by WRDA 96, recommends construction of a new lock chamber at Kentucky L&D measuring 1200' by 110', to be located landward of the existing 600'lock. The new lock will use in-sill intakes with wall filling valves and culverts located in lock walls. A multi-port filling and emptying system will be used to fill and empty the lock chamber. The Corps will use floating approach wall in the upper approach (similar to Olmsted walls) and is considering the use of pre-cast cofferdam which will become a permanent lock wall. This would help to reduce congestion and interference with traffic using the existing lock. The lower guide wall combines roller compacted concrete (RCC) with the foundation constructed "in-the-wet" (cast-in-place) to avoid costly cofferdam construction. The upper guide wall and guard wall will be floating concrete pontoon walls. Construction on the project began in July of 1998 and the scheduled completion date is 2016, depending upon funding.

Photo 18: Aerial view of Kentucky Lock, mile 22.4 on the Tennessee River

6. Marmet Locks and Dam (Kanawha River). Marmet Locks and Dam, built in 1934, were the busiest locks in the Ohio River System in terms of commercial lockage cuts. Small twin 360'x 56' chambers can process only one modern jumbo (195'- 200' x 35') barge at a time. The Marmet project, as authorized for construction by WRDA 96, recommends construction of a new 800' x 110' lock landward of the existing locks. This project contains a number of innovative features which have greatly reduced expected construction costs. These features include long-span prefabricated beams for the upper approach wall; sill face intakes for the filling and emptying (F&E) system (which eliminates mass concrete upper approach walls), a central culvert F&E system (which permits smaller chamber monoliths), and a minimal cofferdam footprint. Construction was completed in 2009. The existing chamber will remain open for emergency use and during maintenance.

Photo 19: Marmet Locks and Dam, mile 67.7 on the Kanawha River

7. London Locks and Dam (Kanawha River). London Locks and Dam have been in operation since September 1933. The landward lock chamber is 360' x 56'. The riverward lock chamber was extended 47 feet in 2003 and is now 407' x 56'. The upstream guard wall was also replaced in 2003. The new upstream guard wall is 525' long and consists of

5 precast, pre-stressed concrete beams, 105' long each, founded on concrete filled sheet pile cells. This new wall provides a major improvement in the downbound approach to the lock. A dnew dike was constructed downstream of the dam to control out-draft currents from the hydropower plant. The dike was constructed of rubble from the demolition of the old upstream guard wall. Lengthening the riverward lock chamber has reduced downbound movements of a full upper Kanawha River tow from 5 cuts to 3 cuts. Construction of the major rehabilitation project at London began in 1999 and concluded in 2003.

Photo 20: London Locks and Dam, mile 82.8 on the Kanawha River

8. Greenup Locks and Dam (Ohio River). The existing 600’ x 110’ auxiliary chamber will be extended to 1200’. The lock extension will be constructed utilizing float-in construction for the new miter gate bay to help minimize interference with traffic utilizing the main lock chamber. After completion of the new miter gate bay, connection of the new miter gate bay to the existing middle wall and construction of a short section of cofferdam on the land side, lock maintenance bulkheads can be installed on the downstream end of the new miter gate bay and the extension of the land wall and the laterals for the filling and emptying system can be constructed in the dry. Upon completion of the auxiliary lock extension, Greenup will have a set of spare miter gate leaves. Scheduled completion is 2012, depending upon funding.

9. J. T. Myers Lock Extension. J. T. Myers Locks and Dam is located just downstream of Uniontown, KY and Mt. Vernon, IN, at Mile 845.9 on the Ohio River. The existing project consists of a main lock chamber 1200 feet long by 110 feet wide, an auxiliary chamber 600 feet long by 110 feet wide, a non-navigable gated dam structure 1,265 feet long and a 2,239 feet long fixed weir. The navigation locks were placed in operation in 1975. Second only to Smithland L&D, which is located about 80 miles downstream, Myers L&D is the second busiest lock in the U.S. in terms of cargo volume. However, Smithland L&D has two 1200-foot long locks to efficiently process long commercial tows, as will the new Olmsted L&D project. An Interim Feasibility Study Report was completed for the project in April 2000. The study concluded that capacity enhancements were warranted at the site. The J. T. Myers Lock Extension project was then authorized by the Water Resources Development Act (WRDA) 2000. The new project consists of extending the auxiliary lock to make it 1200 feet long. As authorized, the project also consists of several other features that are necessary for safe and efficient operation of the extended chamber. These features include the provision of a supplemental Fill and Empty (F/E) system servicing the lower end of the extended chamber, approach wall modifications for the new configuration, shaving of the bank in the lower approach, and a new set of miter gates while keeping the existing gates as spares.

The lock chamber wall extensions will be constructed using float in technology. Precast concrete pontoons that will ultimately make up the lower portions of the monoliths will be constructed in a dry dock area off site. Once the pontoons are complete, the dry dock will be flooded and the pontoons floated. The pontoons will then be moved by towboat to a work trestle at the project site where addition height will be added to the floating shells until a maximum tolerable draft is obtained. The shells will then be floated to their required position in the lock wall. Once in proper position, the shells will be flooded and sank onto their previously prepared foundations. The shells will be leveled using jacks placed beneath the shells. The shells will then be filled with tremie concrete and the void beneath the shells filled with grout. The work to finish out the walls will then be done when the river levels are below the tops of the shells and will be completed using conventional forming and cast in place concrete. Note that this method will include the downstream miter gate bay where a single pontoon will contain both the sill and the base of the two adjacent monoliths. Floating concrete pontoon technology will also be used on the approach wall extensions. Pontoons that are closed on the top will be constructed in a dry dock area and then floated to the project site. However, these pontoons will not be sunk. Several pontoons will be fastened together end to end to form a structure as long as the required approach wall extension. This combined pontoon will then be floated into place between a previously constructed upstream or downstream bull nose and a vertical pylon at the end of the existing approach wall. The pontoon will be attached to the bull nose and pylon in such a way that it can float up and down as the river levels change. In this configuration, the pontoon will then serve as the extended approach wall.

In addition to the wall configurations, the project will contain a very unique filling and emptying system. In the area of the chamber extension, an addition field of laterals will be added. These laterals will be attached to a culvert in the extended land side chamber wall

that will contain reverse tainter culvert valves to control the flow. The culvert will be fed by two new center longitudinal culverts that will run the length of the existing chamber and pass through the upstream miter gate sill to access the upstream pool. The center longitudinal culverts will be built in the dry after the new monoliths are constructed and the new chamber can be dewatered. The culverts in the land side wall extension will be part of the pontoons that are originally floated in place.

10. Chickamauga Lock and Dam (Tennessee River). The existing lock requires aggressive maintenance to confront its Alkali Aggregate Reaction (AAR) problem. This expansion of concrete features is causing misalignment of mechanical components and would eventually cause the lock to be closed. Congress has authorized construction of a 110' x 600' replacement lock riverward of the existing structure which will remove five of the existing spillway bays. Project construction began with utility relocations in 2004, road and bridge relocations in 2005, and cofferdam construction in 2006. The current schedule calls for lock construction to begin in 2010, depending upon funding.

d. Ongoing ORS Studies. Studies are underway at problem areas in the ORS. The problems at these sites are generally related to traffic congestion and structure condition. Current modernization studies are listed as follows:

1. The Upper Ohio Navigation Study. The Upper Ohio Navigation Study will investigate opportunities for maintaining and improving commercial navigation on the upper Ohio River in Pennsylvania and will evaluate the potential for integrating ecosystem restoration features into long-range plans for this river reach. The study will consider engineering, economic and environmental factors to evaluate long-term navigation needs in the context of sustaining human communities and the river's ecosystem. Findings and recommendations from the recently released draft Ohio River Mainstem Systems Study will provide substantial background information from a system-wide perspective to this site-specific navigation feasibility study.

The focus of the upper Ohio River navigation feasibility study is to develop the best plan for maintaining safe, reliable, efficient and environmentally sustainable navigation on the upper 40 miles of the Ohio River. Navigation on the upper Ohio is currently provided through Emsworth, Dashields and Montgomery Locks and Dams, operated by the U.S. Army Corps of Engineers. Constructed during the 1920's and 1930's, these are the oldest structures of the Ohio River navigation system and are in an advanced state of deterioration. Lock wall surfaces may appear in good condition, but interior concrete deterioration and cracking could lead to costly repairs and chamber closures.

The lock chambers of the Emsworth, Dashields and Montgomery facilities are sized to standards established in the late 1800's and are the system's smallest lock chambers. The 110' x 600' main chambers are one-half the capacity of current standard 110' x 1200' locks that accommodate modern tows. This capacity problem is greatly compounded during main chamber closures, when traffic is required to pass through the 56' x 360' auxiliary chambers. These size constraints sometimes create bottlenecks both for commercial and pleasure craft

locking through and can cause delays and inefficiencies which affect consumer costs of commodities transported on the river. This feasibility study will evaluate the economic factors related to construction of larger locks and other alternatives to sustain the reliability of commercial navigation on the upper Ohio River.

Photo 21: Hannibal L&D, mile 126.4, on the Ohio River

2. Ohio River Basin Comprehensive Recon Study. The Ohio River Basin Comprehensive Study (ORBCS) is a multi-District effort to investigate the complex hydrologic, ecological and socioeconomic system of the 204,000 square mile basin that covers portions of 15 states and is home to over 25 million people. The basin has been protected since the late 1930's by a number of flood damage reduction projects that are beginning to show the affects of aging and continuous operation. The ecological complexity, diversity and productivity of the basin are important components of the study.

The recon report will identify the array of problems, needs and opportunities in the basin as perceived by both the Corps and the basin stakeholders, determine what identified water resources development issues may warrant a Federal Interest in pursuing with Federal funds and recommend courses of action, such as feasibility studies and development plans through standing authorities, that can be cost shared by willing and capable non-Federal sponsors.

The ORBCS study is gathering the best planners, ecologists, economists, engineers and other disciplines from Federal, state and local agencies in a comprehensive effort to prepare the

Ohio River Basin flood damage reduction system (both existing facilities and projected new facilities) to operate safely and efficiently into the 21st century. A study web site will be operational by June and a basin-wide GIS database system is being produced through the study effort as well. The plan is scheduled for completion in December 2009.

e. <u>Stakeholders - Industry Partners, Agencies and Others</u>. The waterway industry plays an essential role in improving the reliability and capacity of the waterways. The industry contributes half the cost of the replacement of federally owned and operated navigation projects on fuel-taxed waterways. Since 1980, when fuel taxes were first imposed, waterway users have been contributing to the Inland Waterways Trust Fund. This tax began at $.04 per gallon in October 1980 and gradually increased to its current level of $.20 per gallon in 1995. The fund is used to provide the industry's share of the cost of lock and dam modernization.

The waterway industry has been a valuable participant in modernization planning as it helps the Corps establish priorities, choose among plan alternatives, and establish navigability of improvement plans. This function was formalized when Congress established the Inland Waterway Users Board in 1986. The primary purpose of this 11-member board of waterway users and shippers is to represent the various segments of the waterway and to recommend the prioritization of projects to the Assistant Secretary of the Army and Congress.

The Board advocates rehabilitating and extending the life of the existing system to preserve its efficiency as a long-term policy objective. They also recommend a program for constructing needed new facilities under a cost-reduction program that is being implemented with the Corps' Regional Navigation Design Team (see page 5, Part 1, Overview).

Photo 22: A waterside industrial chemical plant on the Kanawha River

The cost-reduction initiatives focus on incorporating innovative and non-traditional design and construction techniques into program formulation in order to reduce project costs. Further partnering and communication between the Corps and industry with respect to design and construction technology is critical to the success of these initiatives.

The merger of the Association for the Development of Inland Navigation in America's Ohio Valley (DINAMO) and Waterways Work! has produced a very effective Waterways Council, Inc. that promotes the investment in navigation improvements. Two other important associations in the ORB working toward a better navigation system are the Waterways Association of Pittsburgh and the Huntington District Waterways Association. The latter is comprised of three important committees: the Huntington District Waterways Advisory Committee, the Kanawha River Advisory Committee, and the Big Sandy Improvement Committee. Other important groups in the ORB working towards a better navigation system are the Tennessee River Valley Association and its partner the Tennessee-Cumberland Waterways Council, the Ohio River Ice Committee and the Waterway Industry Executive Task Group.

3. Regional Commerce.

a. Waterway Impact on Regional Economy. The inland waterway system facilitates economic development through:

- Lowering transportation costs for bulk commodities
- Improving contact between internal and external markets
- Reducing energy costs for commercial and industrial activities
- Linking producers and markets raw material inputs to production
- Supplying recreational, industrial, and municipal water
- Deriving commercial and support activities
- Creating and providing jobs

In 2006, companies using the ORS shipped $31.8 billion worth of commodities by barge. Major port cities like Pittsburgh, Cincinnati, Louisville, and Huntington have developed as distribution centers for goods produced in the basin. Waterside developments involving electric power plants; steel, chemical and cement plants; quarries; and coal mines all play a significant role in local economies, as well as in the nation's economy.

While coal and coke products are the most important commodities hauled on the basin's rivers, measured in terms of their impact on the region's economy, recent growth in ORS waterborne commerce has been driven largely by increased ores, iron and steel, and aggregates traffic. Total ORS traffic has increased 8.8 percent since 1991. During this time period, iron and steel traffic more than doubled from 6.2 million tons to 14.6 million tons and petroleum products increased by 40 percent. Aggregates traffic increased by more than 61 percent and chemical traffic increased by 7 percent. Normally empty coal backhaul movements are returning with inbound shipments of ores, scrap metals, and imported steel. Mini-mills along the ORS have contributed to the increased iron and steel traffic. A rise in aggregate traffic, which is largely local, correlates to the increased use of desulphurization equipment at electric power plants in the basin.

b. Ohio River Basin Economy. The majority of the waterborne commerce moved in the basin is loaded and unloaded in one of the eight states in the basin with navigable waterways, as previously discussed.

Of the 270.8 million tons of commerce moved in the basin in 2006, 84 percent was shipped from ORB states and 16 percent was shipped from states outside the basin (see **Table 66**).

Photo 23: The port city of Pittsburgh at the confluence of the Allegheny and Monongahela rivers that form the Ohio River

A Bureau of Economic Analysis (BEA) economic area consists of a standard metropolitan statistical area (SMSA), which serves as a center of economic activity for its surrounding counties. **Figure 17** shows the 48 BEA economic areas that either shipped or received ORB commerce in 2006. Only 24 percent of the BEA economic areas are within the ORB indicating commerce extends well beyond basin boundaries. **Tables 67 - 74** show the distribution by commodity group of 2003 - 2006 ORB commerce to BEA economic areas.

Three BEA economic areas accounted for over 55 percent of all ORB shipments. The largest-shipping BEA economic areas were Charleston, Paducah, and Pittsburgh with 56.6, 42.5, and 48.4 million tons, respectively. Coal comprised over 77 percent of this tonnage with 12 percent aggregates, and approximately 7 percent petroleum products.

Table 63
2003 Basin-Wide Waterborne Commerce
(Million Tons)

	Shipments		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	137.1	3.8	140.9
Petroleum Fuels	9.6	7.3	16.9
Aggregates	46.8	0.6	47.4
Grains	10.6	3.5	14.1
Chemicals	2.6	8.8	11.4
Ores & Minerals	0.1	7.3	7.4
Iron & Steel	4.4	9.8	14.2
Other	5.1	2.3	7.4
Total	216.3	43.5	259.8

	Receipts		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	131.4	9.6	141.0
Petroleum Fuels	15.9	1.0	16.9
Aggregates	35.2	12.2	47.4
Grains	4.0	10.0	14.0
Chemicals	9.9	1.5	11.4
Ores & Minerals	7.4	0.1	7.5
Iron & Steel	11.3	3.2	14.5
Other	5.9	1.5	7.4
Total	220.7	39.1	259.8

Source: WCSC Data
Totals may not equal the sum of the commodities due to rounding.

Table 64
2004 Basin-Wide Waterborne Commerce
(Million Tons)

	Shipments		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	140.6	4.7	145.3
Petroleum Fuels	9.1	7.9	17.0
Aggregates	47.0	1.0	48.0
Grains	13.2	3.3	16.5
Chemicals	2.7	8.8	11.5
Ores & Minerals	0.2	7.2	7.4
Iron & Steel	4.6	10.7	15.3
Other	5.4	3.5	8.9
Total	222.9	47.1	270.0

	Receipts		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	134.3	11.0	145.3
Petroleum Fuels	15.9	1.1	17.0
Aggregates	36.7	11.3	48.0
Grains	4.0	12.6	16.6
Chemicals	9.8	1.7	11.5
Ores & Minerals	7.4	0.0	7.4
Iron & Steel	12.3	3.0	15.3
Other	7.6	1.3	8.9
Total	228.0	42.0	270.0

Source: WCSC Data
Totals may not equal the sum of the commodities due to rounding.

Table 65
2005 Basin-Wide Waterborne Commerce
(Million Tons)

	Shipments		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	150.1	5.8	155.9
Petroleum Fuels	11.1	8.6	19.7
Aggregates	47.2	0.9	48.1
Grains	12.3	2.4	14.7
Chemicals	2.2	8.7	10.9
Ores & Minerals	0.3	6.4	6.7
Iron & Steel	4.2	10.0	14.2
Other	6.5	3.5	10.0
Total	233.9	46.3	280.1

	Receipts		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	143.5	12.4	155.9
Petroleum Fuels	18.4	1.2	19.6
Aggregates	35.3	12.8	48.1
Grains	3.2	11.4	14.6
Chemicals	9.6	1.2	10.8
Ores & Minerals	6.6	0.2	6.8
Iron & Steel	11.5	2.8	14.3
Other	8.4	1.6	10.0
Total	236.5	43.6	280.1

Source: WCSC Data
Totals may not equal the sum of the commodities due to rounding.

Table 66
2006 Basin-Wide Waterborne Commerce
(Million Tons)

	Shipments		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	141.6	6.8	148.4
Petroleum Fuels	11.9	7.5	19.4
Aggregates	47.9	0.9	48.8
Grains	13.5	1.5	15.0
Chemicals	2.3	8.2	10.5
Ores & Minerals	0.1	5.9	6.0
Iron & Steel	4.3	10.3	14.6
Other	5.3	2.9	8.2
Total	226.9	44.0	270.9

	Receipts		
Commodity	**ORB**	**Outside**	**Total**
Coal & Coke	136.9	11.5	148.4
Petroleum Fuels	17.9	1.5	19.4
Aggregates	34.2	14.6	48.8
Grains	2.6	12.4	15.0
Chemicals	9.2	1.3	10.5
Ores & Minerals	6.0	0.0	6.0
Iron & Steel	11.9	2.7	14.6
Other	6.9	1.3	8.2
Total	225.6	45.3	270.9

Source: WCSC Data
Totals may not equal the sum of the commodities due to rounding.

The major receiving BEA economic areas of ORB traffic are Pittsburgh, Cincinnati, Charleston, Evansville, New Orleans, Nashville and Louisville with tonnage ranging from 47.7 to 18.4 million tons, respectively. Almost 60 percent of this tonnage consisted of coal. These seven BEA economic areas accounted for over 76 percent of ORB commerce received. Coal and grains destined for export comprised 81 percent of the ORB traffic received in New Orleans, LA.

Due to the presence of available flatlands with access to the river in the ORB and the economic advantage of water transportation for bulk commodities, it is anticipated that riverside industrial expansion and the related growth in navigation traffic will continue into the future.

Figure 17
BEA Economic Areas Shipping or Receiving ORB Commerce

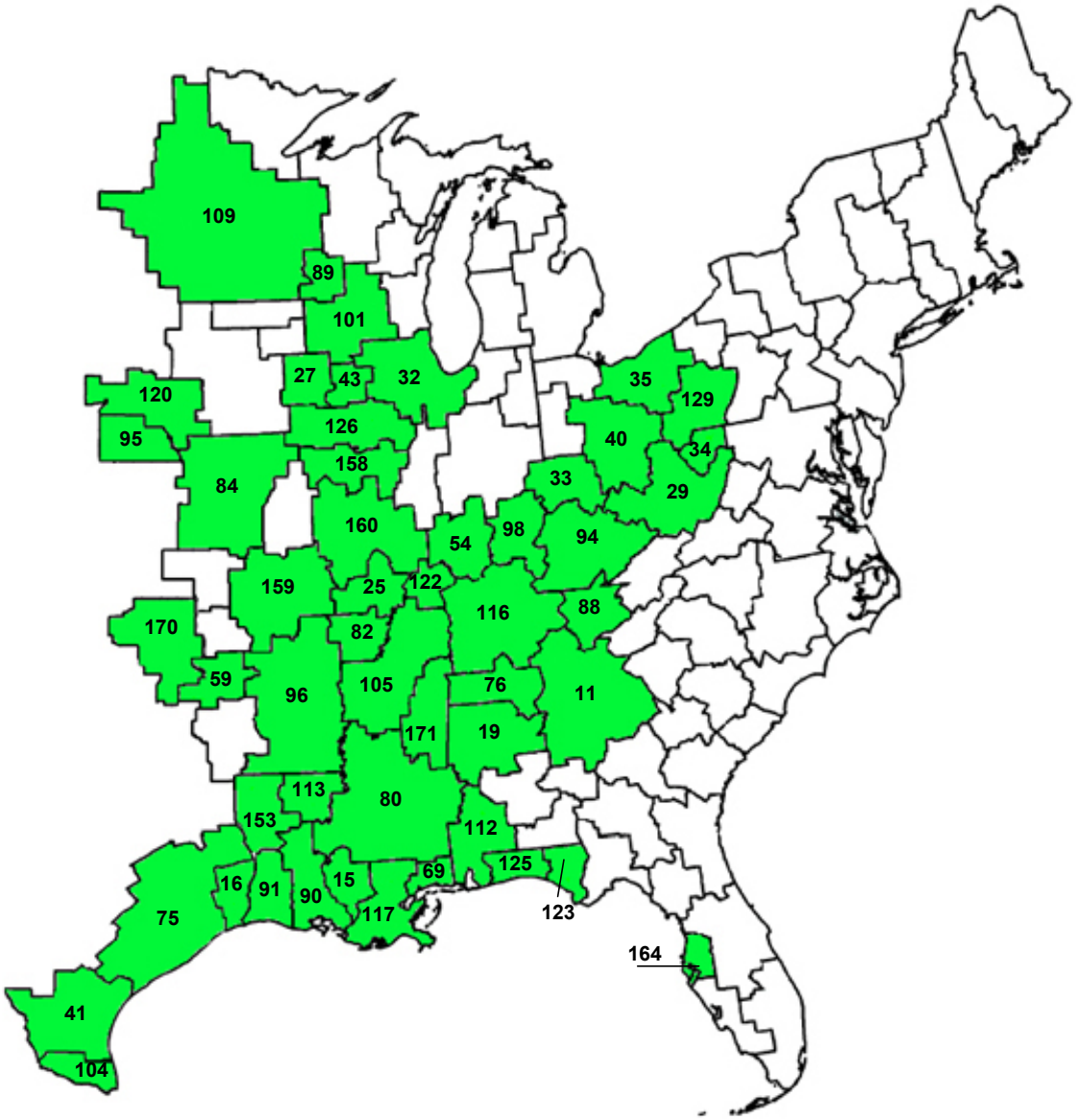


Table 67
2003 Shipments by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA		Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11	Atlanta-Sandy Springs-Gainesville GA-AL	-	-	1,181	5	91	5	249	240	1,771
15	Baton Rouge-Pierre Part LA	104	1,404	17	20	1,788	753	857	290	5,233
16	Beaumont-Port Arthur TX	-	156	-	-	268	-	87	4	515
19	Birmingham-Hoover-Cullman AL	-	-	-	-	-	-	24	171	195
25	Cape Girardeau-Jackson MO-IL	114	10	3	3,607	386	7	-	426	4,553
27	Cedar Rapids IA	-	-	-	94	-	-	-	-	94
29	Charleston WV	48,795	7,644	834	-	387	13	81	53	57,807
32	Chicago-Naperville-Michigan City IL-IN-WI	80	585	37	773	140	-	265	54	1,934
33	Cincinnati-Middletown-Wilmington OH-KY-IN	1,625	15	3,633	1,535	14	17	748	1,692	9,279
34	Clarksburg WV + Morgantown WV	1,759	-	826	-	-	-	1	-	2,586
35	Cleveland-Akron-Elyria OH	-	347	-	23	-	-	34	1	405
40	Columbus-Marion-Chillicothe OH	5,006	-	1,141	-	105	26	-	-	6,278
41	Corpus Christi-Kingsville TX	-	9	-	-	445	136	-	-	590
43	Davenport-Moline-Rock Island IA-IL	-	-	-	275	8	1	1	6	291
54	Evansville IN-KY	15,901	590	2,848	3,530	68	-	260	221	23,418
59	Fort Smith AR-OK	-	-	-	1	3	-	-	2	6
69	Gulfport-Biloxi-Pascagoula MS	-	10	-	2	85	16	-	17	130
75	Houston-Baytown-Huntsville TX	10	304	7	4	2,010	946	34	9	3,324
76	Huntsville-Decatur AL	145	93	660	223	635	4	771	132	2,663
80	Jackson-Yazoo City MS	-	83	-	29	105	7	47	17	288
82	Jonesboro AR	-	-	-	7	71	-	152	40	270
84	Kansas City-Overland Park-Kansas City MO-KS	-	-	-	8	-	-	-	-	8
88	Knoxville-Sevierville-La Follette TN	-	-	2	95	131	11	77	18	334
89	La Crosse WI-MN	-	-	-	5	-	-	-	-	5
90	Lafayette-Acadiana LA	-	64	5	-	-	3,153	-	13	3,235
91	Lake Charles-Jennings LA	5	294	-	1	448	-	-	9	757
96	Little Rock-North Little Rock-Pine Bluff AR	-	3	-	35	-	-	6	11	55
98	Louisville-Elizabethtown-Scottsburg KY-IN	16	45	13,533	554	278	-	545	983	15,954
101	Madison-Baraboo WI	-	-	-	325	-	-	-	-	325
104	McAllen-Edinburg-Pharr TX	-	-	-	-	-	-	6	-	6
105	Memphis TN-MS-AR	-	1,140	955	11	8	-	2	24	2,140
109	Minneapolis-St. Paul-St. Cloud MN-WI	3	56	-	508	87	-	42	-	696
112	Mobile-Daphne-Fairhope AL	3	-	178	-	9	1	127	66	384
113	Monroe-Bastrop LA	-	-	-	3	-	-	-	-	3
116	Nashville-Davidson--Murfreesboro--Columbia TN	-	-	1,363	471	-	-	178	35	2,047
117	New Orleans-Metairie-Bogalusa LA	268	2,340	62	131	2,733	2,280	8,055	499	16,368
120	Omaha-Council Bluffs-Fremont NE-IA	-	-	-	23	-	-	-	-	23
122	Paducah KY-IL	24,821	45	12,556	622	227	21	83	1,040	39,415
126	Peoria-Canton IL	-	-	-	629	274	-	23	4	930
129	Pittsburgh-New Castle PA	38,766	779	3,047	1	285	18	1,392	533	44,821
158	Springfield IL	-	-	-	160	18	1	-	-	179
160	St. Louis-St. Charles-Farmington MO-IL	3,489	778	4,112	219	143	9	92	651	9,493
170	Tulsa-Bartlesville OK	32	31	11	132	180	2	2	10	400
171	Tupelo MS	-	-	392	-	-	-	45	151	588
	Total	140,942	16,825	47,403	14,061	11,430	7,427	14,286	7,422	259,796

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.

2004 BEA Definitions used.

Table 68
2004 Shipments by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	-	3	1,183	11	112	1	306	65	1,682
15 Baton Rouge-Pierre Part LA	29	1,140	36	36	2,102	843	1,243	172	5,601
16 Beaumont-Port Arthur TX	-	154	-	-	169	-	64	4	391
19 Birmingham-Hoover-Cullman AL	17	6	3	-	-	-	51	178	255
25 Cape Girardeau-Jackson MO-IL	80	14	10	3,551	369	-	1	746	4,769
27 Cedar Rapids IA	-	-	-	52	-	-	-	-	52
29 Charleston WV	47,754	6,232	600	-	317	3	71	147	55,125
32 Chicago-Naperville-Michigan City IL-IN-WI	54	662	3	677	70	-	257	185	1,907
33 Cincinnati-Middletown-Wilmington OH-KY-IN	2,341	199	3,817	2,910	9	3	668	1,879	11,824
34 Clarksburg WV + Morgantown WV	1,444	-	922	-	-	-	-	-	2,366
35 Cleveland-Akron-Elyria OH	3	186	2	28	3	2	29	9	262
40 Columbus-Marion-Chillicothe OH	4,683	-	1,401	2	83	3	1	-	6,173
41 Corpus Christi-Kingsville TX	-	15	-	-	456	302	4	-	777
43 Davenport-Moline-Rock Island IA-IL	-	-	-	284	12	-	1	10	307
54 Evansville IN-KY	19,856	1,530	3,014	4,767	66	2	272	204	29,711
59 Fort Smith AR-OK	-	-	-	-	5	-	-	2	7
69 Gulfport-Biloxi-Pascagoula MS	-	4	-	-	82	32	-	19	137
75 Houston-Baytown-Huntsville TX	10	403	-	-	1,906	917	56	12	3,305
76 Huntsville-Decatur AL	96	57	912	201	747	8	693	189	2,903
80 Jackson-Yazoo City MS	-	100	-	100	122	29	69	20	441
82 Jonesboro AR	-	-	-	40	51	-	91	127	309
88 Knoxville-Sevierville-La Follette TN	-	-	7	73	139	8	65	20	312
89 La Crosse WI-MN	-	-	-	17	-	-	-	2	19
90 Lafayette-Acadiana LA	-	29	11	-	-	3,275	1	23	3,338
91 Lake Charles-Jennings LA	30	250	-	-	363	-	-	44	686
94 Lexington-Fayette-Frankfort-Richmond, KY	-	-	-	-	-	-	-	-	-
96 Little Rock-North Little Rock-Pine Bluff AR	-	-	-	64	-	8	23	-	95
98 Louisville-Elizabethtown-Scottsburg KY-IN	91	62	13,801	622	322	3	904	970	16,775
101 Madison-Baraboo WI	-	-	-	199	23	-	-	-	222
104 McAllen-Edinburg-Pharr TX	-	-	-	-	2	-	2	4	8
105 Memphis TN-MS-AR	-	1,111	172	97	20	15	25	37	1,477
108 Milwaukee-Racine-Waukesha, WI	-	-	-	1	-	-	-	-	1
109 Minneapolis-St. Paul-St. Cloud MN-WI	41	95	-	264	93	4	37	-	534
112 Mobile-Daphne-Fairhope AL	2	-	171	5	7	1	215	251	650
113 Monroe-Bastrop LA	-	-	-	12	-	-	-	-	12
116 Nashville-Davidson--Murfreesboro--Columbia TN	-	-	2,217	478	5	-	206	20	2,926
117 New Orleans-Metairie-Bogalusa LA	362	3,062	28	73	2,725	1,767	8,415	999	17,432
122 Paducah KY-IL	24,822	75	12,482	658	247	116	149	998	39,548
126 Peoria-Canton IL	-	-	3	636	224	-	28	4	896
129 Pittsburgh-New Castle PA	39,431	770	3,212	-	302	47	1,228	704	45,693
158 Springfield IL	-	-	-	178	23	-	1	-	202
160 St. Louis-St. Charles-Farmington MO-IL	4,089	845	3,959	377	161	8	67	233	9,738
170 Tulsa-Bartlesville OK	19	9	32	136	165	2	-	8	369
171 Tupelo MS	-	7	35	6	-	2	43	600	692
Total	145,253	17,018	48,033	16,556	11,500	7,401	15,286	8,884	269,930

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.

2004 BEA Definitions used.

Table 69
2005 Shipments by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	-	-	1,256	-	106	-	183	87	1,632
15 Baton Rouge-Pierre Part LA	88	1,068	8	19	2,103	677	1,357	167	5,487
16 Beaumont-Port Arthur TX	-	130	-	3	150	-	31	-	314
19 Birmingham-Hoover-Cullman AL	6	12	1	-	-	-	81	145	245
25 Cape Girardeau-Jackson MO-IL	62	5	7	2,961	171	5	8	792	4,011
27 Cedar Rapids IA	-	-	-	67	-	-	-	-	67
29 Charleston WV	50,800	7,808	874	1	395	38	140	180	60,236
32 Chicago-Naperville-Michigan City IL-IN-WI	38	704	-	458	65	-	250	150	1,665
33 Cincinnati-Middletown-Wilmington OH-KY-IN	1,643	211	3,728	3,039	19	40	489	1,858	11,027
34 Clarksburg WV + Morgantown WV	1,278	-	1,001	-	-	-	-	-	2,279
35 Cleveland-Akron-Elyria OH	3	101	2	57	5	-	30	16	214
40 Columbus-Marion-Chillicothe OH	3,331	-	492	5	86	3	-	-	3,917
41 Corpus Christi-Kingsville TX	-	107	-	-	499	335	-	-	941
43 Davenport-Moline-Rock Island IA-IL	-	-	-	174	23	-	-	3	200
54 Evansville IN-KY	20,109	1,362	2,578	4,282	87	-	233	275	28,926
59 Fort Smith AR-OK	-	-	-	-	-	-	-	1	1
69 Gulfport-Biloxi-Pascagoula MS	-	28	-	-	63	13	-	24	128
75 Houston-Baytown-Huntsville TX	3	388	-	-	2,001	881	79	8	3,360
76 Huntsville-Decatur AL	82	207	782	245	410	11	766	119	2,622
80 Jackson-Yazoo City MS	-	109	-	15	81	14	21	39	279
82 Jonesboro AR	-	-	-	-	-	-	72	106	178
88 Knoxville-Sevierville-La Follette TN	-	-	5	68	135	2	43	21	274
89 La Crosse WI-MN	-	-	-	22	-	-	-	-	22
90 Lafayette-Acadiana LA	-	24	18	2	-	2,662	-	17	2,723
91 Lake Charles-Jennings LA	13	183	-	3	315	2	1	16	533
94 Lexington-Fayette-Frankfort-Richmond KY	-	-	-	-	-	-	-	-	0
96 Little Rock-North Little Rock-Pine Bluff AR	-	-	2	13	-	-	22	2	39
98 Louisville-Elizabethtown-Scottsburg KY-IN	50	201	14,536	624	172	1	812	1,093	17,489
101 Madison-Baraboo WI	-	-	-	349	-	-	-	-	349
104 McAllen-Edinburg-Pharr TX	-	-	-	-	2	-	3	-	5
105 Memphis TN-MS-AR	-	988	912	26	18	25	52	36	2,057
109 Minneapolis-St. Paul-St. Cloud MN-WI	2	35	-	267	16	-	39	-	359
112 Mobile-Daphne-Fairhope AL	4	-	143	-	29	-	86	193	455
113 Monroe-Bastrop LA	-	-	-	3	-	-	-	-	3
116 Nashville-Davidson--Murfreesboro--Columbia TN	-	-	999	388	11	-	237	38	1,673
117 New Orleans-Metairie-Bogalusa LA	326	3,940	52	75	2,771	1,822	7,736	1,226	17,948
122 Paducah KY-IL	26,757	46	13,432	620	266	66	68	2,018	43,273
125 Pensacola-Ferry Pass-Brent FL	-	7	-	-	-	-	-	-	7
126 Peoria-Canton IL	-	-	-	344	232	-	33	6	615
129 Pittsburgh-New Castle PA	45,963	1,116	2,627	-	296	148	1,208	603	51,961
153 Shreveport-Bossier City-Minden LA	-	10	-	-	-	-	-	-	10
158 Springfield IL	-	-	-	199	-	-	3	-	202
160 St. Louis-St. Charles-Farmington MO-IL	5,351	837	4,641	189	252	14	101	161	11,546
170 Tulsa-Bartlesville OK	39	6	18	109	62	-	-	8	242
171 Tupelo MS	-	-	-	-	-	-	41	589	630
Total	155,948	19,633	48,114	14,627	10,841	6,759	14,225	9,997	280,144

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.

2004 BEA Definitions used.

Table 70
2006 Shipments by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	-	15	1,310	1	99	1	254	41	1,721
15 Baton Rouge-Pierre Part LA	31	756	5	-	1,911	568	1,536	142	4,948
16 Beaumont-Port Arthur TX	-	185	-	-	111	-	35	5	337
19 Birmingham-Hoover-Cullman AL	9	20	24	-	-	-	37	139	229
25 Cape Girardeau-Jackson MO-IL	6	-	-	3,128	251	2	2	858	4,247
27 Cedar Rapids IA	-	-	-	47	-	-	-	-	47
29 Charleston WV	46,848	8,584	558	12	362	3	148	238	56,754
32 Chicago-Naperville-Michigan City IL-IN-WI	77	690	9	153	55	-	280	135	1,399
33 Cincinnati-Middletown-Wilmington OH-KY-IN	1,638	213	3,426	2,992	10	-	452	1,838	10,569
34 Clarksburg WV + Morgantown WV	1,189	-	1,019	-	-	-	-	-	2,208
35 Cleveland-Akron-Elyria OH	16	209	-	82	1	-	22	4	333
40 Columbus-Marion-Chillicothe OH	2,664	-	57	2	91	3	-	-	2,817
41 Corpus Christi-Kingsville TX	-	6	-	-	575	191	-	-	773
43 Davenport-Moline-Rock Island IA-IL	-	-	-	285	37	-	-	6	328
54 Evansville IN-KY	20,845	1,228	2,571	4,990	87	3	230	187	30,139
59 Fort Smith AR-OK	-	-	-	2	-	-	-	-	2
69 Gulfport-Biloxi-Pascagoula MS	-	13	-	-	72	-	2	-	87
75 Houston-Baytown-Huntsville TX	59	300	2	-	1,916	855	136	2	3,269
76 Huntsville-Decatur AL	29	191	877	356	576	-	784	86	2,898
80 Jackson-Yazoo City MS	-	66	-	-	6	9	18	26	125
82 Jonesboro AR	-	-	-	-	2	-	111	121	235
88 Knoxville-Sevierville-La Follette TN	-	-	12	70	77	-	30	18	207
89 La Crosse WI-MN	-	-	-	21	-	-	-	-	21
90 Lafayette-Acadiana LA	-	220	9	-	-	2,464	-	2	2,695
91 Lake Charles-Jennings LA	3	181	-	-	364	-	3	11	562
94 Lexington-Fayette-Frankfort-Richmond KY	-	-	-	-	-	-	-	-	0
96 Little Rock-North Little Rock-Pine Bluff AR	-	35	42	2	1	-	39	5	124
98 Louisville-Elizabethtown-Scottsburg KY-IN	30	291	13,670	690	279	5	713	1,007	16,685
101 Madison-Baraboo WI	-	-	-	129	20	-	-	-	149
104 McAllen-Edinburg-Pharr TX	-	-	-	-	-	-	3	-	3
105 Memphis TN-MS-AR	7	681	296	4	6	3	28	39	1,065
109 Minneapolis-St. Paul-St. Cloud MN-WI	-	22	-	207	18	2	18	-	267
112 Mobile-Daphne-Fairhope AL	-	-	101	1	26	2	264	51	445
116 Nashville-Davidson--Murfreesboro--Columbia TN	2	-	1,353	432	20	9	320	12	2,148
117 New Orleans-Metairie-Bogalusa LA	596	3,483	28	40	2,670	1,816	7,563	987	17,182
120 Omaha-Council Bluffs-Fremont NE-IA	-	-	-	21	-	-	-	-	21
122 Paducah KY-IL	24,935	21	15,477	730	273	16	69	985	42,507
126 Peoria-Canton IL	2	-	-	134	169	-	37	6	346
129 Pittsburgh-New Castle PA	42,378	1,142	2,764	-	226	20	1,254	641	48,424
153 Shreveport-Bossier City-Minden LA	-	25	-	-	-	-	-	-	25
158 Springfield IL	-	-	-	204	1	-	-	-	205
160 St. Louis-St. Charles-Farmington MO-IL	7,006	790	4,948	169	142	11	90	184	13,342
170 Tulsa-Bartlesville OK	36	-	27	87	66	-	2	2	219
171 Tupelo MS	-	13	89	2	-	-	103	411	619
Total	148,404	19,378	48,674	14,991	10,524	5,984	14,583	8,187	270,726

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.

2004 BEA Definitions used.

Table 71
2003 Receipts by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	19	273	1,504	132	134	397	152	117	2,728
15 Baton Rouge-Pierre Part LA	49	55	1,926	708	50	25	27	101	2,941
16 Beaumont-Port Arthur TX	-	44	412	-	17	-	16	27	516
19 Birmingham-Hoover-Cullman AL	-	24	1	-	8	-	25	23	81
25 Cape Girardeau-Jackson MO-IL	20	3	56	84	82	1	-	23	269
27 Cedar Rapids IA	424	-	2	-	-	-	-	-	426
29 Charleston WV	6,867	2,321	4,576	-	1,373	1,071	2,343	566	19,117
32 Chicago-Naperville-Michigan City IL-IN-WI	98	23	177	1	112	2	336	297	1,046
33 Cincinnati-Middletown-Wilmington OH-KY-IN	30,220	2,972	2,927	24	1,864	1,001	1,365	967	41,340
34 Clarksburg WV + Morgantown WV	2,935	58	50	-	-	-	47	-	3,090
35 Cleveland-Akron-Elyria OH	41	14	31	-	197	74	35	28	420
40 Columbus-Marion-Chillicothe OH	15,158	579	235	-	630	91	64	494	17,251
41 Corpus Christi-Kingsville TX	5	-	-	6	-	-	-	-	11
43 Davenport-Moline-Rock Island IA-IL	209	1	3	-	10	12	11	5	251
54 Evansville IN-KY	14,819	2,606	6,705	249	1,291	1,670	203	668	28,211
59 Fort Smith AR-OK	-	-	-	5	2	-	15	-	22
69 Gulfport-Biloxi-Pascagoula MS	132	21	470	-	114	-	-	-	737
75 Houston-Baytown-Huntsville TX	-	114	169	-	530	5	483	25	1,326
76 Huntsville-Decatur AL	3,980	561	1,074	2,991	1,328	65	1,136	160	11,295
80 Jackson-Yazoo City MS	74	5	775	10	16	-	-	4	884
82 Jonesboro AR	3	-	7	-	40	1	729	14	794
84 Kansas City-Overland Park-Kansas City MO-KS	-	-	-	-	1	-	-	-	1
88 Knoxville-Sevierville-La Follette TN	3	271	97	423	57	152	17	11	1,031
89 La Crosse WI-MN	17	6	-	-	-	-	-	-	23
90 Lafayette-Acadiana LA	19	-	650	-	11	-	-	3	683
91 Lake Charles-Jennings LA	2	67	1,192	-	7	-	-	48	1,316
96 Little Rock-North Little Rock-Pine Bluff AR	-	-	62	18	67	-	70	-	217
98 Louisville-Elizabethtown-Scottsburg KY-IN	9,060	2,486	5,683	66	731	274	1,403	172	19,875
101 Madison-Baraboo WI	93	-	-	-	9	-	-	-	102
104 McAllen-Edinburg-Pharr TX	5	19	-	-	-	2	252	-	278
105 Memphis TN-MS-AR	317	55	3,024	23	109	101	71	239	3,939
109 Minneapolis-St. Paul-St. Cloud MN-WI	307	14	3	-	15	-	14	6	359
112 Mobile-Daphne-Fairhope AL	504	4	1,013	-	41	12	88	3	1,665
113 Monroe-Bastrop LA	13	2	347	-	12	-	-	3	377
116 Nashville-Davidson--Murfreesboro--Columbia TN	12,779	538	4,240	8	429	379	390	842	19,605
117 New Orleans-Metairie-Bogalusa LA	4,970	395	2,140	9,242	61	3	403	628	17,842
122 Paducah KY-IL	1,235	1,232	2,213	5	760	344	134	156	6,079
123 Panama City-Lynn Haven FL	23	-	13	-	-	-	6	-	42
125 Pensacola-Ferry Pass-Brent FL	295	-	310	-	90	-	-	4	699
126 Peoria-Canton IL	361	-	20	-	4	-	191	4	580
129 Pittsburgh-New Castle PA	34,189	1,920	5,096	42	1,061	1,721	3,736	1,749	49,514
153 Shreveport-Bossier City-Minden LA	29	-	119	-	-	-	-	6	154
158 Springfield IL	48	14	-	-	17	3	-	-	82
160 St. Louis-St. Charles-Farmington MO-IL	1,571	123	20	5	141	18	129	21	2,028
164 Tampa-St. Petersburg-Clearwater FL	-	-	-	-	-	-	1	-	1
170 Tulsa-Bartlesville OK	39	-	-	16	11	-	275	3	344
171 Tupelo MS	13	3	63	-	2	-	122	1	204
Total	140,945	16,823	47,405	14,058	11,434	7,424	14,289	7,418	259,796

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.

2004 BEA Definitions

Table 72
2004 Receipts by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

	BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11	Atlanta-Sandy Springs-Gainesville GA-AL	5	347	1,428	155	125	421	185	62	2,728
15	Baton Rouge-Pierre Part LA	280	44	1,333	314	19	-	6	17	2,013
16	Beaumont-Port Arthur TX	-	60	553	9	-	-	12	14	648
19	Birmingham-Hoover-Cullman AL	111	12	12	-	11	-	31	21	198
25	Cape Girardeau-Jackson MO-IL	24	117	5	315	88	2	3	39	592
27	Cedar Rapids IA	455	-	1	2	3	-	-	-	461
29	Charleston WV	7,774	2,412	4,558	-	1,208	1,050	2,603	570	20,175
32	Chicago-Naperville-Michigan City IL-IN-WI	174	69	244	35	102	3	269	401	1,297
33	Cincinnati-Middletown-Wilmington OH-KY-IN	31,490	2,805	3,155	16	1,915	936	1,153	1,161	42,630
34	Clarksburg WV + Morgantown WV	3,067	60	113	-	11	-	28	-	3,279
35	Cleveland-Akron-Elyria OH	46	30	51	-	221	99	71	29	547
37	Columbia MO	-	-	-	-	-	-	-	7	7
40	Columbus-Marion-Chillicothe OH	15,665	514	425	-	491	113	67	580	17,856
41	Corpus Christi - Kingsville TX	-	16	-	6	-	-	-	-	22
43	Davenport-Moline-Rock Island IA-IL	162	-	3	-	2	-	19	13	199
54	Evansville IN-KY	13,857	2,383	6,540	308	1,460	1,733	364	1,175	27,822
59	Fort Smith AR-OK	-	-	-	3	-	-	20	-	23
69	Gulfport-Biloxi-Pascagoula MS	143	23	470	-	109	-	-	-	745
75	Houston-Baytown-Huntsville TX	-	137	174	17	583	3	458	43	1,413
76	Huntsville-Decatur AL	3,561	538	886	2,940	1,339	64	1,487	405	11,220
80	Jackson-Yazoo City MS	22	25	574	5	23	-	-	3	653
82	Jonesboro AR	-	-	51	-	47	-	928	63	1,090
84	Kansas City-Overland Park-Kansas City MO-KS	-	-	1	-	3	-	-	-	4
88	Knoxville-Sevierville-La Follette TN	10	265	93	192	48	184	17	4	812
89	La Crosse WI-MN	45	10	-	3	-	-	-	-	58
90	Lafayette-Acadiana LA	8	7	1,112	-	30	-	-	-	1,156
91	Lake Charles-Jennings LA	-	63	776	2	4	-	-	10	855
94	Lexington-Fayette--Frankfort--Richmond KY	-	-	-	-	-	-	-	-	0
96	Little Rock-North Little Rock-Pine Bluff AR	-	-	10	26	66	-	66	-	168
98	Louisville-Elizabethtown-Scottsburg KY-IN	10,104	1,856	5,543	47	805	285	1,634	202	20,475
101	Madison-Baraboo WI	108	-	2	4	12	1	-	0	127
104	McAllen-Edinburg-Pharr TX	-	6	-	-	-	-	83	-	90
105	Memphis TN-MS-AR	849	77	2,791	56	139	242	101	237	4,492
109	Minneapolis-St. Paul-St. Cloud MN-WI	222	9	9	11	21	-	13	18	302
112	Mobile-Daphne-Fairhope AL	585	43	963	-	35	3	66	1	1,696
113	Monroe-Bastrop LA	37	-	256	-	6	-	-	-	299
116	Nashville-Davidson--Murfreesboro--Columbia TN	14,520	476	4,731	1	349	379	498	1,046	21,999
117	New Orleans-Metairie-Bogalusa LA	6,206	316	2,024	12,040	45	29	146	383	21,189
122	Paducah KY-IL	1,040	1,226	2,264	1	813	357	80	450	6,231
123	Panama City-Lynn Haven FL	27	-	4	-	-	-	1	-	32
125	Pensacola-Ferry Pass-Brent FL	79	-	374	-	106	-	-	0	560
126	Peoria-Canton IL	396	3	2	-	10	-	148	9	568
129	Pittsburgh-New Castle PA	33,097	2,952	6,416	32	976	1,465	4,111	1,868	50,918
153	Shreveport-Bossier City-Minden LA	-	-	72	-	-	-	-	-	72
158	Springfield IL	57	36	3	-	24	-	2	-	122
160	St. Louis-St. Charles-Farmington MO-IL	981	64	5	-	194	39	180	39	1,502
163	Tallahassee FL	-	-	5	-	-	-	-	-	5
164	Tampa-St. Petersburg-Clearwater FL	-	-	-	-	-	-	1	-	1
170	Tulsa-Bartlesville OK	48	3	2	14	20	-	264	11	361
171	Tupelo MS	-	17	-	-	35	-	164	1	217
	Total	145,253	17,018	48,033	16,556	11,500	7,406	15,280	8,884	269,930

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.
2004 BEA Definitions

Table 73
2005 Receipts by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	1	348	1,303	78	217	399	247	111	2,705
15 Baton Rouge-Pierre Part LA	342	95	1,197	303	44	110	-	34	2,125
16 Beaumont-Port Arthur TX	-	59	559	-	-	-	-	-	618
19 Birmingham-Hoover-Cullman AL	84	17	15	-	6	-	8	-	131
25 Cape Girardeau-Jackson MO-IL	-	132	28	323	28	1	3	27	543
27 Cedar Rapids IA	504	-	2	-	7	-	-	-	513
29 Charleston WV	10,338	3,506	3,895	-	1,309	1,097	2,778	682	23,605
32 Chicago-Naperville-Michigan City IL-IN-WI	178	9	205	24	132	6	356	457	1,368
33 Cincinnati-Middletown-Wilmington OH-KY-IN	32,086	3,332	3,262	17	1,937	842	1,682	1,131	44,288
34 Clarksburg WV + Morgantown WV	2,782	68	-	-	-	-	19	-	2,868
35 Cleveland-Akron-Elyria OH	4	18	16	-	192	123	122	31	506
40 Columbus-Marion-Chillicothe OH	17,230	477	293	-	597	87	42	574	19,300
41 Corpus Christi-Kingsville TX	-	-	-	3	-	-	-	-	3
43 Davenport-Moline-Rock Island IA-IL	105	-	-	-	1	24	18	1	149
54 Evansville IN-KY	15,398	3,071	5,952	172	1,381	1,673	403	1,518	29,568
59 Fort Smith AR-OK	-	-	-	-	-	-	20	-	20
69 Gulfport-Biloxi-Pascagoula MS	114	73	532	-	3	-	-	-	722
75 Houston-Baytown-Huntsville TX	-	258	107	-	374	-	426	11	1,176
76 Huntsville-Decatur AL	2,974	491	1,101	2,551	1,209	74	1,196	435	10,031
80 Jackson-Yazoo City MS	3	24	1,084	3	11	-	5	16	1,147
82 Jonesboro AR	-	-	36	-	20	6	579	161	802
88 Knoxville-Sevierville-La Follette TN	34	285	66	35	41	104	5	20	589
89 La Crosse WI-MN	25	-	-	-	-	-	-	-	25
90 Lafayette-Acadiana LA	-	-	1,345	2	17	-	-	8	1,371
91 Lake Charles-Jennings LA	-	81	1,163	-	-	-	-	157	1,401
94 Lexington-Fayette--Frankfort--Richmond KY	-	-	-	-	-	-	-	-	
96 Little Rock-North Little Rock-Pine Bluff AR	-	-	5	7	18	-	78	2	110
98 Louisville-Elizabethtown-Scottsburg KY-IN	11,129	2,613	6,285	55	780	208	1,529	123	22,723
101 Madison-Baraboo WI	15	-	-	4	11	-	-	-	30
104 McAllen-Edinburg-Pharr TX	-	6	-	-	-	-	162	-	168
105 Memphis TN-MS-AR	1,424	87	2,396	145	134	167	187	264	4,803
109 Minneapolis-St. Paul-St. Cloud MN-WI	215	7	2	7	35	-	7	103	375
112 Mobile-Daphne-Fairhope AL	759	19	996	-	51	-	36	3	1,864
113 Monroe-Bastrop LA	38	-	208	-	4	-	-	-	250
114 Montgomery-Alexander City AL	-	-	3	-	-	-	-	-	3
116 Nashville-Davidson--Murfreesboro--Columbia TN	15,109	647	4,653	-	219	473	407	1,690	23,199
117 New Orleans-Metairie-Bogalusa LA	6,229	333	2,895	10,871	65	20	131	244	20,786
122 Paducah KY-IL	761	1,138	2,299	-	802	375	64	551	5,990
123 Panama City-Lynn Haven FL	96	-	16	-	-	-	6	-	119
125 Pensacola-Ferry Pass-Brent FL	213	3	227	-	101	-	-	-	544
126 Peoria-Canton IL	414	3	3	-	4	-	58	2	484
129 Pittsburgh-New Castle PA	35,664	2,361	5,784	16	919	943	2,946	1,520	50,153
153 Shreveport-Bossier City-Minden LA	40	-	157	-	-	-	-	9	206
158 Springfield IL	61	3	15	-	14	-	-	-	93
160 St. Louis-St. Charles-Farmington MO-IL	1,531	70	7	3	127	26	175	106	2,045
170 Tulsa-Bartlesville OK	47	-	-	8	6	-	348	9	417
171 Tupelo MS	-	-	-	-	23	-	179	1	204
Total	155,948	19,635	48,112	14,627	10,841	6,758	14,224	10,000	280,144

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.
2004 BEA Definitions

Table 74
2006 Receipts by Bureau of Economic Analysis Area – Rivers [1/]
(Kilotons)

BEA	Coal & Coke	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	All Other	Total
11 Atlanta-Sandy Springs-Gainesville GA-AL	11	368	1,353	31	204	349	272	93	2,680
15 Baton Rouge-Pierre Part LA	79	79	1,278	200	42	1	-	-	1,679
16 Beaumont-Port Arthur TX	-	89	460	-	2	-	-	-	550
19 Birmingham-Hoover-Cullman AL	16	18	20	3	3	-	-	-	61
25 Cape Girardeau-Jackson MO-IL	6	102	22	300	45	3	5	12	496
27 Cedar Rapids IA	590	-	8	-	8	-	-	-	606
29 Charleston WV	5,742	3,955	3,485	-	1,323	800	2,339	728	18,373
32 Chicago-Naperville-Michigan City IL-IN-WI	204	41	283	31	102	-	328	339	1,327
33 Cincinnati-Middletown-Wilmington OH-KY-IN	32,979	3,297	3,291	8	1,590	545	1,569	959	44,238
34 Clarksburg WV + Morgantown WV	3,481	58	-	-	-	-	-	-	3,539
35 Cleveland-Akron-Elyria OH	5	41	13	-	220	80	129	33	522
40 Columbus-Marion-Chillicothe OH	14,346	522	283	-	562	91	37	470	16,311
43 Davenport-Moline-Rock Island IA-IL	64	-	-	-	6	16	21	4	111
54 Evansville IN-KY	16,145	2,785	5,640	270	1,407	1,702	552	1,172	29,672
59 Fort Smith AR-OK	-	-	-	-	-	-	21	-	21
69 Gulfport-Biloxi-Pascagoula MS	304	70	512	-	17	-	-	-	903
75 Houston-Baytown-Huntsville TX	-	305	-	2	586	-	342	22	1,258
76 Huntsville-Decatur AL	3,119	477	1,189	1,941	1,154	74	1,750	265	9,969
80 Jackson-Yazoo City MS	-	8	1,161	2	5	3	-	12	1,190
82 Jonesboro AR	-	-	527	-	28	-	639	59	1,254
88 Knoxville-Sevierville-La Follette TN	-	239	69	6	27	137	24	25	527
89 La Crosse WI-MN	12	15	-	7	-	-	-	-	33
90 Lafayette-Acadiana LA	-	-	1,737	-	18	-	-	-	1,755
91 Lake Charles-Jennings LA	-	129	1,189	-	-	-	-	213	1,531
94 Lexington-Fayette--Frankfort--Richmond KY	-	-	-	-	-	-	-	-	
96 Little Rock-North Little Rock-Pine Bluff AR	-	-	56	12	37	-	100	-	205
98 Louisville-Elizabethtown-Scottsburg KY-IN	9,813	2,465	5,813	1	776	229	1,816	63	20,977
101 Madison-Baraboo WI	17	-	-	7	16	-	-	-	40
104 McAllen-Edinburg-Pharr TX	-	1	-	-	-	-	74	-	76
105 Memphis TN-MS-AR	806	107	2,705	191	130	-	211	311	4,462
108 Milwaukee-Racine-Waukesha WI	-	-	-	-	-	-	-	0	
109 Minneapolis-St. Paul-St. Cloud MN-WI	162	14	6	4	21	-	4	-	211
112 Mobile-Daphne-Fairhope AL	1,133	36	802	-	20	-	67	13	2,071
113 Monroe-Bastrop LA	15	6	277	-	9	-	-	5	313
116 Nashville-Davidson--Murfreesboro--Columbia TN	16,069	455	5,577	3	231	424	505	1,185	24,449
117 New Orleans-Metairie-Bogalusa LA	5,779	392	3,307	11,938	36	-	53	294	21,799
122 Paducah KY-IL	841	1,089	2,030	3	742	396	52	315	5,468
123 Panama City-Lynn Haven FL	15	-	-	-	-	-	1	-	16
125 Pensacola-Ferry Pass-Brent FL	434	7	314	-	82	-	-	-	836
126 Peoria-Canton IL	535	7	-	-	3	-	62	2	609
129 Pittsburgh-New Castle PA	34,360	2,046	4,899	10	950	1,092	2,807	1,557	47,720
153 Shreveport-Bossier City-Minden LA	25	7	335	-	3	-	-	7	378
158 Springfield IL	47	50	25	-	5	-	-	-	127
160 St. Louis-St. Charles-Farmington MO-IL	1,186	61	5	2	71	43	98	20	1,486
170 Tulsa-Bartlesville OK	43	-	-	20	13	-	442	6	523
171 Tupelo MS	20	38	3	-	30	-	262	1	355
Total	148,404	19,378	48,674	14,991	10,524	5,984	14,583	8,187	270,726

Source: WCSC Data.

[1]A Bureau of Economic Analysis (BEA) area consists of a standard metropolitan statistical area (SMSA) serving as a center of economic activity and its surrounding counties.
2004 BEA Definitions

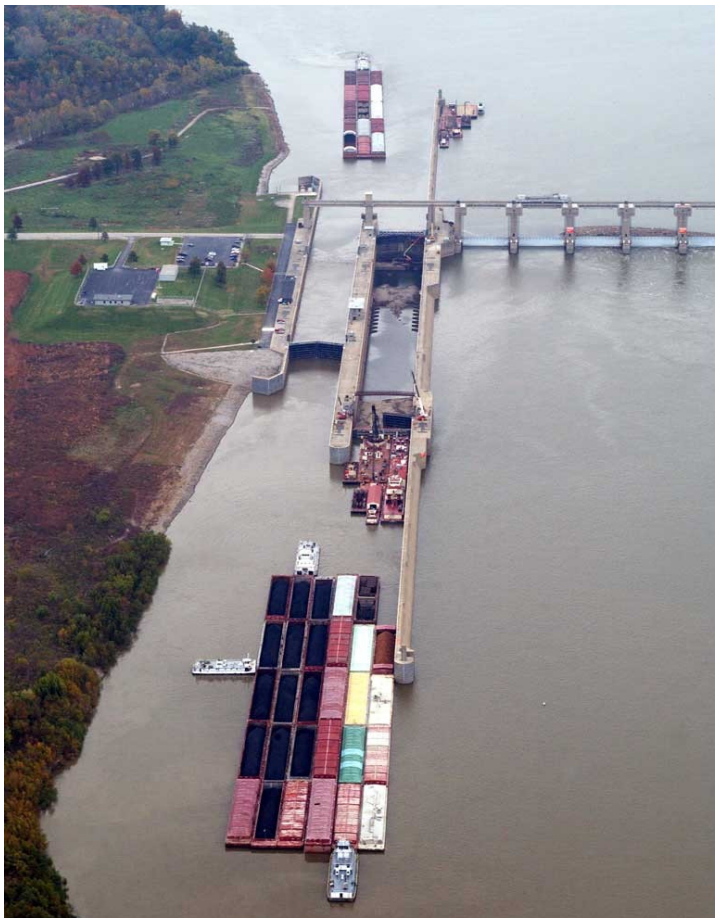


Photo 24: Tows queued at J.T. Myers L&D, mile 846.0 on the Ohio River, during a closure

4. <u>Project Statistics</u>.

a. <u>Project Traffic</u>. The pattern of commodity tonnage distribution is similar at all locks for any given river (see **Tables 75 - 78**). Coal is the largest tonnage moved at every lock on all rivers. **Tables 79 - 82** show commodity tonnage by direction at each project for 2004 and 2007. Total project traffic, for the past 10 years, is listed in **Table 83**.

b. <u>Project Performance</u>. Most Ohio River locks averaged ten or more barges per tow. On the tributaries where the locks are smaller, the average tow size is also smaller, generally between two and six barges except for a few projects on the Cumberland and Tennessee rivers.

Tons per tow also relate to the ratio of unloaded to loaded barges. A majority of the Ohio Basin projects locked empty barges between 35 and 45 percent of the time, indicating that barges generally are dedicated to a particular movement and move full in only one direction. Sixty-two percent of all barges locked at L/D 6, on the Allegheny, were empty in 2007, giving it the highest percentage of empty barge traffic in ORS.

Table 75
2004 Ohio River System Lock Traffic by Commodity
(Kilotons)

River/Project	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River									
Emsworth	13,662	749	1,597	41	798	754	818	372	18,791
Dashields	13,702	960	1,979	47	877	833	892	389	19,679
Montgomery	13,654	1,107	1,615	44	1,080	1,057	1,305	400	20,260
New Cumberland	21,748	1,740	1,279	99	1,925	1,367	2,114	1,205	31,478
Pike Island	26,056	1,988	1,359	103	1,962	1,470	4,550	1,424	38,912
Hannibal	35,941	1,980	1,692	100	2,188	1,758	4,805	1,637	50,101
Willow Island	33,421	2,111	1,934	106	1,932	1,788	4,842	1,988	48,123
Belleville	34,291	2,513	2,697	115	2,515	1,950	5,080	2,220	51,380
Racine	34,511	2,527	2,994	118	2,514	2,249	5,141	2,243	52,297
Robert C. Byrd	35,937	3,688	4,517	158	3,248	2,351	5,292	2,585	57,775
Greenup	37,102	6,146	4,739	183	3,801	2,512	7,396	2,623	64,502
Meldahl	27,963	6,398	4,433	212	3,852	2,738	7,342	2,324	55,262
Markland	18,237	4,615	3,743	2,671	5,612	3,711	8,652	2,809	50,050
McAlpine	17,439	4,836	3,134	3,353	6,318	4,137	10,318	3,218	52,753
Cannelton	20,069	4,395	4,643	3,425	6,610	4,705	10,297	2,745	56,888
Newburgh	26,234	4,959	4,536	4,447	6,946	5,905	10,543	3,581	67,151
J.T. Myers	26,319	4,832	946	7,161	7,852	6,430	10,756	3,585	67,880
Smithland	30,942	4,925	4,660	7,720	7,920	6,416	10,849	3,589	77,020
L/D 52	25,510	7,270	14,459	11,634	10,147	7,602	13,206	5,127	94,954
L/D 53	17,162	7,585	10,664	12,759	10,400	7,682	14,316	4,892	85,459
Kanawha River									
London	1,347	0	12	0	0	0	3	12	1,374
Marmet	12,801	285	372	0	207	89	6	41	13,800
Winfield	13,245	870	2,643	0	736	94	38	181	17,808
Monongahela River									
Opekiska	383	0	34	0	0	8	14	8	446
Hildebrand	382	0	5	0	0	8	14	0	408
Morgantown	382	2	606	0	0	8	14	0	1,011
Point Marion	3,465	89	1,056	0	1	8	14	7	4,638
Grays Landing	3,511	86	1,067	0	1	8	12	7	4,691
Maxwell	9,968	85	1,176	0	1	170	15	213	11,627
L/D 4	7,429	143	1,326	3	21	146	42	334	9,443
L/D 3	9,417	299	1,291	6	166	149	440	206	11,973
Braddock [1/]	13,516	416	1,333	34	410	397	613	288	17,007
Allegheny River									
L/D 8	0	0	763	0	0	0	0	4	767
L/D 7	0	0	46	2	0	0	10	6	64
L/D 6	2	0	48	2	0	3	13	6	74
L/D 5	125	0	698	2	0	11	20	6	860
L/D 4	132	104	815	2	28	28	57	82	1,248
L/D 3	1,482	147	191	5	98	86	161	96	2,266
L/D 2	1,473	143	211	5	105	92	176	81	2,284
Green River									
L/D 2	3,060	0	0	75	0	0	2	21	3,158
L/D 1	6,753	0	78	72	0	324	2	95	7,324
Cumberland River									
Old Hickory	3,516	0	271	0	111	0	3	10	3,911
Cheatham	3,737	426	3,413	6	323	98	735	1,028	9,765
Barkley	355	372	982	154	155	35	255	512	2,821
Tennessee River									
Ft. Loudoun	27	284	38	2	4	208	33	7	602
Watts Bar	30	367	84	250	64	261	74	9	1,139
Chickamauga	32	370	90	261	118	623	73	20	1,585
Nickajack	107	603	376	513	395	647	547	197	3,384
Guntersville	1,122	659	684	1,861	490	974	820	559	7,168
Wheeler	1,253	697	1,000	3,203	2,435	987	2,431	773	12,779
Wilson	1,218	717	917	3,182	2,506	981	2,431	891	12,844
Pickwick	4,763	884	1,623	3,541	1,494	1,061	2,218	1,597	17,181
Kentucky	14,090	1,062	9,335	3,967	1,849	1,487	2,758	2,216	36,764

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 76
2005 Ohio River System Lock Traffic by Commodity
(Kilotons)

River/Project	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River									
Emsworth	16,828	789	1,374	19	674	454	793	248	21,178
Dashields	16,847	876	1,909	19	750	541	821	261	22,024
Montgomery	17,430	1,034	1,350	23	972	748	1,175	409	23,142
New Cumberland	25,488	1,756	950	129	1,753	1,113	2,004	1,184	34,376
Pike Island	29,113	1,922	1,051	125	1,861	1,299	3,678	1,265	40,314
Hannibal	40,686	1,991	1,694	143	2,092	1,355	3,871	1,457	53,288
Willow Island	36,997	2,166	1,967	143	1,741	1,371	3,929	1,850	50,164
Belleville	38,045	2,179	2,459	148	2,276	1,577	4,152	2,053	52,889
Racine	38,201	2,185	2,968	152	2,309	1,911	4,238	2,137	54,100
Robert C. Byrd	42,052	3,390	4,659	170	3,152	2,059	4,449	2,551	62,482
Greenup	42,725	7,765	4,646	201	4,009	2,147	6,417	2,673	70,583
Meldahl	34,298	7,920	4,104	210	4,093	2,338	6,593	2,221	61,778
Markland	22,009	5,345	3,848	2,519	5,925	3,307	8,156	2,738	53,847
McAlpine	20,611	5,666	3,403	3,211	6,476	3,619	9,716	2,992	55,695
Cannelton	23,101	4,195	4,446	3,257	6,862	4,238	9,659	2,552	58,310
Newburgh	28,189	4,713	4,266	4,329	7,303	5,320	10,060	3,319	67,498
J.T. Myers	31,494	4,916	906	6,843	8,145	5,727	10,476	3,394	71,901
Smithland	35,529	4,930	5,005	7,448	8,187	5,661	10,476	3,463	80,697
L/D 52	30,110	7,150	15,690	10,279	10,088	6,523	12,265	5,230	97,336
L/D 53	19,516	7,301	12,384	11,119	10,374	6,814	12,937	5,399	85,845
Kanawha River									
London	787	0	24	0	0	0	4	4	820
Marmet	13,597	272	482	0	260	60	4	40	14,714
Winfield	13,665	893	2,761	0	845	71	65	227	18,527
Monongahela River									
Opekiska	274	0	0	0	0	6	6	0	286
Hildebrand	270	0	0	0	0	6	6	0	282
Morgantown	273	0	597	0	0	6	9	0	885
Point Marion	3,246	70	1,168	0	0	6	9	2	4,501
Grays Landing	3,363	69	1,171	0	2	6	9	2	4,621
Maxwell	12,114	74	1,273	0	3	271	20	109	13,863
L/D 4	9,963	151	1,441	0	9	154	44	251	12,013
L/D 3	11,450	309	1,408	0	154	122	486	155	14,084
Braddock [1/]	16,598	468	1,585	11	347	218	535	109	19,871
Allegheny River									
L/D 8	0	0	674	0	0	0	0	5	678
L/D 7	8	0	43	0	6	11	15	3	85
L/D 6	8	0	41	0	6	11	15	3	83
L/D 5	45	0	46	0	6	27	22	5	152
L/D 4	47	94	1,019	0	49	44	71	23	1,347
L/D 3	1,237	139	86	3	120	77	171	30	1,861
L/D 2	1,239	137	89	3	122	79	185	28	1,882
Green River									
L/D 2	5,201	0	0	33	0	11	2	14	5,261
L/D 1	8,403	0	69	36	0	343	2	90	8,943
Cumberland River									
Old Hickory	4,384	13	270	0	26	0	13	15	4,721
Cheatham	4,443	600	4,058	0	112	187	591	1,035	11,026
Barkley	882	324	1,732	26	101	72	167	602	3,906
Tennessee River									
Ft. Loudoun	25	256	34	0	6	113	15	18	467
Watts Bar	38	383	74	112	25	163	53	26	875
Chickamauga	39	385	77	114	128	559	54	42	1,398
Nickajack	98	652	186	291	389	540	492	204	2,851
Guntersville	436	682	494	1,564	474	872	748	565	5,835
Wheeler	540	732	820	2,411	2,311	975	2,151	860	10,800
Wilson	520	752	825	2,409	2,374	965	2,142	883	10,872
Pickwick	4,382	936	1,408	2,754	1,274	1,045	2,189	1,547	15,535
Kentucky	13,896	1,286	10,185	3,288	1,474	1,310	2,744	2,430	36,613

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 77
2006 Ohio River System Lock Traffic by Commodity
(Kilotons)

River/Project	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River									
Emsworth	16,444	841	1,767	18	727	513	746	368	21,425
Dashields	16,425	899	2,153	19	755	617	781	383	22,032
Montgomery	15,011	960	1,389	19	959	715	1,145	559	20,756
New Cumberland	22,723	1,664	906	108	1,895	1,245	1,896	1,158	31,594
Pike Island	27,151	1,725	1,035	108	2,042	1,449	3,840	1,286	38,636
Hannibal	37,207	1,775	1,449	113	2,230	1,544	3,963	1,408	49,690
Willow Island	33,555	2,004	1,631	111	1,900	1,595	3,969	1,763	46,529
Belleville	34,550	2,224	1,969	113	2,512	1,690	4,067	1,984	49,109
Racine	35,305	2,206	2,343	116	2,510	2,056	4,221	2,109	50,865
Robert C. Byrd	37,408	3,344	4,285	139	3,399	2,177	4,362	2,454	57,568
Greenup	41,473	8,478	4,336	175	3,950	2,252	6,111	2,615	69,390
Meldahl	32,633	8,565	4,026	208	4,005	2,451	6,252	2,021	60,161
Markland	22,163	5,887	3,724	2,388	5,499	3,023	7,747	2,266	52,697
McAlpine	21,566	6,072	3,040	3,188	5,993	3,457	9,427	2,460	55,205
Cannelton	24,266	4,687	4,499	3,247	6,351	4,176	9,540	2,146	58,912
Newburgh	30,600	5,219	4,195	4,431	6,695	5,259	9,987	2,803	69,188
J.T. Myers	32,652	5,381	841	7,075	7,515	5,630	10,272	2,803	72,169
Smithland	36,298	5,418	5,063	7,839	7,561	5,639	10,396	2,811	81,025
L/D 52	29,322	6,394	17,444	10,126	9,493	6,391	12,980	4,255	96,404
L/D 53	19,541	6,547	13,530	11,283	9,979	6,509	13,486	4,184	85,059
Kanawha River									
London	1,854	0	35	0	0	0	3	8	1,900
Marmet	14,209	334	519	0	266	83	3	82	15,497
Winfield	14,811	889	2,837	0	921	156	60	239	19,911
Monongahela River									
Opekiska	240	0	0	0	0	0	1	0	241
Hildebrand	240	0	0	0	0	0	1	0	241
Morgantown	240	0	640	0	0	0	1	0	881
Point Marion	3,615	64	1,299	0	0	0	1	3	4,981
Grays Landing	3,784	64	1,295	0	0	0	1	10	5,154
Maxwell	13,634	67	1,370	0	0	495	1	88	15,654
L/D 4	11,980	151	1,555	0	9	141	25	443	14,303
L/D 3	12,908	320	1,560	0	147	89	435	179	15,638
Braddock [1/]	16,894	377	1,769	12	372	273	543	129	20,368
Allegheny River									
L/D 8	0	0	618	0	0	0	0	5	623
L/D 7	6	0	33	0	0	17	0	9	64
L/D 6	6	0	32	0	0	17	0	6	60
L/D 5	42	0	42	0	3	27	8	9	130
L/D 4	43	155	1,012	0	77	36	23	62	1,408
L/D 3	1,176	205	120	0	175	70	64	66	1,875
L/D 2	1,175	202	126	0	172	68	86	66	1,896
Green River									
L/D 2	5,396	0	6	32	0	0	1	8	5,442
L/D 1	8,063	0	53	32	0	275	1	142	8,564
Cumberland River									
Old Hickory	4,596	0	370	0	29	0	0	6	5,001
Cheatham	4,657	482	4,346	30	156	209	777	1,089	11,746
Barkley	1,122	298	2,065	45	83	107	252	649	4,622
Tennessee River									
Ft. Loudoun	2	248	53	0	11	149	17	4	484
Watts Bar	3	323	105	102	18	206	42	10	809
Chickamauga	3	325	111	103	120	564	41	12	1,279
Nickajack	96	567	168	182	381	541	555	137	2,626
Guntersville	448	615	430	1,496	468	874	814	453	5,600
Wheeler	451	680	707	1,892	2,251	968	2,610	748	10,308
Wilson	448	683	716	2,316	1,877	937	2,631	731	10,338
Pickwick	4,909	797	1,253	2,163	1,414	990	2,471	1,320	15,317
Kentucky	15,599	1,130	10,272	2,766	1,628	1,184	3,114	2,181	37,873

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 78
2007 Ohio River System Lock Traffic by Commodity
(Kilotons)

River/Project	Coal	Petrol	Aggs	Grain	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River									
Emsworth	14,779	865	1,721	19	686	457	550	322	19,399
Dashields	14,779	885	2,362	20	696	514	604	311	20,171
Montgomery	13,687	942	1,845	21	879	621	890	426	19,310
New Cumberland	20,016	1,382	1,287	138	1,777	980	1,438	1,087	28,104
Pike Island	24,038	1,391	1,359	139	1,967	1,112	2,727	1,244	33,976
Hannibal	34,941	1,458	1,540	144	2,098	1,539	3,140	1,435	46,297
Willow Island	31,832	1,651	1,706	150	1,832	1,566	3,185	1,724	43,645
Belleville	32,566	2,091	1,974	154	2,405	1,674	3,447	1,937	46,247
Racine	33,783	2,126	2,384	161	2,478	2,017	3,611	1,981	48,541
Robert C. Byrd	35,292	3,122	4,141	187	3,141	2,166	3,582	2,309	53,940
Greenup	36,320	8,458	4,004	219	4,019	2,333	4,510	2,344	62,208
Meldahl	27,273	8,659	3,713	225	4,164	2,442	4,543	2,144	53,163
Markland	18,159	5,864	3,347	2,148	5,712	3,213	5,635	1,985	46,062
McAlpine	18,128	5,990	2,895	2,778	6,265	3,609	7,311	2,174	49,150
Cannelton	21,637	3,872	4,496	2,834	6,440	4,251	7,260	1,852	52,641
Newburgh	30,356	4,421	4,191	3,945	6,853	5,326	7,508	2,533	65,133
J.T. Myers	28,679	5,000	853	6,352	7,776	5,697	7,800	2,438	64,595
Smithland	33,955	5,071	3,750	7,091	7,797	5,695	7,818	2,502	73,679
L/D 52	28,838	6,012	15,025	9,571	9,646	6,481	9,789	3,592	88,953
L/D 53	18,831	6,120	12,505	10,282	10,044	6,540	10,014	3,939	78,274
Kanawha River									
London	1,937	0	8	0	0	2	0	15	1,962
Marmet	14,813	351	360	0	211	63	14	191	16,002
Winfield	15,305	990	2,319	0	850	78	101	504	20,148
Monongahela River									
Opekiska	240	0	0	0	0	0	0	3	243
Hildebrand	240	0	0	0	0	0	0	3	243
Morgantown	240	0	536	0	0	0	0	3	778
Point Marion	3,259	43	1,214	0	0	0	0	9	4,526
Grays Landing	3,679	46	1,217	0	0	0	0	6	4,947
Maxwell	11,615	48	1,228	0	0	423	4	149	13,466
L/D 4	11,339	106	1,409	0	9	65	12	480	13,420
L/D 3	12,211	256	1,535	0	146	78	290	362	14,877
Braddock [1/]	15,685	389	1,647	21	314	192	399	289	18,937
Allegheny River									
L/D 8	0	0	601	0	0	0	0	1	602
L/D 7	12	0	39	0	0	3	9	1	63
L/D 6	12	0	39	0	0	5	8	1	63
L/D 5	54	0	37	0	0	6	11	1	108
L/D 4	52	114	815	3	48	12	27	100	1,170
L/D 3	1,270	186	70	3	103	36	64	90	1,822
L/D 2	1,291	182	66	3	105	41	74	91	1,854
Green River									
L/D 2	3,496	0	0	15	0	0	0	2	3,512
L/D 1	7,425	0	3	18	0	375	0	125	7,946
Cumberland River									
Old Hickory	4,395	15	395	0	26	0	2	8	4,841
Cheatham	4,397	443	4,254	22	160	191	727	1,008	11,203
Barkley	1,836	350	4,667	259	193	212	552	1,123	9,193
Tennessee River									
Ft. Loudoun	0	275	36	0	14	89	47	12	472
Watts Bar	2	280	98	45	29	114	56	31	655
Chickamauga	2	280	97	53	119	423	52	33	1,059
Nickajack	87	500	180	134	246	451	603	132	2,333
Guntersville	189	565	654	1,521	314	757	725	324	5,050
Wheeler	280	676	914	2,359	2,272	968	2,230	581	10,280
Wilson	269	665	896	2,342	2,365	977	2,224	602	10,340
Pickwick	4,504	711	1,631	2,579	1,256	1,065	2,169	1,307	15,223
Kentucky	13,277	954	7,415	2,774	1,484	1,161	2,429	1,394	30,888

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 79
2004 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River										
Emsworth	Up	7,311	648	912	41	635	711	370	261	10,889
	Down	6,352	101	685	0	162	42	448	111	7,902
Dashields	Up	7,372	805	1,738	47	703	769	381	274	12,089
	Down	6,330	155	241	0	174	64	511	115	7,590
Montgomery	Up	8,030	925	1,522	42	894	1,009	698	353	13,473
	Down	5,624	182	93	2	185	48	606	47	6,787
New Cumberland	Up	16,922	1,271	1,206	76	1,680	1,319	1,443	1,122	25,039
	Down	4,826	469	73	23	245	48	672	83	6,438
Pike Island	Up	20,720	1,463	1,260	80	1,734	1,390	3,364	1,290	31,300
	Down	5,336	525	99	23	229	80	1,186	134	7,613
Hannibal	Up	16,996	1,510	1,574	75	1,760	1,691	3,473	1,472	28,551
	Down	18,945	470	118	25	428	68	1,332	165	21,550
Willow Island	Up	16,839	1,562	1,768	81	1,509	1,721	3,500	1,791	28,770
	Down	16,582	549	166	25	423	67	1,342	198	19,352
Belleville	Up	17,274	2,045	2,533	86	2,109	1,879	3,775	1,997	31,697
	Down	17,016	468	164	29	406	71	1,305	223	19,683
Racine	Up	17,484	2,039	2,166	89	2,110	2,157	3,833	1,991	31,869
	Down	17,027	488	828	29	404	92	1,308	252	20,429
R.C. Byrd	Up	18,481	3,171	4,288	112	2,823	2,253	3,943	2,288	37,359
	Down	17,456	517	228	45	425	99	1,349	297	20,417
Greenup	Up	6,689	1,735	4,533	142	3,245	2,374	5,913	2,249	26,880
	Down	30,413	4,411	206	41	556	138	1,483	374	37,622
Meldahl	Up	3,946	2,059	4,005	160	3,263	2,558	5,968	1,778	23,737
	Down	24,017	4,338	428	53	588	180	1,374	546	31,525
Markland	Up	5,116	2,686	3,593	234	5,022	3,545	6,834	2,402	29,432
	Down	13,120	1,929	150	2,437	589	167	1,818	407	20,618
McAlpine	Up	9,809	2,806	2,937	325	5,451	3,920	7,955	2,753	35,957
	Down	7,630	2,030	197	3,027	867	217	2,363	465	16,797
Cannelton	Up	12,657	3,463	540	360	5,745	4,004	7,911	2,098	36,778
	Down	7,412	932	4,103	3,065	865	702	2,385	646	20,111
Newburgh	Up	19,565	3,951	620	617	6,096	5,137	8,131	2,862	46,979
	Down	6,670	1,007	3,916	3,830	850	769	2,412	718	20,172
J.T. Myers	Up	16,351	3,996	532	497	7,013	5,680	8,297	3,051	45,416
	Down	9,967	836	413	6,664	840	750	2,458	535	22,464
Smithland	Up	15,456	4,072	568	482	7,049	5,693	8,350	2,997	44,667
	Down	15,486	853	4,091	7,238	871	723	2,499	592	32,353
L/D 52	Up	16,378	6,462	2,619	3,391	8,475	6,879	9,950	3,737	57,892
	Down	9,132	808	11,840	8,243	1,672	722	3,256	1,389	37,063
L/D 53	Up	6,820	6,732	615	3,991	8,684	6,948	10,736	3,127	47,652
	Down	10,343	853	10,048	8,768	1,716	734	3,580	1,765	37,807
Kanawha River										
London	Up	8	0	12	0	0	0	0	4	24
	Down	1,339	0	0	0	0	0	3	8	1,351
Marmet	Up	50	277	368	0	207	78	0	21	1,000
	Down	12,751	9	4	0	0	11	6	20	12,800
Winfield	Up	192	861	2,627	0	654	93	35	136	4,596
	Down	13,054	10	17	0	83	2	3	45	13,212
Monongahela River										
Opekiska	Up	5	0	34	0	0	8	14	8	67
	Down	378	0	0	0	0	0	0	0	378
Hildebrand	Up	9	0	5	0	0	8	14	0	35
	Down	373	0	0	0	0	0	0	0	373
Morgantown	Up	5	0	111	0	0	8	14	0	136
	Down	377	2	495	0	0	0	0	0	875
Point Marion	Up	2,440	87	116	0	1	8	14	0	2,665
	Down	1,025	2	940	0	0	0	0	7	1,973

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

Table 79 (cont'd)
2004 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Monongahela River										
Grays Landing	Up	2,387	86	116	0	1	8	12	0	2,609
	Down	1,124	0	952	0	0	0	0	7	2,082
Maxwell	Up	5,012	85	221	0	1	167	15	207	5,709
	Down	4,955	0	955	0	0	2	0	6	5,918
L/D 4	Up	425	142	347	3	19	141	33	321	1,431
	Down	7,003	1	979	0	2	5	9	13	8,012
L/D 3	Up	1,101	298	326	6	141	141	47	183	2,244
	Down	8,316	1	964	0	26	8	393	23	9,730
Braddock [1/]	Up	6,365	362	417	34	274	382	196	260	8,290
	Down	7,150	55	917	0	137	15	417	28	8,718
Allegheny River										
L/D 8	Up	0	0	2	0	0	0	0	0	2
	Down	0	0	762	0	0	0	0	4	766
L/D 7	Up	0	0	11	2	0	0	10	2	24
	Down	0	0	36	0	0	0	0	4	40
L/D 6	Up	2	0	11	2	0	3	13	2	32
	Down	0	0	37	0	0	0	0	4	42
L/D 5	Up	110	0	30	2	0	11	19	2	173
	Down	15	0	668	0	0	0	1	4	688
L/D 4	Up	110	104	53	2	27	24	47	20	385
	Down	23	0	762	0	2	5	10	62	863
L/D 3	Up	1,447	146	72	5	95	80	144	27	2,016
	Down	34	2	119	0	3	6	18	69	249
L/D 2	Up	1,450	143	78	5	102	82	150	25	2,033
	Down	23	0	133	0	3	10	26	57	252
Green River										
L/D 2	Up	2,414	0	0	0	0	0	2	13	2,428
	Down	647	0	0	75	0	0	0	8	730
L/D 1	Up	3,245	0	78	3	0	317	2	69	3,713
	Down	3,509	0	0	69	0	8	0	26	3,611
Cumberland River										
Old Hickory	Up	3,501	0	271	0	103	0	3	7	3,886
	Down	15	0	0	0	8	0	0	2	25
Cheatham	Up	3,702	422	3,379	6	313	78	518	982	9,401
	Down	35	4	34	0	9	20	217	47	365
Barkley	Up	345	363	643	93	79	22	126	432	2,102
	Down	10	9	339	62	77	13	129	81	719
Tennessee River										
Ft. Loudoun	Up	27	280	30	2	4	185	10	3	541
	Down	0	4	8	0	0	23	23	4	61
Watts Bar	Up	30	275	79	173	26	223	25	4	836
	Down	0	92	4	77	38	39	49	5	303
Chickamauga	Up	32	269	85	182	31	586	25	11	1,219
	Down	0	101	6	79	87	37	48	9	366
Nickajack	Up	104	566	351	412	185	561	257	114	2,551
	Down	3	37	25	100	210	86	289	83	834
Guntersville	Up	1,050	619	624	1,676	238	875	395	370	5,848
	Down	71	40	60	185	252	99	424	189	1,320
Wheeler	Up	1,111	657	949	2,929	1,485	866	1,666	573	10,236
	Down	142	40	51	274	950	121	765	200	2,543
Wilson	Up	1,092	662	871	2,911	1,502	870	1,672	667	10,247
	Down	126	55	45	271	1,004	111	759	224	2,597
Pickwick	Up	4,570	830	1,293	3,236	684	906	1,439	584	13,541
	Down	194	54	330	305	810	155	779	1,013	3,640
Kentucky	Up	13,617	1,011	4,757	3,180	1,122	1,094	1,848	1,035	27,664
	Down	473	51	4,577	787	727	392	910	1,181	9,099

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 80
2005 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River										
Emsworth	Up	8,025	655	892	14	558	412	345	190	11,091
	Down	8,803	135	482	5	115	41	448	58	10,087
Dashields	Up	8,096	700	1,727	16	609	500	359	205	12,211
	Down	8,751	176	182	3	141	42	462	56	9,813
Montgomery	Up	8,603	830	1,269	20	794	689	628	353	13,185
	Down	8,827	204	81	3	178	59	547	56	9,956
New Cumberland	Up	18,059	1,208	861	89	1,556	1,061	1,357	1,105	25,296
	Down	7,429	548	88	41	197	51	647	80	9,080
Pike Island	Up	21,711	1,339	935	85	1,677	1,227	2,596	1,172	30,741
	Down	7,402	583	116	41	184	72	1,082	93	9,574
Hannibal	Up	17,084	1,400	1,531	91	1,711	1,282	2,715	1,321	27,135
	Down	23,602	591	162	52	381	73	1,157	136	26,153
Willow Island	Up	16,921	1,504	1,779	91	1,365	1,262	2,755	1,650	27,327
	Down	20,076	662	188	52	376	108	1,174	200	22,836
Belleville	Up	17,703	1,739	2,284	94	1,931	1,466	2,968	1,883	30,069
	Down	20,342	440	175	53	345	111	1,184	170	22,820
Racine	Up	17,713	1,749	2,084	99	1,956	1,788	3,030	1,920	30,338
	Down	20,488	436	884	53	353	122	1,208	218	23,763
R.C. Byrd	Up	20,123	2,896	4,410	110	2,759	1,899	3,172	2,309	37,678
	Down	21,928	495	249	59	393	160	1,277	242	24,803
Greenup	Up	7,178	2,318	4,446	132	3,457	1,972	5,016	2,336	26,854
	Down	35,548	5,447	201	69	551	175	1,401	337	43,729
Meldahl	Up	5,756	2,513	3,814	133	3,502	2,158	5,190	1,687	24,751
	Down	28,543	5,407	291	77	591	180	1,403	535	37,027
Markland	Up	6,299	2,581	3,581	186	5,320	3,106	6,309	2,286	29,667
	Down	15,710	2,764	267	2,333	606	201	1,847	452	24,180
McAlpine	Up	10,951	2,874	3,175	275	5,776	3,428	7,432	2,498	36,408
	Down	9,660	2,792	229	2,936	700	192	2,284	494	19,287
Cannelton	Up	14,242	3,135	478	294	6,163	3,439	7,331	1,898	36,979
	Down	8,859	1,060	3,969	2,963	699	799	2,328	654	21,331
Newburgh	Up	21,602	3,615	587	531	6,597	4,447	7,640	2,654	47,672
	Down	6,587	1,099	3,678	3,798	706	873	2,420	665	19,826
J.T. Myers	Up	19,928	3,985	501	403	7,380	4,939	7,981	2,813	47,930
	Down	11,566	931	405	6,440	765	788	2,495	581	23,971
Smithland	Up	18,617	3,992	567	357	7,375	4,893	7,967	2,814	46,582
	Down	16,912	938	4,438	7,091	812	767	2,509	649	34,114
L/D 52	Up	19,230	6,307	2,260	2,405	8,690	6,026	9,244	3,756	57,918
	Down	10,881	843	13,430	7,874	1,397	497	3,021	1,474	39,418
L/D 53	Up	7,739	6,476	638	2,867	8,905	6,347	9,723	3,311	46,006
	Down	11,777	825	11,746	8,252	1,470	467	3,215	2,087	39,839
Kanawha River										
London	Up	5	0	23	0	0	0	0	2	29
	Down	783	0	2	0	0	0	4	2	791
Marmet	Up	89	265	479	0	259	53	2	30	1,176
	Down	13,507	7	3	0	1	8	2	10	13,537
Winfield	Up	296	888	2,754	0	760	69	63	171	5,002
	Down	13,368	4	8	0	84	2	2	56	13,524
Monongahela River										
Opekiska	Up	106	0	0	0	0	6	6	0	118
	Down	168	0	0	0	0	0	0	0	168
Hildebrand	Up	101	0	0	0	0	6	6	0	113
	Down	170	0	0	0	0	0	0	0	170
Morgantown	Up	98	0	71	0	0	6	9	0	183
	Down	175	0	527	0	0	0	0	0	701
Point Marion	Up	2,401	70	71	0	0	6	9	0	2,557
	Down	844	0	1,098	0	0	0	0	2	1,944

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

Table 80 (cont'd)
2005 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Monongahela River										
Grays Landing	Up	2,389	69	71	0	2	6	9	0	2,545
	Down	974	0	1,101	0	0	0	0	2	2,076
Maxwell	Up	5,207	71	191	0	3	268	20	102	5,862
	Down	6,907	3	1,082	0	0	4	0	6	8,001
L/D 4	Up	428	150	318	0	9	147	41	237	1,330
	Down	9,536	2	1,122	0	0	7	3	14	10,683
L/D 3	Up	1,657	309	325	0	136	116	39	144	2,726
	Down	9,793	0	1,083	0	18	6	447	11	11,358
Braddock [1/]	Up	7,034	383	497	11	249	209	135	78	8,595
	Down	9,565	86	1,088	0	98	9	400	31	11,276
Allegheny River										
L/D 8	Up	0	0	5	0	0	0	0	0	5
	Down	0	0	669	0	0	0	0	5	674
L/D 7	Up	8	0	6	0	6	11	11	0	41
	Down	0	0	37	0	0	0	4	3	44
L/D 6	Up	8	0	6	0	6	11	11	0	41
	Down	0	0	35	0	0	0	4	3	42
L/D 5	Up	17	0	6	0	6	23	17	2	70
	Down	29	0	40	0	0	5	5	3	82
L/D 4	Up	14	94	26	0	49	39	66	9	296
	Down	34	0	993	0	0	5	5	15	1,052
L/D 3	Up	1,199	136	20	2	120	68	163	13	1,721
	Down	38	3	66	2	0	9	8	16	141
L/D 2	Up	1,206	134	23	2	121	70	170	12	1,737
	Down	33	3	66	2	2	9	15	16	145
Green River										
L/D 2	Up	3,710	0	0	0	0	8	2	14	3,733
	Down	1,491	0	0	33	0	3	0	1	1,528
L/D 1	Up	4,098	0	65	3	0	329	2	85	4,581
	Down	4,305	0	5	33	0	14	0	6	4,362
Cumberland River										
Old Hickory	Up	4,359	13	265	0	26	0	13	6	4,682
	Down	25	0	6	0	0	0	0	8	39
Cheatham	Up	4,443	596	4,046	0	112	139	417	1,014	10,766
	Down	0	4	12	0	0	49	174	21	260
Barkley	Up	749	312	1,306	8	47	30	24	461	2,937
	Down	133	12	425	19	54	42	143	141	968
Tennessee River										
Ft. Loudoun	Up	25	256	29	0	6	102	3	8	429
	Down	0	0	5	0	0	11	12	10	38
Watts Bar	Up	38	263	70	34	16	150	16	14	602
	Down	0	121	5	78	9	13	37	12	274
Chickamauga	Up	38	258	69	37	41	546	20	27	1,036
	Down	1	126	7	77	87	13	34	15	362
Nickajack	Up	95	608	154	201	228	460	292	156	2,194
	Down	3	44	31	89	160	80	201	48	657
Guntersville	Up	409	636	440	1,397	282	771	427	440	4,801
	Down	27	46	53	167	192	102	322	126	1,034
Wheeler	Up	457	686	781	2,173	1,489	890	1,360	711	8,547
	Down	83	46	39	238	822	86	791	150	2,253
Wilson	Up	440	703	790	2,158	1,489	876	1,350	736	8,543
	Down	80	49	35	251	885	89	792	147	2,329
Pickwick	Up	4,247	842	1,187	2,497	627	947	1,324	586	12,257
	Down	135	94	220	257	647	99	866	961	3,278
Kentucky	Up	13,388	1,195	4,900	2,499	911	1,139	1,776	1,248	27,056
	Down	507	92	5,285	790	563	171	968	1,181	9,557

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 81
2006 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River										
Emsworth	Up	9,180	693	1,304	18	603	476	278	293	12,845
	Down	7,264	148	463	0	125	37	468	75	8,580
Dashields	Up	9,163	714	1,949	19	627	552	300	290	13,614
	Down	7,261	185	204	0	128	65	482	93	8,418
Montgomery	Up	7,350	761	1,239	19	820	655	552	513	11,909
	Down	7,661	199	150	0	139	60	593	46	8,847
New Cumberland	Up	16,346	1,013	823	35	1,679	1,140	1,232	1,083	23,352
	Down	6,376	651	82	72	215	106	664	74	8,242
Pike Island	Up	20,232	1,077	957	39	1,847	1,315	2,780	1,176	29,421
	Down	6,920	649	78	69	195	134	1,060	110	9,214
Hannibal	Up	16,243	1,146	1,373	42	1,836	1,400	2,778	1,272	26,090
	Down	20,964	629	76	71	394	144	1,185	137	23,601
Willow Island	Up	16,098	1,279	1,495	42	1,508	1,429	2,794	1,544	26,189
	Down	17,457	725	136	69	392	166	1,175	219	20,340
Belleville	Up	16,807	1,620	1,812	45	2,115	1,518	2,874	1,759	28,550
	Down	17,742	604	157	68	397	172	1,193	225	20,559
Racine	Up	16,797	1,607	1,567	47	2,120	1,865	2,948	1,781	28,731
	Down	18,508	599	775	69	390	191	1,273	328	22,134
R.C. Byrd	Up	17,368	2,708	3,996	64	2,901	1,984	3,098	2,142	34,262
	Down	20,040	636	288	75	497	194	1,264	312	23,306
Greenup	Up	6,088	2,342	4,185	90	3,269	2,045	4,748	2,225	24,993
	Down	35,385	6,136	151	85	680	207	1,363	390	44,397
Meldahl	Up	4,856	2,540	3,669	104	3,311	2,171	4,838	1,443	22,932
	Down	27,777	6,025	357	105	694	280	1,414	577	37,229
Markland	Up	6,902	2,567	3,493	173	4,821	2,768	5,884	1,808	28,416
	Down	15,261	3,320	231	2,215	677	256	1,863	458	24,281
McAlpine	Up	12,082	2,714	2,829	181	5,148	3,160	7,217	1,909	35,241
	Down	9,484	3,359	211	3,007	846	297	2,210	551	19,964
Cannelton	Up	15,220	3,004	422	211	5,543	3,316	7,301	1,377	36,394
	Down	9,046	1,683	4,076	3,036	808	860	2,239	769	22,518
Newburgh	Up	23,638	3,498	476	400	5,905	4,222	7,732	2,028	47,898
	Down	6,962	1,721	3,719	4,031	790	1,037	2,255	775	21,290
J.T. Myers	Up	20,992	3,724	463	165	6,733	4,661	7,972	2,148	46,860
	Down	11,661	1,657	378	6,910	781	969	2,300	655	25,309
Smithland	Up	18,976	3,738	554	161	6,730	4,651	8,059	2,128	44,996
	Down	17,322	1,680	4,509	7,679	831	988	2,338	683	36,030
L/D 52	Up	19,768	5,320	3,004	1,503	7,995	5,690	9,827	3,090	56,198
	Down	9,553	1,074	14,440	8,623	1,498	700	3,153	1,166	40,206
L/D 53	Up	8,789	5,479	755	2,266	8,377	5,827	10,119	2,663	44,275
	Down	10,752	1,069	12,775	9,017	1,602	682	3,367	1,521	40,785
Kanawha River										
London	Up	9	0	35	0	0	0	0	5	49
	Down	1,845	0	0	0	0	0	3	3	1,851
Marmet	Up	58	321	513	0	266	76	2	31	1,268
	Down	14,151	13	5	0	0	7	2	51	14,229
Winfield	Up	708	870	2,773	0	803	155	53	186	5,548
	Down	14,102	19	63	0	119	1	6	54	14,364
Monongahela River										
Opekiska	Up	240	0	0	0	0	0	0	0	240
	Down	0	0	0	0	0	0	1	0	1
Hildebrand	Up	240	0	0	0	0	0	0	0	240
	Down	0	0	0	0	0	0	1	0	1
Morgantown	Up	240	0	119	0	0	0	0	0	359
	Down	0	0	522	0	0	0	1	0	522
Point Marion	Up	3,041	64	119	0	0	0	0	1	3,224
	Down	573	0	1,181	0	0	0	1	2	1,757

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

Table 81 (cont'd)
2006 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Monongahela River										
Grays Landing	Up	2,957	64	120	0	0	0	0	1	3,141
	Down	828	0	1,175	0	0	0	1	10	2,012
Maxwell	Up	6,168	67	188	0	0	495	0	85	7,002
	Down	7,466	0	1,182	0	0	0	1	4	8,652
L/D 4	Up	2,090	150	363	0	9	134	22	328	3,094
	Down	9,890	2	1,192	0	0	7	3	115	11,209
L/D 3	Up	3,103	319	393	0	130	78	34	170	4,226
	Down	9,805	2	1,168	0	17	11	401	9	11,411
Braddock [1/]	Up	8,314	342	539	12	259	250	115	108	9,939
	Down	8,580	35	1,230	0	112	23	428	21	10,429
Allegheny River										
L/D 8	Up	0	0	0	0	0	0	0	1	1
	Down	0	0	618	0	0	0	0	5	622
L/D 7	Up	6	0	9	0	0	17	0	4	35
	Down	0	0	24	0	0	0	0	5	29
L/D 6	Up	6	0	9	0	0	17	0	2	33
	Down	0	0	23	0	0	0	0	5	27
L/D 5	Up	6	0	12	0	3	25	6	4	56
	Down	36	0	30	0	0	2	2	5	73
L/D 4	Up	6	112	25	0	61	33	20	8	264
	Down	37	43	987	0	16	3	3	54	1,144
L/D 3	Up	1,138	153	36	0	158	61	61	18	1,626
	Down	38	52	85	0	16	9	3	48	249
L/D 2	Up	1,137	156	39	0	158	58	71	17	1,636
	Down	38	46	87	0	15	10	16	49	261
Green River										
L/D 2	Up	3,485	0	6	0	0	0	1	3	3,494
	Down	1,912	0	0	32	0	0	0	5	1,948
L/D 1	Up	3,450	0	53	2	0	272	1	126	3,902
	Down	4,613	0	0	30	0	3	0	16	4,662
Cumberland River										
Old Hickory	Up	4,552	0	366	0	29	0	0	4	4,951
	Down	44	0	4	0	0	0	0	2	50
Cheatham	Up	4,619	479	4,310	30	156	107	553	1,065	11,319
	Down	38	4	36	0	0	101	224	23	427
Barkley	Up	1,051	283	1,672	7	55	35	51	530	3,684
	Down	70	15	394	38	28	73	201	119	938
Tennessee River										
Ft. Loudoun	Up	2	247	40	0	11	135	3	2	439
	Down	0	1	13	0	0	15	15	2	46
Watts Bar	Up	3	247	93	18	14	189	17	5	585
	Down	0	76	12	84	5	18	25	5	225
Chickamauga	Up	3	247	99	18	27	547	17	6	963
	Down	0	78	12	86	93	18	24	6	316
Nickajack	Up	93	543	135	116	234	446	330	103	1,999
	Down	3	24	33	67	147	95	225	34	627
Guntersville	Up	410	581	400	1,342	308	760	483	387	4,671
	Down	38	34	30	155	161	114	331	66	929
Wheeler	Up	422	639	679	1,618	1,411	851	1,852	612	8,084
	Down	30	42	28	274	839	117	758	136	2,224
Wilson	Up	418	645	687	1,606	1,415	823	1,854	617	8,064
	Down	30	39	28	271	901	114	777	114	2,274
Pickwick	Up	4,843	751	928	1,896	731	854	1,652	572	12,227
	Down	66	47	325	267	683	136	819	748	3,090
Kentucky	Up	15,148	1,071	4,555	1,948	1,021	995	2,240	1,309	28,288
	Down	451	59	5,717	818	607	188	873	872	9,585

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 82
2007 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Ohio River										
Emsworth	Up	8,393	665	1,088	14	549	393	213	165	11,478
	Down	6,386	200	633	6	138	64	338	157	7,921
Dashields	Up	8,417	639	2,144	15	574	460	253	157	12,659
	Down	6,362	245	218	6	121	54	351	154	7,512
Montgomery	Up	6,521	716	1,534	15	746	536	447	329	10,844
	Down	7,166	226	311	6	133	85	443	97	8,466
New Cumberland	Up	13,799	878	1,017	42	1,573	891	958	1,002	20,160
	Down	6,218	504	270	96	203	89	479	85	7,944
Pike Island	Up	17,331	930	1,130	45	1,755	973	1,869	1,113	25,146
	Down	6,707	461	228	94	211	139	859	131	8,831
Hannibal	Up	14,810	993	1,381	45	1,721	1,356	2,038	1,208	23,552
	Down	20,131	466	159	99	376	184	1,103	227	22,744
Willow Island	Up	14,775	1,104	1,498	50	1,454	1,368	2,062	1,445	23,755
	Down	17,058	546	208	100	378	198	1,123	279	19,890
Belleville	Up	15,459	1,593	1,752	53	2,040	1,467	2,312	1,624	26,300
	Down	17,107	498	222	100	365	206	1,135	313	19,947
Racine	Up	15,623	1,587	1,440	56	2,094	1,813	2,356	1,656	26,624
	Down	18,160	539	944	106	384	203	1,255	326	21,917
R.C. Byrd	Up	15,488	2,622	3,703	81	2,670	1,917	2,395	1,955	30,831
	Down	19,805	500	437	106	471	249	1,187	355	23,109
Greenup	Up	5,164	2,336	3,760	110	3,347	2,068	3,168	1,883	21,835
	Down	31,157	6,122	244	109	672	265	1,343	461	40,373
Meldahl	Up	4,184	2,294	3,403	117	3,382	2,172	3,258	1,428	20,240
	Down	23,089	6,365	310	107	782	270	1,285	716	32,924
Markland	Up	6,261	2,346	3,221	170	4,980	2,920	3,895	1,471	25,265
	Down	11,897	3,518	126	1,978	732	293	1,740	514	20,798
McAlpine	Up	11,540	2,472	2,716	204	5,411	3,243	5,114	1,597	32,297
	Down	6,588	3,518	180	2,574	854	366	2,196	577	16,853
Cannelton	Up	15,309	2,566	310	210	5,662	3,272	5,085	1,087	33,501
	Down	6,329	1,306	4,185	2,623	778	979	2,174	765	19,140
Newburgh	Up	24,345	3,068	387	387	6,040	4,200	5,351	1,835	45,614
	Down	6,011	1,353	3,804	3,557	813	1,126	2,157	698	19,519
J.T. Myers	Up	18,880	3,441	379	282	6,996	4,660	5,486	1,882	42,007
	Down	9,769	1,559	475	6,071	779	1,037	2,314	556	22,559
Smithland	Up	17,923	3,499	485	279	7,028	4,689	5,508	1,902	41,313
	Down	16,032	1,572	3,265	6,812	769	1,006	2,310	600	32,367
L/D 52	Up	18,815	5,017	1,374	2,118	8,228	5,714	6,874	2,699	50,839
	Down	10,022	995	13,651	7,453	1,418	767	2,915	893	38,114
L/D 53	Up	7,679	5,107	530	2,574	8,528	5,812	6,939	2,397	39,566
	Down	11,152	1,013	11,975	7,708	1,516	727	3,075	1,542	38,708
Kanawha River										
London	Up	5	0	8	0	0	0	0	8	20
	Down	1,933	0	0	0	0	2	0	7	1,941
Marmet	Up	112	351	346	0	211	63	2	83	1,168
	Down	14,702	0	14	0	0	0	12	108	14,834
Winfield	Up	659	981	2,300	0	741	78	76	231	5,065
	Down	11,646	9	19	0	109	0	25	274	12,082
Monongahela River										
Opekiska	Up	240	0	0	0	0	0	0	2	241
	Down	0	0	0	0	0	0	0	2	2
Hildebrand	Up	240	0	0	0	0	0	0	2	241
	Down	0	0	0	0	0	0	0	2	2
Morgantown	Up	240	0	119	0	0	0	0	0	359
	Down	0	0	400	0	0	0	0	2	401
Point Marion	Up	2,279	43	135	0	0	0	0	2	2,459
	Down	980	0	1,079	0	0	0	0	7	2,067

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

Table 82 (cont'd)
2007 Ohio River System Lock Commodity Traffic by Direction
(Kilotons)

River/Project	Direction	Coal	Petrol	Aggs	Grains	Chem	Ores & Minerals	Iron & Steel	Other	Total
Monongahela River										
Grays Landing	Up	2,253	46	135	0	0	0	0	2	2,435
	Down	1,426	0	1,082	0	0	0	0	4	2,512
Maxwell	Up	4,977	48	147	0	0	421	4	142	5,738
	Down	6,638	0	1,081	0	0	2	0	7	7,727
L/D 4	Up	2,355	106	328	0	9	64	10	458	3,329
	Down	8,984	0	1,081	0	0	2	2	22	10,091
L/D 3	Up	3,075	254	466	0	124	72	24	313	4,327
	Down	9,136	2	1,068	0	23	6	267	49	10,550
Braddock [1/]	Up	7,722	326	611	14	213	155	80	257	9,378
	Down	7,963	63	1,036	7	101	38	319	32	9,559
Allegheny River										
L/D 8	Up	0	0	26	0	0	0	0	0	26
	Down	0	0	575	0	0	0	0	1	576
L/D 7	Up	12	0	8	0	0	3	9	0	32
	Down	0	0	30	0	0	0	0	1	31
L/D 6	Up	12	0	8	0	0	5	8	0	32
	Down	0	0	30	0	0	0	0	1	31
L/D 5	Up	15	0	8	0	0	5	11	0	38
	Down	39	0	29	0	0	1	0	1	69
L/D 4	Up	12	92	22	0	44	9	24	16	218
	Down	40	22	793	3	5	3	3	84	952
L/D 3	Up	1,227	157	24	3	97	30	61	19	1,617
	Down	43	29	47	0	6	6	3	71	205
L/D 2	Up	1,238	154	26	3	98	30	61	20	1,630
	Down	54	28	41	0	8	10	13	71	224
Green River										
L/D 2	Up	2,342	0	0	0	0	0	0	1	2,342
	Down	1,154	0	0	15	0	0	0	1	1,170
L/D 1	Up	2,319	0	3	0	0	335	0	113	2,770
	Down	5,106	0	0	18	0	41	0	11	5,176
Cumberland River										
Old Hickory	Up	4,376	15	389	0	26	0	0	3	4,810
	Down	18	0	6	0	0	0	2	5	32
Cheatham	Up	4,329	426	4,187	21	157	88	427	956	10,592
	Down	68	17	67	2	3	103	300	52	612
Barkley	Up	1,763	343	3,616	154	120	120	278	801	7,196
	Down	73	7	1,051	106	73	91	275	322	1,998
Tennessee River										
Ft. Loudoun	Up	5	288	32	0	0	69	0	4	397
	Down	0	0	2	0	0	31	33	3	69
Watts Bar	Up	2	274	87	15	27	95	5	25	530
	Down	0	6	11	30	2	20	52	5	125
Chickamauga	Up	2	274	88	23	29	394	8	27	843
	Down	0	6	9	30	90	29	45	7	215
Nickajack	Up	86	496	162	102	159	386	289	112	1,793
	Down	2	5	18	31	87	64	313	21	541
Guntersville	Up	140	548	637	1,442	221	670	406	289	4,353
	Down	50	17	17	79	94	87	319	35	696
Wheeler	Up	189	639	886	2,169	1,528	914	1,472	465	8,263
	Down	91	36	28	190	744	54	758	116	2,017
Wilson	Up	181	627	868	2,178	1,529	922	1,470	477	8,252
	Down	88	38	28	187	814	56	754	125	2,088
Pickwick	Up	4,400	670	1,150	2,396	647	988	1,362	379	11,992
	Down	104	41	480	184	609	78	807	928	3,231
Kentucky	Up	12,784	901	2,744	2,276	945	1,027	1,630	717	23,025
	Down	492	53	4,671	498	539	134	799	677	7,864

Source: COE LPMS data

Totals may not equal the sum of the commodities due to rounding.

[1/] Mon 2 was renamed Braddock in 2004

Table 83
1998 – 2007 Ohio River System Total Traffic by Project
(Kilotons)

River/Project	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Annual Rate 1998-2007
Ohio River											
Emsworth	23,153	23,561	22,334	21,729	23,687	19,211	18,791	21,178	21,425	19,399	-1.8%
Dashields	24,563	24,528	23,230	22,839	24,516	20,012	19,679	22,024	22,032	20,171	-2.0%
Montgomery	26,866	26,560	25,974	25,555	26,709	21,093	20,260	23,142	20,756	19,310	-3.2%
New Cumberland	35,425	33,906	34,062	33,854	35,251	32,189	31,478	34,376	31,594	28,104	-2.3%
Pike Island	43,027	41,276	41,460	41,682	43,634	39,062	38,912	40,314	38,636	33,976	-2.3%
Hannibal	47,627	47,258	48,344	49,476	51,200	48,884	50,101	53,288	49,690	46,297	-0.3%
Willow Island	44,766	44,320	45,635	46,975	48,422	46,592	48,123	50,164	46,529	43,645	-0.3%
Belleville	48,688	47,983	49,201	49,243	51,118	49,482	51,380	52,889	49,109	46,247	-0.5%
Racine	49,517	48,646	50,022	50,239	51,764	50,625	52,297	54,100	50,865	48,541	-0.2%
R.C. Byrd	57,855	55,970	57,879	58,108	54,898	53,164	57,775	62,482	57,568	53,940	-0.7%
Greenup	70,635	70,044	71,713	70,563	65,915	62,135	64,502	70,583	69,391	62,208	-1.3%
Meldahl	63,739	62,784	63,391	63,813	57,771	53,222	55,240	61,778	60,161	53,163	-1.8%
Markland	55,119	54,850	56,062	55,807	49,625	45,248	50,050	53,847	52,697	46,062	-1.8%
McAlpine	52,857	54,835	55,790	56,170	51,893	49,482	52,753	55,695	55,205	49,150	-0.7%
Cannelton	54,386	56,650	55,786	56,653	55,841	54,002	56,888	58,310	58,912	52,641	-0.3%
Newburgh	64,131	64,509	64,433	66,527	64,200	62,475	67,151	67,498	69,188	65,133	0.2%
J.T. Myers [1/]	74,151	71,393	72,447	75,290	68,961	62,655	67,880	71,901	72,169	64,565	-1.4%
Smithland	84,606	82,115	82,610	85,915	79,040	72,305	77,020	80,697	81,025	73,679	-1.4%
L/D 52	97,695	95,125	94,687	96,715	93,382	87,420	94,954	97,336	96,404	88,953	-0.9%
L/D 53 [2/]	---	87,814	89,161	87,085	85,638	81,742	85,459	85,845	85,059	78,274	n/a
Kanawha River											
London	7,278	6,505	6,017	4,662	4,466	2,872	1,374	820	1,900	1,962	-12.3%
Marmet	16,274	14,733	16,481	16,439	13,477	14,107	13,800	14,714	15,521	16,002	-0.2%
Winfield	21,356	19,537	20,693	20,309	17,567	18,076	17,808	18,527	19,911	17,148	-2.2%
Monongahela River											
Opekiska	179	28	66	289	442	57	446	286	241	243	3.1%
Hildebrand	177	26	72	292	442	47	408	282	241	243	3.2%
Morgantown	247	358	601	830	924	491	1,011	885	881	760	11.9%
Point Marion	5,194	5,218	5,608	5,893	5,594	4,508	4,638	4,501	4,981	4,526	-1.4%
Grays Landing	5,658	5,777	5,855	6,073	5,720	4,563	4,691	4,621	5,154	4,947	-1.3%
Maxwell	10,886	13,384	12,338	12,565	12,869	12,427	11,627	13,863	15,654	13,466	2.1%
L/D 4	10,880	13,220	11,960	11,928	12,905	9,849	9,443	12,013	14,303	13,420	2.1%
L/D 3	16,110	18,011	15,613	14,660	15,446	11,699	11,973	14,084	15,638	14,877	-0.8%
Braddock [3/]	20,534	21,137	20,088	19,706	21,734	16,979	17,007	19,871	20,368	18,937	-0.8%
Allegheny River											
L/D 8	463	673	702	229	328	797	767	678	623	602	2.7%
L/D 7	471	134	137	104	56	240	64	85	64	63	-18.2%
L/D 6	179	164	137	119	65	243	74	83	60	63	-9.9%
L/D 5	757	769	691	176	787	910	860	152	130	108	-17.7%
L/D 4	1,789	1,630	1,410	502	1,038	1,170	1,248	1,347	1,408	1,170	-4.2%
L/D 3	2,555	2,581	2,554	2,407	1,671	2,373	2,266	1,861	1,875	1,822	-3.3%
L/D 2	2,480	2,621	2,582	2,459	1,746	2,422	2,284	1,882	1,896	1,854	-2.9%
Green River											
L/D 2	2,122	1,502	1,553	4,320	6,083	3,781	3,157	5,261	5,442	3,512	5.2%
L/D 1	4,783	4,371	3,984	7,200	9,514	6,845	7,324	8,943	8,564	7,946	5.2%
Cumberland River											
Old Hickory	3,511	3,942	3,836	3,850	4,181	4,536	3,911	4,721	5,001	4,841	3.3%
Cheatham	8,710	9,551	8,659	9,124	9,434	9,783	9,765	11,026	11,746	11,203	2.5%
Barkley	9,654	9,081	8,967	8,398	6,901	2,294	2,821	3,906	4,622	9,193	-0.5%
Tennessee River											
Ft. Loudoun	627	639	819	682	570	565	602	467	484	466	-2.9%
Watts Bar	1,701	1,768	1,995	1,586	1,498	1,417	1,139	875	809	655	-9.1%
Chickamauga	2,529	2,306	2,452	1,924	1,902	1,845	1,585	1,398	1,279	1,059	-8.3%
Nickajack	4,959	4,687	4,793	4,093	3,941	3,696	3,384	2,851	2,626	2,333	-7.3%
Guntersville	8,974	9,390	8,942	8,581	9,091	7,612	7,168	5,835	5,600	5,050	-5.6%
Wheeler	14,373	15,350	14,628	12,484	13,120	12,874	12,779	10,800	10,308	10,280	-3.3%
Wilson	14,605	15,518	14,798	12,673	13,272	12,971	12,844	10,872	10,338	10,340	-3.4%
Pickwick	20,388	20,405	19,153	17,628	18,303	16,916	17,181	15,535	15,317	15,223	-2.9%
Kentucky	33,356	31,767	28,836	27,737	29,579	32,403	36,764	36,613	37,873	30,888	-0.8%

Source: COE LPMS

[1/] Uniontown was renamed J.T. Myers in 1997

[2/] No data collected at L/D 53 before 1999

[3/] Mon 2 was renamed Braddock in 2004

All of these factors affect transit times, which are composed of delay and processing times and relate directly to the transportation cost borne by the shipper. In 2007, L/D 52 on the Ohio and Kentucky Lock on the Tennessee River had the highest average tow transit times in the ORS with 7.4 and 6.2 hours per tow each, due to high delays. Chickamauga lock on the Tennessee River had the highest average tow processing time of 5.8 hours per tow, due to a high number of lockage cuts per tow. Project performance in 2004 - 2007 is shown in **Tables 84 - 87**. Historic delay performance is shown in **Table 88**.

Overall, a majority of ORS projects show a decrease in traffic relative to 10 years ago. The Green River projects show growth as demand for its coal has increased.On average, most projects in the ORS show historic traffic growth. Growth on the lower Ohio, with the exception of Newburgh has declined over the last ten years.

Photo 25: Tow with coal barges locking through Locks and Dam 2, Monongahela River

Table 84
2004 Performance Characteristics of Ohio River System

River/Project	No. Tows	Number of Barges Loaded	Empty	Total	Avg. Barges /Tow	Avg. Tons Ktons	/Tow	Avg. Time /Tow (min.) Delay	Process	Total	Comm. Lockages	Avg. Lock Cuts/Tow [1/]
Ohio River												
Emsworth	4,096	13,491	7,803	21,294	5.2	18,791	4,588	35.0	63.8	98.8	4,856	1.2
Dashields	3,920	14,479	8,680	23,159	5.9	19,679	5,020	29.4	63.5	92.9	4,750	1.2
Montgomery	4,020	14,276	8,304	22,580	5.6	20,260	5,040	34.3	65.8	100.1	4,850	1.2
New Cumberland	4,285	21,032	15,418	36,450	8.5	31,478	7,346	16.1	57.6	73.7	4,283	1.0
Pike Island	4,842	25,823	18,600	44,423	9.2	38,912	8,036	18.7	54.1	72.8	4,842	1.0
Hannibal	4,632	33,209	15,729	48,938	10.6	50,101	10,816	26.3	55.6	81.9	4,633	1.0
Willow Island	4,246	31,913	14,470	46,383	10.9	48,123	11,334	25.4	56.6	82.0	4,246	1.0
Belleville	4,310	33,953	15,691	49,644	11.5	51,380	11,921	30.4	45.0	75.4	4,309	1.0
Racine	4,420	34,551	15,687	50,238	11.4	52,297	11,832	41.1	64.8	105.9	4,420	1.0
R.C. Byrd	5,131	37,391	15,858	53,249	10.4	57,775	11,260	40.2	60.0	100.2	5,146	1.0
Greenup	5,844	40,681	22,125	62,806	10.7	64,502	11,037	43.8	51.8	95.6	5,879	1.0
Capt. A. Meldahl	4,834	34,245	16,437	50,682	10.5	55,240	11,427	63.0	59.9	122.9	4,934	1.0
Markland	4,550	31,346	12,843	44,189	9.7	50,050	11,000	48.6	59.3	107.9	4,621	1.0
McAlpine	5,123	32,845	15,171	48,016	9.4	52,753	10,297	80.6	57.1	137.7	5,042	1.0
Cannelton	5,109	35,952	18,040	53,992	10.6	56,888	11,135	40.6	59.0	99.6	5,112	1.0
Newburgh	6,211	42,610	24,520	67,130	10.8	67,151	10,812	32.3	50.3	82.6	6,382	1.0
J.T. Myers	5,724	42,552	21,137	63,689	11.1	67,880	11,859	41.6	52.0	93.6	5,778	1.0
Smithland	7,023	48,000	24,133	72,133	10.3	77,020	10,967	15.1	55.8	70.9	7,082	1.0
L/D 52	9,394	58,862	31,548	90,410	9.6	94,954	10,108	24.1	14.7	38.8	9,390	1.0
L/D 53	6,863	52,409	23,138	75,547	11.0	85,459	12,452	6.0	5.4	11.4	6,863	1.0
Kanawha River												
London	512	1,205	1,182	2,387	4.7	1,374	2,684	2.6	100.4	103.0	1,153	2.3
Marmet	4,025	10,420	9,851	20,271	5.0	13,800	3,429	82.5	164.4	246.9	15,919	4.0
Winfield	2,361	12,913	9,143	22,056	9.3	17,808	7,543	23.0	72.3	95.3	2,363	1.0
Monongahela River												
Opekiska	212	376	394	770	3.6	446	2,104	0.4	29.5	29.9	212	1.0
Hildebrand	187	336	384	720	3.9	408	2,182	3.1	34.6	37.7	187	1.0
Morgantown	459	826	810	1,636	3.6	1,011	2,203	0.4	30.8	31.2	459	1.0
Point Marion	1,412	4,069	3,513	7,582	5.4	4,638	3,285	1.9	35.1	37.0	1,412	1.0
Grays Landing	1,431	4,118	3,527	7,645	5.3	4,691	3,278	2.4	37.8	40.2	1,431	1.0
Maxwell	3,131	10,004	8,837	18,841	6.0	11,627	3,714	5.5	44.9	50.4	3,131	1.0
L/D 4	4,053	7,342	7,531	14,873	3.7	9,443	2,330	17.6	42.1	59.7	4,307	1.1
L/D 3	5,235	9,012	7,917	16,929	3.2	11,973	2,287	15.2	36.4	51.6	5,235	1.0
Braddock [2/]	3,587	12,180	7,006	19,186	5.3	17,007	4,741	13.2	47.3	60.5	4,046	1.1
Allegheny River												
L/D 8	974	481	493	974	1.0	767	787	0.6	28.6	29.2	976	1.0
L/D 7	88	66	89	155	1.8	64	727	0.1	31.5	31.6	104	1.2
L/D 6	99	72	97	169	1.7	74	747	0.1	32.9	33.0	115	1.2
L/D 5	1,033	902	938	1,840	1.8	860	833	1.8	49.0	50.8	1,645	1.6
L/D 4	1,427	1,186	1,238	2,424	1.7	1,248	875	3.0	46.0	49.0	2,180	1.5
L/D 3	1,343	1,955	1,983	3,938	2.9	2,266	1,687	6.9	57.9	64.8	2,144	1.6
L/D 2	1,442	1,973	2,070	4,043	2.8	2,284	1,584	6.9	60.2	67.1	2,255	1.6
Green River												
L/D 2	995	2,125	1,540	3,665	3.7	3,157	3,173	0.5	21.4	21.9	995	1.0
L/D 1	1,956	4,898	1,957	6,855	3.5	7,324	3,744	1.5	23.2	24.7	1,956	1.0
Cumberland River												
Old Hickory	828	2,169	2,161	4,330	5.2	3,911	4,723	5.8	106.7	112.5	1,573	1.9
Cheatham	1,370	5,723	5,370	11,093	8.1	9,765	7,128	54.1	86.4	140.5	1,632	1.2
Barkley	884	1,561	4,572	6,133	6.9	2,821	3,191	20.6	73.7	94.3	1,130	1.3
Tennessee River												
Ft. Loudoun	183	331	237	568	3.1	602	3,290	33.0	226.2	259.2	604	3.3
Watts Bar	238	718	539	1,257	5.3	1,139	4,786	42.9	340.8	383.7	1,270	5.3
Chickamauga	275	1,055	830	1,885	6.9	1,585	5,764	211.8	405.5	617.3	1,873	6.8
Nickajack	652	2,174	1,711	3,885	6.0	3,384	5,190	5.9	83.1	89.0	824	1.3
Guntersville	951	4,627	3,588	8,215	8.6	7,168	7,537	45.3	117.7	163.0	1,615	1.7
Wheeler	1,657	7,944	5,557	13,501	8.1	12,779	7,712	34.1	102.7	136.8	2,510	1.5
Wilson	1,674	7,961	5,595	13,556	8.1	12,844	7,673	54.2	118.7	172.9	2,524	1.5
Pickwick	1,958	10,992	8,803	19,795	10.1	17,181	8,775	42.1	94.3	136.4	2,787	1.4
Kentucky	3,485	22,981	15,658	38,639	11.1	36,764	10,549	285.7	118.2	403.9	5,967	1.7

Source: COE LPMS Data

[1/] Statistic calculated on processed tows (non open pass).

[2/] Mon 2 was renamed Braddock in 2004

Table 85
2005 Performance Characteristics of Ohio River System

River/Project	No. Tows	Number of Barges Loaded	Empty	Total	Avg. Barges /Tow	Ktons	Avg. Tons /Tow	Avg. Time /Tow (min.) Delay	Process	Total	Comm. Lockages	Avg. Lock Cuts/Tow [1/]
Ohio River												
Emsworth	4,017	15,040	8,153	23,193	5.8	21,178	5,272	34.8	68.6	103.4	4,790	1.2
Dashields	3,779	15,951	9,050	25,001	6.6	22,024	5,828	28.1	66.1	94.2	4,558	1.2
Montgomery	4,072	16,131	9,410	25,541	6.3	23,142	5,683	40.2	70.4	110.6	4,991	1.2
New Cumberland	4,229	22,753	15,649	38,402	9.1	34,376	8,129	24.5	61.1	85.6	4,236	1.0
Pike Island	4,649	26,363	17,868	44,231	9.5	40,314	8,672	23.4	55.7	79.1	4,649	1.0
Hannibal	5,029	34,740	21,158	55,898	11.1	53,288	10,596	121.3	57.5	178.8	5,143	1.0
Willow Island	4,521	32,588	18,546	51,134	11.3	50,164	11,096	117.9	57.3	175.2	4,521	1.0
Belleville	4,531	34,270	18,783	53,053	11.7	52,889	11,673	94.5	57.5	152.0	4,531	1.0
Racine	4,810	35,054	18,996	54,050	11.2	54,100	11,247	102.1	65.9	168.0	5,154	1.1
R.C. Byrd	5,457	38,483	19,302	57,785	10.6	62,482	11,450	59.1	62.1	121.2	5,466	1.0
Greenup	6,204	43,750	25,919	69,669	11.2	70,583	11,377	77.4	53.6	131.0	6,326	1.0
Capt. A. Meldahl	5,287	37,393	18,267	55,660	10.5	61,778	11,685	59.0	60.5	119.5	5,307	1.0
Markland	4,882	33,588	12,837	46,425	9.5	53,847	11,030	64.4	61.3	125.7	4,997	1.0
McAlpine	5,219	34,753	15,198	49,951	9.6	55,695	10,672	105.8	61.1	166.9	5,140	1.0
Cannelton	5,201	37,183	18,715	55,898	10.7	58,310	11,211	40.3	60.7	101.0	5,203	1.0
Newburgh	6,385	43,025	25,331	68,356	10.7	67,498	10,571	62.7	51.3	114.0	6,528	1.0
J.T. Myers	6,064	45,441	22,468	67,909	11.2	71,901	11,857	52.3	52.7	105.0	6,073	1.0
Smithland	7,418	50,825	26,222	77,047	10.4	80,697	10,879	28.6	57.1	85.7	7,446	1.0
L/D 52	9,823	61,357	32,800	94,157	9.6	97,336	9,909	255.7	40.6	296.3	9,820	1.0
L/D 53	7,197	53,824	23,226	77,050	10.7	85,845	11,928	73.0	13.7	86.7	7,178	1.0
Kanawha River												
London	316	801	803	1,604	5.1	820	2,595	0.7	99.4	100.1	715	2.3
Marmet	4,176	10,985	10,386	21,371	5.1	14,714	3,523	74.6	177.8	252.4	17,161	4.1
Winfield	2,446	13,168	9,737	22,905	9.4	18,527	7,574	19.6	73.7	93.3	2,457	1.0
Monongahela River												
Opekiska	119	248	243	491	4.1	286	2,403	0.0	29.7	29.7	119	1.0
Hildebrand	120	244	250	494	4.1	282	2,350	0.2	32.4	32.6	120	1.0
Morgantown	415	820	838	1,658	4.0	885	2,133	0.3	31.4	31.7	415	1.0
Point Marion	1,339	4,236	3,839	8,075	6.0	4,501	3,361	1.8	35.8	37.6	1,339	1.0
Grays Landing	1,408	4,339	3,941	8,280	5.9	4,621	3,282	2.4	38.3	40.7	1,408	1.0
Maxwell	3,883	12,017	11,410	23,427	6.0	13,863	3,570	3.9	44.4	48.3	3,883	1.0
L/D 4	5,046	9,336	9,459	18,795	3.7	12,013	2,381	23.3	41.9	65.2	5,322	1.1
L/D 3	5,945	10,819	8,910	19,729	3.3	14,084	2,369	17.7	37.7	55.4	5,945	1.0
Braddock [2/]	3,335	14,186	7,553	21,739	6.5	19,871	5,958	19.8	55.8	75.6	3,868	1.2
Allegheny River												
L/D 8	859	425	441	866	1.0	678	789	2.9	28.5	31.4	861	1.0
L/D 7	102	77	104	181	1.8	85	833	7.4	36.4	43.8	127	1.2
L/D 6	102	75	114	189	1.9	83	814	0.2	38.7	38.9	127	1.2
L/D 5	185	122	156	278	1.5	152	822	0.3	39.9	40.2	216	1.2
L/D 4	2,467	1,301	1,348	2,649	1.1	1,347	546	1.4	28.0	29.4	2,573	1.0
L/D 3	1,065	1,486	1,523	3,009	2.8	1,861	1,747	6.3	63.9	70.2	1,864	1.8
L/D 2	1,158	1,497	1,563	3,060	2.6	1,882	1,625	8.5	66.8	75.3	1,967	1.7
Green River												
L/D 2	1,611	3,509	2,349	5,858	3.6	5,261	3,266	1.7	30.6	32.3	1,611	1.0
L/D 1	2,408	5,946	2,707	8,653	3.6	8,943	3,714	2.4	25.0	27.4	2,408	1.0
Cumberland River												
Old Hickory	942	2,589	2,540	5,129	5.4	4,721	5,012	10.6	110.6	121.2	1,824	1.9
Cheatham	1,408	6,480	6,179	12,659	9.0	11,026	7,831	33.8	103.0	136.8	2,039	1.4
Barkley	1,104	2,283	7,159	9,442	8.6	3,906	3,538	13.4	82.7	96.1	1,538	1.4
Tennessee River												
Ft. Loudoun	184	260	214	474	2.6	467	2,538	13.5	168.9	182.4	492	2.7
Watts Bar	236	541	441	982	4.2	875	3,708	16.5	253.3	269.8	984	4.2
Chickamauga	296	891	746	1,637	5.5	1,398	4,723	24.1	317.1	341.2	1,651	5.6
Nickajack	590	1,759	1,457	3,216	5.5	2,851	4,832	23.9	84.9	108.8	737	1.2
Guntersville	860	3,715	3,046	6,761	7.9	5,835	6,785	17.1	107.4	124.5	1,288	1.5
Wheeler	1,561	6,698	4,790	11,488	7.4	10,800	6,919	26.6	96.4	123.0	2,277	1.5
Wilson	1,551	6,659	4,817	11,476	7.4	10,872	7,010	50.3	113.6	163.9	2,268	1.5
Pickwick	1,793	9,996	8,371	18,367	10.2	15,535	8,664	55.6	104.0	159.6	2,570	1.4
Kentucky	3,356	23,515	14,537	38,052	11.3	36,613	10,910	333.4	125.3	458.7	5,668	1.7

Source: COE LPMS Data

[1/] Statistic calculated on processed tows (non open pass).

[2/] Mon 2 was renamed Braddock in 2004

Table 86
2006 Performance Characteristics of Ohio River System

River/Project	No. Tows	Number of Barges Loaded	Empty	Total	Avg. Barges /Tow	Ktons	Avg. Tons /Tow	Avg. Time /Tow (min.) Delay	Process	Total	Comm. Lockages	Avg. Lock Cuts/Tow [1/]
Ohio River												
Emsworth	4,007	15,573	9,002	24,575	6.1	21,425	5,347	43.0	69.1	112.1	5,040	1.3
Dashields	3,817	16,176	9,685	25,861	6.8	22,032	5,772	34.3	67.5	101.8	4,933	1.3
Montgomery	3,721	14,420	7,809	22,229	6.0	20,756	5,578	41.9	70.9	112.8	4,660	1.3
New Cumberland	3,893	20,530	13,528	34,058	8.7	31,594	8,116	14.8	59.3	74.1	3,890	1.0
Pike Island	4,493	24,843	16,448	41,291	9.2	38,636	8,599	14.7	54.9	69.6	4,493	1.0
Hannibal	4,739	31,966	18,891	50,857	10.7	49,690	10,485	22.6	55.9	78.5	4,740	1.0
Willow Island	4,273	29,778	16,353	46,131	10.8	46,529	10,889	26.3	56.9	83.2	4,273	1.0
Belleville	4,348	31,226	16,877	48,103	11.1	49,109	11,295	42.1	56.7	98.8	4,344	1.0
Racine	4,548	31,900	17,168	49,068	10.8	50,865	11,184	34.9	62.4	97.3	4,541	1.0
R.C. Byrd	5,151	35,145	18,135	53,280	10.3	57,568	11,176	43.1	62.1	105.2	5,182	1.0
Greenup	6,257	42,420	26,979	69,399	11.1	69,391	11,090	98.3	52.9	151.2	6,530	1.0
Capt. A. Meldahl	5,366	35,779	19,481	55,260	10.3	60,161	11,212	95.0	63.2	158.2	5,687	1.1
Markland	4,877	32,554	13,119	45,673	9.4	52,697	10,805	34.6	58.1	92.7	4,873	1.0
McAlpine	5,266	34,249	15,320	49,569	9.4	55,205	10,483	66.2	59.5	125.7	5,201	1.0
Cannelton	5,203	37,262	18,501	55,763	10.7	58,912	11,323	138.5	64.5	203.0	5,556	1.1
Newburgh	6,492	43,856	25,631	69,487	10.7	69,188	10,657	37.3	50.0	87.3	6,528	1.0
J.T. Myers	6,115	45,307	22,182	67,489	11.0	72,169	11,802	42.6	52.0	94.6	6,118	1.0
Smithland	7,370	50,633	26,553	77,186	10.5	81,025	10,994	24.5	58.4	82.9	7,397	1.0
L/D 52	9,515	60,384	30,963	91,347	9.6	96,404	10,132	340.9	23.6	364.5	9,489	1.0
L/D 53	6,984	52,988	22,013	75,001	10.7	85,059	12,179	13.9	7.7	21.6	6,978	1.0
Kanawha River												
London	659	1,640	1,639	3,279	5.0	1,900	2,883	1.6	111.4	113.0	1,641	2.5
Marmet	4,328	11,478	10,865	22,343	5.2	15,521	3,586	107.1	178.2	285.3	18,219	4.2
Winfield	2,529	14,062	9,976	24,038	9.5	19,911	7,873	20.3	73.5	93.8	2,529	1.0
Monongahela River												
Opekiska	71	212	220	432	6.1	241	3,394	0.0	28.8	28.8	71	1.0
Hildebrand	71	212	220	432	6.1	241	3,394	0.0	32.8	32.8	71	1.0
Morgantown	410	811	829	1,640	4.0	881	2,149	0.7	32.6	33.3	410	1.0
Point Marion	1,403	4,619	4,326	8,945	6.4	4,981	3,550	2.2	36.3	38.5	1,403	1.0
Grays Landing	1,440	4,789	4,183	8,972	6.2	5,154	3,579	2.7	38.3	41.0	1,440	1.0
Maxwell	3,776	13,474	9,740	23,214	6.1	15,654	4,146	1.5	45.4	46.9	3,776	1.0
L/D 4	5,308	11,380	8,539	19,919	3.8	14,303	2,695	25.3	42.3	67.6	5,629	1.1
L/D 3	5,845	12,239	7,628	19,867	3.4	15,638	2,675	20.6	39.9	60.5	5,845	1.0
Braddock [2/]	3,427	14,778	7,137	21,915	6.4	20,368	5,943	54.4	63.4	117.8	4,421	1.3
Allegheny River												
L/D 8	795	393	418	811	1.0	623	784	1.5	27.2	28.7	801	1.0
L/D 7	94	60	104	164	1.7	64	681	0.9	46.4	47.3	120	1.3
L/D 6	92	56	106	162	1.8	60	652	0.9	38.9	39.8	116	1.3
L/D 5	178	105	147	252	1.4	130	730	1.1	35.3	36.4	205	1.2
L/D 4	2,385	1,303	1,291	2,594	1.1	1,408	590	1.5	26.7	28.2	2,474	1.0
L/D 3	1,054	1,596	1,574	3,170	3.0	1,875	1,779	5.1	57.9	63.0	1,691	1.6
L/D 2	1,135	1,612	1,634	3,246	2.9	1,896	1,670	5.5	58.6	64.1	1,799	1.6
Green River												
L/D 2	1,660	3,621	2,573	6,194	3.7	5,442	3,278	2.7	34.2	36.9	1,660	1.0
L/D 1	2,415	5,699	3,295	8,994	3.7	8,564	3,546	1.8	27.7	29.5	2,415	1.0
Cumberland River												
Old Hickory	993	2,725	2,699	5,424	5.5	5,001	5,036	8.3	112.1	120.4	1,934	1.9
Cheatham	1,487	6,945	6,427	13,372	9.0	11,746	7,899	26.9	100.2	127.1	2,146	1.4
Barkley	1,106	2,636	7,390	10,026	9.1	4,622	4,179	17.3	88.6	105.9	1,633	1.5
Tennessee River												
Ft. Loudoun	145	254	197	451	3.1	484	3,338	21.3	235.7	257.0	497	3.4
Watts Bar	166	472	354	826	5.0	809	4,873	23.9	320.6	344.5	859	5.2
Chickamauga	206	806	626	1,432	7.0	1,279	6,209	36.5	419.5	456.0	1,463	7.1
Nickajack	511	1,609	1,242	2,851	5.6	2,626	5,139	5.0	88.6	93.6	633	1.2
Guntersville	761	3,576	2,824	6,400	8.4	5,600	7,359	14.0	113.7	127.7	1,149	1.5
Wheeler	1,427	6,401	4,136	10,537	7.4	10,308	7,224	21.9	94.0	115.9	2,063	1.4
Wilson	1,393	6,334	4,197	10,531	7.6	10,338	7,421	1244.3	219.1	1,463.4	4,194	3.0
Pickwick	1,704	9,821	8,095	17,916	10.5	15,317	8,989	46.9	104.5	151.4	2,507	1.5
Kentucky	3,308	23,897	13,150	37,047	11.2	37,873	11,449	394.0	129.7	523.7	5,623	1.7

Source: COE LPMS Data

[1/] Statistic calculated on processed tows (non open pass).

[2/] Mon 2 was renamed Braddock in 2004

Table 87
2007 Performance Characteristics of Ohio River System

River/Project	No. Tows	Number of Barges			Avg. Barges /Tow	Ktons	Avg. Tons /Tow	Avg. Time /Tow (min.)			Comm. Lockages	Avg. Lock Cuts/Tow [1/]
		Loaded	Empty	Total				Delay	Process	Total		
Ohio River												
Emsworth	3,851	13,974	8,552	22,526	5.8	19,399	5,037	54.8	71.0	125.8	4,786	1.2
Dashields	3,633	14,683	9,180	23,863	6.6	20,171	5,552	24.8	64.8	89.6	4,514	1.2
Montgomery	3,597	13,323	7,887	21,210	5.9	19,310	5,368	53.3	75.4	128.7	4,478	1.2
New Cumberland	3,633	18,208	12,213	30,421	8.4	28,104	7,736	13.2	60.2	73.4	3,633	1.0
Pike Island	4,183	21,812	14,739	36,551	8.7	33,976	8,122	13.4	54.0	67.4	4,183	1.0
Hannibal	4,523	29,778	17,556	47,334	10.5	46,297	10,236	82.0	52.3	134.3	4,873	1.1
Willow Island	4,151	27,916	15,201	43,117	10.4	43,645	10,514	22.9	55.6	78.5	4,151	1.0
Belleville	4,285	29,301	15,829	45,130	10.5	46,247	10,793	27.5	58.6	86.1	4,284	1.0
Racine	4,416	29,973	16,112	46,085	10.4	48,541	10,992	36.7	62.0	98.7	4,400	1.0
R.C. Byrd	4,799	32,716	16,175	48,891	10.2	53,940	11,240	41.0	62.2	103.2	4,812	1.0
Greenup	5,969	37,444	25,502	62,946	10.5	62,208	10,422	56.5	53.1	109.6	6,047	1.0
Capt. A. Meldahl	5,087	30,865	17,414	48,279	9.5	53,163	10,451	57.8	57.9	115.7	5,106	1.0
Markland	4,446	27,899	12,388	40,287	9.1	46,062	10,360	70.1	61.5	131.6	4,572	1.0
McAlpine	5,059	29,989	16,489	46,478	9.2	49,150	9,715	74.8	59.4	134.2	4,975	1.0
Cannelton	5,053	33,186	20,071	53,257	10.5	52,641	10,418	67.0	62.2	129.2	5,126	1.0
Newburgh	6,510	41,034	26,906	67,940	10.4	65,133	10,005	37.7	50.5	88.2	6,513	1.0
J.T. Myers	5,892	40,155	21,275	61,430	10.4	64,565	10,958	38.0	53.2	91.2	5,895	1.0
Smithland	6,985	45,625	25,820	71,445	10.2	73,679	10,548	19.9	59.4	79.3	6,990	1.0
L/D 52	9,254	54,981	30,306	85,287	9.2	88,953	9,612	396.5	45.2	441.7	9,384	1.0
L/D 53	7,036	48,592	23,187	71,779	10.2	78,274	11,125	45.9	17.3	63.2	7,014	1.0
Kanawha River												
London	789	1,589	1,590	3,179	4.0	1,962	2,487	2.5	98.5	101.0	1,776	2.3
Marmet	6,024	11,282	10,776	22,058	3.7	16,002	2,656	91.1	131.3	222.4	19,657	3.3
Winfield	2,744	13,743	10,378	24,121	8.8	20,148	7,343	24.2	70.9	95.1	2,744	1.0
Monongahela River												
Opekiska	69	204	212	416	6.0	243	3,522	0.6	28.5	29.1	69	1.0
Hildebrand	69	204	212	416	6.0	243	3,522	0.0	29.9	29.9	69	1.0
Morgantown	348	693	700	1,393	4.0	778	2,236	0.6	32.1	32.7	348	1.0
Point Marion	1,115	4,145	2,783	6,928	6.2	4,526	4,059	1.4	38.1	39.5	1,115	1.0
Grays Landing	1,196	4,564	2,712	7,276	6.1	4,947	4,136	2.5	39.5	42.0	1,196	1.0
Maxwell	3,385	11,324	7,967	19,291	5.7	13,466	3,978	1.1	46.3	47.4	3,385	1.0
L/D 4	5,227	10,727	7,588	18,315	3.5	13,420	2,567	25.3	39.9	65.2	5,313	1.0
L/D 3	5,671	11,720	7,112	18,832	3.3	14,877	2,623	17.9	38.7	56.6	5,671	1.0
Braddock [2/]	3,254	13,994	6,788	20,782	6.4	18,931	5,818	37.4	62.9	100.3	4,126	1.3
Allegheny River												
L/D 8	759	380	385	765	1.0	602	793	1.1	28.3	29.4	761	1.0
L/D 7	93	61	94	155	1.7	63	677	1.2	36.9	38.1	111	1.2
L/D 6	91	61	98	159	1.7	63	692	0.3	37.3	37.6	109	1.2
L/D 5	154	91	128	219	1.4	108	701	2.7	42.2	44.9	173	1.1
L/D 4	1,967	1,055	1,056	2,111	1.1	1,170	595	1.7	28.1	29.8	2,060	1.0
L/D 3	1,015	1,569	1,546	3,115	3.1	1,822	1,795	5.9	60.0	65.9	1,611	1.6
L/D 2	1,073	1,593	1,558	3,151	2.9	1,854	1,728	5.5	57.3	62.8	1,673	1.6
Green River												
L/D 2	977	2,340	1,279	3,619	3.7	3,512	3,595	1.5	39.3	40.8	977	1.0
L/D 1	2,492	5,290	3,625	8,915	3.6	7,946	3,189	2.9	30.5	33.4	2,492	1.0
Cumberland River												
Old Hickory	996	2,668	2,638	5,306	5.3	4,841	4,860	6.7	110.4	117.1	1,938	1.9
Cheatham	1,433	6,586	6,020	12,606	8.8	11,203	7,818	22.7	97.4	120.1	2,020	1.4
Barkley	1,447	5,404	7,874	13,278	9.2	9,193	6,353	81.5	91.1	172.6	2,090	1.4
Tennessee River												
Ft. Loudoun	160	233	168	401	2.5	466	2,913	11.5	182.4	193.9	447	2.8
Watts Bar	174	367	282	649	3.7	655	3,764	14.2	230.0	244.2	668	3.8
Chickamauga	194	655	555	1,210	6.2	1,059	5,459	19.1	349.5	368.6	1,208	6.2
Nickajack	488	1,431	1,045	2,476	5.1	2,333	4,781	6.8	83.4	90.2	573	1.2
Guntersville	779	3,189	2,673	5,862	7.5	5,050	6,483	10.8	98.5	109.3	1,113	1.4
Wheeler	1,445	6,164	4,412	10,576	7.3	10,280	7,114	26.0	97.7	123.7	2,090	1.4
Wilson	1,439	6,233	4,360	10,593	7.4	10,340	7,186	41.0	118.4	159.4	2,087	1.5
Pickwick	1,815	9,662	8,658	18,320	10.1	15,223	8,387	42.7	97.9	140.6	2,548	1.4
Kentucky	2,954	19,185	13,038	32,223	10.9	30,889	10,457	246.4	126.7	373.1	4,953	1.7

Source: COE LPMS Data

[1/] Statistic calculated on processed tows (non open pass).

[2/] Mon 2 was renamed Braddock in 2004

Table 88
Historic Average Lock Delays at Ohio River System Projects
(Minutes/Tow)

River/Project	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Ohio River										
Emsworth	57.0	51.0	40.1	85.9	38.7	52.2	34.9	34.7	43.0	54.9
Dashields	37.0	35.0	31.9	52.7	37.6	36.7	29.4	28.1	34.4	24.9
Montgomery	55.0	57.0	56.6	45.7	178.4	32.7	34.3	40.2	41.9	53.2
New Cumberland	17.0	15.0	15.2	16.5	73.7	18.5	16.1	24.5	14.8	13.2
Pike Island	20.0	15.0	65.7	17.9	22.7	21.6	18.7	23.4	14.7	13.4
Hannibal	15.0	16.0	14.9	21.3	19.2	23.7	26.3	121.3	22.6	82.0
Willow Island	21.0	43.0	25.2	25.2	62.1	25.3	25.4	121.7	26.3	22.9
Belleville	19.0	21.0	21.1	20.3	21.4	22.1	30.3	94.4	42.0	27.4
Racine	29.0	24.0	27.1	31.5	30.1	30.1	41.1	102.1	34.9	36.7
R.C. Byrd	38.0	37.0	39.8	34.6	24.9	33.6	40.0	59.1	43.0	41.0
Greenup	142.0	140.0	56.1	55.4	45.8	342.3	43.8	77.4	98.3	56.5
Capt. A. Meldahl	50.0	56.0	59.2	95.4	198.7	58.2	62.3	58.9	94.9	57.8
Markland	35.0	59.0	35.8	57.7	51.9	72.6	48.3	64.3	34.6	70.1
McAlpine	59.0	150.0	87.2	83.7	62.4	50.6	80.6	105.9	66.2	74.7
Cannelton	36.0	86.0	40.3	45.1	39.6	34.9	40.6	40.2	138.7	67.0
Newburgh	24.0	27.0	27.7	46.7	31.7	39.3	32.2	62.7	37.3	37.7
J.T. Myers	43.0	40.0	65.6	184.0	42.5	68.0	41.5	52.3	42.6	38.0
Smithland	14.0	4.0	2.0	3.7	22.3	16.3	15.1	28.7	24.6	19.9
L/D 52 [1/]	146.0	242.0	183.4	170.3	183.7	28.7	24.1	255.3	340.6	395.8
L/D 53	-	-	-	-	51.1	1.3	5.3	72.7	13.9	45.8
Kanawha River										
London	15.0	10.0	7.0	6.7	34.0	30.2	2.5	0.7	1.6	2.5
Marmet	153.0	85.0	92.8	109.1	45.3	98.9	82.6	74.6	107.0	91.0
Winfield	35.0	19.0	23.3	26.8	20.8	24.9	23.8	19.6	20.3	24.3
Monongahela River										
Opekiska	6.0	0.0	15.0	0.0	0.1	0.0	0.2	0.0	0.0	0.6
Hildebrand	4.0	0.0	0.5	0.2	2.4	0.8	0.7	0.2	0.0	0.0
Morgantown	0.0	1.0	0.4	0.4	0.4	0.5	0.4	0.3	0.7	0.6
Point Marion	3.0	2.0	2.2	2.4	2.2	3.2	1.9	1.8	2.2	1.4
Grays Landing	3.0	3.0	3.1	3.2	3.4	2.3	2.4	2.4	2.7	2.5
Maxwell	1.0	2.0	1.3	1.4	2.6	1.3	5.5	3.9	1.5	1.1
L/D 4	12.0	16.0	15.1	17.2	25.9	26.0	17.6	23.3	25.3	25.3
L/D 3	18.0	25.0	17.6	15.6	19.2	13.3	15.2	17.7	20.7	17.9
Braddock [2/]	20.0	18.0	19.0	21.0	25.8	15.4	13.2	19.8	54.4	37.5
Allegheny River										
L/D 8	1.0	1.0	0.6	0.6	1.0	1.2	0.6	2.8	1.5	1.1
L/D 7	1.0	2.0	1.3	3.7	0.2	1.2	0.1	7.4	0.9	1.2
L/D 6	1.0	4.0	3.2	4.8	1.1	1.2	0.1	0.2	0.9	0.3
L/D 5	2.0	3.0	3.5	2.6	2.0	2.2	1.8	0.2	1.1	2.7
L/D 4	8.0	8.0	7.4	3.4	3.5	3.2	3.0	1.4	1.5	1.7
L/D 3	8.0	9.0	8.7	10.7	6.6	8.0	6.8	6.3	5.1	5.9
L/D 2	9.0	13.0	12.6	10.1	6.9	8.3	6.9	8.5	5.5	5.5
Green River										
L/D 2	1.0	1.0	0.0	9.4	1.9	0.7	0.5	1.8	2.7	1.5
L/D 1	0.0	0.0	0.9	0.4	0.8	1.5	1.5	2.4	1.8	2.9
Cumberland River										
Old Hickory	9.0	10.0	7.6	6.8	7.5	8.6	5.8	10.6	8.3	6.7
Cheatham	26.0	15.0	18.7	20.4	52.8	31.8	54.1	33.8	27.3	22.7
Barkley	68.0	32.0	17.8	61.1	28.0	12.2	20.5	13.4	17.3	81.5
Tennessee River										
Ft. Loudoun	18.0	31.0	22.9	18.1	12.7	12.0	32.8	13.5	21.3	11.5
Watts Bar	45.0	55.0	85.4	83.8	61.4	91.4	42.9	16.5	23.9	14.2
Chickamauga	100.0	85.0	74.8	91.0	56.9	86.3	212.3	24.1	36.5	19.1
Nickajack	19.0	8.0	7.7	6.2	7.9	7.2	5.9	23.9	5.0	6.8
Guntersville	19.0	54.0	37.2	24.0	25.4	22.1	45.2	17.1	13.9	10.8
Wheeler	33.0	36.0	40.5	36.7	105.5	35.3	34.0	26.5	21.9	25.9
Wilson	66.0	77.0	613.0	63.2	68.1	160.7	54.2	50.2	1240.1	40.9
Pickwick	36.0	42.0	34.8	42.4	59.6	47.5	42.0	55.4	46.9	42.7
Kentucky	271.0	255.0	189.8	224.7	178.5	257.1	284.4	329.9	393.6	246.5

Source: COE LPMS Data.

[1/] Average over all tows, including navigable pass

[2/] Mon 2 was renamed Braddock in 2004

Table 89
Historic Number of Tows at Ohio River System Projects

River/Project	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Ann. Rate 1998-2007
Ohio River											
Emsworth	5,165	5,115	4,996	4,586	4,402	4,480	4,096	4,017	4,007	3,851	-2.9%
Dashields	5,108	4,700	4,738	4,400	4,184	4,242	3,920	3,779	3,817	3,633	-3.4%
Montgomery	4,868	4,685	4,624	4,316	4,416	4,323	4,020	4,072	3,721	3,597	-3.0%
New Cumberland	4,572	4,401	4,347	4,379	4,332	4,334	4,285	4,229	3,893	3,633	-2.3%
Pike Island	5,133	4,936	4,764	4,792	5,071	4,813	4,842	4,649	4,493	4,183	-2.0%
Hannibal	4,487	4,397	4,480	4,418	4,528	4,491	4,632	5,029	4,739	4,523	0.1%
Willow Island	4,121	4,002	4,083	4,084	4,067	4,106	4,246	4,521	4,273	4,151	0.1%
Belleville	4,514	4,080	4,236	4,090	4,167	4,148	4,310	4,531	4,348	4,285	-0.5%
Racine	4,542	4,277	4,476	4,346	4,416	4,296	4,420	4,810	4,548	4,416	-0.3%
R.C. Byrd	5,263	5,012	5,082	4,994	4,808	4,694	5,131	5,457	5,151	4,799	-0.9%
Greenup	6,639	6,694	6,841	6,812	6,347	5,600	5,844	6,204	6,257	5,969	-1.1%
Capt. A. Meldahl	5,604	5,482	5,471	5,521	5,085	4,755	4,834	5,287	5,366	5,087	-1.0%
Markland	4,938	4,960	5,129	5,333	4,625	4,401	4,550	4,882	4,877	4,446	-1.0%
McAlpine	4,513	4,772	5,036	5,289	5,016	4,883	5,123	5,219	5,266	5,059	1.1%
Cannelton	4,421	4,643	4,594	4,706	4,816	4,943	5,109	5,201	5,203	5,053	1.3%
Newburgh	5,645	5,878	5,790	6,021	5,832	5,810	6,211	6,385	6,492	6,510	1.4%
J.T. Myers	6,040	5,997	5,958	6,085	5,734	5,465	5,724	6,064	6,115	5,892	-0.2%
Smithland	7,376	7,338	7,265	7,540	7,198	6,795	7,023	7,418	7,370	6,985	-0.5%
L/D 52	9,472	9,621	9,557	9,695	9,221	8,591	9,394	9,823	9,515	9,254	-0.2%
L/D 53	-	8,121	7,634	7,194	6,943	6,504	6,863	7,197	6,984	7,036	n/a
Kanawha River											
London	2,797	2,428	2,145	1,624	1,648	1,099	512	316	659	789	-11.9%
Marmet	4,299	3,902	4,225	4,350	3,793	4,028	4,025	4,176	4,328	6,024	3.4%
Winfield	3,087	2,909	3,075	3,269	2,737	2,590	2,361	2,446	2,529	2,744	-1.2%
Monongahela River											
Opekiska	107	19	50	128	172	30	212	119	71	69	-4.3%
Hildebrand	106	24	51	130	172	26	187	120	71	69	-4.2%
Morgantown	147	186	316	462	402	261	459	415	410	348	9.0%
Point Marion	1,690	1,633	1,651	1,830	1,680	1,361	1,412	1,339	1,403	1,115	-4.1%
Grays Landing	1,949	1,868	1,777	1,899	1,707	1,393	1,431	1,408	1,440	1,196	-4.8%
Maxwell	3,677	4,074	3,826	4,139	3,995	3,719	3,131	3,883	3,776	3,385	-0.8%
L/D 4	4,368	4,901	4,619	4,695	5,088	4,025	4,053	5,046	5,308	5,227	1.8%
L/D 3	6,650	7,142	6,521	6,354	6,826	5,292	5,235	5,945	5,845	5,671	-1.6%
Braddock [1/]	4,257	5,042	4,412	4,369	4,106	3,551	3,587	3,335	3,427	3,254	-2.7%
Allegheny River											
L/D 8	575	859	884	288	414	945	974	859	795	759	2.8%
L/D 7	600	142	170	124	80	227	88	102	94	93	-17.0%
L/D 6	225	191	175	148	91	229	99	102	92	91	-8.7%
L/D 5	520	481	489	215	944	1,023	1,033	185	178	154	-11.5%
L/D 4	1,540	1,438	1,210	483	1,179	1,259	1,427	2,467	2,385	1,967	2.5%
L/D 3	1,523	1,518	1,432	1,330	990	1,246	1,343	1,065	1,054	1,015	-4.0%
L/D 2	1,516	1,548	1,462	1,386	1,041	1,404	1,442	1,158	1,135	1,073	-3.4%
Green River											
L/D 2	824	648	672	1,389	1,937	1,191	995	1,611	1,660	977	1.7%
L/D 1	1,703	1,428	1,328	2,139	2,691	2,012	1,956	2,408	2,415	2,492	3.9%
Cumberland River											
Old Hickory	809	831	758	724	852	934	828	942	993	996	2.1%
Cheatham	1,451	1,564	1,422	1,372	1,278	1,335	1,370	1,408	1,487	1,433	-0.1%
Barkley	1,798	1,710	1,520	1,421	1,262	691	884	1,104	1,106	1,447	-2.1%
Tennessee River											
Ft. Loudoun	242	269	246	195	204	178	183	184	145	160	-4.1%
Watts Bar	295	313	279	222	259	251	238	236	166	174	-5.1%
Chickamauga	407	370	349	272	299	306	275	296	206	194	-7.1%
Nickajack	967	889	900	863	835	734	652	590	511	488	-6.6%
Guntersville	1,365	1,397	1,204	1,171	1,123	2,310	951	860	761	779	-5.5%
Wheeler	1,966	2,129	1,891	1,655	1,640	1,657	1,657	1,561	1,427	1,445	-3.0%
Wilson	2,055	2,211	1,937	1,741	1,718	1,720	1,674	1,551	1,393	1,439	-3.5%
Pickwick	2,336	2,312	2,227	2,033	2,106	1,881	1,958	1,793	1,704	1,815	-2.5%
Kentucky	3,078	3,167	2,911	2,788	2,942	3,312	3,485	3,356	3,308	2,954	-0.4%

Source: COE LPMS Data

[1/] Mon 2 was renamed Braddock in 2004

3. <u>Recreational Traffic</u>. The multi-purpose development of water resources in the Ohio River Basin has allowed for the recreational development of project lands and adjacent water surface areas. These facilities attracted almost 95 million recreation visitors in 2006. The Ohio River main stem navigation pools provide a 981-mile long series of contiguous recreational lakes with nearly stable summer navigation pools and a substantial length of shoreline for private recreational development.

Most navigation projects in the basin process small recreational craft, in addition to commercial traffic. Current statistics on recreational traffic at ORB projects are displayed in **Table 90**.

Safety precautions prohibit mixed lockages of tows and recreation craft. At projects that contain more than a single chamber, recreational craft use the auxiliary chamber. This separation between commercial and recreational craft improves safety and efficiency for all users of the waterway.

Recreational craft have access to most public facilities developed for commercial towing, but generally use privately developed boat launching ramps, landings, and small boat harbors. They are generally located near population centers with convenient access to the pools formed by the navigation dams and are situated off the commercial navigation channels, in coves and embayments, or along smaller waterways that are not commercially navigable. Those situated along commercial waterways are frequently enhanced with facilities to serve a wide variety of recreation needs. There are over 750 such public and private pleasure craft facilities situated along the basin's waterways.

Photo 26: Recreation traffic at Guntersville L&D, mile 349.0 on the Tennessee River

Table 90
Historic Ohio River System Recreational Traffic
(Vessels)

River/Project	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Ohio River										
Emsworth	3,125	3,939	2,739	3,140	3,276	2,302	1,998	2,948	2,328	2,392
Dashields	2,468	2,717	2,093	2,677	2,215	1,769	1,625	1,612	1,316	1,399
Montgomery	2,120	2,455	1,756	1,899	1,123	998	861	971	759	884
New Cumberland	2,420	3,076	2,241	2,338	2,311	1,436	1,472	882	1,044	1,139
Pike Island	1,406	1,752	1,448	1,495	1,522	1,112	912	825	917	947
Hannibal	1,099	1,534	1,317	1,163	1,361	1,222	670	461	634	715
Willow Island	1,688	1,818	2,027	1,791	1,738	1,180	873	1,024	883	965
Belleville	1,165	1,246	1,096	940	1,066	668	706	862	526	1,121
Racine	881	1,246	1,051	896	884	637	517	554	424	627
R.C. Byrd	905	1,165	1,191	1,001	834	547	433	369	313	369
Greenup	1,051	1,452	940	762	636	460	477	626	407	590
Capt. A. Meldahl	5,595	6,564	5,388	2,984	2,037	2,668	2,190	2,726	1,344	2,016
Markland	4,561	4,880	4,296	3,033	3,413	2,340	2,478	2,215	2,543	2,817
McAlpine	1,121	1,184	746	595	595	523	364	415	427	520
Cannelton	1,147	1,162	1,038	859	1,012	923	1,006	1,338	938	1,271
Newburgh	1,608	1,942	1,744	1,141	1,272	933	1,088	1,656	1,225	1,453
J.T. Myers	2,750	3,439	2,389	2,299	2,519	1,211	1,439	1,841	1,593	1,647
Smithland	1,084	1,610	967	1,773	1,115	1,534	2,330	1,475	1,109	874
L/D 52	596	911	977	759	635	586	559	643	476	594
L/D 53	-	566	460	388	417	300	420	580	380	479
Kanawha River										
London	717	850	555	513	363	311	374	421	308	284
Marmet	361	544	469	385	422	264	361	432	275	248
Winfield	666	847	916	563	736	508	424	434	433	520
Monongahela River										
Opekiska	340	246	807	740	635	487	293	284	414	572
Hildebrand	275	129	389	315	287	172	122	171	200	301
Morgantown	584	754	736	642	523	309	208	217	237	420
Point Marion	513	688	501	463	515	350	357	326	250	403
Grays Landing	1,250	1,781	1,464	1,475	1,466	777	815	922	610	841
Maxwell	2,457	2,563	2,277	2,141	2,294	1,715	1,287	1,321	1,153	1,361
L/D 4	1,559	1,977	1,577	1,028	1,224	738	506	604	352	463
L/D 3	1,752	1,840	1,547	1,304	1,458	984	888	1,277	571	946
Braddock [1/]	2,686	3,144	2,677	2,328	2,976	1,703	1,643	2,408	1,517	1,721
Allegheny River										
L/D 8	1,687	1,926	1,020	242	1,175	595	595	938	476	1,050
L/D 7	1,936	1,896	1,277	1,614	1,569	1,032	894	1,181	769	1,300
L/D 6	1,541	1,483	1,258	1,391	1,367	860	717	750	493	916
L/D 5	2,367	2,438	1,891	2,018	2,112	1,431	1,148	1,325	953	1,266
L/D 4	3,775	3,558	2,391	2,529	2,788	1,656	1,541	2,183	1,617	2,282
L/D 3	3,439	3,495	2,628	2,780	2,882	1,940	1,769	2,338	1,839	2,491
L/D 2	6,685	8,892	6,126	8,099	7,548	5,006	4,260	6,087	4,388	5,784
Green River										
L/D 2	161	313	153	165	210	113	121	177	131	192
L/D 1	1,187	1,608	1,901	2,128	1,256	1,099	985	1,427	1,006	1,513
Cumberland River										
Old Hickory	2,586	2,911	3,164	2,708	2,592	2,402	2,398	2,209	1,835	1,971
Cheatham	1,176	1,469	1,249	1,426	1,230	951	851	844	737	769
Barkley	2,050	1,867	1,759	1,191	1,412	1,506	1,369	1,231	832	1,236
Tennessee River										
Ft. Loudoun	2,992	2,755	2,952	2,147	2,507	1,985	1,981	1,909	1,935	1,755
Watts Bar	4,683	4,506	3,037	2,347	2,665	2,201	2,327	2,112	1,874	2,122
Chickamauga	4,821	4,537	4,803	4,335	4,356	3,556	2,970	4,614	4,944	4,797
Nickajack	1,847	1,914	1,888	1,740	1,916	1,856	1,512	1,475	1,717	1,770
Guntersville	4,555	4,436	2,875	2,315	2,462	2,310	2,067	2,761	1,847	1,991
Wheeler	2,989	2,843	1,964	1,865	1,624	1,813	1,683	1,812	1,459	1,572
Wilson	2,297	2,072	2,283	2,281	1,746	1,789	1,755	1,979	1,557	1,905
Pickwick	2,043	2,058	1,830	1,801	1,682	1,600	1,624	1,476	1,451	1,385
Kentucky	659	858	653	574	433	430	411	361	419	282

Source: COE LPMS/OMNI Data

[1/] Mon 2 was renamed Braddock in 2004

5. State and Port Commerce.

a. State-to-State. In 2006, as **Table 94** indicates, more Kentucky commerce moved on the ORS than any other state. Approximately 108.5 million tons of commerce were moved on the ORS to or from or within the state of Kentucky. Roughly 76 million tons were shipped mainly to surrounding ORB states and some other states. It received 50.8 million tons of commerce on the ORS from those states. In addition there were 18 million tons of commerce that moved from one Kentucky dock to another. Almost 50 percent of Kentucky's commerce that shipped on the ORS consisted of coal (see **Tables 95 - 102** for other State to State commodity receipts and shipments for the years 2003 - 2006). Many of the industries utilizing bulk commodities in the state have their own waterfront facilities along the Ohio River or several of its tributaries, including the Green, Cumberland, and Tennessee rivers. There are over 50 coal-loading facilities on these waterways. Most of the major petroleum companies have riverside loading facilities in this area. There are also over 40 dry bulk commodity facilities, other than coal, which transfer grains, aggregates and various ores.

West Virginia's 2006 commercial waterway tonnage was the second largest in the basin with 71.3 million tons. West Virginia shipped 54.4 million tons of commerce on the ORS and received 24.7 million tons. Of these shipments and receipts, 78.4 percent was coal. Over one-fourth of the state's total coal output is transported to market via the inland waterway. Coal moves primarily out of the Kanawha River and the port of Huntington to electric generating facilities and coking plants throughout the region.

Ohio, in 2006, had the third largest tonnage of waterborne commerce on the ORS, moving almost 64.6 million tons of traffic on the ORS; shipping 20.9 million tons of goods, receiving 51.4 million tons of goods.

The state's Ohio River docks are dispersed along 450 miles of the river that forms the state's southern boundary. The largest group of ORS users in Ohio is the electric power generating industry. They power the valley's heavy industries, such as chemical and petroleum corporations. These companies also use the waterway system to receive manufacturing inputs.

Pennsylvania, in 2006 had the fourth largest tonnage of waterborne commerce on the ORS, moving over 42.0 million tons of traffic on the ORS; shipping 22.9 million tons of goods, receiving 31.3 million tons of goods. Of the total commerce shipped by Pennsylvania on the ORS 79.4 percent was coal. Most of Pennsylvania's industries that use the ORS are consumers of coal. They include the electric power generating industry and the steel industry. Aggregates accounted for 13 percent of the commodity movements to, from, or within Pennsylvania. Petroleum movements have declined as more crude petroleum is piped to the East Coast.

Ohio River commerce at Indiana docks in 2006 amounted to 38.7 million tons. Following coal, aggregates comprised the second most prominent commodity group, accounting for

over 22 percent of all commerce shipped by Indiana on the ORS; grain was third with 9 percent.

In 2006, Tennessee moved 37.1 million tons of traffic on the ORS. Tennessee docks received about 31.8 million tons and shipped 5.3 million tons of goods on the ORS.

In Alabama, the 200-mile reach of the Tennessee River has numerous docks, which in 2006, received over 12.1 million tons of commerce and shipped another 3.6 million tons. Over 44 percent of Alabama's shipments went outside the ORB. About 36 percent of the state's receipts were coal, coming from Kentucky and other ORB states.

The Ohio River is only one of several navigable waterways within the state of Illinois, but it is critical to the transportation of bulk commodities between the southern part of the state and other ORB states. Illinois is an overall exporter, especially of coal and grains. In 2006, Illinois shipped more than nine times the commerce it received. Most of Illinois' shipments went to Indiana, comprising 32 percent of all shipments.

State-to-State movements from 2003 -2006 ORB traffic are summarized in **Tables 91 -102**. **Tables 91 - 94** display interstate as well as intrastate traffic while **Tables 95 - 102** show state distributions of shipments and receipts by commodity group.

Table 91
2003 Ohio River System State to State Tonnage

	Shipping State									
Receiving State	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
West Virginia	10.0	3.7	4.7	3.4	0.5	1.5	0.0	0.0	2.9	26.7
Kentucky	11.3	14.8	1.6	1.6	4.5	2.9	0.2	0.9	9.2	47.0
Pennsylvania	13.5	1.4	10.2	2.3	0.1	0.1	0.0	0.2	3.3	31.3
Ohio	16.5	11.7	2.4	10.0	1.4	2.0	0.1	0.0	8.4	52.4
Illinois	0.1	0.5	0.1	0.1	2.0	0.4	0.3	0.2	0.3	4.1
Indiana	1.8	3.2	0.5	0.8	11.4	4.5	0.2	0.3	2.9	25.6
Alabama	0.6	5.0	0.1	0.1	2.6	0.3	0.3	0.4	3.7	13.1
Tennessee	0.3	14.3	0.2	0.2	5.2	0.2	0.2	3.6	2.8	27.1
Other	2.3	11.8	1.0	1.8	9.2	3.2	1.9	1.0	0.0	32.2
Total[1]	56.6	66.5	20.6	20.4	37.0	15.0	3.2	6.7	33.5	259.8

Source: WCSC data

[1] Totals may not equal the sum of the commodities due to rounding.

Table 92
2004 Ohio River System State to State Tonnage

	Shipping State									
Receiving State	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
West Virginia	9.1	4.2	4.1	4.7	0.7	1.6	0.0	0.0	3.2	27.5
Kentucky	10.5	15.9	0.6	1.8	4.1	3.1	0.2	1.0	10.7	47.8
Pennsylvania	11.2	2.0	11.3	3.2	0.3	0.3	0.1	0.2	3.9	32.5
Ohio	17.5	13.3	2.3	8.6	1.8	2.3	0.0	0.1	8.1	54.1
Illinois	0.1	0.5	0.0	0.1	2.2	0.5	0.3	0.2	0.4	4.7
Indiana	1.5	3.5	0.6	0.6	12.0	4.5	0.2	0.4	2.6	26.0
Alabama	0.1	4.6	0.0	0.1	3.0	0.4	0.6	0.5	3.8	13.1
Tennessee	0.3	15.7	0.2	0.2	6.7	0.2	0.3	3.0	3.2	29.7
Other	2.7	11.8	0.8	3.2	7.8	4.8	2.1	1.1	0.0	34.3
Total[1]	53.1	71.6	19.8	22.7	38.5	17.7	3.8	6.4	36.1	269.9

Source: WCSC data

[1] Totals may not equal the sum of the commodities due to rounding.

Table 93
2005 Ohio River System State to State Tonnage

	Shipping State									
Receiving State	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
West Virginia	8.2	5.0	4.4	6.2	1.2	1.3	0.0	0.0	3.1	29.4
Kentucky	11.5	18.5	0.6	2.3	4.3	2.9	0.2	0.9	11.8	53.0
Pennsylvania	12.6	1.6	11.0	3.5	0.1	0.1	0.1	0.1	3.2	32.3
Ohio	20.6	13.2	3.1	6.7	2.5	2.0	0.1	0.1	7.7	56.0
Illinois	0.0	0.5	0.0	0.2	2.3	0.5	0.3	0.2	0.6	4.6
Indiana	1.7	3.9	1.5	0.5	12.3	3.2	0.2	0.3	2.8	26.4
Alabama	0.2	4.3	0.0	0.1	2.2	0.8	0.6	0.3	3.5	12.0
Tennessee	0.3	17.0	0.4	0.2	6.0	0.4	0.3	2.9	3.2	30.7
Other	2.9	13.3	1.3	3.1	8.4	4.5	1.6	0.9	0.0	36.0
Total[1]	58.0	77.3	22.3	22.8	39.3	15.7	3.4	5.7	35.9	280.1

Source: WCSC data

[1] Totals may not equal the sum of the commodities due to rounding.

Table 94
2006 Ohio River System State to State Tonnage

	Shipping State									
Receiving State	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
West Virginia	7.8	3.5	4.9	3.7	0.7	1.1	0.0	0.0	3.0	24.7
Kentucky	10.9	18.0	1.3	3.1	3.3	2.5	0.2	0.7	10.8	50.8
Pennsylvania	11.5	1.1	12.2	3.3	0.1	0.0	0.1	0.1	3.0	31.3
Ohio	18.7	11.9	1.5	7.7	3.2	1.6	0.0	0.0	6.6	51.4
Illinois	0.0	0.5	0.0	0.1	2.2	0.4	0.3	0.1	0.5	4.1
Indiana	2.1	4.2	1.3	0.2	12.6	3.3	0.2	0.3	2.7	27.1
Alabama	0.4	4.3	0.0	0.1	1.8	0.8	0.8	0.3	3.5	12.1
Tennessee	0.2	17.7	1.0	0.2	6.3	0.4	0.3	2.7	3.0	31.8
Other	2.8	14.6	0.7	2.4	9.3	4.9	1.6	1.0	0.0	37.3
Total[1]	54.4	75.7	22.9	20.9	39.4	14.9	3.6	5.3	33.5	270.7

Source: WCSC data

[1] Totals may not equal the sum of the commodities due to rounding.

Table 95
2003 Ohio River System State Commodity Shipments
(Million Tons)

	Shipping States[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	48.1	33.1	16.1	16.5	22.8	3.9	0.1	0.0	0.4	141.0
Petroleum Fuels	5.9	2.2	0.5	0.4	1.3	0.4	0.1	1.1	4.9	16.8
Aggregates	2.0	23.9	2.8	1.8	4.7	7.2	0.8	3.9	0.3	47.4
Grains	0.0	2.2	0.0	0.9	5.7	2.8	0.2	0.6	1.7	14.1
Chemicals	0.2	0.6	0.1	0.1	0.9	0.3	0.6	0.2	8.3	11.3
Ores & Minerals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.3
Iron & Steel	0.3	1.7	0.8	0.5	0.3	0.3	0.9	0.6	8.9	14.3
Other	0.1	2.7	0.4	0.2	1.2	0.2	0.4	0.3	2.0	7.5
Total[2]	56.6	66.5	20.6	20.4	37.0	15.0	3.2	6.7	33.7	259.8

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 96
2003 Ohio River System State Commodity Receipts
(Million Tons)

	Receiving State[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	16.8	22.2	21.2	37.6	0.6	16.6	4.6	13.1	8.3	141.0
Petroleum	2.0	7.2	1.3	2.1	0.2	1.4	0.6	1.1	0.7	16.6
Aggregates	5.1	9.0	4.3	2.5	1.9	4.9	2.1	8.4	9.2	47.4
Grain	0.0	0.2	0.0	0.0	0.1	0.1	3.0	0.6	10.0	14.0
Chemicals	1.0	2.2	0.9	2.7	0.3	0.9	1.4	0.7	1.2	11.3
Ores & Minerals	0.7	1.5	1.0	2.1	0.0	0.9	0.1	1.0	0.0	7.3
Iron & Steel	0.4	3.9	1.2	3.5	0.5	0.5	1.2	0.9	2.1	14.2
Other	0.7	0.7	1.3	1.8	0.4	0.3	0.2	1.2	0.9	7.5
Total[2]	26.7	47.0	31.3	52.4	4.1	25.6	13.1	27.1	32.5	259.8

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 97
2004 Ohio River System State Commodity Shipments
(Million Tons)

	Shipping States[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	45.9	37.8	15.0	17.6	23.7	4.5	0.1	0.0	0.5	145.1
Petroleum Fuels	4.4	2.1	0.4	0.8	1.5	1.3	0.1	1.1	5.3	17.0
Aggregates	1.9	23.7	3.2	1.7	5.1	7.1	1.1	3.6	0.7	48.1
Grains	0.0	2.6	0.0	2.0	6.0	3.9	0.2	0.6	1.4	16.7
Chemicals	0.3	0.5	0.1	0.1	0.8	0.4	0.8	0.3	8.4	11.7
Ores & Minerals	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.3
Iron & Steel	0.3	1.8	0.6	0.4	0.3	0.2	1.0	0.6	10.1	15.3
Other	0.1	3.0	0.5	0.2	1.3	0.2	0.6	0.3	2.7	8.9
Total[2]	53.1	71.6	19.8	22.7	38.5	17.7	3.8	6.4	36.3	269.9

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 98
2004 Ohio River System State Commodity Receipts
(Million Tons)

	Receiving State[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	16.9	22.7	20.8	38.8	0.6	16.8	4.3	15.4	8.9	145.2
Petroleum	2.4	6.2	1.6	2.4	0.3	1.5	0.6	1.2	0.8	17.0
Aggregates	5.5	9.0	5.3	3.0	1.9	4.7	1.9	8.4	8.5	48.2
Grain	0.0	0.3	0.0	0.0	0.3	0.1	2.9	0.4	12.5	16.5
Chemicals	1.0	2.4	0.8	2.7	0.4	1.0	1.4	0.6	1.3	11.6
Ores & Minerals	0.7	1.7	1.0	1.8	0.0	0.9	0.1	1.2	0.0	7.4
Iron & Steel	0.5	4.2	1.4	3.5	0.5	0.7	1.6	1.1	1.9	15.4
Other	0.5	1.4	1.6	1.9	0.8	0.3	0.4	1.4	0.6	8.9
Total[2]	27.5	47.8	32.5	54.1	4.7	26.0	13.1	29.7	34.6	269.9

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 99
2005 Ohio River System State Commodity Shipments
(Million Tons)

	Shipping States[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	49.4	41.4	17.8	18.0	25.4	3.2	0.1	0.0	0.6	155.9
Petroleum Fuels	6.1	2.2	0.7	0.7	1.5	1.2	0.2	1.0	6.0	19.6
Aggregates	1.9	25.4	2.6	1.2	5.4	6.8	0.9	3.2	0.7	48.1
Grains	0.0	2.5	0.0	2.0	4.5	3.6	0.2	0.5	1.4	14.7
Chemicals	0.3	0.6	0.1	0.1	0.5	0.3	0.4	0.3	8.3	10.9
Ores & Minerals	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	6.4	6.6
Iron & Steel	0.2	1.4	0.6	0.6	0.3	0.2	0.9	0.5	9.4	14.1
Other	0.1	3.6	0.5	0.1	1.6	0.4	0.5	0.3	2.8	9.9
Total[2]	58.0	77.3	22.3	22.8	39.3	15.7	3.4	5.7	35.6	279.8

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 100
2005 Ohio River System State Commodity Receipts
(Million Tons)

	Receiving State[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	19.5	24.3	22.4	41.2	0.7	17.9	3.8	16.6	9.5	155.9
Petroleum	2.5	8.5	1.2	2.7	0.2	1.6	0.5	1.4	1.0	19.6
Aggregates	4.8	10.1	4.6	2.8	1.9	3.8	2.1	7.6	10.3	48.0
Grain	0.0	0.2	0.0	0.0	0.3	0.1	2.6	0.3	11.2	14.7
Chemicals	1.0	2.4	0.7	2.7	0.3	0.9	1.3	0.6	0.8	10.7
Ores & Minerals	0.6	1.6	0.8	1.5	0.0	0.8	0.1	1.1	0.1	6.6
Iron & Steel	0.4	4.1	1.2	3.2	0.4	0.9	1.2	1.0	1.7	14.1
Other	0.5	1.8	1.4	1.8	0.8	0.4	0.4	2.1	0.9	10.1
Total[2]	29.4	53.0	32.3	56.0	4.6	26.4	12.0	30.7	35.5	280.1

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 101
2006 Ohio River System State Commodity Shipments
(Million Tons)

	Shipping States[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	46.2	37.1	18.0	16.6	26.5	3.2	0.0	0.0	0.8	148.4
Petroleum Fuels	6.3	2.7	0.7	0.9	1.5	1.1	0.2	0.7	5.3	19.4
Aggregates	1.5	28.3	2.8	0.8	4.9	5.6	1.0	3.1	0.7	48.7
Grains	0.0	3.0	0.0	1.9	4.4	3.8	0.4	0.5	1.0	15.0
Chemicals	0.3	0.6	0.0	0.1	0.5	0.4	0.6	0.2	7.9	10.6
Ores & Minerals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	5.9
Iron & Steel	0.1	1.1	0.7	0.6	0.4	0.5	1.1	0.6	9.6	14.7
Other	0.1	2.9	0.6	0.1	1.3	0.3	0.3	0.2	2.4	8.2
Total[2]	54.4	75.7	22.9	20.9	39.4	14.9	3.6	5.3	33.6	270.7

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

Table 102
2006 Ohio River System State Commodity Receipts
(Million Tons)

	Receiving State[1]									
Commodity	**WV**	**KY**	**PA**	**OH**	**IL**	**IN**	**AL**	**TN**	**Other**	**Total**
Coal & Coke	15.8	22.9	22.0	38.2	0.7	18.9	4.3	16.9	8.7	148.4
Petroleum	2.4	9.0	1.1	2.3	0.2	1.3	0.5	1.2	1.2	19.2
Aggregates	3.9	9.6	4.1	2.8	1.7	3.7	2.0	9.1	11.8	48.7
Grain	0.0	0.3	0.0	0.0	0.3	0.0	1.9	0.2	12.1	14.8
Chemicals	1.0	2.1	0.8	2.6	0.3	0.9	1.2	0.6	1.0	10.5
Ores & Minerals	0.7	1.6	0.8	0.9	0.1	0.9	0.1	0.9	0.0	6.0
Iron & Steel	0.4	3.9	1.0	3.1	0.3	1.2	1.8	1.2	1.7	14.6
Other	0.6	1.3	1.5	1.5	0.5	0.3	0.3	1.6	0.6	8.2
Total[2]	24.7	50.8	31.3	51.4	4.1	27.1	12.1	31.8	37.6	270.7

Source: WCSC Data.

[1]Includes intrastate movements.

[2]Totals may not equal the sum of the commodities due to rounding.

b. <u>Port Statistics</u>. Ohio Basin commerce statistics are available for eight ports as shown in **Tables 103 - 110**. Tables 103 - 106 show port statistics for 2003 - 2006 by commodity for the five largest ports in the basin, all of which are on the Ohio River. Tables 107 - 110 give statistics by shipment and receipts for all eight ports. Port definitions are based upon dock locations. For example, the port of Pittsburgh includes all docks along 113 miles of waterway that extends to mile 40 on the Ohio, mile 43 on the Monongahela and mile 30 on the Allegheny River.

The port of Huntington is defined as 100 miles on the Ohio, 90 miles on the Kanawha and 9 miles on the Big Sandy and is the largest port in the ORB with 77.2 million tons of traffic in 2006. Pittsburgh, with 42 million tons, is the second largest port on the ORS in terms of total tonnage. **Table 106** shows that in 2006, traffic at all five ports declined from the previous year. Of the 270.9 million tons of traffic moved in the basin in 2006, **Table 110** shows that 145.9 million tons (54 percent) were received or shipped at one of these five ports. The ports of Pittsburgh and Huntington, due to their large area, demonstrate the most "local" traffic in which cargo is loaded and unloaded within the port's dimensions. Also, Huntington is primarily a shipping port while Pittsburgh is more of a receiving port.

Table 103
2003 Commerce at Principal Ohio River Ports
(Million Tons)

Commodity	Pittsburgh	Huntington[1]	Cincinnati	Louisville	Mt. Vernon
Coal & Coke	30.1	60.8	3.2	1.5	1.2
Petroleum Fuels	1.7	8.2	2.1	2.5	0.6
Aggregates	4.5	3.4	1.1	3.2	0.1
Grains	0.0	0.0	0.9	0.1	1.0
Chemicals	1.0	1.6	1.7	0.5	0.8
Ores & Minerals	1.0	0.5	1.0	0.1	0.1
Iron & Steel	2.0	2.4	1.0	0.5	0.0
Other	1.3	0.7	0.7	0.2	0.1
Total[2]	41.7	77.6	11.8	8.5	3.9
Percent Change from 2002	-20.0%	-4.3%	-9.2%	9.0%	2.6%

Source: WCSC Data

[1]Port of Huntington was expanded from 14 miles to 199 miles in 2000

[2]Totals may not equal the sum of the commodities due to rounding.

Table 104
2004 Commerce at Principal Ohio River Ports
(Million Tons)

Commodity	Pittsburgh	Huntington[1]	Cincinnati	Louisville	Mt. Vernon
Coal & Coke	28.2	61.6	4.1	1.5	1.7
Petroleum Fuels	2.0	6.8	2.2	1.8	1.7
Aggregates	5.3	3.5	1.3	2.9	0.0
Grains	0.0	0.0	2.0	0.1	1.3
Chemicals	0.8	1.4	1.8	0.5	0.8
Ores & Minerals	1.0	0.5	0.9	0.1	0.1
Iron & Steel	2.0	2.6	0.8	0.6	0.1
Other	1.7	0.9	0.7	0.2	0.1
Total[2]	41.0	77.3	13.9	7.8	5.8
Percent Change from 2003	-1.7%	-0.4%	17.7%	-8.2%	48.7%

Source: WCSC Data

[1]Port of Huntington was expanded from 14 miles to 199 miles in 2000

[2]Totals may not equal the sum of the commodities due to rounding.

Table 105
2005 Commerce at Principal Ohio River Ports
(Million Tons)

Commodity	Pittsburgh	Huntington[1]	Cincinnati	Louisville	Mt. Vernon
Coal & Coke	32.4	65.7	4.5	1.5	2.1
Petroleum Fuels	1.8	9.3	2.4	2.5	1.6
Aggregates	4.6	3.1	1.1	3.4	0.0
Grains	0.0	0.0	2.0	0.0	1.0
Chemicals	0.8	1.6	1.9	0.5	0.7
Ores & Minerals	0.9	0.5	0.8	0.1	0.1
Iron & Steel	1.8	2.8	1.2	0.3	0.2
Other	1.4	0.9	0.7	0.2	0.1
Total[2]	43.6	83.9	14.6	8.5	5.8
Percent Change from 2004	6.3%	8.5%	5.0%	9.0%	0.0%

Source: WCSC Data

[1]Port of Huntington was expanded from 14 miles to 199 miles in 2000

[2]Totals may not equal the sum of the commodities due to rounding.

Table 106
2006 Commerce at Principal Ohio River Ports
(Million Tons)

Commodity	Pittsburgh	Huntington[1]	Cincinnati	Louisville	Mt. Vernon
Coal & Coke	31.3	58.4	4.3	1.4	2.2
Petroleum Fuels	1.6	10.5	2.4	2.4	1.3
Aggregates	4.1	3.1	1.0	2.8	0.0
Grains	0.0	0.0	1.8	0.0	1.1
Chemicals	0.8	1.5	1.6	0.5	0.8
Ores & Minerals	0.9	0.3	0.5	0.1	0.1
Iron & Steel	1.6	2.4	1.1	0.1	0.2
Other	1.5	0.9	0.5	0.1	0.1
Total[2]	42.0	77.2	13.3	7.4	5.7
Percent Change from 2005	-3.7%	-8.0%	-8.9%	-12.9%	-1.7%

Source: WCSC Data

[1]Port of Huntington was expanded from 14 miles to 199 miles in 2000

[2]Totals may not equal the sum of the commodities due to rounding.

Table 107
2003 Ohio River System Port Commerce
(Million Tons)

Port	Receipt	Shipment	Intraport	Total
Pittsburgh	21.1	10.4	10.2	41.7
Huntington	15.7	55.4	6.5	77.6
Cincinnati	10.7	1.1	0.0	11.8
Louisville	7.6	0.8	0.0	8.4
Mt. Vernon	1.3	2.6	0.0	3.9
Nashville	3.8	0.2	0.0	4.0
Guntersville	1.6	0.5	0.0	2.1
Chattanooga	2.3	0.5	0.0	2.8
Total	64.1	71.5	16.7	152.3

Source: WCSC Data

Table 108
2004 Ohio River System Port Commerce
(Million Tons)

Port	Receipt	Shipment	Intraport	Total
Pittsburgh	21.2	8.6	11.3	41.1
Huntington	18.9	52.3	6.0	77.2
Cincinnati	11.6	2.3	0.0	13.9
Louisville	7.0	0.8	0.0	7.8
Mt. Vernon	1.4	4.3	0.0	5.7
Nashville	3.8	0.2	0.0	4.0
Guntersville	1.5	0.3	0.0	1.8
Chattanooga	2.3	0.4	0.0	2.7
Total	67.7	69.2	17.3	154.2

Source: WCSC Data

Table 109
2005 Ohio River System Port Commerce
(Million Tons)

Port	Receipt	Shipment	Intraport	Total
Pittsburgh	21.3	11.3	11.0	43.6
Huntington	22.0	55.7	6.2	83.9
Cincinnati	12.3	2.3	0.0	14.6
Louisville	7.9	0.5	0.1	8.5
Mt. Vernon	1.4	4.4	0.0	5.8
Nashville	4.3	0.2	0.0	4.5
Guntersville	1.6	0.3	0.0	1.9
Chattanooga	2.3	0.3	0.0	2.6
Total	73.1	75.0	17.3	165.4

Source: WCSC Data

Table 110
2006 Ohio River System Port Commerce
(Million Tons)

Port	Receipt	Shipment	Intraport	Total
Pittsburgh	19.1	10.7	12.2	42.0
Huntington	19.0	54.2	4.0	77.2
Cincinnati	11.2	2.2	0.0	13.4
Louisville	7.0	0.4	0.1	7.5
Mt. Vernon	1.3	4.5	0.0	5.8
Nashville	4.3	0.2	0.0	4.5
Guntersville	1.6	0.2	0.0	1.8
Chattanooga	2.3	0.3	0.0	2.6
Total	65.8	72.7	16.3	154.8

Source: WCSC Data

Photo 27: A towboat pushes its 15-barge tow through Newburgh Lock and Dam on the Ohio River.

PART 4. OTHER SOURCES OF WATERWAY INFORMATION

1. Waterborne Commerce Statistics Center. The WCSC publishes a five volume annual report "Waterborne Commerce of the United States". Part 2 contains Ohio River System data and Part 3 contains Great Lakes data. Both can be purchased from:

Waterborne Commerce Statistics Center
U.S. Army Corps of Engineers
PO Box 61280
New Orleans, LA 70161-1280

They also annually update a data file compiled from their national origin-destination commerce file. To maintain confidentiality of shipper information, commerce data are made public in summary form only or as statistical abstracts. A response to an individual request will include all commerce data for the three most recently available years, summarized by reach and 15 commodity groups. This information is available on disk and in hard copy. These listings include:

-reach to reach combinations, sorted by the origin river reach;
-reach to reach combinations, sorted by the destination river reach;
-commodity groups sorted by the origin river reach.

For data requests or more information, call the Corps' WCSC Office in New Orleans at (504) 862-1470.

2. Navigation Condition Report. A navigation condition report is available for ORS navigation users. It is updated daily and provides information on gage readings, weather and ice conditions, dam conditions, precipitation, tows waiting, tows locked and delay times for each lock in the basin. This service is free to the public and access can be obtained at www.lrd-wc.usace.army.mil/navreps.html. For more information, call (513) 684-6055 or e-mail navinfo@www.lrd-wc.usace.army.mil.

3. Lock Performance Monitoring System Statistics. Lock specific statistics are available on the portions of the inland waterway system having locks. They are based on tow related data collected from towboat operators during lockages and are maintained by the Corps' Navigation Data Center (NDC) in a data base system known as the Lock Performance Monitoring System (LPMS).

The lock specific tonnage data contained in this file are based on a different collection methodology and data source than the WCSC database and will differ from those values. It is not possible to obtain tonnages and ton-miles for river systems from this source. For these reasons the WCSC records, which are usually a year behind the LPMS records, are used for river system statistics and the LPMS data are used for navigation project statistics.

The Navigation Data Center publishes a quarterly summary of lock statistics for use by waterway planners and shippers, which may be obtained free of charge from:

U.S. Army Corps of Engineers
CEWRC-NDC
7701 Telegraph Rd., Casey Building
Alexandria, VA 22315

The Water Resources Support Center will also respond to specific requests for more detailed file information subject to the Corps' confidentiality constraints. These reports are computer generated and are furnished at cost. Contact the NDC at (703) 428-9061 for more information.

4. Dock Listings. A listing of dock facilities is published by the Port Facilities Branch of the Navigation Data Center. The 57 separate reports in the Port Series cover the principal U.S. Coastal, Great Lakes, and Inland ports. They can be contacted at:

Navigation Data Center
CEWRC-NDC-P
7701 Telegraph Rd., Casey Building
Alexandria, VA 22315-3868
(703) 428-8059 or FAX (703) 428-6047

5. Relevant Web Pages.

U.S. Army Corps of Engineers Headquarters:
www.usace.army.mil

Great Lakes and Ohio River Division (CE-LRD):
www.lrd.usace.army.mil/ (main page)

Huntington District (CE-LRH):
www.lrh.usace.army.mil (main page)
outreach.lrh.usace.army.mil (Navigation Outreach page)
www.lrh.usace.army.mil/about/capabilities
inlandwaterways.lrh.usace.army.mil/ (Center of Expertise for Inland Navigation page)

Louisville District (CE-LRL):
www.lrl.usace.army.mil

Pittsburgh District (CE-LRP):
www.lrp.usace.army.mil

Nashville District (CE-LRN):
www.lrn.usace.army.mil

Buffalo District (CE-LRB):
www.lrb.usace.army.mil

Chicago District (CE-LRC):
www.lrc.usace.army.mil

Detroit District (CE-LRE):
www.lre.usace.army.mil

Navigation Data Center (NDC):
www.iwr.usace.army.mil/ndc

Waterborne Commerce Statistics Center (WCSC):
www.iwr.usace.army.mil/ndc/wcsc/wcsc.htm

Navigation Information Connection (NIC):
www.mvr.usace.army.mil/navdata/nic.htm (main page)
www.mvr.usace.army.mil/navdata/boat-loc.htm (vessel locations)
www.mvr.usace.army.mil/navdata/boat-que.htm (vessels queued at locks)

Navigation Investment Technologies (NETS)
www.corpsnets.us

Government Printing Office (Navigation charts)
bookstore.gpo.gov

Rahall Transportation Institute at Marshall University
www.njrati.org

Coast Guard (USCG)
www.uscg.mil

Maritime Administration (MARAD)
marad.dot.gov

International Joint Commission (IJC)
www.ijc.org

Great Lakes Commission (GLC)
www.glc.org

Saint Lawrence Seaway Development Corporation (SLSDC) and St. Lawrence Seaway Management Corporation (SLSMC)
www.greatlakes-seaway.com

Tennessee Valley Authority (TVA)
www.tva.gov

6. Private-sector Organizations.

Waterway Councils, Inc.
www.waterwayscouncil.org

American Association of Port Authorities
www.aapa-ports.org

Port of Pittsburgh PA
www.port.pittsburgh.pa.us

Ports of Indiana
www.portsofindiana.com

National Waterways Conference
www.waterways.org