

Ohio River Basin Profile



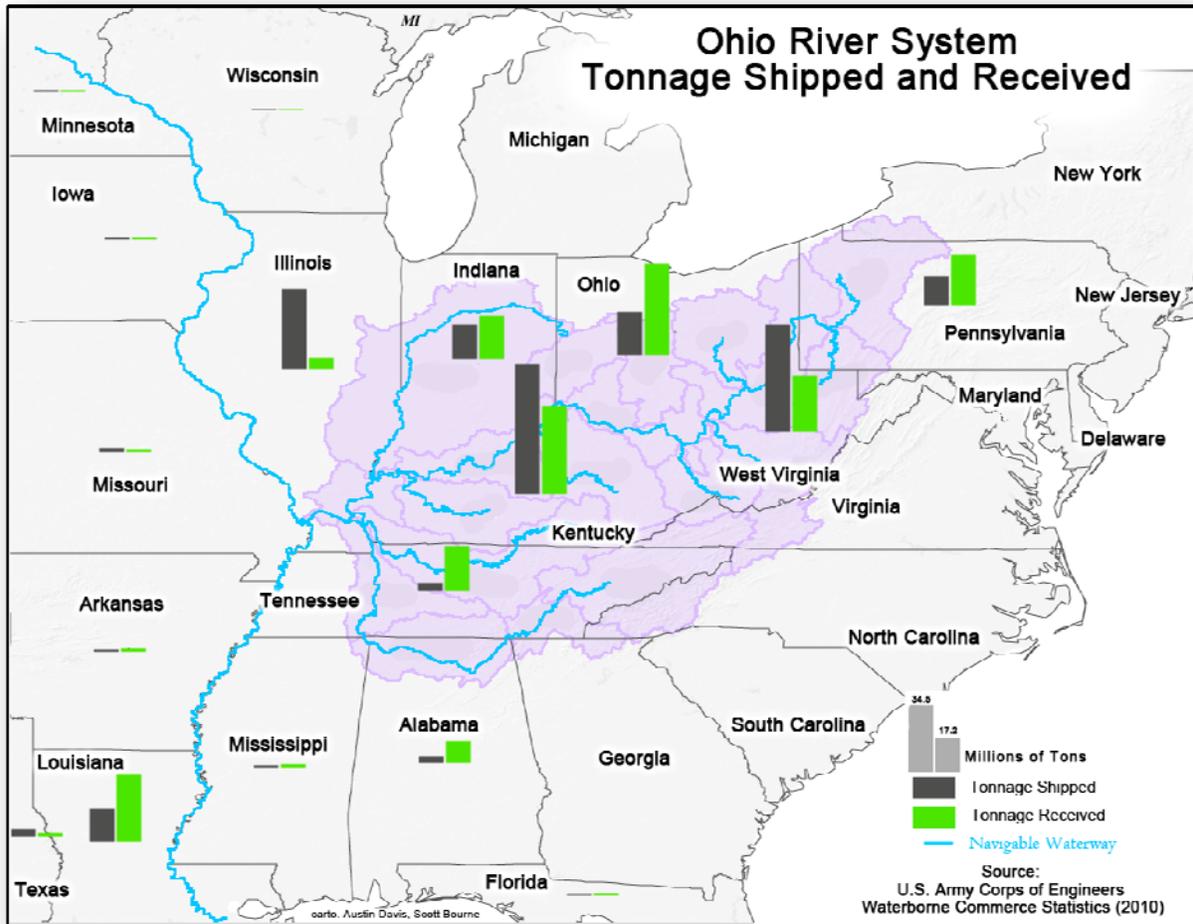
BASIN CHARACTERISTICS

The Ohio River basin is approximately 204,430 square miles and drains portions of 15 states. The Ohio River Basin contains over 2,800 miles of navigable waterways. The Ohio River’s 981 miles flow from Pittsburgh to the Mississippi River. The basin also includes the Ohio’s tributaries, the Muskingum, Kentucky, Wabash, Tennessee, Cumberland, Monongahela, Allegheny, Green, Kanawha and Big Sandy Rivers.

The Ohio River basin is the 10th largest population center in the United States. The principal states of the basin (Ohio, Kentucky, Indiana, West Virginia, and Tennessee) harvested approximately 12% of total US crop plants for 2012.¹ Coal production in 2011 for the Ohio River Basin states was dominated by West Virginia (135 million tons) and Kentucky (109 million tons), while the remaining principal states collectively produce the equivalent tonnage of either West Virginia or Kentucky (Pennsylvania, 59

¹ <http://usda01.library.cornell.edu/usda/nass/CropProdSu//2010s/2012/CropProdSu-01-11-20132.pdf>

million; Indiana, 37 million; Ohio, 28 million; and Tennessee, 1.5 million). The total coal production from these Ohio River basin states is about 81%² of the total coal production east of the Mississippi River.



MAJOR MARKET CENTERS AND PORTS

The Ohio River basin straddles the typical designation of the mid-Atlantic region and the Midwest region. The major US cities in this basin are Charleston, Cincinnati, Columbus, Evansville, Indianapolis, Knoxville, Lexington, Louisville, Nashville, and Pittsburgh. The inland waterway system provides access to all but a few of these major mid-west cities.

The major ports along the Ohio River and its tributaries are: Cincinnati, Pittsburgh, Louisville, Mount Vernon, Chattanooga, and Nashville. Tennessee River, a tributary of the Ohio, has nine ports that provide inland waterway access to the southern portion of the basin. Fossil fuel power plants represent a high percent of those individual dockside facilities numbering in the hundreds of individual docks.

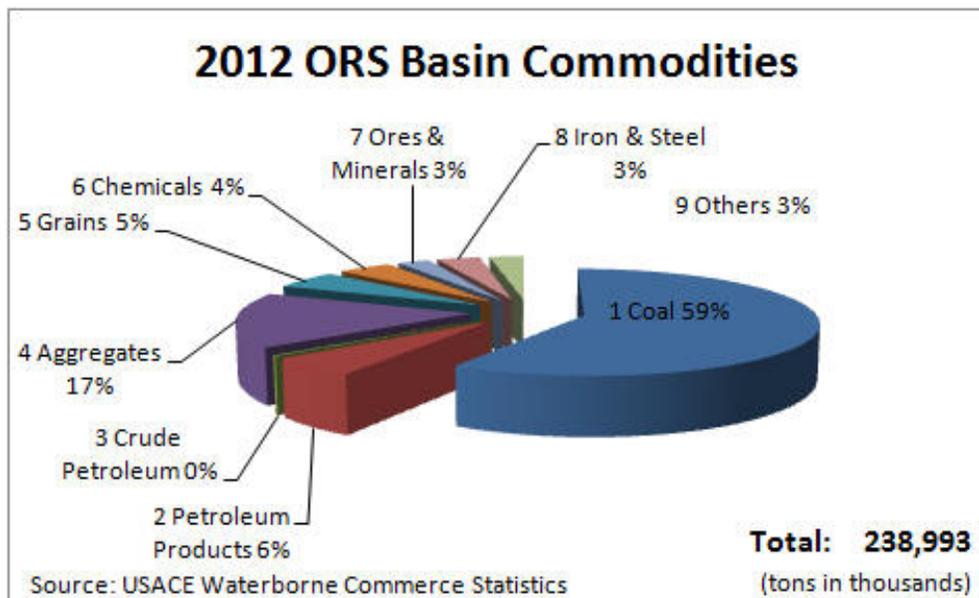
² <http://www.eia.gov/coal/annual/pdf/table6.pdf>



Clockwise from top, left: Charleston, WV; Louisville, KY; Cincinnati, OH; Pittsburgh, PA

COMMODITY CHARACTERISTICS

The advantage of the inland waterway system over other modes is the cost and emission efficiencies relative to other modes per ton-mile. In 2012, coal was the highest commodity moved in terms of tonnage. The highest value commodity moved per ton was petroleum and the lowest was aggregates.



COAL

Coal is the dominate commodity in the Ohio River Basin. In 2012, 112 million tons or 80% of the coal on the inland system in the Ohio River Basin was destined to coal fire power generation facilities.

Production of Appalachian coal in 2011 was approximately 455.8 million tons³. The total movement of coal on the Ohio River basin inland system represents about 31% of total Appalachian coal production.

AGGREGATE

Critical to the construction industry, aggregate is the second highest commodity group shipped within the Ohio River Basin inland waterway at 40 million tons in 2012. Aggregates include sand, gravel, and stone used in the production of concrete and as ballast in road construction. Aggregates also include crushed limestone in the production of cement and steel, and as a desulfurization agent by coal-fired electric generating plants. By way of comparison, the Midwest sold or used approximately 241 million tons of sand and gravel⁴ and 323 million tons of crushed stone⁵.

PETROLEUM

Crude petroleum and petroleum products are the third highest commodity group for the Ohio River Basin inland waterway at 14.4 million tons in 2012. Movement of petroleum is tracked by the U.S. Energy Information Administration⁶. For the sake of comparison, the movement of total petroleum from the east coast to the Midwest was approximately 15 million tons. The east coast only received about 5 million tons from the Midwest. The biggest movement of petroleum was between the Gulf Coast and the Midwest. Petroleum movements from the Midwest to the Gulf Coast were about 39 million tons. The reverse movement (Gulf to Midwest) was about 76 million tons. Since the EIA's definition of the Midwest includes the Mississippi River basin, a direct comparison with the Ohio River basin petroleum can't be performed.

IRON & STEEL⁷

Iron and steel production in the US totaled about 30 million tons of pig iron and 86 million tons of steel in 2011. Pig iron was produced by 5 companies operating integrated steel mills in 15 locations whereas there were 48 companies producing raw steel at approximately 108 mini-mills. Of the Midwestern states in the Ohio River basin, Indiana was the leader in raw steel production at 23% followed by Ohio (14%), and Pennsylvania (6%). In 2012, the inland waterway system in the Ohio River Basin moved 8.3 million tons of iron and steel.

³ http://www.eia.gov/totalenergy/data/annual/pdf/sec7_7.pdf

⁴ http://minerals.usgs.gov/minerals/pubs/commodity/sand_&_gravel_construction/

⁵ http://minerals.usgs.gov/minerals/pubs/commodity/stone_crushed/

⁶ <http://www.eia.gov/petroleum/data.cfm>

⁷ http://minerals.usgs.gov/minerals/pubs/commodity/iron_&_steel/

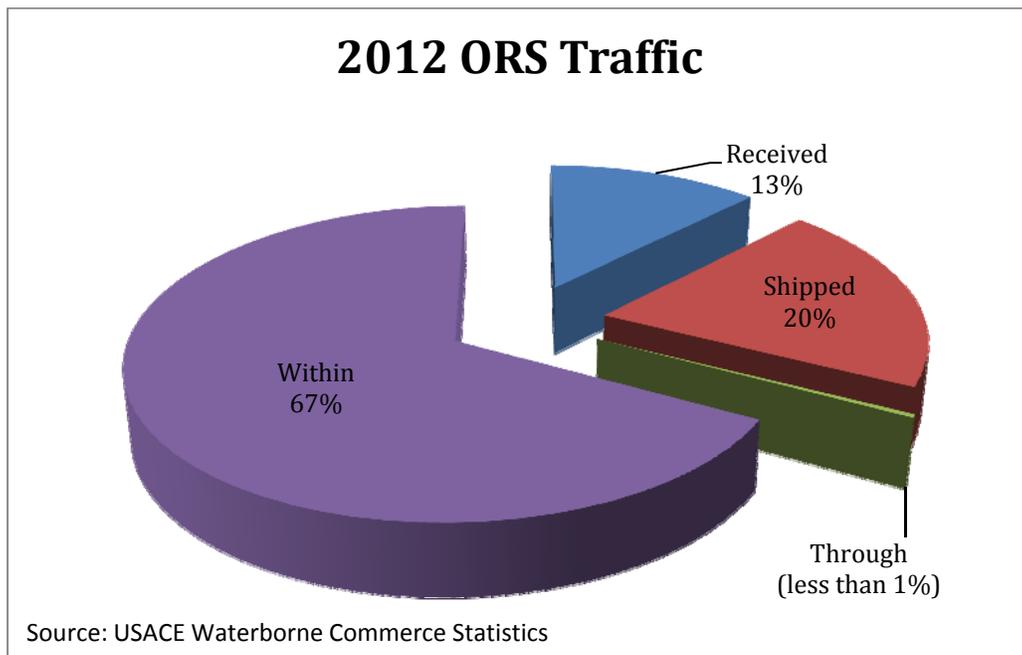
GRAIN

In 2010, the USDA and USDOT published a study of rural transportation issues⁸. This study noted that grain is particularly dependent on barge transportation for access to international markets, with the Upper Mississippi, Illinois, Ohio, and Columbia-Snake rivers being the primary conduits. Approximately 13 million tons of grain were shipped through the Ohio River basin inland waterway system in 2012. By way of comparison the total export of wheat, corn, and soybean to international markets from the United States in 2012 was 85 million tons⁹.

Corn and soya beans dominated Ohio River basin grain movements, accounting for 70% of the grain movements (37% for corn and 33% for soya beans). Corn used in the domestic market (primarily for feed and production of corn syrups) is transported mostly by truck, while the inland waterway is the conduit for the export market. In 2007 the Mississippi Gulf exported 63% of the animal feed corn production for the US.

COMMODITY MOVEMENT

The Ohio River Basin was the conduit for the movement of over 239 million tons of commodities. Four perspectives of this traffic are offered: Commodities moved out of the Ohio River basin (shipped), moved into the Ohio River basin (received), shipped and received within the basin (within), or shipped through the basin from a port outside the basin. The majority of commodity movements in the Ohio River basin were shipments that were sent and received within the basin.

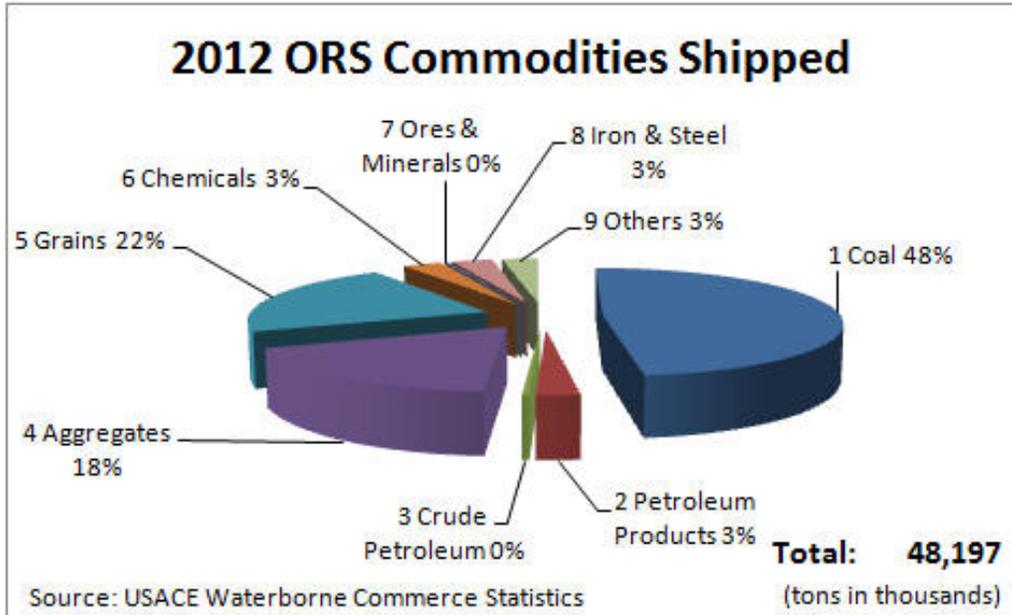


⁸ <http://www.ams.usda.gov/AMsv1.0/>

⁹ <http://www.statista.com/statistics/190348/total-us-grain-exports-from-2001/>

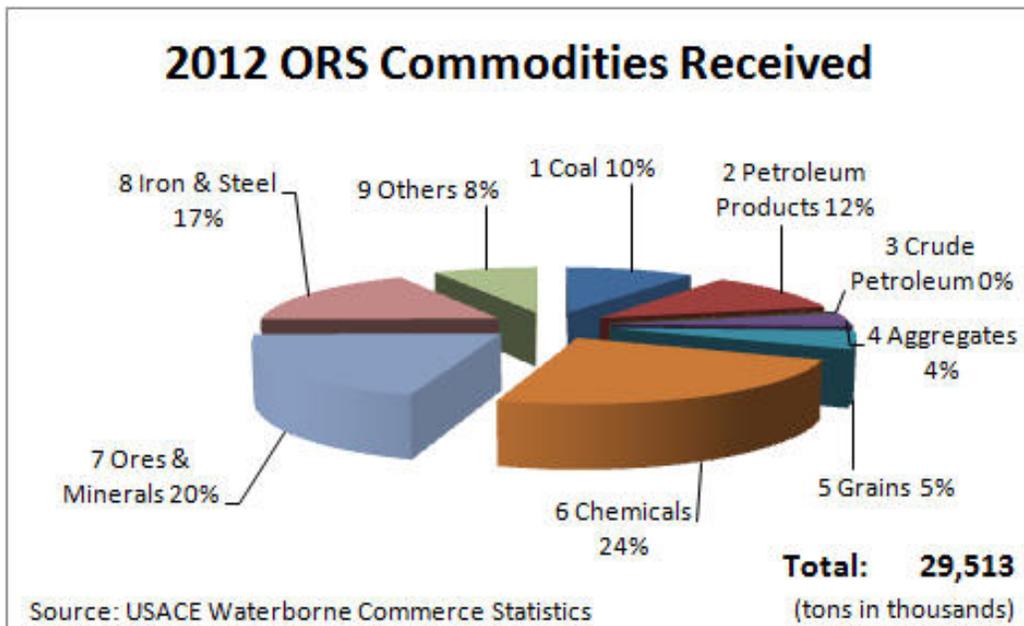
Shipped

The highest tonnage commodities that were shipped out of the Ohio River basin were coal, aggregate, and grain. The state that received most of these commodities was Louisiana (received over 38 million tons). Overall the basin shipped over 48 million tons out of the basin.



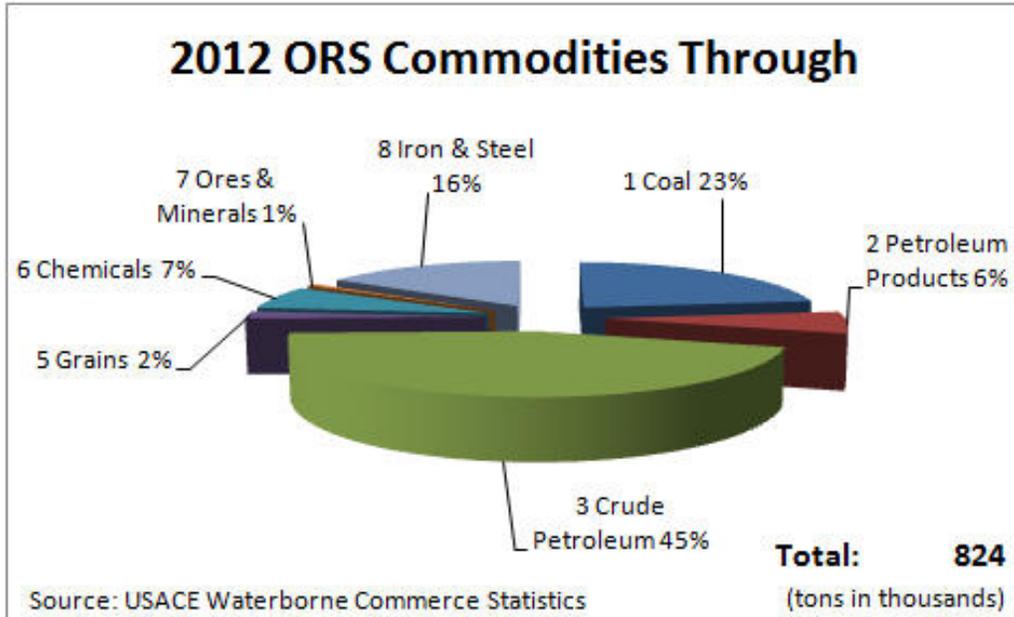
Received

The Ohio River basin states received nearly 30 million tons of commodities from outside the basin. Kentucky was the leader in receipts of waterborne barge traffic in 2012 at over 45 million tons.



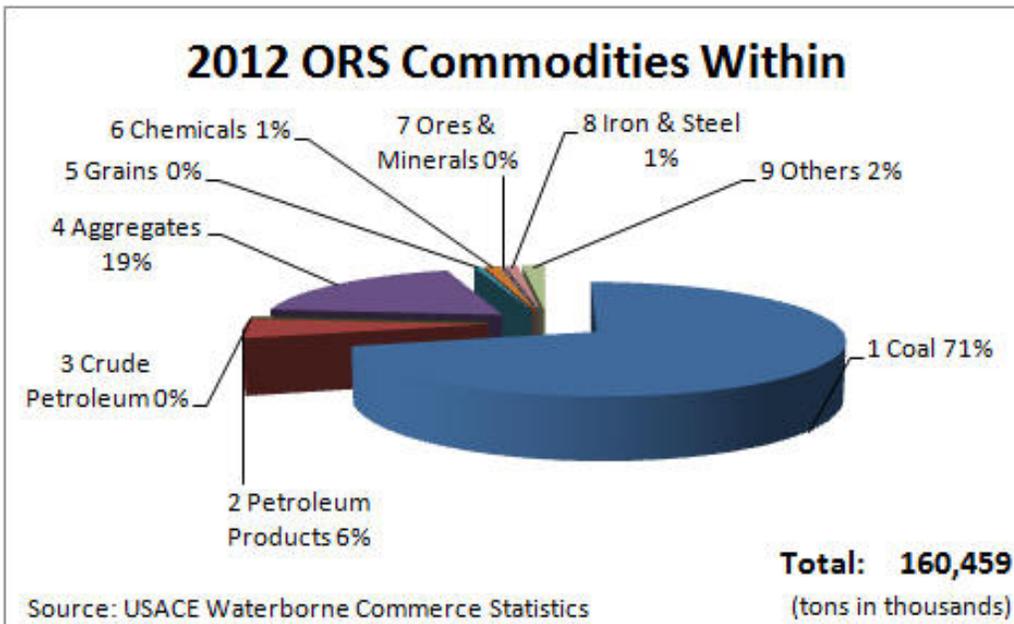
Through

Less than 1 million tons of waterborne cargo moved through the basin. These moves typically involve moves between the Alabama Gulf Coast and the Upper Mississippi River by way of the Tennessee-Tombigbee.



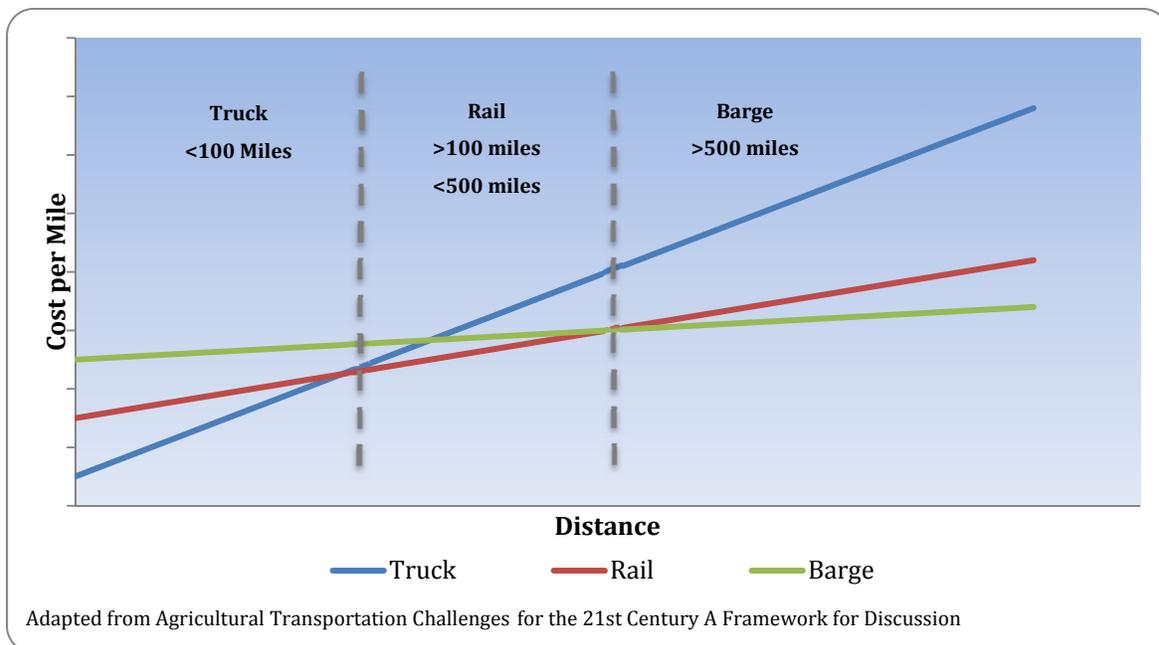
Within

The vast majority of the commodity movements, 160 million tons, did originate and were destined for ports within the basin.



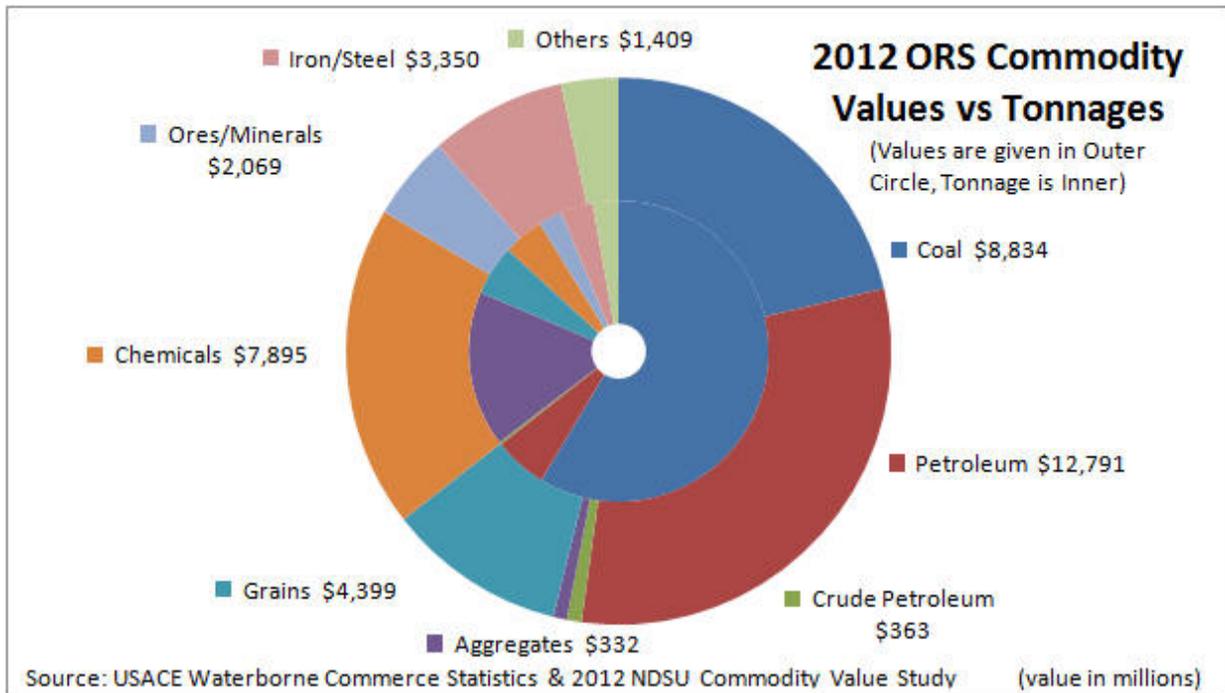
VALUE TO THE NATION

The inland waterway provides an efficient means of moving large volumes of commodities over long distances. On average, a gallon of fuel allows one ton of cargo to be shipped 59 miles by truck, 202 miles by rail, and 514 miles by barge. The origin of a commodity relative to its final destination may find more savings via truck or rail. Rail and Barge have higher upfront terminal costs but significantly lower line-haul (per-mile) costs as the distance between origin and destination, for that mode, increases. The inland waterway system provides the most cost effective mode for the movement of large volume commodities over long distances.



The value of the commodities moved in 2012 was over \$41 billion. The relationship of the per ton value of the commodity move does not track one-to-one with the tonnage moved on the system. Crude petroleum, petroleum products, and chemicals are the highest value commodities per ton, but represent some of the lowest tonnages moved in the system.

In contrast, coal is the highest volume commodity moved on the Ohio River System. The majority of which is used in the production of power for residential and commercial consumption. However, the value of that coal represents a much smaller amount of the total value of commodities.



SUMMARY

In summary, the Ohio River Basin inland navigation system provides some commodity movements to Mississippi River system, but predominately moves commodities within the basin. In terms of numbers the Ohio River Basin moves two-thirds of the commodities, as a percentage of tonnage, within the basin. Grains and grain products moving on this part of the inland system are likely destined for export to international markets. The receipts of chemicals, non-metallic ores, and iron related commodities far exceed the basins shipments.