

The Economic Impact of Reduced Dredging of the Mississippi River



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EXECUTIVE SUMMARY

- The Mississippi River is the highway to the vast central portion of the United States. Many of the commodities and goods produced in the heartland of the United States are brought to world markets via the Mississippi River to the Gulf of Mexico and beyond to the world economies. Likewise, important products are transported from the rest of the world to the entire United States via the Mississippi River. Much of the Midwest grain and crop production can only competitively enter world markets via waterborne transportation through the Mississippi River. Any increase in costs to U. S. producers, especially farmers, would therefore lead to lost production to foreign competitors. In addition, a large portion of the United States gasoline supply is transported as foreign crude oil to oil refineries on the Mississippi River.
- The Mississippi River system offers users significantly reduced transportation costs when compared to overland methods; however, draft restrictions on the Lower Mississippi River (specifically at Southwest Pass) reduce the positive cost savings. The increased costs associated with draft or channel restrictions negates the competitive advantage U.S. shippers have over competing world markets and threatens the vital competitive advantage of U. S. producers.
- Much of this is threatened by the decision of the Corps of Engineers to reduce dredging activity on the Lower Mississippi River (LMR), specifically at the three areas that require maintenance dredging: the Crossings, the New Orleans Harbor, and Southwest Pass. Historically, the Corps has dredged the River to depths that would allow vessels with draft in excess of 45 feet to navigate the passes to and out of the River. The current USACE budget will lead to significantly reduced widths and depths on the LMR. In the face of the current government fiscal crisis, funding for the Corps of Engineers dredging budget has been cut. According to the Louisiana Congressional delegation, the reduction amounts to \$45 million per year. Current discussions call for a dredging program that may only be able to maintain depths of 38 feet in certain areas of the LMR. There are vessel operators that require several feet of clearance below their vessels keels, the most cautious require up to three feet of under-keel clearance. These vessels could then be reduced to drafts of 35 feet when the controlling depth on the LMR is 38 feet.
- Table S1 presents the total amount of the top 10 import and export commodities transported through the mouth of the Mississippi River. It also presents the loss in tonnage of each commodity if the River is maintained to 38 feet. In 2010, the base year for this study, the top ten commodities carried on the lower Mississippi River accounted for 99.66 million short tons of export and 106.68 million tons of import commodities.
- If the controlling depth is reduced to 38 feet of draft, the nation and the world stand to lose 12.38 million tons of exports (12.4% of the total) and 5.87 million tons of imports (5.5% of the total). On the export side, the most affected commodities are soybeans and other agricultural products and on the import side, most of the impact or loss will be crude oil destined for the refineries along the Mississippi River.

Table S1

Total Tonnage and Tonnage Lost by Commodity at 38 Feet

Export Top 10 Commodities	Total Tonnage	Tonnage Lost	Percentage Lost
Coal	12,759,567	2,759,394	21.6%
Gasoline	1,473,371	23,711	1.6%
Corn	35,570,803	923,996	2.6%
Pig Iron	1,357,576	39,858	2.9%
Crude Oil	12,354,918	4,576,680	37.0%
Rice	2,422,224	1,064	0.0%
Cyanide Hdrx	1,059,216	-	0.0%
Soybean Oil	1,233,169	-	0.0%
Soybeans	28,982,631	4,049,330	14.0%
Vegetables	2,449,354	4,206	0.2%
Total Export	99,662,829	12,378,240	12.4%
Import Major Commodities			
Bauxite	3,448,109	13,580	0.4%
Phosphate	1,257,913	51,162	4.1%
Coal	1,860,163	59,339	3.2%
Fusel	2,099,231	18,551	0.9%
Iron Ore	2,043,138	52,352	2.6%
Limestone	1,683,764	82,395	4.9%
Pig Iron	3,156,734	120,524	3.8%
ND Fertilizer	2,034,671	-	0.0%
Crude Oil	85,589,492	5,437,667	6.4%
Slag Fertilizer	3,509,888	38,550	1.1%
Total Import	106,683,103	5,874,120	5.5%
Grand Total	206,345,932	18,252,360	8.8%

Source: Blue Water Shipping, PIERS, and Author's Calculations

- Table S2 presents the dollar loss associated with the tonnage loss presented in Table S1. In 2010, the Mississippi River handled over \$40.12 billion in just the top ten commodities on the export side and \$62.75 billion of import commodities. The dredging restriction could cause a loss of \$5.52 billion on the export side and \$3.71 billion on the import side. In total, the U. S. economy could stand to lose over \$9.23 billion worth of cargo.

Table S2

Total Value Lost by Commodity at 38 Feet

Export Major Commodities	Total Value	Value Lost	Percentage Lost
Coal	\$2,141,427,629	\$463,106,856	21.6%
Gasoline	\$1,139,832,112	\$18,343,617	1.6%
Corn	\$8,938,593,246	\$232,191,086	2.6%
Pig Iron	\$278,303,080	\$8,170,938	2.9%
Crude Oil	\$8,249,891,392	\$3,056,038,818	37.0%
Rice	\$1,352,612,433	\$594,144	0.0%
Cyanide Hdrx	\$529,608,000	\$-	0.0%
Soybean Oil	\$1,364,828,761	\$-	0.0%
Soybeans	\$12,462,429,754	\$1,741,197,914	14.0%
Vegetables	\$3,666,327,346	\$6,296,324	0.2%
Total Exports	\$40,123,853,755	\$5,525,939,696	13.8%
Import Major Commodities			
Bauxite	\$1,517,114,857	\$5,975,021	0.4%
Phosphate	\$225,378,997	\$9,166,654	4.1%
Coal	\$312,189,625	\$9,958,863	3.2%
Fusel	\$-	\$-	0.0%
Iron Ore	\$328,496,446	\$8,417,153	2.6%
Limestone	\$33,604,670	\$1,644,441	4.9%
Pig Iron	\$647,130,470	\$24,707,339	3.8%
ND Fertilizer	\$929,925,367	\$-	0.0%
Crude Oil	\$57,151,655,182	\$3,630,955,976	6.4%
Slag Fertilizer	\$1,604,158,062	\$17,618,833	1.1%
Total Imports	\$62,749,653,676	\$3,708,444,280	5.9%
Grand Total	\$102,873,507,431	\$9,234,383,976	9.0%

Source: Blue Water Shipping, PIERS, and Author's Calculations

- These cargo reductions will have a serious impact on the United States economy in three major ways: a) the loss to the Louisiana economy related to the handling of this cargo; b) the loss to the U. S. producers due to the increased costs of American made goods for export; and c) the loss to the American consumers due to higher gasoline prices that will result from the reductions of imported crude oil.

LOSS TO THE LOUISIANA ECONOMY

- Over 20% of United States waterborne commerce passes through the Lower Mississippi River and the Louisiana economy. Shipping is big business in Louisiana. Millions of dollars of business and thousands of jobs are related to the handling, financing, processing, and transporting that cargo. The ship movements create a large number of economic opportunities related to the servicing of the vessels that call on the ports along the LMR. The LMR also acts as a magnet for attracting warehousing and manufacturing firms that use the River to import raw materials into the area or export finished products out of the area.

As a result of the reduced dredging activities of the Corps of Engineers, the Louisiana economy could lose \$268.14 million in direct spending, \$155.45 million in secondary spending for a total spending loss of \$423.59 million. In addition, the Louisiana economy could lose \$117.96 million of income and 3,815 jobs in the state. Local governments could lose \$13.24 million annually in tax revenue, the state government could lose \$14.54 million in tax revenues, and the federal government could lose \$13.05 million annually in income tax revenues. (See Table S3)

Table S3

Total Dollar Loss to the Louisiana Economy

Category

Total Loss in \$s

Direct Spending

\$268,141,204

Secondary Spending

\$155,447,650

Total Spending

\$423,588,854

Earnings

\$117,955,050

Jobs

3,815

State Taxes

\$14,536,790

Local Taxes

\$13,237,223

Federal Taxes

\$13,045,829

S & L Taxes

\$27,774,013

Total Taxes

\$40,819,841

Source: Author's Calculations

LOSS TO U. S. PRODUCERS DUE TO HIGHER COSTS OF TRANSPORTATION

- American producers have two options in the face of the dredging restrictions:
 - Option 1 -- reduce production to lower the quantities produced and therefore shipped. Given the fact that the increased costs of shipping the commodities may make American goods, especially farm products, less competitive than foreign produced goods, this is a likely outcome. For this option, the reduction in production would equal the loss in commodities shipped as identified in Tables 11 and 13.
 - Option 2 -- to absorb the higher transportation costs. If the producers choose this option, they will find the least cost method of shipping the goods and this will be the cost they will absorb. Given the fact that most of the commodities identified in Tables 11 and 13 are commodities that are shipped in bulk (mostly agricultural products and crude oil), it will still be cheaper to barge these commodities down the Mississippi River and put them on an additional ship to the ultimate destination. The number of additional vessels needed for each commodity depends on the tonnage lost. The average size of an outbound vessel from the Mississippi River in 2010 according to PIERS is 55,151 tons. Thus, a total of 224 additional ocean-going vessels will be needed to transport the cargo lost. That is distributed as follows: Coal (50 ships), Gasoline (0 ship), Corn (17 ships), Pig Iron (1 ships), Crude Oil (83 ships), Rice (0 ships), Cyanide Hydroxide (0 ships), Soybean Oil (0 ships), Soybeans (73 ships), and Vegetable Oils (0 ship). For those commodities listed with zero additional ships, it is assumed that they would be matched with existing ships that have additional capacity (albeit at some cost). The costs of an additional bulk ship of 55,000-ton capacity for a trip from New Orleans to China would be, on average, \$1,983,316. The per ship additional costs are the losses that the producers would have to bear in Option 2.
- The economic losses resulting from the dredging restrictions are significant for the country as a whole. In just one year, under Option 1, American producers, mostly farmers, could lose \$5.53 billion in direct losses in production. The ripple effect, or secondary spending effect, could add another \$4.97 billion. The total loss to the U. S. economy of the reduced dredging could be \$10.50 billion in lost production.
- In addition, the nation's economy could lose 33,800 jobs as a result of the losses in production and \$1.69 billion in lost income for American workers. These are losses that would be even more significant in the current weak economy. Finally, when the private sector loses production and jobs, state, local, and federal governments suffer losses in revenue. The economic losses resulting from the reduced dredging could cost state and local governments \$108.96 million in lost revenues and the federal government would lose \$186.91 million in lost personal income tax revenues alone. The total loss to all levels of government could be \$295.87 million. See Table S4.
- Under Option 2, in just one year, American producers, mostly farmers, could lose \$445.14 million in direct losses in production. The ripple effect, or secondary spending

effect, could add another \$414.11 million. The total loss to the U. S. economy of the reduced dredging could be \$859.25 million in lost production under Option 2.

- In addition, the nation’s economy could stand to lose 2,720 jobs as a result of the losses in production and \$136.02 million in lost income for American workers. These are losses that would be even more significant in the current weak economy. Finally, when the private sector declines through lost production and lost jobs, state, local, and federal governments suffer losses in revenue. The economic losses resulting from the reduced dredging could cost state and local governments \$8.77 million in lost revenues and the federal government would lose \$15.04 million in lost personal income tax revenues alone. The total loss to all levels of government could be \$23.81 million. See Table S4.

BIG RIVER COALITION

Table S4
Economic Loss to American Producers

Category	Economic Loss, Option 1	Economic Loss, Option 2
Direct Spending	\$5,525,939,696	\$445,140,769
Total Spending	\$10,502,750,760	\$859,251,515
Federal taxes	\$186,912,704	\$15,043,687
Total Taxes	\$295,866,972	\$23,812,882
Earnings	\$1,689,988,285	\$136,018,872
Jobs	33,800	2,720

Source: Author’s Calculations

LOSS FROM HIGHER GAS PRICES

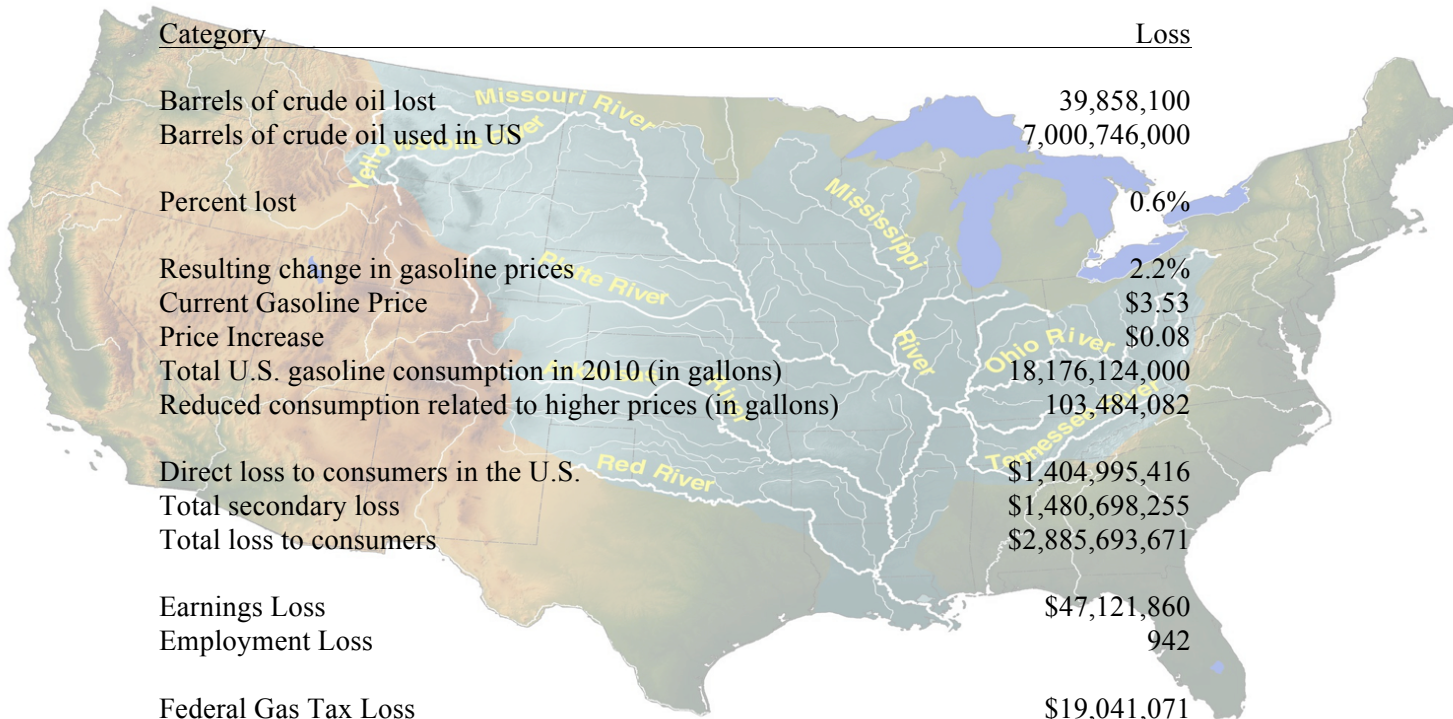
- The final category of loss is the loss to American consumers associated with higher gasoline prices. The shallower channel could cause the loss of 5,437,667 short tons of crude oil in just one year. There are 7.33 barrels of crude oil in one short ton. Thus, the reduced dredging could cause the loss of 39.86 million barrels of oil. In 2010, U. S. oil refineries used 7.00 billion barrels of crude oil in producing gasoline for American consumers. Thus, the draft restrictions could cause a loss of 0.9% of all crude oil and a corresponding decrease in the amount of gasoline refined from that crude.
- According to a recent study, the average price elasticity of demand for gasoline in the United States is -0.26. That means that a 0.6% increase in the price of gasoline will cause a .26% decrease in quantity demanded. Another way of looking at the elasticity is that a 0.6% reduction in the quantity supplied of gasoline could cause a 2.2% increase in price.
- Thus, it can be anticipated that the reduced channel maintenance and the resulting 0.9% reduction in gasoline supply will result in a 2.2% increase in price. The current average retail price of gasoline is \$3.53 (Source: U. S. Energy Information Administration). Thus,

the channel restrictions could cause a \$0.08 increase in retail gasoline prices. In 2010, consumers in the United States consumed 18.18 billion gallons of gasoline. The reduced dredging could cause a loss to consumers of \$0.08 for every gallon consumed or a total loss of \$1.40 billion annually in higher gasoline expenditures. The loss in quantity demanded could be 103.48 million gallons.

- In addition to the direct loss to consumers, there could also be related losses in secondary spending, government tax revenue, earnings, and jobs. These losses are presented in Table S5.

BIG RIVER COALITION

Table S5
Losses Due to Reductions in Crude Oil Imports



Category	Loss
Barrels of crude oil lost	39,858,100
Barrels of crude oil used in US	7,000,746,000
Percent lost	0.6%
Resulting change in gasoline prices	2.2%
Current Gasoline Price	\$3.53
Price Increase	\$0.08
Total U.S. gasoline consumption in 2010 (in gallons)	18,176,124,000
Reduced consumption related to higher prices (in gallons)	103,484,082
Direct loss to consumers in the U.S.	\$1,404,995,416
Total secondary loss	\$1,480,698,255
Total loss to consumers	\$2,885,693,671
Earnings Loss	\$47,121,860
Employment Loss	942
Federal Gas Tax Loss	\$19,041,071
State Gas Tax Loss	\$31,459,161
Total Gas Tax Loss	\$50,500,232

Source: Author's Calculations

OVERALL ECONOMIC LOSS

- The final analysis calls for a benefit/cost analysis of the decision to save the \$45 million and reduce the Corps' budget to not allow for dredging to traditional levels. The benefits of this action are the savings to the federal government and the costs are the economic

losses documented in this report. For the sake of simplicity, we will focus on the following categories of the economic loss associated with the reduced dredging:

1. Direct spending
2. Total spending
3. Federal taxes
4. Total taxes
5. Earnings for citizens
6. Employment.

- Table S6 presents a summary of these losses.

BIG RIVER COALITION

Table S6 A

Summary of Losses Due to Reduced Dredging, Option 1
(Dollar Figures in Millions)

Category	Losses Due To Reduced Cargo Handling	Losses Due to Reduced Exports	Losses Due to Higher Gas Prices	Total Losses
Direct Spending	\$268.14	\$5,525.94	\$1,405.00	\$7,199.08
Total Spending	\$423.59	\$10,502.75	\$2,885.69	\$13,812.03
Federal Taxes	\$13.05	\$186.91	\$19.04	\$219.00
Total Taxes	\$40.82	\$295.87	\$50.50	\$387.19
Earnings	\$117.96	\$1,689.99	\$47.12	\$1,855.07
Jobs	3,815	33,800	942	38,557

Source: Author's Calculations

Table S6 B

Summary of Losses Due to Reduced Dredging, Option 2
(Dollar Figures in Millions)

Category	Losses Due To Reduced Cargo Handling	Losses Due to Reduced Exports	Losses Due to Higher Gas Prices	Total Losses
Direct Spending	\$268.14	\$445.14	\$2,467.76	\$3,181.04
Total Spending	\$423.59	\$859.25	\$5,068.48	\$6,351.32
Federal Taxes	\$13.05	\$15.04	\$19.04	\$47.13
Total Taxes	\$40.82	\$23.81	\$50.50	\$115.13
Earnings	\$117.96	\$136.02	\$82.77	\$336.74
Jobs	3,815	2,720	1,655	8,191

- Thus, in 2012, the first year in which the reduced dredging expenditures will have a full impact, the losses in direct spending could amount to a total of \$7,199.08 million or **\$7.20 billion** under Option 1 and \$3,181.04 million or **\$3.18 billion** under Option 2. The losses in total spending, including the secondary spending or ripple effect, could be \$13,812.03 million or **\$13.81 billion** under Option 1 and **\$6.35 billion** under Option 2.
- The irony of the situation is that even the federal government will lose money by this decision. The loss in federal tax revenues could be **\$219.00 million** annually under Option 1 and **\$47.13 million** under Option 2. In other words, in order to save \$45 million, the government could give up \$219.00 million or \$47.13 in reduced tax revenues on the economic activity lost to the reduced cargo movements. In addition, state and local governments could also lose tax revenue. In total, all governments could lose \$387.19 million or \$115.13 million in tax revenues to save \$45 million.
- Finally, the reduction in dredging frequency could cost U. S. citizens their jobs and part of their income or earnings. The reduction in employment could be 38,557 or 8,191 jobs nationally. Citizens could lose between \$336.74 million and \$1.86 billion annually in income or earnings.
- The figures described above are for one year only. They are likely to increase over time for two reasons. First, the natural growth of the shipping business that is likely to occur over the next five to ten years as a result of economic growth. The U. S. and worldwide recession has slowed cargo movements through the Mississippi River. The 2010 totals were up 21.9% compared to 2009. Over the ten-year period from 2000 to 2010, the totals were up by 4.8% per year. The second reason that the cargo movements are expected to increase is the opening of the new locks and cargo movement infrastructure of the Panama Canal in 2014. The “new” Panama Canal is expected to increase cargo, especially cargo moving on larger ships that can now be accommodated by the Canal, by 30%. The increase for 2012 through 2014 in the Mississippi River is expected to grow at 4.8% annually and after that by 6.3% annually. Tables S7A and S7B present the expected benefits (federal government savings from reduced dredging activities) and the expected costs (losses due to the reduced cargo movements) from 2012 to 2021.

Table S7 A

Annual Costs and Benefits of Reduced Dredging, Option 1
(Dollar Figures in Millions)

Year	Dredging Spending	Direct Spending	Total Spending	Earnings	Federal Taxes
2012	\$45.00	\$7,199.08	\$13,812.03	\$1,855.07	\$219.00
2013	\$46.08	\$7,545.21	\$14,476.12	\$1,944.26	\$229.53
2014	\$47.18	\$7,907.98	\$15,172.13	\$2,037.74	\$240.56
2015	\$48.30	\$8,402.26	\$16,120.45	\$2,165.10	\$255.60
2016	\$49.46	\$8,927.44	\$17,128.04	\$2,300.43	\$271.58
2017	\$50.64	\$9,485.44	\$18,198.61	\$2,444.22	\$288.55
2018	\$51.85	\$10,078.31	\$19,336.09	\$2,596.99	\$306.59
2019	\$53.09	\$10,708.25	\$20,544.68	\$2,759.31	\$325.75
2020	\$54.36	\$11,377.56	\$21,828.80	\$2,931.78	\$346.11
2021	\$55.65	\$12,088.70	\$23,193.19	\$3,115.03	\$367.74
Present Value	\$430.64	\$79,830.79	\$153,162.09	\$20,570.88	\$2,428.49
Benefit/Cost Ratio	NA	0.005	0.003	0.021	0.177

Source: Author's Calculations

Table S7 B

Annual Costs and Benefits of Reduced Dredging, Option 2
(Dollar Figures in Millions)

Year	Dredging Spending	Direct Spending	Total Spending	Earnings	Federal Taxes
2012	\$45.00	\$3,181.04	\$6,351.32	\$336.74	\$47.13
2013	\$46.08	\$3,333.98	\$6,656.69	\$352.93	\$49.40
2014	\$47.18	\$3,494.28	\$6,976.75	\$369.90	\$51.77
2015	\$48.30	\$3,712.69	\$7,412.82	\$393.02	\$55.01
2016	\$49.46	\$3,944.75	\$7,876.15	\$417.58	\$58.45
2017	\$50.64	\$4,191.31	\$8,368.44	\$443.68	\$62.10
2018	\$51.85	\$4,453.28	\$8,891.51	\$471.42	\$65.98
2019	\$53.09	\$4,731.63	\$9,447.26	\$500.88	\$70.10
2020	\$54.36	\$5,027.38	\$10,037.75	\$532.19	\$74.49
2021	\$55.65	\$5,341.61	\$10,665.15	\$565.45	\$79.14
Present Value	\$430.64	\$35,274.66	\$70,430.03	\$3,734.12	\$522.63
Benefit/Cost Ratio	NA	0.012	0.006	0.115	0.824

Source: Author's Calculations

- The case for increased spending on dredging could not be clearer. The present value of the stream is also presented. The future benefits and costs are discounted to the present using the current long-term U. S. Treasury bond rate of 2.77%. The present value of the ten-year projections of the benefits and costs from reduced dredging presents a startling comparison. The benefits of the activity (reducing federal spending on dredging) are outweighed by the costs no matter what measure of costs are used.
- Under Option 1, if direct costs are used as the cost measure, the B/C ratio is .005. In cost benefit analysis, a B/C ratio of one implies that the benefits and costs are equal. A B/C ratio of more than one implies the benefits outweigh the costs and a B/C ratio of less than one implies the costs outweigh the benefits. If total costs are used as the costs, the B/C ratio is .003. If earnings or income is used, the B/C ratio is .021. Finally, if federal tax revenues are used, the B/C ratio is .177.
- Under Option 2, if direct costs are used as the cost measure, the B/C ratio is .012. If total costs are used as the cost measure, the B/C ratio is .006. If earnings or income is used, the B/C ratio is .115. Finally, if federal tax revenues are used, the B/C ratio is .824.
- **Clearly, no matter what measure of costs is employed, the result is a B/C ratio of significantly less than one. Under any measure, the decision by the government to reduce the Corps' funding for dredging is a poor policy decision.**

LOSSES AT VARIOUS CHANNEL DEPTHS

- The analysis in this report is based on the Corps maintaining the Lower Mississippi River to 38 feet. Dredging is not an exact science. The actual depths can be impacted by natural phenomena that occur in the River itself. This section of the report analyzes the impact of dredging the channel to various depths.
- If the channel is dredged to 45 feet, the losses to the United States economy will be \$423.37 million in direct spending, \$789.09 million in total spending, \$118.15 million in earnings or income for American residents, and \$13.55 million in federal taxes lost (See Table S8). For every foot below 45 feet, the losses get larger and larger. If the channel is maintained to a depth of only 35 feet, the losses will be \$14.02 billion in direct spending, \$27.30 billion in total spending, \$3.58 billion in earnings, and \$424.32 million in federal taxes.
- Table S9 presents the economic losses as we move from 45 feet channel depths to 35 feet. Reducing the channel from 45 to 44 feet will create losses of \$455.23 million in direct spending. Reducing it from 44 to 43 will create additional losses of \$593.98 million and so forth. As the channel depths get lower the losses get higher and higher. **On average, a one foot reduction in the channel creates an additional loss in the first year to the United States economy of \$1.47 billion per foot in direct spending, \$2.87 billion per foot in total spending, \$374.46 million per foot in earnings, and \$44.45 million per foot in federal tax revenues.**

Table S8

Losses at Various Channel Depths
(Dollar figures in millions)

Depth in Feet	Direct Spending	Total Spending	Earnings	Federal Taxes
35	\$14,024.51	\$27,300.89	\$3,579.76	\$424.32
36	\$11,653.16	\$22,611.44	\$2,977.56	\$352.76
37	\$9,281.79	\$17,921.99	\$2,375.37	\$281.20
38	\$7,199.08	\$13,812.03	\$1,855.07	\$219.00
39	\$5,311.24	\$10,118.65	\$1,384.44	\$162.69
40	\$3,668.25	\$6,947.59	\$966.94	\$113.11
41	\$2,594.55	\$4,929.20	\$691.52	\$80.55
42	\$1,821.82	\$3,483.23	\$488.22	\$56.75
43	\$1,227.83	\$2,351.16	\$331.18	\$38.40
44	\$772.60	\$1,459.67	\$209.65	\$24.26
45	\$424.37	\$789.09	\$118.15	\$13.55

Source: Author's Calculations

Table S9

Incremental Losses at Various Channel Depths
(Dollar figures in millions)

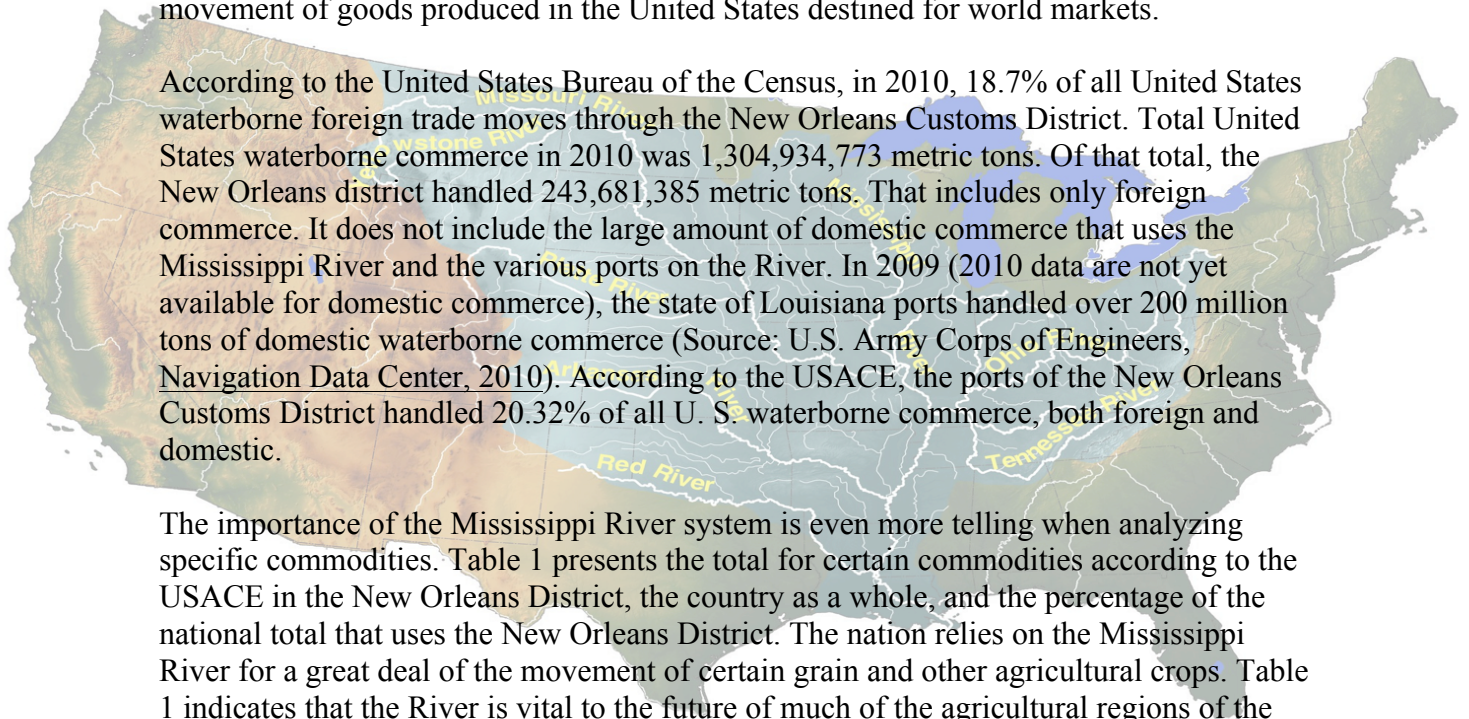
Depth in Feet	Direct Spending	Total Spending	Earnings	Federal Taxes
44-45	\$455.23	\$891.49	\$121.53	\$14.15
43-44	\$593.98	\$1,132.07	\$157.04	\$18.35
42-43	\$772.74	\$1,445.97	\$203.30	\$23.80
41-42	\$1,073.69	\$2,018.40	\$275.42	\$32.56
40-41	\$1,643.00	\$3,171.05	\$417.50	\$49.58
39-40	\$1,887.83	\$3,693.39	\$470.63	\$56.30
37-38	\$2,082.72	\$4,109.96	\$520.31	\$62.20
36-37	\$2,371.36	\$4,689.44	\$602.18	\$71.56
35-36	\$2,371.35	\$4,689.45	\$602.20	\$71.56
Average	\$1,472.43	\$2,871.25	\$374.46	\$44.45

Source: Author's Calculations

INTRODUCTION

The Mississippi River is the highway to the vast central portion of the United States. Much of the commodities and goods produced in the heartland of the United States are brought to world markets via the Mississippi River to the Gulf of Mexico and beyond to the world economies. Likewise, important products are transported from the rest of the world to the entire United States via the Mississippi River.

Much of the Midwest grain and crop production can only competitively enter world markets by ship transportation through the Mississippi River. A large portion of the United States gasoline supply is transported as foreign crude oil to oil refineries on the Mississippi River. It is not an exaggeration to say that the economy of a large part of the country is dependent on the Mississippi River for both the inbound movement of inputs into domestic production processes, especially crude oil, as well as the outbound movement of goods produced in the United States destined for world markets.



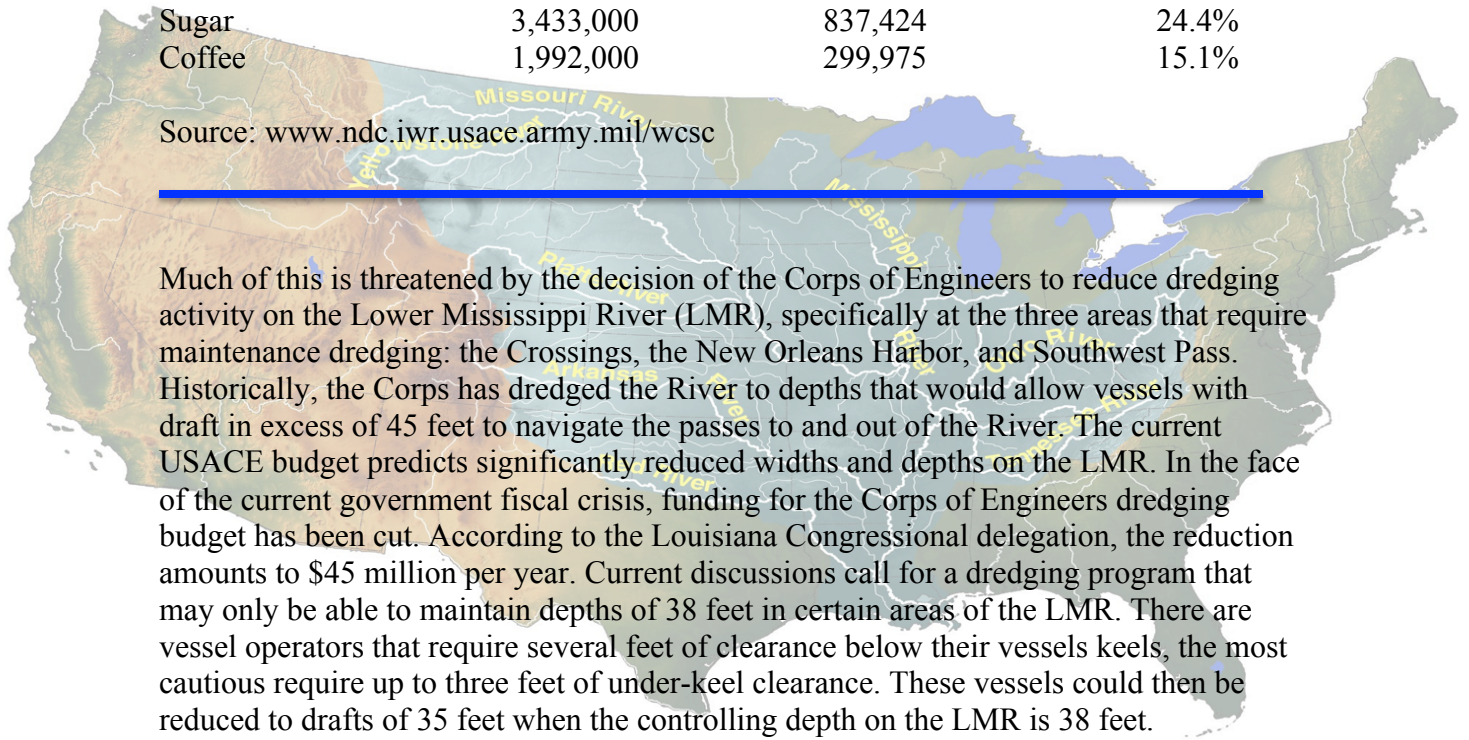
According to the United States Bureau of the Census, in 2010, 18.7% of all United States waterborne foreign trade moves through the New Orleans Customs District. Total United States waterborne commerce in 2010 was 1,304,934,773 metric tons. Of that total, the New Orleans district handled 243,681,385 metric tons. That includes only foreign commerce. It does not include the large amount of domestic commerce that uses the Mississippi River and the various ports on the River. In 2009 (2010 data are not yet available for domestic commerce), the state of Louisiana ports handled over 200 million tons of domestic waterborne commerce (Source: U.S. Army Corps of Engineers, Navigation Data Center, 2010). According to the USACE, the ports of the New Orleans Customs District handled 20.32% of all U. S. waterborne commerce, both foreign and domestic.

The importance of the Mississippi River system is even more telling when analyzing specific commodities. Table 1 presents the total for certain commodities according to the USACE in the New Orleans District, the country as a whole, and the percentage of the national total that uses the New Orleans District. The nation relies on the Mississippi River for a great deal of the movement of certain grain and other agricultural crops. Table 1 indicates that the River is vital to the future of much of the agricultural regions of the United States, especially for corn, soybeans, rice, and vegetable oils.

Table 1

Commodity Movements, 2009 (in short tons)

Commodity	U. S. Total	New Orleans Total	N.O. as a % of U.S.
Pig Iron	6,085,000	4,703,583	77.3%
Wheat	32,535,000	8,237,789	25.3%
Corn	79,695,000	62,991,950	79.0%
Rice	5,479,000	3,318,541	60.6%
Sorghum	3,361,000	1,137,653	33.8%
Soybeans	65,010,000	45,284,354	69.7%
Vegetable Oils	5,236,000	3,078,468	58.8%
Grain Mill Products	5,533,000	2,897,712	52.4%
Sugar	3,433,000	837,424	24.4%
Coffee	1,992,000	299,975	15.1%

Source: www.ndc.iwr.usace.army.mil/wcsc

Much of this is threatened by the decision of the Corps of Engineers to reduce dredging activity on the Lower Mississippi River (LMR), specifically at the three areas that require maintenance dredging: the Crossings, the New Orleans Harbor, and Southwest Pass. Historically, the Corps has dredged the River to depths that would allow vessels with draft in excess of 45 feet to navigate the passes to and out of the River. The current USACE budget predicts significantly reduced widths and depths on the LMR. In the face of the current government fiscal crisis, funding for the Corps of Engineers dredging budget has been cut. According to the Louisiana Congressional delegation, the reduction amounts to \$45 million per year. Current discussions call for a dredging program that may only be able to maintain depths of 38 feet in certain areas of the LMR. There are vessel operators that require several feet of clearance below their vessels keels, the most cautious require up to three feet of under-keel clearance. These vessels could then be reduced to drafts of 35 feet when the controlling depth on the LMR is 38 feet.

The reduction of the maximum draft of vessels on the River from the current 47 feet or so to 38 feet would have a significant impact on shipping on the Mississippi River and the United States as a whole. The purpose of this report is to identify the loss in cargo that will result from the reduction in maximum draft and the economic impact to the Louisiana and national economies.

ESTIMATED LOSS OF CARGO CAPACITY

This section of the report identifies the loss in cargo capacity as a result of the reduced maximum draft. The base year of the study is 2010. The study uses 2010 data to estimate the impact of the reduced draft. The State and Federal Pilots on the LMR provided a data set of all ocean-going vessels that travelled up or down the Mississippi River in 2010. That data set provides a great deal of information about the trip – ship name, draft in feet on the inbound trip, draft in feet on the outbound trip, destination on the River, and date of trip, among other information. This data set is referred to as the Master Data Set. (Source: State and Federal Pilots on the LMR). In 2010, there were 2,184 vessels that had a depth of 38 feet or greater on one leg or the other of their trip (See Table 2). Of that total, 754 were inbound, or import vessels, and 1,394 were outbound, or export, vessels. In 2010, 14.8% of all inbound vessels and 27.4% of all outbound vessels carried more than 38 feet of draft. Of all vessels, 21.1% had more than 38 feet of draft. It is clear from these numbers that action that reduced the draft of the River would impact a large percentage of total cargo carried on the River, thereby significantly affecting United States commerce and international trade, especially in certain commodities as will be indicated in this report.

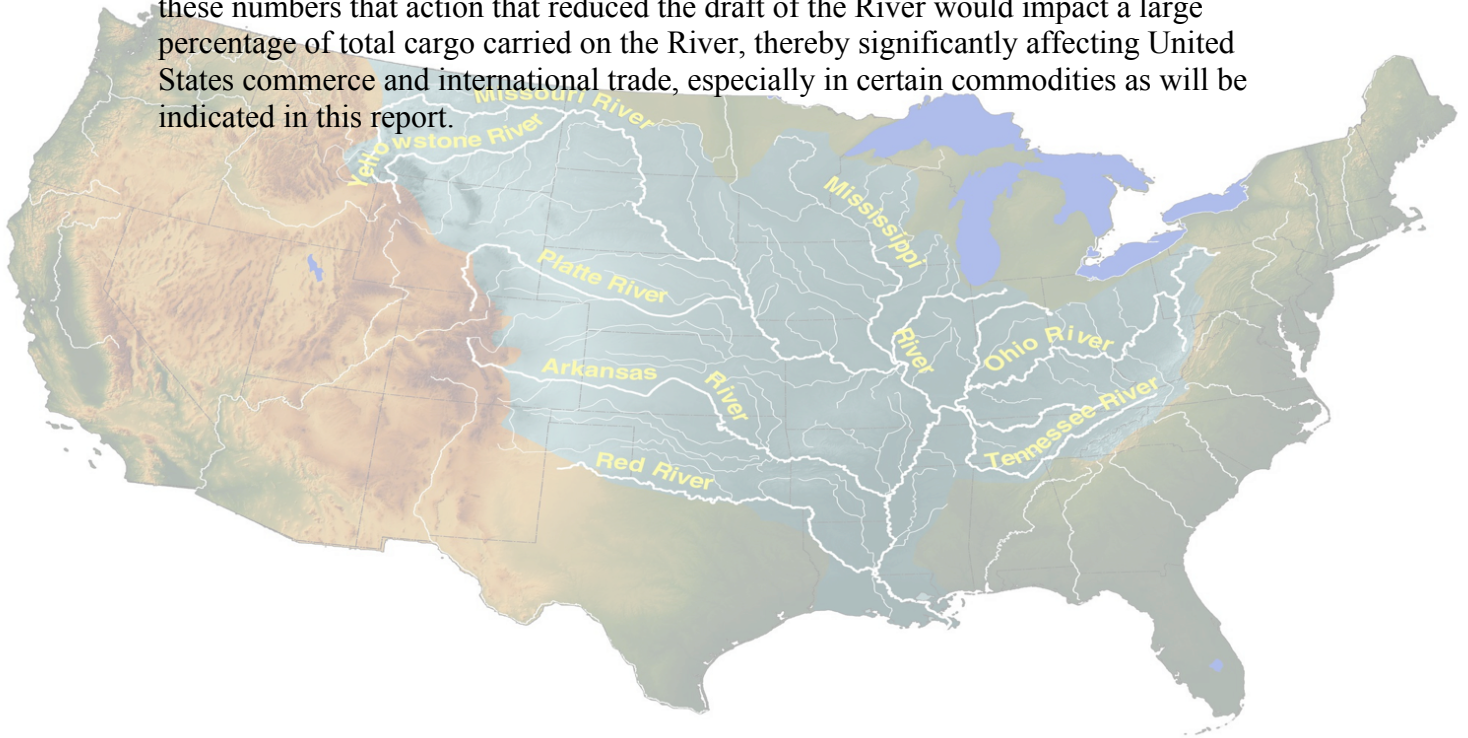


Table 2

Number of Vessels Travelling the Lower Mississippi River, 2010, by Draft

Draft In Feet	Outbound Ships	Percent of Total	Inbound Ships	Percent of Total	Total Ships	Percent of Total
< 20	520	10.2%	156	3.1%	676	6.6%
20	316	6.2%	79	1.6%	395	3.9%
21	335	6.6%	83	1.6%	418	4.1%
22	375	7.4%	107	2.1%	482	4.7%
23	337	6.6%	136	2.7%	473	4.6%
24	319	6.3%	164	3.2%	483	4.7%
25	226	4.4%	179	3.5%	405	4.0%
26	229	4.5%	264	5.2%	493	4.8%
27	304	6.0%	309	6.1%	613	6.0%
28	180	3.5%	347	6.8%	527	5.2%
29	126	2.5%	221	4.3%	347	3.4%
30	113	2.2%	242	4.8%	355	3.5%
31	116	2.3%	167	3.3%	283	2.8%
32	172	3.4%	270	5.3%	442	4.3%
33	155	3.0%	189	3.7%	344	3.4%
34	129	2.5%	205	4.0%	334	3.3%
35	121	2.4%	235	4.6%	356	3.5%
36	132	2.6%	204	4.0%	336	3.3%
37	133	2.6%	141	2.8%	274	2.7%
38	183	3.6%	153	3.0%	336	3.3%
39	226	4.4%	503	9.9%	729	7.2%
40	134	2.6%	278	5.5%	412	4.0%
41	52	1.0%	102	2.0%	154	1.5%
42	44	0.9%	85	1.7%	129	1.3%
43	18	0.4%	74	1.5%	92	0.9%
44	36	0.7%	58	1.1%	94	0.9%
45	46	0.9%	64	1.3%	110	1.1%
46	12	0.2%	46	0.9%	58	0.6%
47	3	0.1%	31	0.6%	34	0.3%
Total	5,092	100.0%	5,092	100.0%	10,184	100.0%
> 38 Feet	754	14.8%	1,394	27.4%	2,148	21.1%

Source: State and Federal Pilots

In order to estimate the economic impact of this reduction in River dredging, it is necessary to identify the commodities that were carried by these vessels. The Master data Set had no commodity information. It was necessary to use two additional data sets to get the commodity information connected to the vessels name and draft information contained in the Master Data Set. The first additional data set was the export vessel movements for grain and pig iron obtained from Blue Water Shipping. That data set had approximately 1,000 separate vessels names and the specific cargoes carried. The Blue Water data set was then matched by hand based on the vessel names to the original Master Data Set. This data set provided data on approximately 20% of the export vessels.

The second data set was provided by the Port of New Orleans from the PIERS data service. PIERS provided data by vessel name on 1,588 inbound ships and 2,083 outbound ships. The data provided included vessel name, tonnage of all commodities by four-digit commodity codes, among other variables. This data set provided data on approximately 30% of the import vessels and 40% of the export vessels on the master list.

Matching the PIERS list by vessel name allowed the development of a data set of vessels that had vessel name, draft, specific cargo carried, and tonnage. These are the elements needed to estimate the losses from reduced dredging. Table 3 presents the commodity data. The data was truncated to analyze only the ten largest categories of commodities in each category – inbound and outbound. Thus, in 2010, the top ten commodities by weight accounted for 99.66 million short tons of export commodities and 106.68 million short ton of imports.

On the export side, agricultural commodities accounted for the largest cargoes, with corn and soybeans at the top of the list. Crude oil and coal were also very important cargoes. On the import side, crude oil dominated the list, accounting for 80.2% of exports that moved through the mouth of the Mississippi River in 2010.

Table 3

Total Tonnage by Commodity

Export Major Commodities **Tonnage**

Coal	12,759,567
Gasoline	1,473,371
Corn	35,570,803
Pig Iron	1,357,576
Crude Oil	12,354,918
Rice	2,422,224
Cyanide Hydroxide	1,059,216
Soybean Oil	1,233,169
Soybeans	28,982,631
Vegetable Oils	2,449,354

TOTAL OUTBOUND **99,662,829**

Import Major Commodities **Tonnage**

Bauxite	3,448,109
Phosphate	1,257,913
Coal	1,860,163
Fusel	2,099,231
Iron Ore	2,043,138
Limestone	1,683,764
Pig Iron	3,156,734
ND Fertilizer	2,034,671
Crude Oil	85,589,492
Slag Fertilizer	3,509,888

TOTAL INBOUND **106,683,103**

Source: Blue Water Shipping and PIERS

The next step was to estimate the tonnage for all 10,184 vessel movements so that the total loss from reduced dredging can be estimated. Based on the matching of tonnage and draft in the previous step, it was possible to perform a linear regression relating draft to tonnage. Actually two regressions were performed, one for inbound vessels and one for outbound vessels. In total, 30% of all inbound and 40% of all outbound vessels were matched to provide the sample for the regression. This is a huge sample size and, as a result, the regression was very robust. The regression allowed the development of an

average relationship between draft and tonnage. Table 4 presents the result of this analysis.

Table 4

Draft and Load in S Tons of Vessels Travelling the Mississippi River, 2010

Draft In Feet	Average Load in S Tons, Inbound	Average Load in S Tons, Outbound
< 20	27,881	4,659
20	29,038	7,321
21	30,194	9,983
22	31,351	12,645
23	32,507	15,307
24	33,663	17,969
25	34,820	20,631
26	35,976	23,293
27	37,133	25,955
28	38,289	28,617
29	39,446	31,279
30	40,602	33,941
31	41,759	36,603
32	42,915	39,265
33	44,071	41,927
34	45,228	44,589
35	46,384	47,251
36	47,541	49,913
37	48,697	52,575
38	49,854	55,237
39	51,010	57,899
40	52,167	60,561
41	53,323	63,223
42	54,480	65,885
43	55,636	68,547
44	56,792	71,209
45	57,949	73,871
46	59,105	76,533
47	60,262	79,195

Source: Author's Calculations

The next step was to estimate the loss in tonnage if channel is reduced to 38 feet. The loss depends on the kind of vessel used – Panamax or Cape sized vessels. Panamax vessels are those specifically designed to use the Panama Canal and are therefore smaller in size than vessels that do not use the Canal. The difference is that Panamax vessels can carry a maximum load of approximately 95,000 tons and Cape sized vessels can carry much larger tonnage. Thus, the loss of tonnage per foot of draft reduced is greater for a Cape sized vessel. Based on industry standards, each foot of draft lost results in the loss of 2,400 tons for a Panamax vessel and 3,600 for a Cape sized vessel. According to the Master Data Set, approximately 90% of the vessels using the Mississippi River in 2010 were Panamax vessels and 10% were Cape sized vessels. Thus, a weighted average of 2,520 was used, which assumes 90% of vessels in each foot of draft category were Panamax and 10% were Cape. Tables 5 and 6 present the losses based on the loss per vessel multiplied times the number of vessels in that category.

The average load and therefore the potential loss is likely to increase in 2014 with the Panama Canal expansion. Maritime indicators are positive that more vessels will approach the maximum draft on the LMR when the Canal expansion is complete. At that time, the LMR’s controlling depth will dictate the maximum draft of vessels entering and leaving the LMR headed for the Far East because the Panama Canal will be deeper.

Table 5
Inbound Ships by Draft and Tonnage

Draft	Number of Ships	Average Load in Short Tons	Loss in Tonnage If Depth is Reduced
38	183	49,854	461,160
39	226	51,010	1,139,040
40	134	52,167	1,013,040
41	52	53,323	524,160
42	44	54,480	554,400
43	18	55,636	272,160
44	36	56,792	635,040
45	46	57,949	927,360
46	12	59,105	272,160
47	3	60,262	75,600
Total	754	-	5,874,120

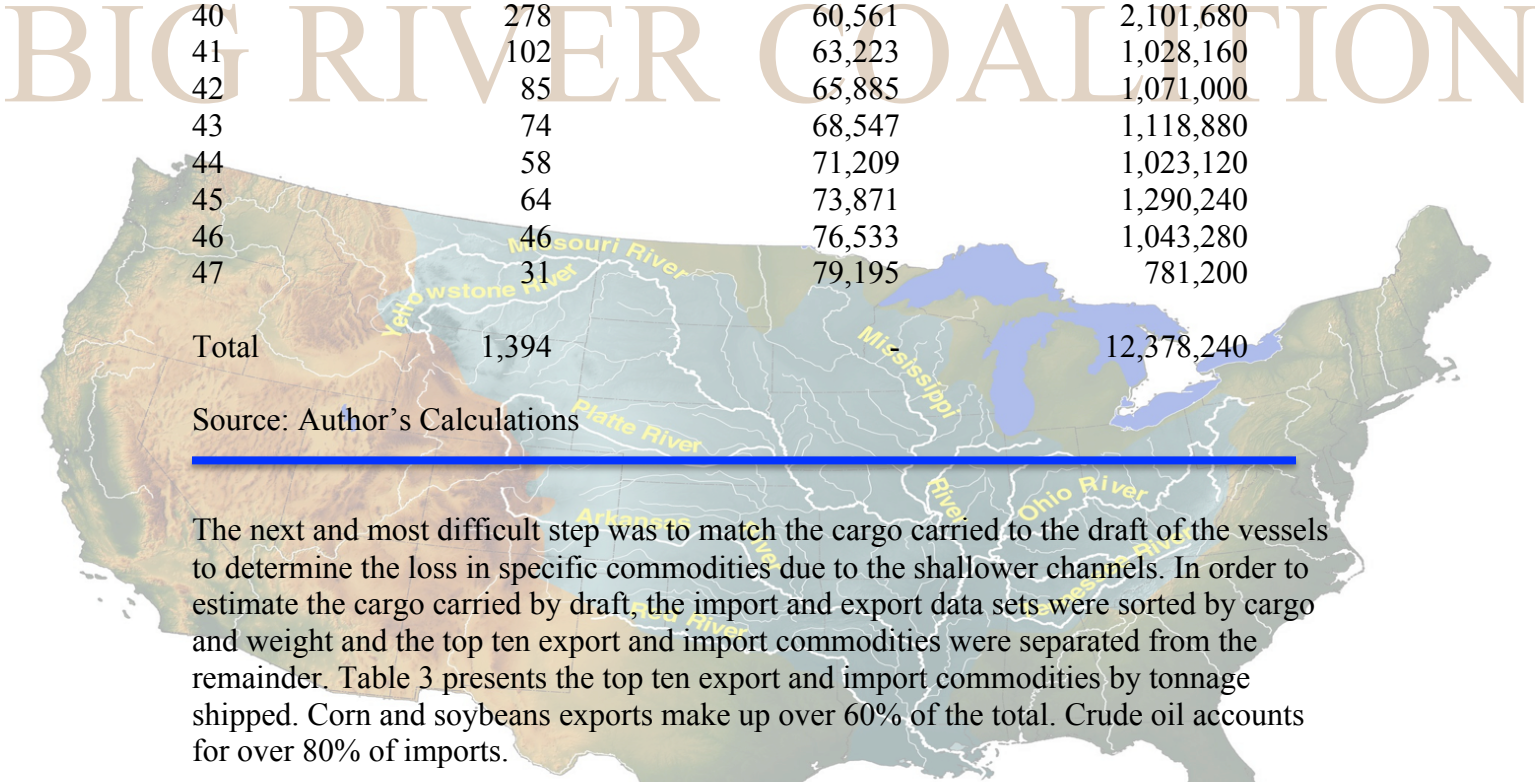
Source: Author’s Calculations

Table 6

Outbound Ships by Draft and Tonnage

Draft	Number of Ships	Average Load in Short Tons	Loss in Tonnage if Depth is Reduced
38	153	55,237	385,560
39	503	57,899	2,535,120
40	278	60,561	2,101,680
41	102	63,223	1,028,160
42	85	65,885	1,071,000
43	74	68,547	1,118,880
44	58	71,209	1,023,120
45	64	73,871	1,290,240
46	46	76,533	1,043,280
47	31	79,195	781,200
Total	1,394		12,378,240

Source: Author's Calculations



The next and most difficult step was to match the cargo carried to the draft of the vessels to determine the loss in specific commodities due to the shallower channels. In order to estimate the cargo carried by draft, the import and export data sets were sorted by cargo and weight and the top ten export and import commodities were separated from the remainder. Table 3 presents the top ten export and import commodities by tonnage shipped. Corn and soybeans exports make up over 60% of the total. Crude oil accounts for over 80% of imports.

Then the top ten export and import commodities were separated by size of the total vessel load to determine which vessels – those that require deep draft or those that require shallow draft – are carrying the various commodities. Table 7 and 8 present the breakdown of the various commodities by the total weight of the ship's load.

Tables 5 and 6 identify the total loss in tonnage associated with the reduction of maximum draft from 47 feet to 38 feet. The next step is to apportion the total loss of 10.68 million tons of import cargo and 20.63 million tons of export cargo to the specific types of cargo. This is done by using the cargo breakdowns by tonnage presented in Tables 7 and 8 and combine that with the relationship between vessel weight and vessel draft determined by the linear regression. Tables 9 and 10 present the total loss of each commodity by weight.

Table 7

Import (inbound) Commodities Carried by Size of Ship

Commodities	0 - 10K	10k - 20K	20K - 30K	30K - 40K	40K - 50K
Bauxite	34,190	-	21,881	-	343,317
Phosphate	11,735	33,943	-	-	93,515
Coal	78,566	67,002	20,709	-	-
Fusel	106,379	593,158	465,478	494,235	46,683
Iron Ore	39,344	51,729	118,889	452,119	546,704
Limestone	11,847	45,481	46,095	35,630	133,037
Pig Iron	106,288	138,579	187,415	407,589	409,051
ND Fertilizer	69,085	481,572	581,311	130,556	716,021
Crude Oil	102,206	266,287	690,730	1,283,873	1,751,635
Slag Fertilizer	17,719	236,910	657,094	278,232	817,918
TOTAL	577,359	1,914,661	2,789,602	3,082,234	4,857,881

Commodities	60 - 70K	70k - 80K	80K - 90K	90K - 100K	100K - 110K
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Bauxite	2,947,704	-	-	-	101,017
Phosphate	440,340	220,440	-	-	-
Coal	-	-	-	-	-
Fusel	-	-	-	-	-
Iron Ore	372,686	154,190	169,956	-	-
Limestone	327,217	427,121	-	-	-
Pig Iron	603,558	539,158	576,206	-	-
ND Fertilizer	56,126	-	-	-	-
Crude Oil	5,040,602	12,667,900	8,496,229	4,801,149	4,022,955
Slag Fertilizer	980,150	70,139	-	-	-
TOTAL	10,768,383	14,078,948	9,242,391	4,801,149	4,123,972

Commodities	110 - 130K	130K - 150K	Over 150K	Total
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Bauxite	-	-	-	3,448,109
Phosphate	-	-	-	1,257,913
Coal	-	-	1,693,886	1,860,163
Fusel	117,706	-	275,592	2,099,231
Iron Ore	-	137,521	-	2,043,138
Limestone	-	-	-	1,683,764
Pig Iron	-	-	-	3,156,734
ND Fertilizer	-	-	-	2,034,671
Crude Oil	3,482,988	3,972,424	34,429,813	85,589,492
Slag Fertilizer	-	-	-	3,509,888
TOTAL	3,600,694	4,109,945	36,399,291	106,683,103

Source: Author's Calculations

Table 8

Export (Outbound) Commodities Carried by Size of Ship

Commodities	0 - 10K	10k - 20K	20K - 30K	30K - 40K	40K - 50K
Coal	157,934	111,549	589,414	1,255,683	1,380,876
Gasoline	72,851	177,277	253,864	536,473	168,430
Corn	675,729	2,755,736	6,694,331	5,311,129	3,557,897
Pig Iron	33,497	12,125	-	66,877	767,725
Crude Oil	79,550	496,914	526,908	1,582,048	3,402,428
Rice	468,032	618,339	570,651	513,825	129,963
Cyanide Hydrox	94,470	207,423	301,055	277,639	178,629
Soybean Oil	306,112	232,749	139,347	145,889	409,072
Soybeans	1,352,404	2,516,975	2,534,165	1,607,012	1,626,933
Vegetable Oils	49,951	106,574	268,768	428,941	533,498

TOTAL	3,290,530	7,235,661	11,878,503	11,725,516	12,155,451
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Commodities	60 - 70K	70k - 80K	80K - 90K	90K - 100K	100K - 110K
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Coal	1,050,529	2,888,886	2,969,115	328,876	108,025
Gasoline	-	72,430	-	-	-
Corn	6,233,569	2,689,078	82,327	-	-
Pig Iron	327,659	-	87,964	-	-
Crude Oil	1,199,521	1,089,362	682,569	1,057,529	204,586
Rice	57,412	-	-	-	-
Cyanide Hydrox	-	-	-	-	-
Soybean Oil	-	-	-	-	-
Soybeans	3,058,377	2,209,071	938,840	94,807	-
Vegetable Oils	808,594	-	-	-	-

TOTAL	12,735,661	8,948,827	4,760,815	1,481,212	312,611
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Commodities	110 - 130K	130k - 150K	Over 150K	Total
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Coal	-	-	-	12,759,567
Gasoline	-	-	-	1,473,371
Corn	-	-	-	35,570,803
Pig Iron	-	-	-	1,357,576
Crude Oil	366,635	-	189,804	12,354,918
Rice	-	-	-	2,422,224
Cyanide Hdrx	-	-	-	1,059,216
Soybean Oil	-	-	-	1,233,169
Soybeans	979,496	409,307	-	28,982,631
Vegetable Oils	-	-	-	2,449,354

TOTAL	1,346,131	409,307	189,804	99,662,829
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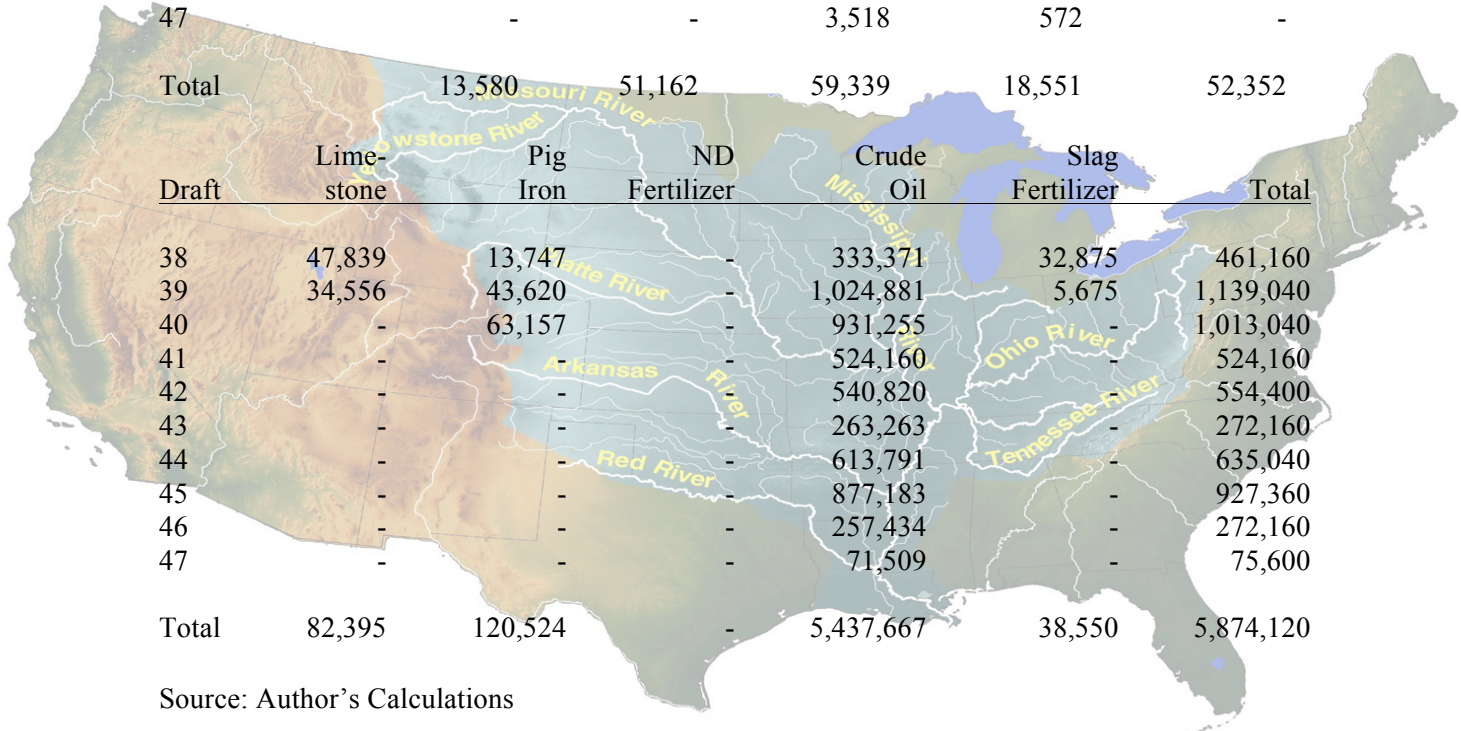
Source: Author's Calculations

Table 9

Loss in Tons -- Inbound Vessels

Draft in Feet	Bauxite	Phosphate	Coal	Fusel	Iron Ore
38	-	33,328	-	-	-
39	-	17,834	-	-	12,475
40	-	-	-	-	18,629
41	-	-	-	-	-
42	13,580	-	-	-	-
43	-	-	-	8,897	-
44	-	-	-	-	21,249
45	-	-	43,156	7,021	-
46	-	-	12,665	2,061	-
47	-	-	3,518	572	-
Total	13,580	51,162	59,339	18,551	52,352

BIG RIVER COALITION



Source: Author's Calculations

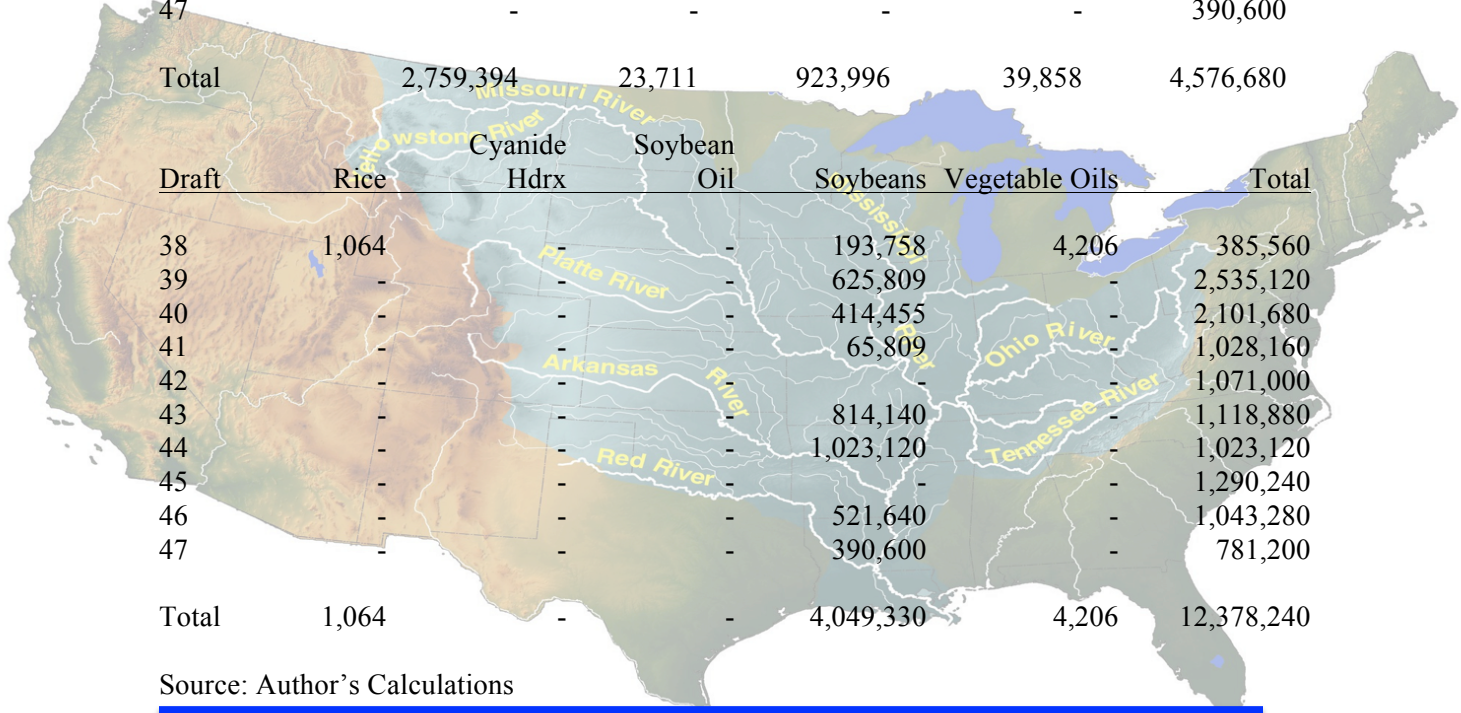
Table 10

Loss in Tons -- Outbound Vessels

Draft in Feet	Coal	Gasoline	Corn	Pig Iron	Crude Oil
38	31,896	3,193	125,861	1,026	24,555
39	818,395	20,519	761,791	-	308,606
40	1,310,727	-	36,344	38,832	301,323
41	228,284	-	-	-	734,067
42	370,092	-	-	-	700,908
43	-	-	-	-	304,740
44	-	-	-	-	-
45	-	-	-	-	1,290,240
46	-	-	-	-	521,640
47	-	-	-	-	390,600

BIG RIVER COALITION

Total	2,759,394	23,711	923,996	39,858	4,576,680
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Draft	Rice	Cyanide Hdrx	Soybean Oil	Soybeans	Vegetable Oils	Total
38	1,064	-	-	193,758	4,206	385,560
39	-	-	-	625,809	-	2,535,120
40	-	-	-	414,455	-	2,101,680
41	-	-	-	65,809	-	1,028,160
42	-	-	-	-	-	1,071,000
43	-	-	-	814,140	-	1,118,880
44	-	-	-	1,023,120	-	1,023,120
45	-	-	-	-	-	1,290,240
46	-	-	-	521,640	-	1,043,280
47	-	-	-	390,600	-	781,200
Total	1,064	-	-	4,049,330	4,206	12,378,240

Source: Author's Calculations

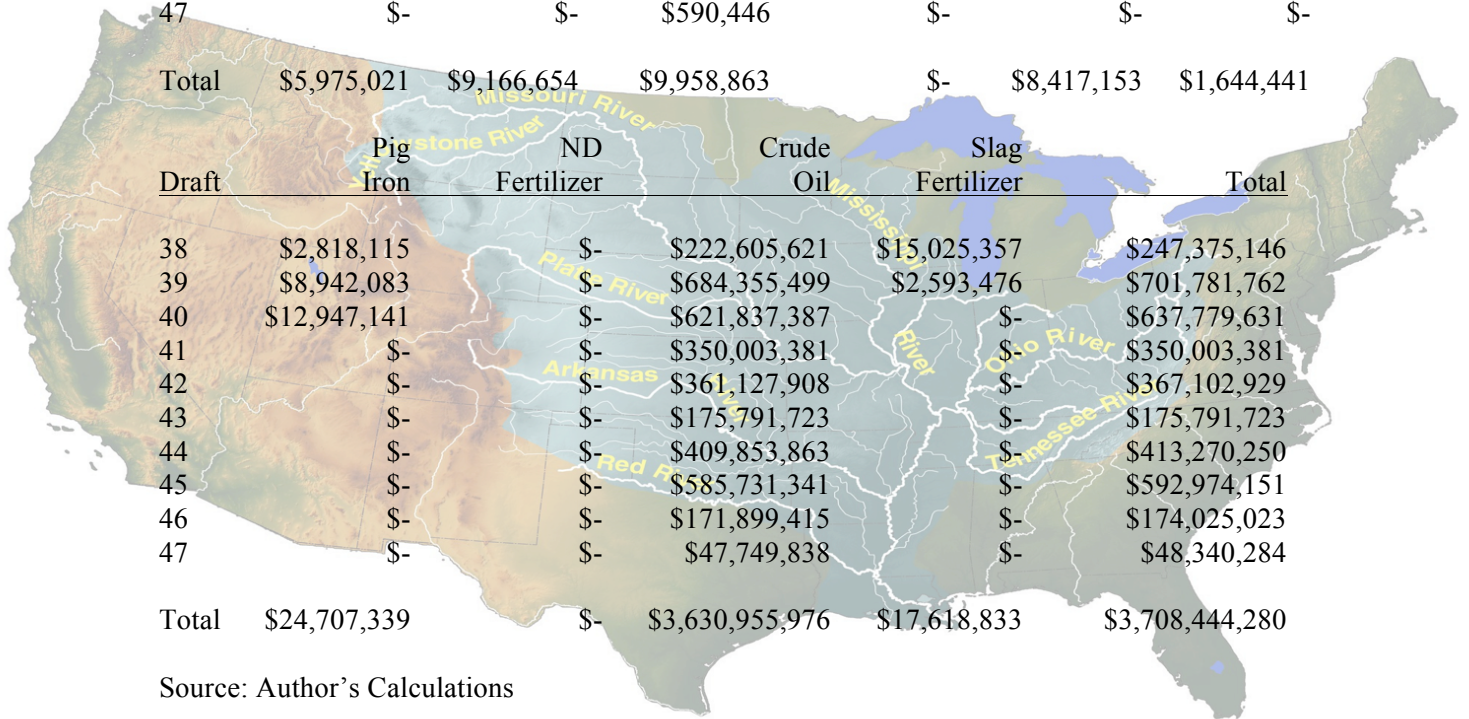
The final step is to estimate the total dollar loss based on the tonnage loss in Table 9 and 10. Using commodity wholesale prices available from IndexMundi, the United States Department of Agriculture, and the U. S. Energy Information Agency, the dollar losses were estimated by multiplying the losses in tons times the wholesale price per ton. Tables 11 and 12 present the dollar loss figures. Thus, the total dollar loss to the United States economy is over **\$9.23 billion**. This is only the loss in value. It does not include the loss in consumers' income due to higher gas and other prices. All that will be estimated in the next section of this report.

Table 11

Loss in Dollar Value -- Inbound Vessels

Draft	Bauxite	Phosphate	Coal	Fusel	Iron Ore	Limestone
38	\$-	\$5,971,277	\$-	\$-	\$-	\$954,776
39	\$-	\$3,195,376	\$-	\$-	\$2,005,663	\$689,665
40	\$-	\$-	\$-	\$-	\$2,995,103	\$-
41	\$-	\$-	\$-	\$-	\$-	\$-
42	\$5,975,021	\$-	\$-	\$-	\$-	\$-
43	\$-	\$-	\$-	\$-	\$-	\$-
44	\$-	\$-	\$-	\$-	\$3,416,387	\$-
45	\$-	\$-	\$7,242,810	\$-	\$-	\$-
46	\$-	\$-	\$2,125,607	\$-	\$-	\$-
47	\$-	\$-	\$590,446	\$-	\$-	\$-
Total	\$5,975,021	\$9,166,654	\$9,958,863	\$-	\$8,417,153	\$1,644,441

BIG RIVER COALITION



Draft	Pig Iron	ND Fertilizer	Crude Oil	Slag Fertilizer	Total
38	\$2,818,115	\$-	\$222,605,621	\$15,025,357	\$247,375,146
39	\$8,942,083	\$-	\$684,355,499	\$2,593,476	\$701,781,762
40	\$12,947,141	\$-	\$621,837,387	\$-	\$637,779,631
41	\$-	\$-	\$350,003,381	\$-	\$350,003,381
42	\$-	\$-	\$361,127,908	\$-	\$367,102,929
43	\$-	\$-	\$175,791,723	\$-	\$175,791,723
44	\$-	\$-	\$409,853,863	\$-	\$413,270,250
45	\$-	\$-	\$585,731,341	\$-	\$592,974,151
46	\$-	\$-	\$171,899,415	\$-	\$174,025,023
47	\$-	\$-	\$47,749,838	\$-	\$48,340,284
Total	\$24,707,339	\$-	\$3,630,955,976	\$17,618,833	\$3,708,444,280

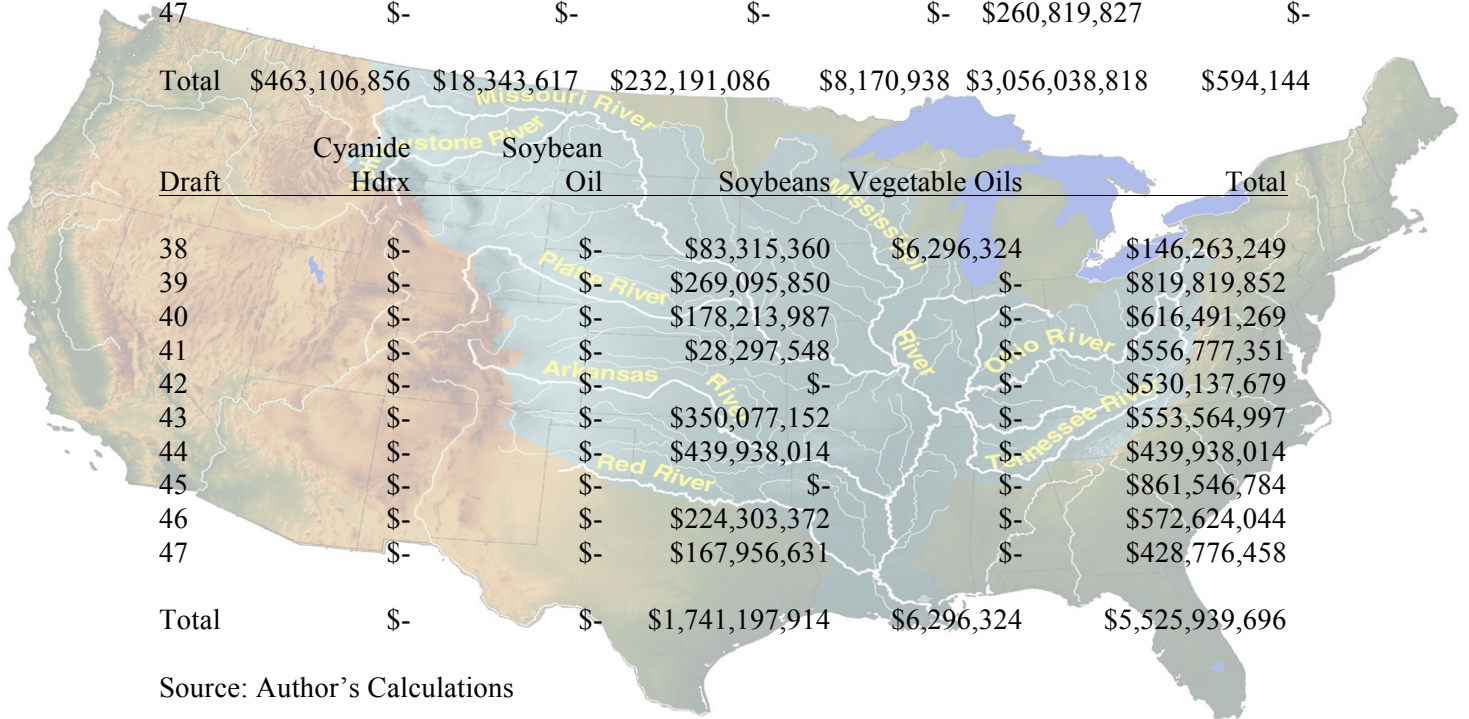
Source: Author's Calculations

Table 12

Loss in Dollar Value -- Outbound Vessels

Draft in Feet	Coal	Gasoline	Corn	Pig Iron	Crude Oil	Rice
38	\$5,353,142	\$2,469,863	\$31,627,724	\$210,369	\$16,396,323	\$594,144
39	\$137,350,511	\$15,873,755	\$191,430,580	\$-	\$206,069,157	\$-
40	\$219,978,264	\$-	\$9,132,782	\$7,960,569	\$201,205,668	\$-
41	\$38,312,733	\$-	\$-	\$-	\$490,167,070	\$-
42	\$62,112,206	\$-	\$-	\$-	\$468,025,472	\$-
43	\$-	\$-	\$-	\$-	\$203,487,844	\$-
44	\$-	\$-	\$-	\$-	\$-	\$-
45	\$-	\$-	\$-	\$-	\$861,546,784	\$-
46	\$-	\$-	\$-	\$-	\$348,320,672	\$-
47	\$-	\$-	\$-	\$-	\$260,819,827	\$-
Total	\$463,106,856	\$18,343,617	\$232,191,086	\$8,170,938	\$3,056,038,818	\$594,144

BIG RIVER COALITION



Draft	Cyanide Hdrx	Soybean Oil	Soybeans	Vegetable Oils	Total
38	\$-	\$-	\$83,315,360	\$6,296,324	\$146,263,249
39	\$-	\$-	\$269,095,850	\$-	\$819,819,852
40	\$-	\$-	\$178,213,987	\$-	\$616,491,269
41	\$-	\$-	\$28,297,548	\$-	\$556,777,351
42	\$-	\$-	\$-	\$-	\$530,137,679
43	\$-	\$-	\$350,077,152	\$-	\$553,564,997
44	\$-	\$-	\$439,938,014	\$-	\$439,938,014
45	\$-	\$-	\$-	\$-	\$861,546,784
46	\$-	\$-	\$224,303,372	\$-	\$572,624,044
47	\$-	\$-	\$167,956,631	\$-	\$428,776,458
Total	\$-	\$-	\$1,741,197,914	\$6,296,324	\$5,525,939,696

Source: Author's Calculations

THE ECONOMIC LOSS TO THE LOUISIANA ECONOMY

This section of the report identifies the potential loss to the Louisiana economy as a result of the reduced dredging levels. Shipping is a large part of the Louisiana economy. As reported earlier, over 20% of United States waterborne commerce passes through the Lower Mississippi River and the Louisiana economy. Shipping is big business in Louisiana. Those millions of tons of cargo just don't pass through the River without leaving a mark on the local economy. Millions of dollars of business and thousands of jobs are related to the handling, financing, processing, and transporting that cargo.

The ship movements create a large number of economic opportunities related to the servicing of the vessels that call on the ports along the River. The LMR also acts as a magnet for attracting warehousing and manufacturing firms that use the River to import raw materials into the area or export finished products out of the area.

Hundreds of firms are located in the New Orleans area simply because of the existence of the maritime industry. These firms include large steamship companies; firms providing longshoremen services; railroads, tugboat, barge, and trucking companies that ship the goods to and from the port; freight forwarding companies; law firms that hire maritime attorneys to handle legal work for the maritime industry; and insurance companies that write marine insurance. These firms are referred to as the port industry, which includes the following kinds of businesses:

1. The Ports themselves. There are several port authorities along the River. They operate and manage the public facilities, and spend money for operating expenses and capital projects and are thus part of the economic impact.
2. The companies engaged in ocean-going transportation -- i.e., the steamship companies.
3. Ship services:
 - a. Navigational services;
 - b. Customs and other government;
 - c. Loading and unloading cargo;
 - d. Ship's agents;
 - e. Ship supplies;
 - f. Ship repair;
 - g. Cargo packing;
 - h. Freight forwarding;
 - i. Marine insurance;
 - j. Custom house brokers; and
 - k. Other ship services.

4. Inland transportation:

- a. Railroads;
- b. Barge lines;
- c. Other River transportation;
- d. Drayage; and
- e. Long-haul truck transportation.

In addition to the port industry identified above, many firms use the port as a means of transporting raw materials and finished products. These include warehouses that store goods for export or import and manufacturing firms that locate in the New Orleans area and in Louisiana because they need the Mississippi River and the port to transport their goods out of the country or to more populated regions of the United States. These firms are referred to as port users.

The economic impact as estimated in this study is made up of three components: the direct, or primary, spending; the indirect spending; and the induced spending. The direct spending is the initial increase in output, or total spending, of the port industry and port users.

This direct or primary spending produces additional spending in the economy, referred to as indirect and induced spending. Indirect spending includes the spending of local firms that provide inputs or supplies to the firms involved in the direct spending. The induced spending is a result of the income produced in the local area by the direct and indirect spending. When these dollars are spent, they produce income for someone else in the local economy. The recipients of that income then spend part of their new income in the local economy, thus producing income for still other local residents. The process continues to third, fourth, and further rounds of spending.

The indirect and induced spending are added together to produce secondary spending. The secondary spending is sometimes referred to as the "ripple effect" or the multiplier effect. The multipliers used in this study are calculated by the Bureau of Economic Analysis, U.S. Department of Commerce¹. The multipliers are industry specific. Thus, each area of spending -- i.e., spending on wages and salaries, ship repair, ship services, manufacturing, etc. -- has a different multiplier. The BEA study cited above also estimates multipliers for earnings and employment related to the direct spending in each industry.

In order to gain information about the spending of firms in the categories described above, the University of New Orleans conducted surveys in the New Orleans metro area

1 Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II) (Washington: U.S. Government Printing Office, 2010).

and the rest of the state, which will be collectively referred to as "the survey." Questions about employment, sales, and the like were asked of the firms throughout the state of Louisiana. Based on the responses of the survey, we were able to estimate the total amount of spending and income generated from the activities of the port. To supplement the survey results we used the following sources:

1. Louisiana Department of Labor data on total employment and total wages by three-digit Standard Industrial Classification (SIC) code;
2. Bureau of Economic Analysis data on total employment and total wages by two-digit SIC code;
3. Bureau of Economic Analysis regional multipliers for the New Orleans MSA and the state of Louisiana.

The basic methodology employed was to use the survey results to calculate the average, or typical, spending or employment of a port-related firm. In order to estimate the total impact associated with **all** of the port-related firms in each area, it was necessary to develop some estimate of the total size of the industry in each case. This was done using the three sources cited above. The specific methodology employed differed for each of the port-related industries and will be explained in more detail in the text of that section. This information was supplemented by data on cargo volume handled by the Port of New Orleans, Board direct spending, and capital projects of the Board over the past year.

Table 13 presents the total impact on the Louisiana economy per 1,000 tons of cargo shipped (or not shipped) through the Mississippi River. For every 1,000 tons of cargo lost due to the reduced dredging frequency, the local economy will lose \$14,691 in spending on ship services (loading, unloading, freight forwarding, dockage, etc.); inland transportation; and loss of business for port users, mostly manufacturing firms. This loss in direct spending creates additional losses in the local economy in secondary spending, sometimes referred to as the "ripple effect," total spending (direct plus secondary spending), earnings of affected workers, jobs, and tax revenues for local, state, and federal governments.

Table 13

Dollar Loss to the Louisiana Economy per 1,000 tons of Cargo Loss

Category	Loss in \$s per 1,000 tons
Direct Spending	\$14,691
Secondary Spending	\$8,517
Total Spending	\$23,207
Earnings	\$6,462
Jobs	0.21
Local Taxes	\$725
State Taxes	\$796
U.S. Federal Taxes	\$715
S & L Taxes	\$1,522
Total Taxes	\$2,236

Source: Author's Calculations

To estimate the total loss that could be created by the reduction in channel depths, the per 1,000 ton losses are multiplied by the total loss of tonnage (as reported in Tables 10 and 11) divided by 1,000. The total loss in tonnage is 18,252,360 short tons. Table 14 presents these estimates.

Thus, as a result of the reduced dredging activities of the Corps of Engineers, the Louisiana economy could lose \$268.14 million in direct spending, \$155.45 million in secondary spending for a total spending loss of \$423.59 million. In addition, the Louisiana economy could lose \$117.96 million of income and 6,078 jobs in the state. Local governments could lose \$13.24 million annually in tax revenue, the state government \$14.54 million in tax revenues, and the federal government \$13.05 million annually in income tax revenues.

BIG RIVER COALITION

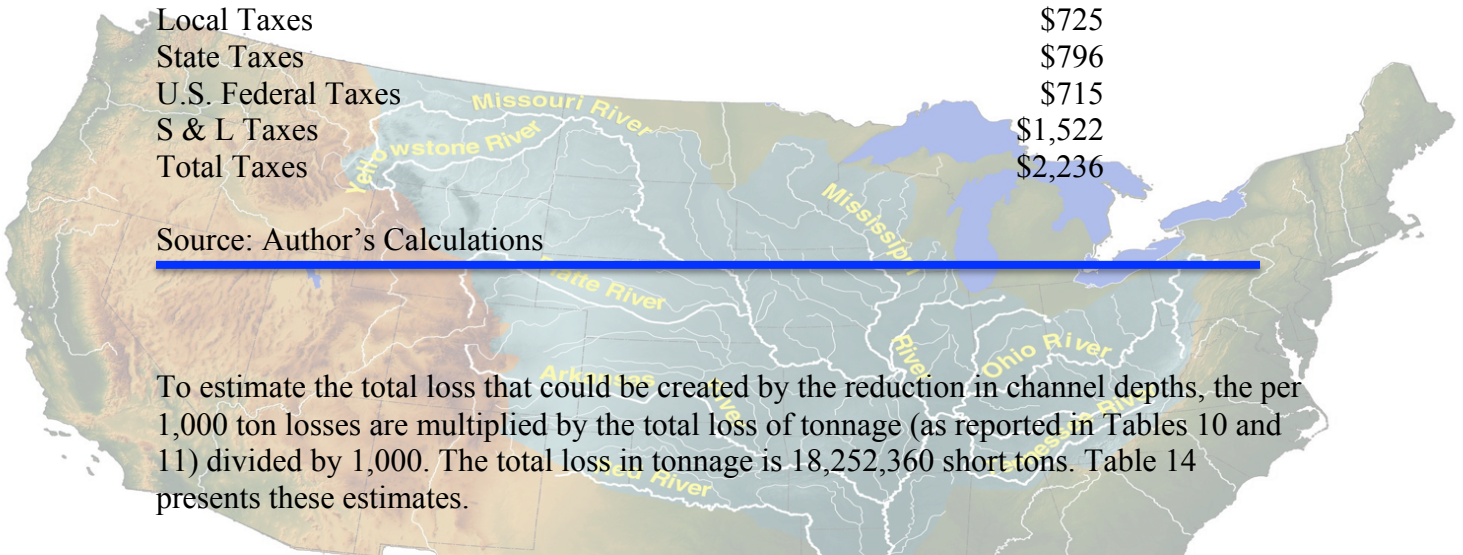


Table 14

Total Dollar Loss to the Louisiana Economy

Category	Total Loss in \$s
Direct Spending	\$268,141,204
Secondary Spending	\$155,447,650
Total Spending	\$423,588,854

Earnings \$117,955,050

Jobs 3,815

State Taxes \$14,536,790

Local Taxes \$13,237,223

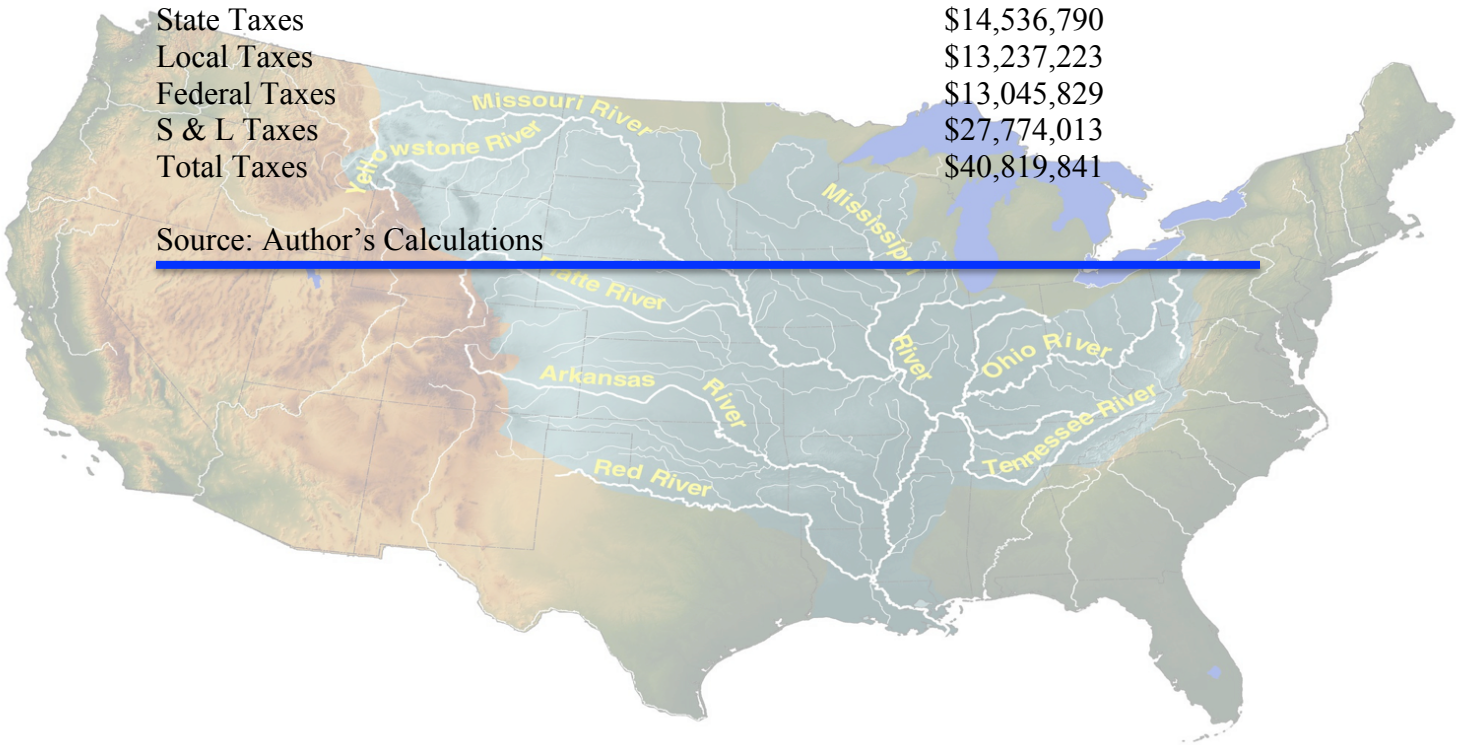
Federal Taxes \$13,045,829

S & L Taxes \$27,774,013

Total Taxes \$40,819,841

Source: Author's Calculations

BIG RIVER COALITION



THE ECONOMIC LOSS TO THE UNITED STATES ECONOMY

In addition to the loss to the Louisiana economy in the handling and processing of the inbound and outbound cargo that will be lost, the national economy will suffer losses as well. There are basically two kinds of losses that will be suffered nationally. First is the loss of production that will result from the higher costs of transporting American made goods for export. Second is the loss to American consumers that will result from higher prices for imported goods into the United States.

Goods exported from the United States compete in world markets. What this means is that the price of the goods is set by worldwide forces of supply and demand. According to economic theory, no individual seller can set the price but must take the price as given. What this means in this context is that the American producers of affected goods cannot pass the higher shipping costs on to higher prices. They have two choices –they can reduce production and sell smaller quantities at the market price or they can absorb the losses themselves in the form of reduced prices that they receive for their goods. If they choose the first option, the prices that they receive from their sales will be reduced by the amount of the increased transportation costs. Most domestic producers, especially farmers, operate at very low margins. Thus, it is quite likely that American producers will lose markets to foreign competitors and therefore reduce output corresponding to the reduction in cargo that can be carried with the lower dredging. We will consider both alternatives.

The direct loss to the United States economy from the reductions on the import side are all a result of higher prices of imported goods that result from the cargo restrictions. As indicated in Table 9, 92.6% of the loss of inbound cargo is crude oil. This crude is destined for United States oil refineries, especially those along the Mississippi River. The loss to the U. S. economy will be as a result of higher retail gasoline prices caused by the import restrictions.

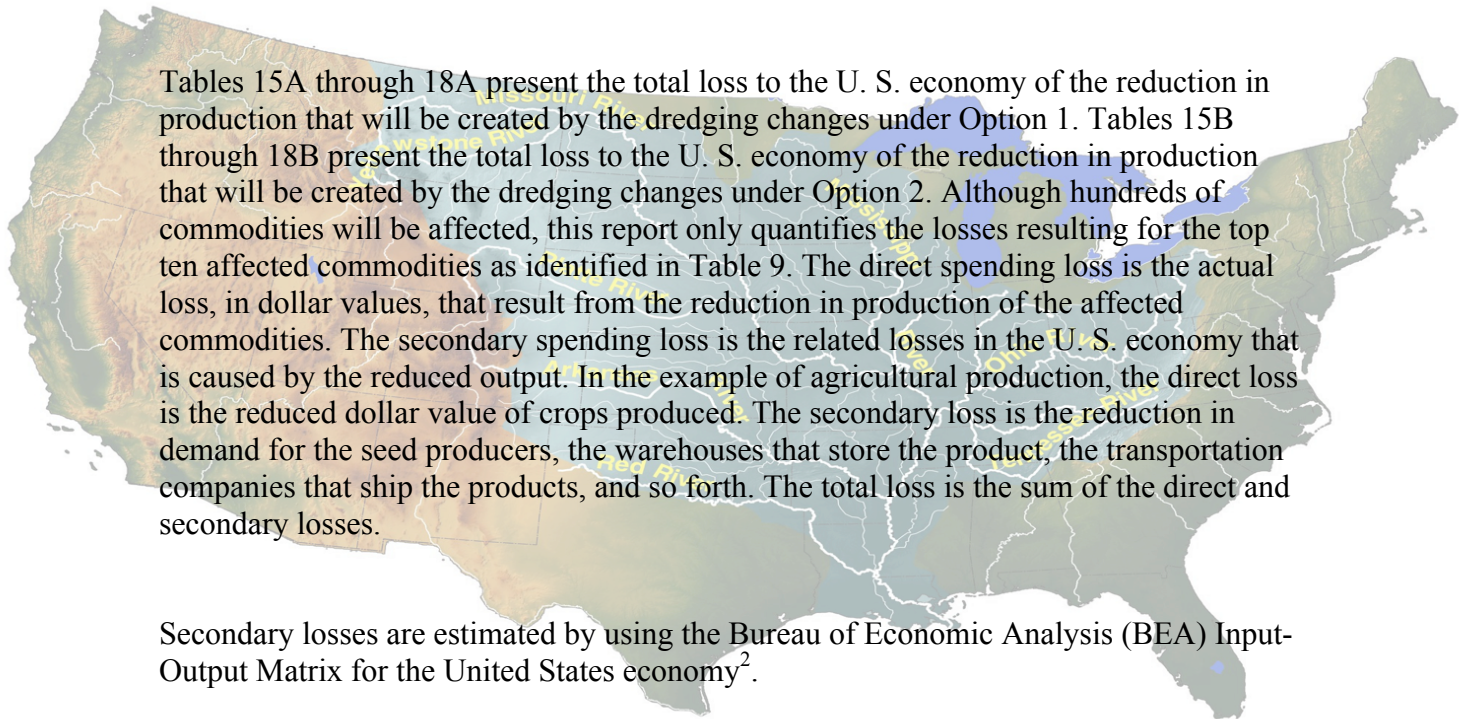
ECONOMIC LOSS TO AMERICAN PRODUCERS

As discussed earlier in this report, American producers have two options in the face of the dredging restrictions:

1. Option 1 -- reduce production to lower the quantities produced and therefore shipped. For this option, the reduction in production would equal the loss in commodities shipped as identified in Tables 10 and 12.
2. Option 2 -- to absorb the higher transportation costs. If the producers choose this option, they will find the least cost method of shipping the goods and this will be the cost they will absorb. Given the fact that most of the commodities identified in Tables 10 and 12 are commodities that are shipped in bulk (mostly agricultural

products and crude oil), it will still be cheaper to barge these commodities down the Mississippi River and put them on an additional ship to the ultimate destination. The number of additional vessels needed for each commodity depends on the tonnage lost. The average size of an outbound vessel from the Mississippi River in 2010 according to PIERS is 55,151 tons. Thus, a total of 224 additional ocean-going vessels will be needed to transport the cargo lost. That is distributed as follows: Coal (50 ships), Gasoline (0 ship), Corn (17 ships), Pig Iron (1 ships), Crude Oil (83 ships), Rice (0 ships), Cyanide Hydroxide (0 ships), Soybean Oil (0 ships), Soybeans (73 ships), and Vegetable Oils (0 ship). For those commodities listed with zero additional ships, it is assumed that they would be matched with existing ships that have additional capacity (albeit at some cost). The costs of an additional bulk ship of 55,000-ton capacity for a trip from New Orleans to China would be, on average, \$1,983,316. The per ship additional costs are the losses that the producers would have to bear in Option 2.

BIG RIVER DREDGING ALTERNATION



Tables 15A through 18A present the total loss to the U. S. economy of the reduction in production that will be created by the dredging changes under Option 1. Tables 15B through 18B present the total loss to the U. S. economy of the reduction in production that will be created by the dredging changes under Option 2. Although hundreds of commodities will be affected, this report only quantifies the losses resulting for the top ten affected commodities as identified in Table 9. The direct spending loss is the actual loss, in dollar values, that result from the reduction in production of the affected commodities. The secondary spending loss is the related losses in the U. S. economy that is caused by the reduced output. In the example of agricultural production, the direct loss is the reduced dollar value of crops produced. The secondary loss is the reduction in demand for the seed producers, the warehouses that store the product, the transportation companies that ship the products, and so forth. The total loss is the sum of the direct and secondary losses.

Secondary losses are estimated by using the Bureau of Economic Analysis (BEA) Input-Output Matrix for the United States economy².

2 Source: United States Bureau of Economic Analysis, Input-Output Matrix, Industry-by-Commodity Total requirement, after Redefinitions, 2009. (http://www.bea.gov/industry/iotables/table_list.cfm?anon=1014948&CFID=9590711&CFTOKEN=8fbb32a9f0d8bb16-7E9445D5-B4F1-FBCF-8A293C165CF6E7BA&jsessionid=a03030f485be931aa5d0651f5687b1180654)

Table 15 A

Total Loss to the U. S. Economy Resulting from Export Losses, Option 1

Commodity	Loss in Tons	Dollar Loss
Coal	2,759,394	\$463,106,856
Gasoline	23,711	\$18,343,617
Corn	923,996	\$232,191,086
Pig Iron	39,858	\$8,170,938
Crude Oil	4,576,680	\$3,056,038,818
Rice	1,064	\$594,144
Cyanide Hydroxide	-	\$-
Soybean Oil	-	\$-
Soybeans	4,049,330	\$1,741,197,914
Vegetable Oils	4,206	\$6,296,324
Total Loss	12,378,240	\$5,525,939,696

Source: Author's Calculations

Table 16 A

Total Loss to the U. S. Economy Resulting from Export Losses, Option 1

Commodity	Direct	Secondary	Total Loss
Coal	\$463,106,856	\$304,022,241	\$767,129,097
Gasoline	\$18,343,617	\$20,113,312	\$38,456,930
Corn	\$232,191,086	\$309,307,457	\$541,498,543
Pig Iron	\$8,170,938	\$8,455,930	\$16,626,868
Crude Oil	\$3,056,038,818	\$2,006,240,588	\$5,062,279,406
Rice	\$594,144	\$791,473	\$1,385,617
Cyanide Hydroxide	\$-	\$-	\$-
Soybean Oil	\$-	\$-	\$-
Soybeans	\$1,741,197,914	\$2,319,492,574	\$4,060,690,488
Vegetable Oils	\$6,296,324	\$8,387,488	\$14,683,812
Total	\$5,525,939,696	\$4,976,811,063	\$10,502,750,760

Source: Author's Calculations

Table 17 A

Jobs and Earnings Loss Resulting from Export Losses, Option 1

Commodity	Earnings	Jobs
Coal	\$141,840,559	2,837
Gasoline	\$7,095,231	142
Corn	\$70,688,357	1,414
Pig Iron	\$2,170,506	43
Crude Oil	\$936,004,831	18,720
Rice	\$180,881	4
Cyanide Hydroxide	\$-	-
Soybean Oil	\$-	-
Soybeans	\$530,091,064	10,602
Vegetable Oils	\$1,916,856	38
Total	\$1,689,988,285	33,800

Source: Author's Calculations

Table 18 A

Government Revenue Loss Resulting from Export Losses, Option 1

Commodity	State & Local Tax Revenues	Federal Tax Revenues	Total Government Tax Revenues
Coal	\$9,144,522	\$15,687,566	\$24,832,087
Gasoline	\$457,433	\$784,732	\$1,242,165
Corn	\$4,557,309	\$7,818,132	\$12,375,441
Pig Iron	\$139,933	\$240,058	\$379,991
Crude Oil	\$60,344,632	\$103,522,134	\$163,866,767
Rice	\$11,661	\$20,005	\$31,667
Cyanide Hydroxide	\$-	\$-	\$-
Soybean Oil	\$-	\$-	\$-
Soybeans	\$34,175,198	\$58,628,072	\$92,803,269
Vegetable Oils	\$123,581	\$212,004	\$335,585
Total	\$108,954,268	\$186,912,704	\$295,866,972

Source: U. S. Census Bureau and Author's Calculations

The economic losses resulting from the dredging restrictions are significant for the country as a whole. In just one year, under Option 1, American producers, mostly farmers, could lose \$5.23 billion in direct losses in production. The ripple effect, or secondary spending effect, could add another \$4.98 billion. The total loss to the U. S. economy of the reduced dredging could be \$10.50 billion in lost production.

In addition, the nations' economy could stand to lose 33,800 jobs as a result of the losses in production and \$1.69 billion in lost income for American workers. These are losses that would be even more significant in the current weak economy. Finally, when the private sector loses production and jobs, state, local, and federal governments suffer losses in revenue. The economic losses resulting from the reduced dredging could cost state and local governments \$118.95 million in lost revenues and the federal government would lose \$186.91 million in lost personal income tax revenues alone. The total loss to all levels of government could be \$295.87 million.

Tables 15B through 18B present the economic losses associated with the reduction in dredging expenditures under Option 2.

Table 15 B

Total Loss to the U. S. Economy Resulting from Export Losses, Option 2

Commodity	Loss in Tons	Dollar Loss
Coal	2,759,394	\$99,232,108
Gasoline	23,711	\$852,697
Corn	923,996	\$33,228,330
Pig Iron	39,858	\$1,433,364
Crude Oil	4,576,680	\$164,584,516
Rice	1,064	\$38,262
Cyanide Hydroxide	-	\$-
Soybean Oil	-	\$-
Soybeans	4,049,330	\$145,620,224
Vegetable Oils	4,206	\$151,268
Total Loss	12,378,240	\$445,140,769

Source: Author's Calculations

Table 16 B

Total Loss to the U. S. Economy Resulting from Export Losses, Option 2

Commodity	Direct	Secondary	Total Loss
Coal	\$99,232,108	\$65,144,291	\$164,376,399
Gasoline	\$852,697	\$934,961	\$1,787,657
Corn	\$33,228,330	\$44,264,275	\$77,492,605
Pig Iron	\$1,433,364	\$1,483,358	\$2,916,722
Crude Oil	\$164,584,516	\$108,047,101	\$272,631,618
Rice	\$38,262	\$50,970	\$89,232
Cyanide Hydroxide	\$-	\$-	\$-
Soybean Oil	\$-	\$-	\$-
Soybeans	\$145,620,224	\$193,984,283	\$339,604,507
Vegetable Oils	\$151,268	\$201,507	\$352,775
Total	\$445,140,769	\$414,110,747	\$859,251,515

Source: Author's Calculations

Table 17 B

Jobs and Earnings Loss Resulting from Export Losses, Option 2

Commodity	Earnings	Jobs
Coal	\$30,392,851	608
Gasoline	\$329,819	7
Corn	\$10,116,047	202
Pig Iron	\$380,755	8
Crude Oil	\$50,409,014	1,008
Rice	\$11,649	0
Cyanide Hydroxide	\$-	-
Soybean Oil	\$-	-
Soybeans	\$44,332,685	887
Vegetable Oils	\$46,052	1
Total	\$136,018,872	2,720

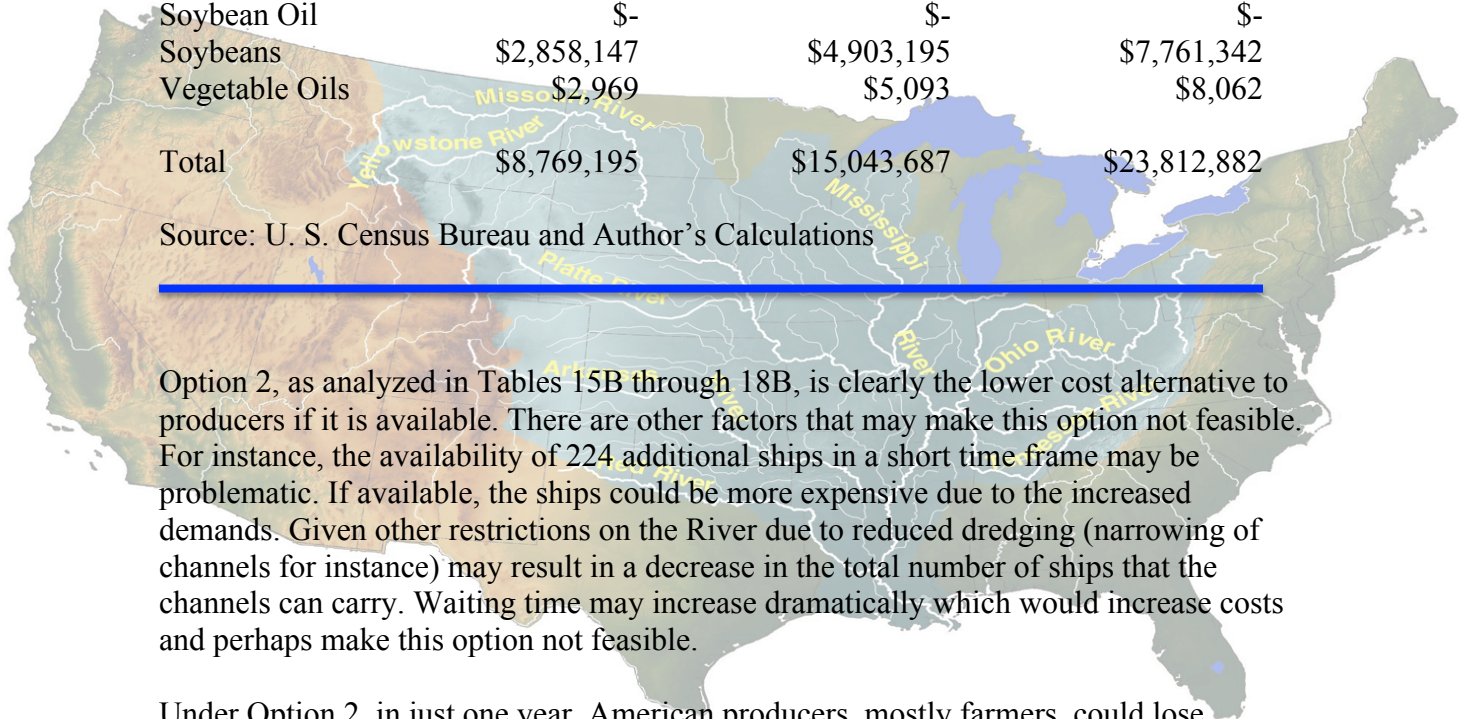
Source: Author's Calculations

Table 18 B

Government Revenue Loss Resulting from Export Losses, Option, 2

Commodity	State & Local Tax Revenues	Federal Tax Revenues	Total Government Tax Revenues
Coal	\$1,959,440	\$3,361,449	\$5,320,889
Gasoline	\$21,264	\$36,478	\$57,742
Corn	\$652,186	\$1,118,835	\$1,771,021
Pig Iron	\$24,547	\$42,112	\$66,659
Crude Oil	\$3,249,891	\$5,575,237	\$8,825,128
Rice	\$751	\$1,288	\$2,039
Cyanide Hydroxide	\$-	\$-	\$-
Soybean Oil	\$-	\$-	\$-
Soybeans	\$2,858,147	\$4,903,195	\$7,761,342
Vegetable Oils	\$2,969	\$5,093	\$8,062
Total	\$8,769,195	\$15,043,687	\$23,812,882

Source: U. S. Census Bureau and Author's Calculations



Option 2, as analyzed in Tables 15B through 18B, is clearly the lower cost alternative to producers if it is available. There are other factors that may make this option not feasible. For instance, the availability of 224 additional ships in a short time frame may be problematic. If available, the ships could be more expensive due to the increased demands. Given other restrictions on the River due to reduced dredging (narrowing of channels for instance) may result in a decrease in the total number of ships that the channels can carry. Waiting time may increase dramatically which would increase costs and perhaps make this option not feasible.

Under Option 2, in just one year, American producers, mostly farmers, could lose \$445.14 million in direct losses in production. The ripple effect, or secondary spending effect, will add another \$414.11 million. The total loss to the U. S. economy of the reduced dredging could be \$959.25 million in lost production under Option 2.

In addition, the nation's economy could stand to lose 2,720 jobs as a result of the losses in production and \$136.02 million in lost income for American workers. These are losses that would be even more significant in the current weak economy. Finally, when the private sector loses production and jobs, state, local, and federal governments suffer losses in revenue. The economic losses resulting from the reduced dredging could cost state and local governments \$8.77 million in lost revenues and the federal government

would lose \$15.04 million in lost personal income tax revenues alone. The total loss to all levels of government could be \$23.81 million.

LOSSES ASSOCIATED WITH INCREASED GASOLINE PRICES

The loss on the inbound, or import, side of the process is from higher retail prices of goods consumed in the United States. Although there are hundreds of goods affected, the largest impact by far is on the importation of crude oil. Thus, this section of the report will focus solely on the impact of the dredging restrictions on crude oil imports and the retail price of gasoline. The U. S. economy relies very heavily on imported crude and the refineries along the Mississippi River are critical in the production of gasoline for American consumers.

The reduced dredging could cause the loss of 5,437,667 short tons of crude oil in just one year (See Table 9). There are 7.33 barrels of crude oil in one short ton. Thus, the shallower channels could cause the loss of 39.86 million barrels of oil. In 2010, U. S. oil refineries used 7.00 billion barrels of crude oil in producing gasoline for American consumers (Source: U. S. Energy Information Administration). Thus, the dredging restrictions could cause a loss of 0.6% of all crude oil and a corresponding decrease in the amount of gasoline refined from that crude.

In order to estimate the impact of the 0.6% reduction in gasoline to consumers on the price of gasoline it is necessary to know the relationship between price and quantity consumed. That relationship is described by the elasticity of demand. The elasticity of demand is defined as the percentage change in quantity that results from a one percent change in price. That relationship is always negative, meaning that an increase in price will cause a reduction in quantity demanded and a decrease in price will result in an increase in quantity demanded.

There are many empirical studies of the short-run elasticity of demand for gasoline. According to a recent study, the average price elasticity of demand for gasoline in the United States is -0.26 (Source: Molly Espey, "Explaining the Variation in Elasticity Estimates of Gasoline Demand in the United States; a Meta-Analysis," in *Energy Journal*, Vol. 17, # 3, PP. 49-60, 1996). That means that a 0.6% increase in the price of gasoline will cause a .26% decrease in quantity demanded. Another way of looking at the elasticity is that a 0.6% reduction in the quantity supplied of gasoline will cause a 2.2% increase in price (0.6/0.26).

Thus, it can be anticipated that the shallower channels and the resulting 0.6% reduction in gasoline supply could result in a 2.2% increase in price. The current average retail price of gasoline is \$3.53 (Source: U. S. Energy Information Administration). Thus, the draft restrictions could cause a \$0.08 increase in retail gasoline prices. In 2010, consumers in the United States consumed 18.18 billion gallons of gasoline. The reduced channel will

cause a loss to consumers of \$0.08 for every gallon consumed or a total loss of \$1.40 billion annually in higher gasoline expenditures. The loss in quantity demanded could be 103.48 million gallons.

In addition to the losses to the consumers, federal and state and local government will lose also. Gasoline is heavily taxed in the United States. At the federal level, the gasoline tax is a tax of \$0.184 per gallon consumed. At the state level, the average tax is \$0.344 per gallon (Source: American Petroleum Institute, <http://www.api.org/statistics/fueltaxes/>). Thus, in total, every gallon of gasoline not consumed in the United States costs governments \$0.488. Thus, the draft restrictions could cost state governments \$50.81 million annually in gasoline taxes and cost the federal government \$30.75 million annually. The total loss to governments could be \$81.56 million. Table 19 summarizes the impacts on higher gasoline prices and related activities.

BIG BROTHER QUALITY

Table 19
Losses Due to Reductions in Crude Oil Imports

Category	Loss
Barrels of crude oil lost	39,858,100
Barrels of crude oil used in US	7,000,746,000
Percent lost	0.6%
Resulting change in gasoline prices	2.2%
Current Gasoline Price	\$3.53
Price Increase	\$0.08
Total U.S. gasoline consumption in 2010 (in gallons)	18,176,124,000
Reduced consumption related to higher prices (in gallons)	103,484,082
Direct loss to consumers in the U.S.	\$1,404,995,416
Total secondary loss	\$1,480,698,255
Total loss to consumers	\$2,885,693,671
Earnings Loss	\$47,121,860
Employment Loss	942
Federal Gas Tax Loss	\$19,041,071
State Gas Tax Loss	\$31,459,161
Total Gas Tax Loss	\$50,500,232

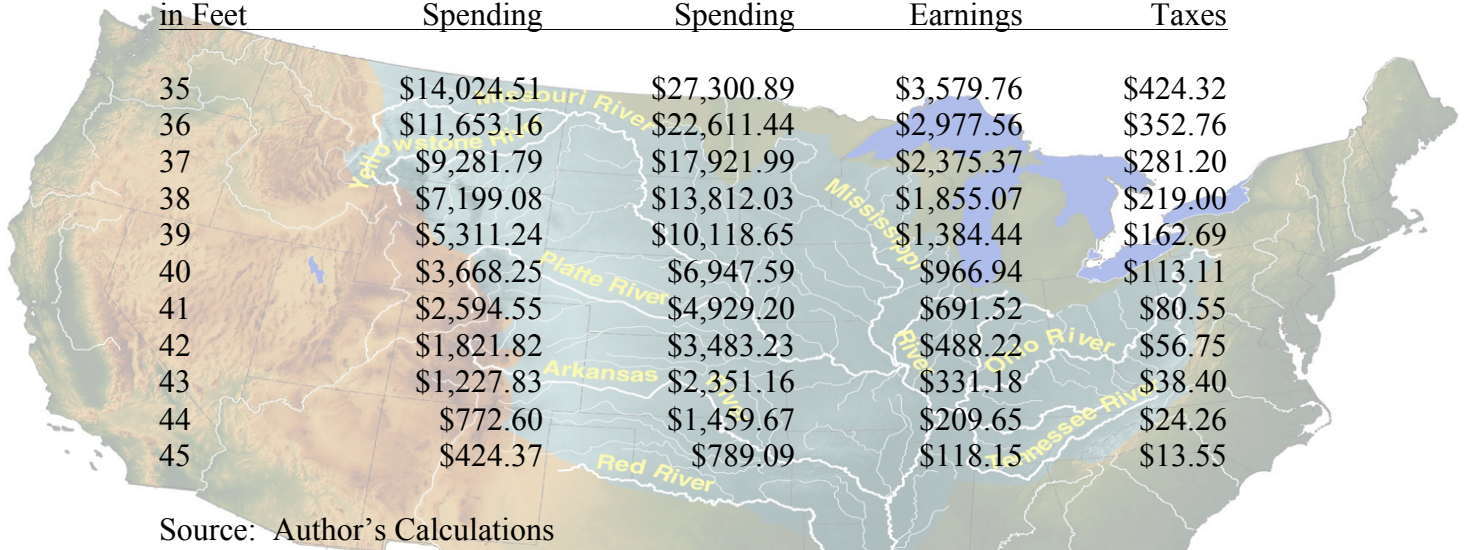
Source: Author's Calculations

LOSSES AT VARIOUS CHANNEL DEPTHS

The analysis in this report is based on the Corps only maintaining the Lower Mississippi River at 38 feet. Dredging is not an exact science. The actual depths can be impacted by natural phenomena that occur in the River itself. This section of the report analyzes the impact of dredging the channel to various depths.

Table 20

Losses at Various Channel Depths
(Dollar figures in millions)



Depth in Feet	Direct Spending	Total Spending	Earnings	Federal Taxes
35	\$14,024.51	\$27,300.89	\$3,579.76	\$424.32
36	\$11,653.16	\$22,611.44	\$2,977.56	\$352.76
37	\$9,281.79	\$17,921.99	\$2,375.37	\$281.20
38	\$7,199.08	\$13,812.03	\$1,855.07	\$219.00
39	\$5,311.24	\$10,118.65	\$1,384.44	\$162.69
40	\$3,668.25	\$6,947.59	\$966.94	\$113.11
41	\$2,594.55	\$4,929.20	\$691.52	\$80.55
42	\$1,821.82	\$3,483.23	\$488.22	\$56.75
43	\$1,227.83	\$2,351.16	\$331.18	\$38.40
44	\$772.60	\$1,459.67	\$209.65	\$24.26
45	\$424.37	\$789.09	\$118.15	\$13.55

Source: Author's Calculations

If the channel is dredged to 45 feet, the losses to the United States economy will be \$423.37 million in direct spending, \$789.09 million in total spending, \$118.15 million in earnings or income for American residents, and \$13.55 million in federal taxes lost (See Table 20). For every foot below 45 feet, the losses get larger and larger. If the channel is maintained to a depth of only 35 feet, the losses will be \$14.02 billion in direct spending, \$27.30 billion in total spending, \$3.58 billion in earnings, and \$424.32 million in federal taxes.

CONCLUSION: A BENEFIT/COST ANALYSIS OVER A MULTI-YEAR PERIOD

In the face of the current government fiscal crisis, funding for the Corps of Engineers dredging budget has been cut. According to the Louisiana Congressional delegation, the reduction amounts to \$45 million per year. This section of the report presents the benefit/cost analysis of the decision to save the \$45 million and reduce the Corps’ budget to not allow for dredging to traditional levels. The benefits of this action are the savings to the federal government and the costs are the economic losses documented in this report. For the sake of simplicity, this section will focus on the following categories of the economic loss associated with the reduced dredging:

- 7. Direct spending
- 8. Total spending
- 9. Federal taxes
- 10. Total taxes
- 11. Earnings for citizens
- 12. Employment.

Tables 21A and 21B present a summary of these losses.

Table 21 A
Summary of Losses Due to Reduced Dredging, Option 1
(Dollar Figures in Millions)

Category	Losses Due To Reduced Cargo Handling	Losses Due to Reduced Exports	Losses Due to Higher Gas Prices	Total Losses
Direct Spending	\$268.14	\$5,525.94	\$1,405.00	\$7,199.08
Total Spending	\$423.59	\$10,502.75	\$2,885.69	\$13,812.03
Federal Taxes	\$13.05	\$186.91	\$19.04	\$219.00
Total Taxes	\$40.82	\$295.87	\$50.50	\$387.19
Earnings	\$117.96	\$1,689.99	\$47.12	\$1,855.07
Jobs	3,815	33,800	942	38,557

Source: Author’s Calculations

Table 21 BSummary of Losses Due to Reduced Dredging, Option 2
(Dollar Figures in Millions)

Category	Losses Due To Reduced Cargo Handling	Losses Due to Reduced Exports	Losses Due to Higher Gas Prices	Total Losses
Direct Spending	\$268.14	\$445.14	\$2,467.76	\$3,181.04
Total Spending	\$423.59	\$859.25	\$5,068.48	\$6,351.32
Federal Taxes	\$13.05	\$15.04	\$19.04	\$47.13
Total Taxes	\$40.82	\$23.81	\$50.50	\$115.13
Earnings	\$117.96	\$136.02	\$82.77	\$336.74
Jobs	3,815	2,720	1,655	8,191

Source: Author's Calculations

Thus, in 2012, the first year in which the reduced dredging expenditures will have a full impact, the losses in direct spending could amount to a total of \$7,199.08 million or **\$7.20 billion** under Option 1 and \$3,181.04 million or **\$3.18 billion** under Option 2. The losses in total spending, including the secondary spending or ripple effect, could be \$13,812.03 million or **\$13.81 billion** under Option 1 and **\$6.35 billion** under Option 2.

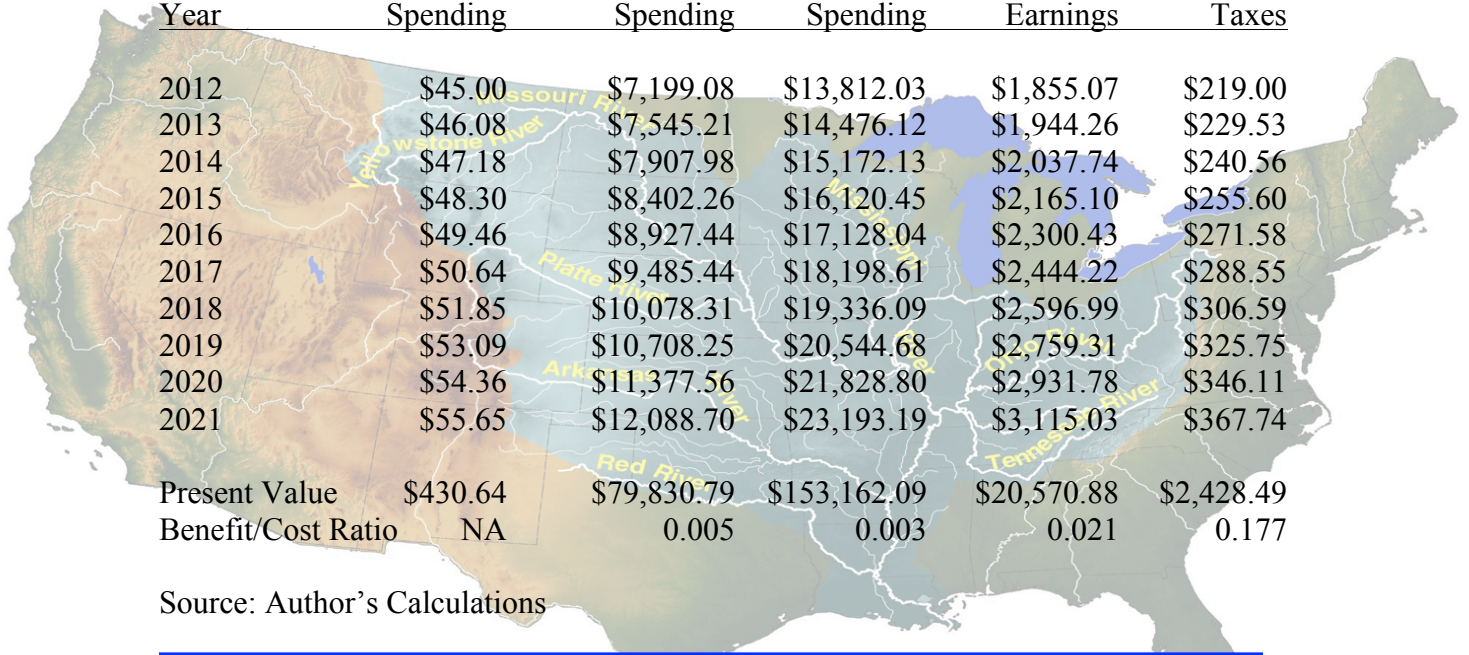
The irony of the situation is that even the federal government will lose money by this decision. The loss in federal tax revenues could be **\$219.00 million** annually under Option 1 and **\$47.13 million** under Option 2. In other words, in order to save \$45 million, the government could give up \$219.00 million or \$47.13 in reduced tax revenues on the economic activity lost to the reduced cargo movements. In addition, state and local governments could also lose tax revenue. In total, all governments could lose \$387.19 million or \$115.13 million in tax revenues to save \$45 million.

Finally, the reduction in dredging frequency will cost people. It could cost U. S. citizens their jobs and part of their income or earnings. The reduction in employment could be 38,557 or 8,191 jobs nationally. Citizens could lose between \$336.74 million and \$1.86 billion annually in income or earnings.

The figures described above are for one year only. They are likely to increase over time for two reasons. First, the natural growth of the shipping business that is likely to occur over the next five to ten years as a result of economic growth. The U. S. and worldwide recession has slowed cargo movements through the Mississippi River. The 2010 totals were up 21.9% compared to 2009. Over the ten-year period from 2000 to 2010, the totals were up by 4.8% per year. The second reason that the cargo movements are expected to increase is the opening of the new locks and cargo movement infrastructure of the

Panama Canal in 2014. The “new” Panama Canal is expected to increase cargo, especially cargo moving on larger ships that can now be accommodated by the Canal, by 30%. The increase for 2012 through 2014 in the Mississippi River is expected to grow at 4.8% annually and after that by 6.3% annually. Tables 22A and 22B present the expected benefits (federal government savings from reduced dredging activities) and the expected costs (losses due to the reduced cargo movements) from 2012 to 2021.

Table 22 A
Annual Costs and Benefits of Reduced Dredging, Option 1
(Dollar Figures in Millions)



Year	Dredging Spending	Direct Spending	Total Spending	Earnings	Federal Taxes
2012	\$45.00	\$7,199.08	\$13,812.03	\$1,855.07	\$219.00
2013	\$46.08	\$7,545.21	\$14,476.12	\$1,944.26	\$229.53
2014	\$47.18	\$7,907.98	\$15,172.13	\$2,037.74	\$240.56
2015	\$48.30	\$8,402.26	\$16,120.45	\$2,165.10	\$255.60
2016	\$49.46	\$8,927.44	\$17,128.04	\$2,300.43	\$271.58
2017	\$50.64	\$9,485.44	\$18,198.61	\$2,444.22	\$288.55
2018	\$51.85	\$10,078.31	\$19,336.09	\$2,596.99	\$306.59
2019	\$53.09	\$10,708.25	\$20,544.68	\$2,759.31	\$325.75
2020	\$54.36	\$11,377.56	\$21,828.80	\$2,931.78	\$346.11
2021	\$55.65	\$12,088.70	\$23,193.19	\$3,115.03	\$367.74
Present Value	\$430.64	\$79,830.79	\$153,162.09	\$20,570.88	\$2,428.49
Benefit/Cost Ratio	NA	0.005	0.003	0.021	0.177

Source: Author’s Calculations

The case for increased spending on dredging could not be clearer. Table 22 A presents the expected annual benefits and costs of reduced dredging under Option 1. The present value of the stream is also presented. The future benefits and costs are discounted to the present using the current long-term (20 Year Constant Maturity) U. S. Treasury bond rate of 2.77%. The present value of the ten-year projections of the benefits and costs from reduced dredging presents a startling comparison. The benefits of the activity (reducing federal spending on dredging) are outweighed by the costs (reduced economic activity from less cargo movements) no matter what measure of costs are used.

Under Option 1, if direct costs are used as the cost measure, the B/C ratio is .005. In cost benefit analysis, a B/C ratio of one implies that the benefits and costs are equal. A B/C ratio of more than one implies the benefits outweigh the costs and a B/C ratio of less than

one implies the costs outweigh the benefits. If total costs are used as the costs, the B/C ratio is .003. If earnings or income is used, the B/C ratio is .021. Finally, if federal tax revenues are used, the B/C ratio is .177.

Table 22B presents the present value calculations for Option 2. If direct costs are used as the cost measure, the B/C ratio is .012. If total costs are used as the cost measure, the B/C ratio is .006. If earnings or income is used, the B/C ratio is .115. Finally, if federal tax revenues are used, the B/C ratio is .824.

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Table 22 B

Annual Costs and Benefits of Reduced Dredging, Option 2
(Dollar Figures in Millions)

Year	Dredging Spending	Direct Spending	Total Spending	Earnings	Federal Taxes
2012	\$45.00	\$3,181.04	\$6,351.32	\$336.74	\$47.13
2013	\$46.08	\$3,333.98	\$6,656.69	\$352.93	\$49.40
2014	\$47.18	\$3,494.28	\$6,976.75	\$369.90	\$51.77
2015	\$48.30	\$3,712.69	\$7,412.82	\$393.02	\$55.01
2016	\$49.46	\$3,944.75	\$7,876.15	\$417.58	\$58.45
2017	\$50.64	\$4,191.31	\$8,368.44	\$443.68	\$62.10
2018	\$51.85	\$4,453.28	\$8,891.51	\$471.42	\$65.98
2019	\$53.09	\$4,731.63	\$9,447.26	\$500.88	\$70.10
2020	\$54.36	\$5,027.38	\$10,037.75	\$532.19	\$74.49
2021	\$55.65	\$5,341.61	\$10,665.15	\$565.45	\$79.14
Present Value	\$430.64	\$35,274.66	\$70,430.03	\$3,734.12	\$522.63
Benefit/Cost Ratio	NA	0.012	0.006	0.115	0.824

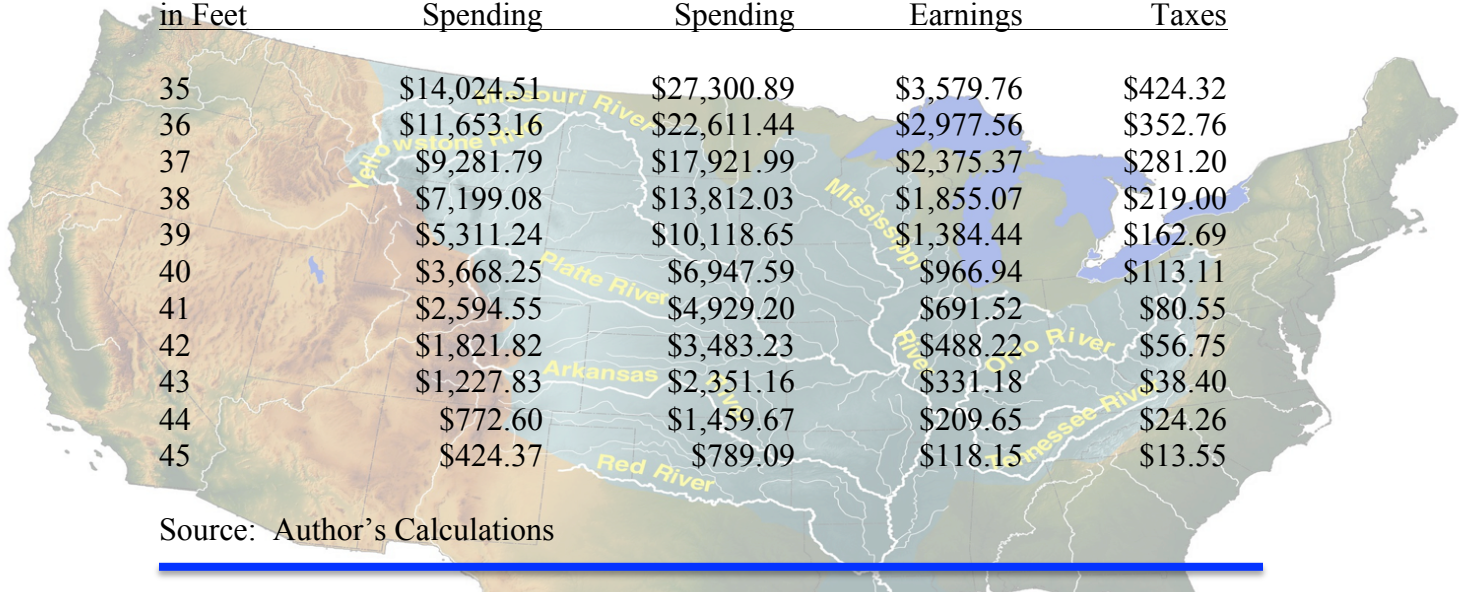
Source: Author's Calculations

Clearly, no matter what measure of costs is employed and no matter which Option is considered, the result is a B/C ratio of significantly less than one. Even using direct federal government return in tax revenues under the lower option – Option 2 -- the benefit/cost ratio is .824, still significantly lower than one. Under any measure, the decision by the government to reduce the Corps' funding for dredging is a poor policy decision.

ADDENDUM -- LOSSES AT VARIOUS CHANNEL DEPTHS

The analysis in this report is based on the Corps maintaining the Lower Mississippi River to 38 feet. Dredging is not an exact science. The actual depths can be impacted by natural phenomena that occur in the River itself. This section of the report analyzes the impact of dredging the channel to various depths.

Table 23
 Losses at Various Channel Depths
 (Dollar figures in millions)



Depth in Feet	Direct Spending	Total Spending	Earnings	Federal Taxes
35	\$14,024.51	\$27,300.89	\$3,579.76	\$424.32
36	\$11,653.16	\$22,611.44	\$2,977.56	\$352.76
37	\$9,281.79	\$17,921.99	\$2,375.37	\$281.20
38	\$7,199.08	\$13,812.03	\$1,855.07	\$219.00
39	\$5,311.24	\$10,118.65	\$1,384.44	\$162.69
40	\$3,668.25	\$6,947.59	\$966.94	\$113.11
41	\$2,594.55	\$4,929.20	\$691.52	\$80.55
42	\$1,821.82	\$3,483.23	\$488.22	\$56.75
43	\$1,227.83	\$2,351.16	\$331.18	\$38.40
44	\$772.60	\$1,459.67	\$209.65	\$24.26
45	\$424.37	\$789.09	\$118.15	\$13.55

Source: Author's Calculations

If the channel is dredged to 45 feet, the losses to the United States economy will be \$423.37 million in direct spending, \$789.09 million in total spending, \$118.15 million in earnings or income for American residents, and \$13.55 million in federal taxes lost (See Table 23). For every foot below 45 feet, the losses get larger and larger. If the channel is maintained to a depth of only 35 feet, the losses will be \$14.02 billion in direct spending, \$27.30 billion in total spending, \$3.58 billion in earnings, and \$424.32 million in federal taxes.

Table 24 presents the economic losses as we move from 45 feet channel depths to 35 feet. Reducing the channel from 45 to 44 feet will create losses of \$455.23 million in direct spending. Reducing it from 44 to 43 will create additional losses of \$593.98 million and so forth. As the channel depths get lower the losses get higher and higher. **On average, a one foot reduction in the channel creates an additional loss to the United States economy of \$1.47 billion per foot in direct spending, \$2.87 billion per foot in total**

spending, \$374.46 million per foot in earnings, and \$44.45 million per foot in federal tax revenues.

Table 24
Incremental Losses at Various Channel Depths
(Dollar figures in millions)

Depth in Feet	Direct Spending	Total Spending	Earnings	Federal Taxes
44-45	\$455.23	\$891.49	\$121.53	\$14.15
43-44	\$593.98	\$1,132.07	\$157.04	\$18.35
42-43	\$772.74	\$1,445.97	\$203.30	\$23.80
41-42	\$1,073.69	\$2,018.40	\$275.42	\$32.56
40-41	\$1,643.00	\$3,171.05	\$417.50	\$49.58
39-40	\$1,887.83	\$3,693.39	\$470.63	\$56.30
37-38	\$2,082.72	\$4,109.96	\$520.31	\$62.20
36-37	\$2,371.36	\$4,689.44	\$602.18	\$71.56
35-36	\$2,371.35	\$4,689.45	\$602.20	\$71.56
Average	\$1,472.43	\$2,871.25	\$374.46	\$44.45

Source: Author's Calculations

BIG RIVER COALITION

