

Review of Comments Regarding the Economics of Lower Snake River Dredging

Prepared for the
Center for Economic Development, Education, and Research

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October 2014

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Review of Comments Regarding the Economics of Lower Snake River Dredging Executive Summary

I have been retained by the Center for Economic Development, Education, and Research (CEDER), to provide an economic analysis of August 14, 2014, comments submitted to the Inland Waterways Users Board.

Last year, I submitted comments to the U.S. Army Corps of Engineers in a letter dated August 9, 2013, regarding comments on the economics of dredging the Lower Snake River, in which I concluded that Lower Snake River freight traffic is growing toward pre-recession levels; competition from Lower Snake River barges disciplines rail transport prices; the region's rail network was at risk of congestion; expenditures on Lower Snake River dredging cannot be characterized as a "subsidy" to barge companies; and the benefits in a single year of dredging the Lower Snake River would exceed the costs by at least \$5.5 million.

These conclusions remain unchanged. In fact, rail congestion and capacity constraints indicate that the net benefits of maintaining the river for commercial navigation have increased. For example:

- As of 2012, the most recent year for which information is available, Snake River traffic volume is approaching pre-recession levels;
- Snake River traffic is expected to continue to increase as the economy improves, overseas demand for soft white wheat increases, and the energy boom diverts rail shipments to the river system;
- Rail capacity constraints and rail demand from energy shippers is increasing the importance of river transportation as both a complement and a substitute for rail;
- Expansion of the Panama Canal will likely have no impact on the supply or demand for Lower Snake River transportation.

Opponents of maintaining the Lower Snake River for commercial navigation have distributed comments they characterize as a *Reality Check*. These comments present a flawed economic approach that is based on speculation and produces incorrect and inflated impacts. Many of the comments are unsupported assertions, rather than conclusions based on analysis of facts and data. Because of the methodological and analytical errors, these comments cannot be relied upon in any way to suggest that the costs of dredging the Lower Snake River outweigh the benefits.

Review of Comments Regarding the Economics of Lower Snake River Dredging

Eric Fruits, Ph.D.
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October 10, 2014

I have been retained by the Pacific Northwest Waterways Association to provide an economic analysis of August 14, 2014, comments submitted by dredging opponents in a report by Linwood Laughy with the title "Waterborne Commerce on the Lower Snake River: A 2014 Reality Check" (hereafter *Reality Check*).

I am a president and chief economist at Economics International Corp., an Oregon consulting firm that specializes in providing economics services to private and public sector clients. I earned both my masters and Ph.D. in economics from Claremont University, and a B.S. with Distinction in Business Economics and Public Policy from Indiana University. In addition to my Pacific Northwest economics consulting practice, I am an adjunct economics professor at Portland State University, and am an expert on economics, finance and statistics. A copy of my curriculum vitae is attached as Exhibit 1. My comments are based on my general expertise and knowledge regarding economics, finance, and statistics as well as publicly available information regarding river transportation and associated benefits and costs.

I have submitted comments to the U.S. Army Corps of Engineers in letter dated August 9, 2013. Based on my analysis, in that letter I concluded the following:

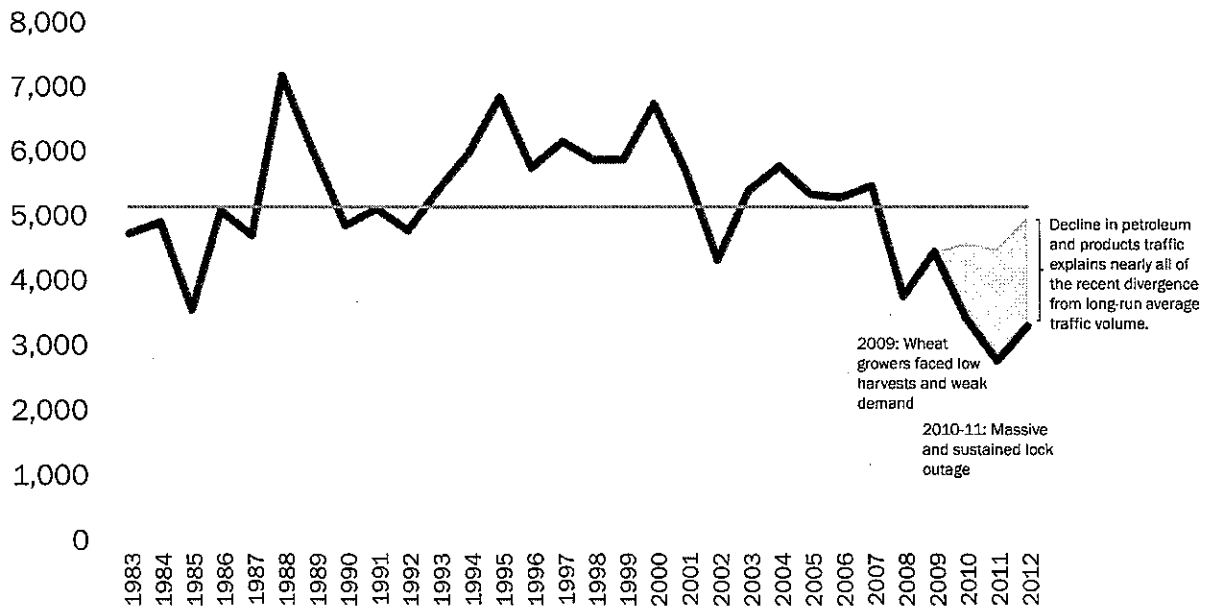
- The benefits in a single year of dredging the Lower Snake River would exceed the costs by at least \$5.5 million;
- Lower Snake River freight traffic is growing toward pre-recession levels;
- The benefits to grain shippers alone is sufficient to justify the costs of dredging;
- The benefits to container shippers and the cruise ship industry and tourists provide additional justification for dredging;
- Competition from Lower Snake River barges disciplines rail transport prices;

- The region’s rail network is at risk of congestion and rail costs would increase with the elimination of barging on the Lower Snake River as a transportation option; and
- Expenditures on Lower Snake River dredging cannot be characterized as a “subsidy” to barge companies.

As described more fully below, *Reality Check* presents a flawed economic approach that is based on speculation and produces inflated impacts. Many of the comments are unsupported assertions, rather than conclusions based on analysis of facts and data. Because of the methodological and analytical errors, these comments cannot be relied upon in any way to suggest that the costs of dredging the Lower Snake River outweigh the benefits.

Figure 1
Snake River Freight Traffic, Total

Thousand short tons, 1983–2012



Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States

1 Snake River freight traffic is growing toward pre-recession levels

Figure 1 provides the amount of freight traffic on the Snake River from 1983 through 2012. The figure shows that average freight traffic is 5.1 million tons a year, but varies widely from year to year. Total Snake River freight traffic slowly increased through the 1980s and early 1990s, peaking in the mid-1990s. Since then, total Snake River freight traffic slowly declined, then dropped sharply with the most recent recession.¹

Much of the decline in container volume at the Port of Lewiston coincided with the onset of the most recent recession. The recession began in December 2007 and continued through the middle of 2009. In the first year of the recession, container volume at the Port of Lewiston dropped by 39 percent as it did elsewhere throughout the country. For example, Mississippi River food and farm product shipments declined by more than 30 percent and all other product shipments declined by almost 25 percent in the first year of the recession; total U.S. grain shipments by barge declined by almost 20 percent.² As the economy began to recover, labor and management problems at the Port of Portland created logistical uncertainties for upriver shippers who sought more stable alternatives.

From the end of 2010 through the first quarter of 2011, the Columbia-Snake River System underwent a long-term, planned closure for maintenance. The coordinated closure eliminated barge transportation on much of the Columbia River and all of the Snake River for about 16 weeks. The result was a steep drop in reported Snake River freight traffic for 2010 and 2011.

Figure 2 provides the amount of freight traffic associated with food and farm products on the Snake River from 1983 through 2012. The figure shows that average freight traffic is 3.2 million tons a year, accounting for approximately two-thirds of total traffic volume over that period. In 2012, the most recent year for which information is available, food and farm product volume was only 10 percent below the long-run average.

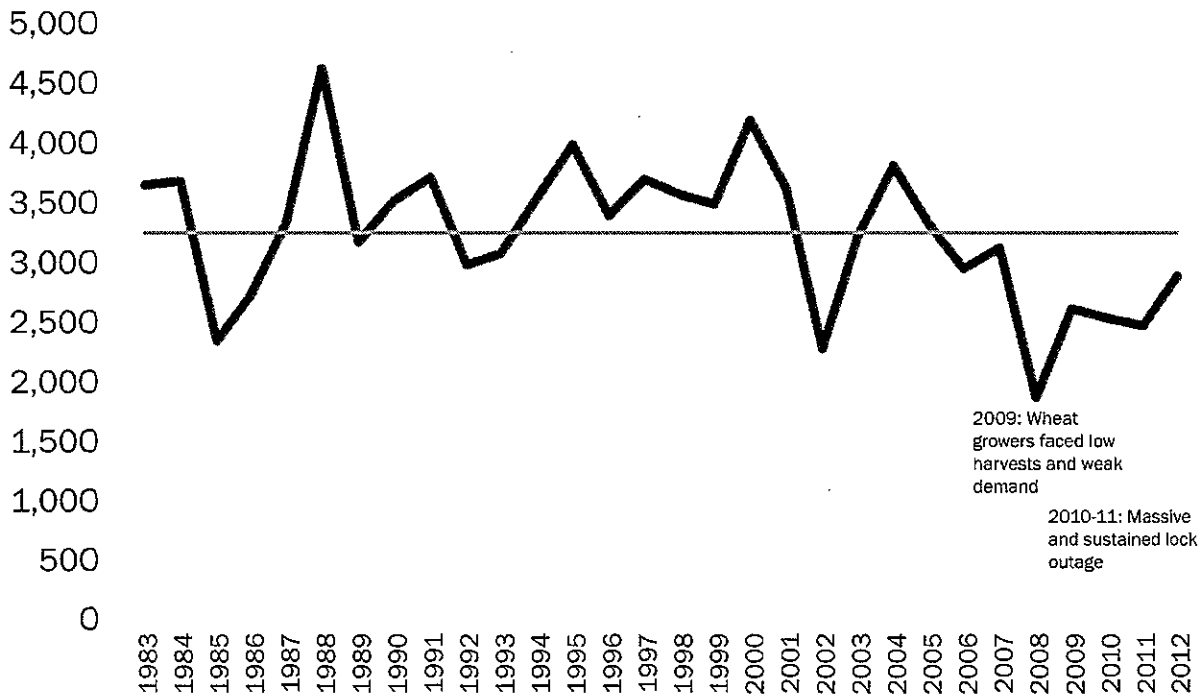
¹ The National Bureau of Economic Research concludes that the most recent recession began in December 2007 and ended in June 2009. The recovery since the end of the recession has been widely described by economists as “sluggish” and “lackluster.”

² U.S. Department of Agriculture and U.S. Department of Transportation. Study of rural transportation issues, Chapter 12: Barge transportation. 2010.

Figure 2

Snake River Freight Traffic, Food and Farm Products

Thousand short tons, 1983–2012



Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States

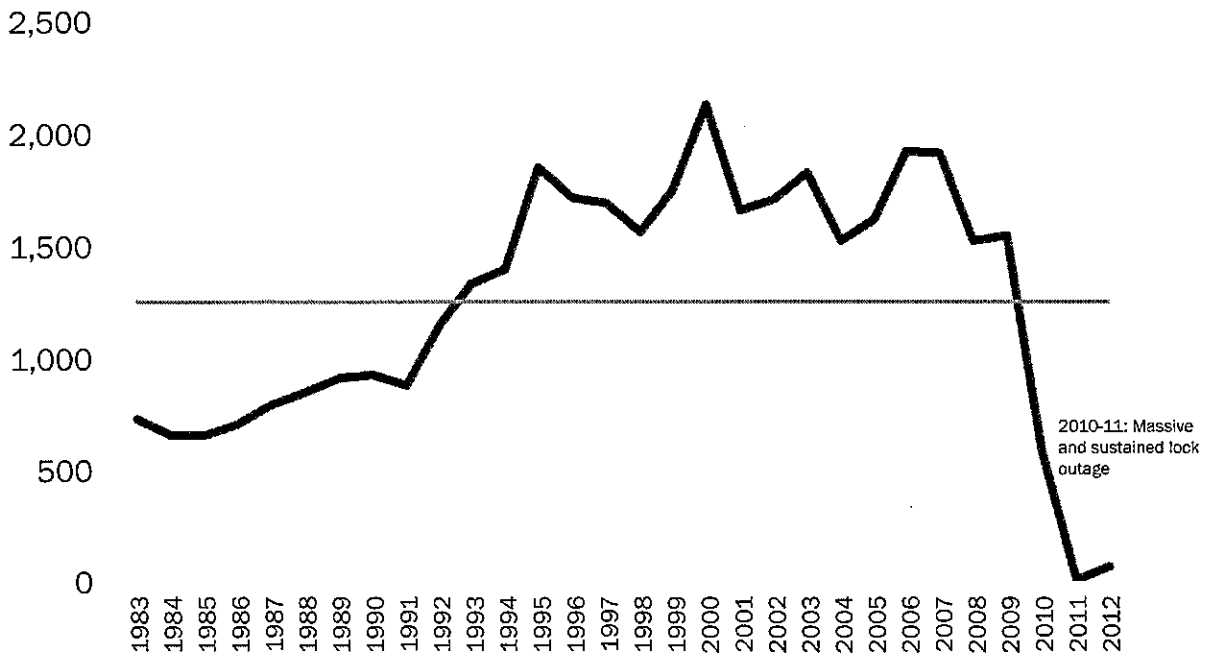
For many years, petroleum and petroleum products accounted for the second largest share of Snake River traffic. Figure 3 shows that from 2000 to 2009, average freight traffic was 1.7 million tons, accounting for one-third of river traffic during that period. During the 2010–11 coordinated closure of the Columbia-Snake River System, petroleum and petroleum products dropped to zero. The Port of Wilma oil and fertilizer terminal shut down in the year leading up to coordinated lock closure. Several factors accounted for the shut down including low activity at the terminal, consolidation of oil majors, and more aggressive pricing at Spokane and Pasco terminals.

Thus, a series of idiosyncratic events leading to and during the coordinated closure of the river system have accounted for nearly all of the decline in Snake River traffic.

Figure 3

Snake River Freight Traffic, Petroleum & Petroleum Products

Thousand short tons, 1983-2012



Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States

Figure 1 shows that if petroleum products were at the same levels as the decade before the coordinated closure of the Columbia-Snake River System, total river traffic would be almost the same as the long-run average.

Looking toward the future, a surge in oil trains hauling North Dakota oil is interfering with grain shipments to Pacific Northwest ports. Indeed some shippers who typically rely on railroads are increasingly paying truckers to move their wheat to a barge port.³ The continuing energy boom will likely lead to increased demand for river transport. Also, looking toward the future, the Lower Snake River anticipates increased activity at two fertilizer projects, one of which has been completed and has been associated with a recent delivery of liquid fertilizer to the Port of Whitman County, Wilma site. Another project is anticipated to be completed in late 2015 or early 2016.

In summary, there is no evidence that commercial navigation on the Lower Snake River is undergoing a long-run systematic decline. Rather, much of the decline in traffic over

³ González, Á. Oil trains crowd out grain shipments to NW ports. *Seattle Times*. July 26, 2014.

the past few years can be attributed to a series of idiosyncratic events such as the recession, the coordinated closure of the river system, and labor/management issues at the Port of Portland.

In fact, despite the idiosyncratic issues, recent shipping volumes show that river traffic is returning to pre-recession levels. As a result, it is likely that Lower Snake River traffic volumes will continue their upward trend into the foreseeable future.

In contrast, *Reality Check* concludes that the Lower Snake River is a “waterway in decline” (p. 1). This conclusion is based on erroneous data and cannot be relied upon. The comments state that freight volume at Ice Harbor locks declined from 9.1 million tons in 1998 to 3.2 million tons in 2012, representing a drop of 64 percent (p. 1). Data published by the U.S. Army Corp of Engineers, however indicates that in 1998, 4.6 million tons passed through Ice Harbor locks (Exhibit 2).⁴ In this way, *Reality Check* overstates the decline in traffic by a factor of two. Because of this error the comments also erroneously conclude that the “majority of the decline” in river traffic occurred before the recent recession. Thus, the comments’ conclusions are erroneous and cannot be relied upon.

2 Alternative modes as complements and substitutes

Opponents of maintaining the Lower Snake River for commercial navigation suggest that capital projects at the Panama Canal will cause container traffic to be diverted from west coast ports to ports in the Gulf of Mexico and the east coast.

The Chief Commercial Officer at the Port of Portland has concluded that changes at the Panama Canal will have virtually no impact on the Port of Portland.⁵ The Pacific Northwest is an export hub for farm products, especially grains. The Port of Portland executive indicated that large grain handling companies, such as Cargill and Mitsui, are directing their investments toward the Pacific Northwest rather than the Mississippi River valley. He said, such large investments mean that handlers are “betting on geography, betting on the river system, and betting on railroads.” In other words, investors recognize the Pacific Northwest as a coordinated transportation system in which rail transport and the river system are important complements.

⁴ U.S. Army Corps of Engineers. Lower Snake River Programmatic Sediment Management Plan. Draft Environmental Impact Statement. December 2012. Table 3-13.

⁵ Ruda, S. Will the new Panama Canal impact the Port of Portland? Lecture conducted from Columbia Corridor Association and Portland City Club, Portland, OR. September 24, 2014.

While rail and barge transportation are complements, the existence of competition from barging disciplines rail pricing and provides an alternative when railroads become capacity constrained. For example, research has found that competition supplied by truck-barge transportation results in a 20 percent reduction in rail rates for grain shipments.⁶ This is consistent with earlier research demonstrating that wheat shipments originating 200 miles from water transport are subject to transportation rates that are 18.1 percent higher than those shipments originating 50 miles from water transport.⁷ All of this demonstrates that barge transportation on the Columbia and Snake Rivers competes with rail transportation and disciplines the rates that can be charged for rail transportation.⁸

My comments last year noted that increasing demand for coal from China and increasing production of oil in North Dakota's Bakken oil field would likely to increase rail traffic and add congestion to the Pacific Northwest's rail network. This prediction has come true. This year, grain shippers report weeks-late trains and rising rail rates while railroads report a backlog of grain cars. River transportation has provided a critical alternative in the face of a rail transportation shortage, as noted in the *Seattle Times*: "Washington wheat farmers have been luckier than their Upper Midwest cousins because most can ship their wheat by barge down the Columbia River." In addition, one of the largest wheat shipping facilities in Ritzville, Washington, saw its rail shipping drop by more than half.⁹ The continuing intermountain energy boom will continue to strain rail resources until rail firms complete their investments to expand capacity, further adding value to the Snake River as an alternative for grain shippers.

3 Costs of dredging

The Corps has historically used dredging as its primary method of removing accumulated sediment that interferes with use of the Lower Snake River. In December

⁶ Winston, C., Maheshri, V., and Dennis, S. M. (2011). Long-run effects of mergers: The case of U.S. western railroads. *Journal of Law and Economics*, 54(2):275-304.

⁷ Wu, F. L. (2010). An assessment of the impact of competition on rail rates for agricultural shipments: An empirical study of Minnesota rail rates on soybean, corn and wheat shipments. Minnesota Department of Agriculture, Agricultural Marketing Services, <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5084325>.

⁸ Casavant, K. and Jessup, E. (2006). Palouse River and Coulee City Railroad: Market assessment. Washington State Department of Transportation Office of Freight Strategy and Policy.

⁹ González, Á. Oil trains crowd out grain shipments to NW ports. *Seattle Times*. July 26, 2014.

Gillie, J. Port of Tacoma executive asking railroad for better service. *News Tribune*. July 30, 2014.

2012, the Corps produced a draft Programmatic Sediment Management Plan (PSMP) and Environmental Impact Statement (EIS) for managing sediment. My 2013 letter to the Corps provided an analysis of comments regarding the costs and benefits of dredging the Lower Snake River.

I understand that the Corps has budgeted a total of \$6.5 million for the project. The Lower Snake River last was dredged at the end of 2005 and early 2006. By the time the anticipated dredging begins, there will have been a nearly 10 year interval between dredging activities. Before the 2005–06 activity, the last dredging occurred in 1999.

Rather than focusing on the costs and benefits of dredging, *Reality Check* attempts to enumerate “all costs related to commercial navigation on the lower Snake” (p. 3). The comments provide a list of expenditures on the Lower Snake River, including appropriations under the stimulus package known as the American Recovery and Reinvestment Act, capital costs associated with repairs and maintenance, an allocation of fish mitigation costs, and costs to the Bonneville Power Administration. It is not clear in what way any of these expenditures and projects are relevant to the costs and benefits of dredging the Lower Snake River.

Dredging opponents cite expenditures under the American Recovery and Reinvestment Act to conclude that “costs are rising.” However, the comments provide no baseline to measure whether or to what extent “costs are rising.” Without such context, the conclusions are meaningless. In addition, the comments do not indicate how such stimulus spending is relevant to the ongoing costs and benefits of dredging the Lower Snake River.

Similarly, opponents of maintaining the Lower Snake River for commercial navigation identify past capital costs—some as long ago as 1996—associated with repair and maintenance, but provide no demonstration that these costs are relevant to the ongoing costs and benefits of dredging the Lower Snake River.

Reality Check relies on a 15 year old position paper to provide a speculative allocation of fish mitigation costs associated with Lower Snake River dams (p. 4). The costs presented in the comments are merely a hypothetical allocation of costs. Such speculative estimates cannot be relied upon. In addition, the comments do not indicate how such a cost allocation is relevant to the costs and benefits of dredging the Lower Snake River.

Dredging opponents have identified construction costs associated with “saving threatened and endangered fish.” The comments do not indicate how these capital costs

are relevant to the costs and benefits of dredging the Lower Snake River. The comments assert, but do not demonstrate, that annual maintenance costs on these projects will increase. In contrast, the capital projects cited in *Reality Check* include the installation of spillway weirs, which have no moving parts and require virtually no ongoing maintenance once installed. In this way, *Reality Check* is erroneous and cannot be relied upon.

It has been pointed out that an increase in wildfires in the Lower Snake River basin have led, and will lead, to increased sedimentation and, in turn, an increased demand for dredging. To a large extent, forest policy and wildfire risk is managed by the U.S. Bureau of Land Management and outside the scope of the Corps' dredging decision making process.

Opponents of maintaining the Lower Snake River for commercial navigation have identified the costs of developing the Lower Snake River Programmatic Sediment Management Plan (PSMP) and associated environmental impact statement. These costs stem from the settlement of a lawsuit filed by Save Our Wild Salmon and other environmental groups. In agreeing to the settlement, the parties implicitly understand that benefits of the PSMP and associated EIS process would exceed the costs. In this way, the PSMP and EIS process could be counted as a net benefit, rather than a cost.

In summary, *Reality Check* and similar comments from dredging opponents provide no demonstration that "costs are rising" with respect to Lower Snake River commerce. The comments rely on irrelevant, outdated, and meaningless dollar amounts that cannot be relied upon to evaluate the benefits and costs of dredging the Lower Snake River.

4 The dredging-as-subsidy myth

Reality Check (p. 5) asserts that barge shippers receive a "subsidy" of "at least" \$10 million a year. It also asserts (p. 4) that the "subsidy per ton of freight shipped" on the Lower Snake River has "risen dramatically." These comments single out the barge industry and do not identify any other river user as a recipient of the so-called "subsidy."

Under the definition of "subsidy" as used by dredging opponents, public education would be a subsidy to parents, national parks would be a subsidy to hikers, and highway maintenance would be a subsidy to trucking companies. In other words, under the spending-as-subsidy approach adopted by commercial navigation opponents, every dollar the government spends is a subsidy to someone.

The notion of a “subsidy” described by opponents of maintaining the Lower Snake River for commercial navigation yields implausible implications that are not supported by fundamental principles of economics. For example, its per-ton-of-freight-shipped “subsidy” decreases with increased barge volume, which suggests the easiest way for dredging to pay for itself would be to encourage *more* barge traffic. Under this flawed thinking, the “subsidy” would be halved if barge volumes doubled.

A short ton of crude oil is approximately 6.65 barrels and is priced at roughly \$90 a barrel, or just under \$600 a short ton. On the other hand, a short ton of wheat is approximately 33.3 bushels and is priced at roughly \$6 a bushel, or just about \$200 a short ton. This raises a question for dredging opponents: If the weights are the same, but the values are different, is the subsidy the same? Similarly, should the “subsidy” to cruise ships be measured by number of passengers, or their weight? These are nonsense questions because the concept of a per-vessel, per-ton, per-dollar, or per-person “subsidy” makes no economic sense.

It is a well known and widely accepted principle of economics that one cannot allocate common costs (e.g., dredging costs) across multiple products (e.g., barges full of grain, barges loaded with containers, cruise ships, and kayaks).¹⁰ Nobel laureate George Stigler notes: “Such an allocation must be arbitrary, for there is no one basis of allocation that is more persuasive than others.”¹¹

In reality, navigable waterways are a benefit enjoyed by many. Barges, cruise ships, and recreational users all share a common benefit from dredging, as well as infrastructure maintenance and improvements. These benefits are transmitted throughout the economy in the form of lower transportation costs for shippers, increased revenues to growers, lower prices for consumers, increased employment opportunities at ports, improved recreational opportunities, and through many other ways.

5 Conclusion

Based on my research and general experience and education as a professional and academic economist, I am confident that a comprehensive cost-benefit analysis would conclude that the benefits of dredging demonstrably outweigh the costs. The comments

¹⁰ In economics this is known as the “beef and hides” problem in that it is impossible to allocate the cost of raising a cow across beef that is sold as food and the hides that are sold as leather. It was first articulated in Marshall, A. (1890). *Principles of economics*, available at <http://www.econlib.org/library/Marshall/marP.html>.

¹¹ Stigler, G. J. (1966) *The theory of price*, 3rd ed. Macmillan.

in *Reality Check* cannot be relied upon. Many of its conclusions are merely unsupported assertions. Other conclusions are based on erroneous, irrelevant, and/or meaningless information.

The total tonnage moved on the lower Snake River fluctuates from year to year, depending on crop production, the state of the U.S. economy, and trends in world trade. The U.S. and world economies suffered a deep recession in 2007, 2008, and 2009 (the most recent years for which data was available), and the volumes barged on the lower Snake River dropped as a result. In contrast, the Pacific Northwest wheat forecast for 2011 is strong and world demand is growing, which is likely to result in substantial cargo volume growth. Table 3-13 presents the total tonnages of cargo moved through the lower Snake River, and includes McNary Reservoir since cargo statistics do not differentiate between the Snake and Columbia River portions of McNary Reservoir.

Table 3-13. Lower Snake River Navigation Lock Detail (million tons)

Year	Lower Granite	Little Goose	Lower Monumental	Ice Harbor	McNary*
1994	2,314	3,542	3,678	4,278	7,976
1995	2,414	3,776	3,924	4,581	8,670
1996	1,771	2,912	3,098	3,564	7,886
1997	1,952	3,180	3,675	4,205	8,294
1998	2,221	3,554	4,018	4,571	8,591
1999	1,987	3,128	3,496	4,067	7,604
2000	2,264	3,103	4,110	4,560	8,461
2001	1,820	2,811	3,408	3,952	8,102
2002	1,349	2,427	2,687	3,086	6,372
2003	1,527	2,579	2,866	3,210	6,998
2004	1,749	2,951	3,267	4,119	7,508
2005	1,661	2,724	2,991	3,519	6,652
2006	1,570	2,717	2,915	3,371	6,950
2007	1,763	2,933	3,268	3,611	7,351
2008	1,164	1,840	2,119	2,161	5,301
2009	1,226	2,503	2,536	2,867	6,125

*Note: McNary Pool includes facilities on both the Snake and Columbia Rivers.

Source: Corps of Engineers

Cargo volumes at the Lower Granite lock were reduced between 2007 and 2008, dropping from 1.76 million short tons¹ to 1.16 million short tons. In 2009, the last year for which data was available, Lower Granite volume increased somewhat over 2008, growing to 1.23 million short tons.

¹ Short ton is 2,000 pounds. It is specified here to distinguish from metric ton (1,000 kilograms, or 2,205 pounds), which is frequently used for world grain production statistics.