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**NATHAN**  
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**Eric Fruits, Ph.D.**  
Director, Pacific Northwest

August 9, 2013

U.S. Army Corps of Engineers,  
Walla Walla District  
PSMP/EIS, Attention: Sandy Shelin, CENWW-PM-PD-EC,  
201 North Third Avenue  
Walla Walla, WA 99362-1876  
psmp@usace.army.mil

**RE:** Response to Comments Submitted by American Rivers et al., and Ernie Niemi on the Draft Environmental Impact Statement for the Lower Snake River Programmatic Sediment Management Plan prepared by the U.S. Army Corps of Engineers

Dear Ms. Shelin:

I have been retained by the Pacific Northwest Waterways Association (“PNWA”), to provide an economic analysis of comments submitted by Ernie Niemi on behalf of American Rivers, Earthjustice, Save Our Wild Salmon, Sierra Club, and others (hereafter, “American Rivers”) regarding the supposed “costs and benefits” of dredging associated with the U.S. Army Corps of Engineers’ (“Corps”) Lower Snake River Draft Programmatic Sediment Management Plan and corresponding environmental analysis.

I am a managing economist at Nathan Associates Inc., an international 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. My comments are based on my general expertise and knowledge regarding economics, finance, and statistics as well as publicly available information regarding dredging and associated benefits and costs.

As described more fully below, I conclude that the Niemi Comments are not based on sound economic principles, and are both misleading and factually unsupported. Contrary to Mr. Niemi's conclusions, the available information suggests that:

1. **The benefits of dredging exceed the costs by at least \$5.5 million.** I draw this conclusion using the same methodology employed by Mr. Niemi, but adjust for inflation and use the correct cost of dredging and the correct measures of traffic volume. I reach the conclusion that the net benefits of dredging exceed the costs by at least \$5.5 million *without* addressing additional dredging benefits derived from recreational uses of the river and the additional employment (e.g., port employment) and other economic activity associated with river transportation (which would normally be included in any formal cost/benefit analysis). Taken together, I am confident that if conducted, a comprehensive cost-benefit analysis would conclude that the benefits of dredging demonstrably outweigh the costs.

	High Cost Low Benefit	Low Cost High Benefit
Annual benefits of dredging		
Grain shippers	\$4,207,840	\$10,289,760
Container shippers	837,518	998,607
Cruise ships and associated tourism	2,600,000	5,300,000
Less: Costs of dredging, annualized	\$2,166,667	\$812,500
Net benefit of dredging	\$5,478,692	\$15,775,867

2. **Snake River freight traffic increased 50 percent in 2012 and is growing toward pre-recession levels.** I conclude that freight traffic is rising and currently trending toward pre-recession levels. In reaching a contrary conclusion, the Niemi Comments appear to "cherry pick" the years 1994 and 2009 to conclude that freight traffic on the Lower Snake River is undergoing a "structural" decline. Mr. Niemi disregards general economic trends as well as idiosyncratic economic conditions that explain the unusually low traffic in the years 2009 through 2011.
3. **The benefits to grain shippers alone is sufficient to justify the costs of dredging.** The annual benefits to grain shippers of dredging could be as high as \$10.3 million a year, in which case the benefits *in a single year* would be enough to justify the \$6.5 million the Corps has budgeted for dredging. In reaching a contrary conclusion, Mr. Niemi fails to use accurate dredging costs, fails to account

for inflation, and uses incorrect river traffic data. These inaccuracies and omissions by themselves invalidate Mr. Niemi's conclusions.

4. **The benefits to container shippers and the cruise ship industry and tourists provide additional justification for dredging.** The annual benefits of dredging for container shippers and the cruise ship industry could be as high as \$6.2 million a year, demonstrating that the benefits *in a single year* would be almost enough to justify the \$6.5 million the Corps has budgeted for dredging. The Niemi Comments fail to address the benefits of dredging to container shippers or the cruise ship industry and its customers. Because these obvious dredging benefits would normally be factored into any cost/benefit analysis, the absence thereof in the Niemi Comments renders his analysis both incomplete and economically inaccurate.
5. **Competition from Lower Snake River barges disciplines rail transport prices.** The Niemi Comments also overlook and fail to factor the benefits of dredging that is produced as a result of competition from truck-barge transportation. This well-recognized economic benefit normally results in a 20 percent reduction in rail rates for grain shipments. Mr. Niemi notes that competition between barge and rail has induced railroads to keep rates lower than they would be if truck/barge competition did not exist, but then fails to account for this obvious benefit.
6. **The region's rail network is at risk of congestion and the cost would increase with the elimination of barging on the Lower Snake River as a transportation option.** Without a truck-barge shipping option, increasing competition for rail resources from coal and oil shippers could result in steep price increases for grain shipments by rail. The Niemi Comments do not address the likelihood that the loss of barge transportation could choke the region's rail network.
7. **Expenditures on Lower Snake River dredging cannot be characterized as a "subsidy" to barge companies.** The Niemi Comments' description of a per-barge subsidy is at odds with basic principles of economics and completely ignores the benefits to growers, shippers, cruise ships, tourists, and other river users.

### **The Niemi Comments are based on an ad hoc approach that is at odds with basic economics principles**

The Niemi Comments do not present a complete cost/benefit analysis. In fact, they reflect a flawed economic approach that uses selective and non-representative data, focuses on a narrow subset of economic activity, to opine that the costs of dredging exceed the benefits. Many of his comments are unsupported policy assertions, rather than conclusions based on analysis of facts and data. Because of the methodological and analytical errors, the Niemi Comments cannot be relied upon in any way to suggest that the costs of dredging outweigh the benefits.

- Mr. Niemi narrowly focuses on the change in lock traffic between the years 1994 (the middle of a peak period in river traffic) and 2009 (a year of low harvests and weak demand for Northwest wheat). By selectively focusing on these two dates, Mr. Niemi concludes that river traffic is facing “structural” decline (p. 17). In contrast, lock information through 2012 indicates that river traffic is approaching pre-recession levels.
- The Niemi Comments speculate that the costs of dredging would be \$2 million a year, rather than relying on the amount currently budgeted by the Corps (\$6.5 million) for the first dredging to occur in eight years.
- Mr. Niemi calculates the benefits of dredging for only a single activity: the shipping of grain. His analysis relies on a 10 year old study, but makes no adjustments for inflation. In addition, he uses the wrong measure of freight traffic that understates volume by a factor of nine. In particular, he focuses only on grain shipments reported by the Port of Lewiston, rather than total grain traffic as used in the study he cites.
- The Niemi Comments’ conclusions about the benefits to non-grain shippers are based on speculation rather than hard data (i.e., “If the saving per ton to shippers for other commodities are similar to those for grain ...,” p. 17). Moreover, while relying on the 10 year old study for his grain calculations, Mr. Niemi omits any discussion of containers, logs and wood chips, and petroleum products, which also benefit from dredging and were discussed in that report.
- The Niemi Comments examine annualized costs and benefits, when the standard approach employed by economists calculates *net present value*—a well known and widely accepted method that uses inflation and interest rates to measure the value today of a stream of future costs and benefits. While the Niemi Com-

ments (p. 7) cite an Office of Management and Budget document describing the process of calculating net present value and (p. 18) and another study concerning a rail facility, he diverges from the approaches used in these studies in presenting his annualized calculations.

- The Niemi Comments make numerous legal and regulatory conclusions that are generally understood to be outside the scope of economic analysis.

These methodological and analytical errors bias Mr. Niemi's conclusions and render them invalid for any regulatory purpose.

### **Commercial navigation increased 50 percent in 2012, is trending upward towards pre-recession levels, and is expected to continue to rise**

Focusing on the decline in lock traffic between the years 1994 (the middle of a peak period in river traffic) and 2009 (a year of low harvests and weak demand for Northwest wheat), the Niemi Comments (p. 17) assert that the decline reflects a "structural" trend unrelated to the decline in commerce associated with the most recent recession.

In contrast, my analysis of Lower Snake River freight traffic, lock traffic, shipping reports from the Port of Lewiston, and conversations with staff at the Port of Clarkston and the Lewis Clark Terminal indicate that *Snake River traffic increased 50 percent in 2012 and is growing toward pre-recession levels.*

Figure 1 provides the amount of freight traffic on the Snake River from 1983 through 2012.<sup>1</sup> The exhibit shows that freight traffic varies widely from year to year. An examination of five-year averages smooths the year-over-year variations and shows that freight traffic has been relatively stable since 1983, averaging about 5.2 million short tons of freight traffic a year.

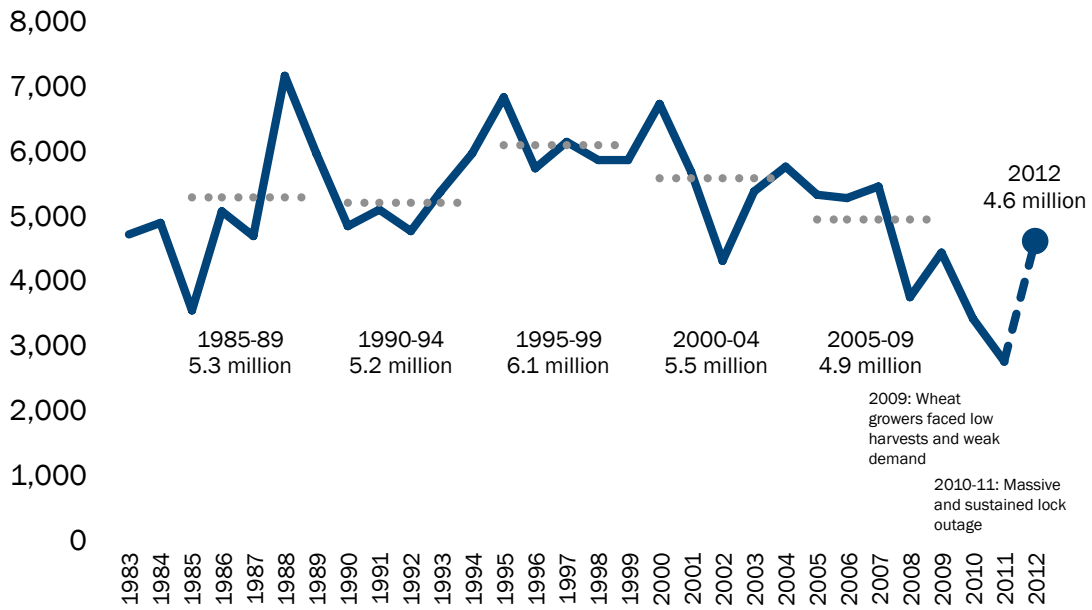
Total Snake River freight traffic slowly increased through the 1980s and early 1990s, peaking in the mid-1990s. Since then, total Snake River freight traffic slowly declined, then dropped sharply with the most recent recession.<sup>2</sup>

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<sup>1</sup> U.S. Army Corps of Engineers (various). Waterborne commerce of the United States.

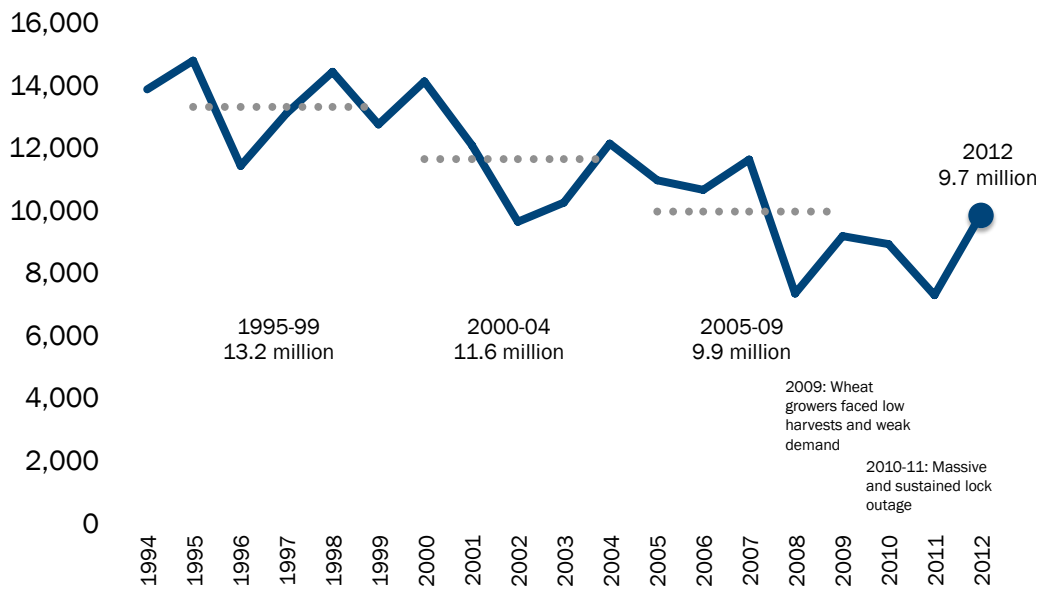
<sup>2</sup> The National Bureau of Economic Research concludes that the most recent recession began in December 2007 and ended in June 2009. The recovery since the end of the recession has been widely described by economists as "sluggish" and "lackluster."

**Figure 1: Snake River traffic, thousand short tons, 1983–2012**



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

**Figure 2: Snake River lock traffic, Lower Granite, Little Goose, Lower Monumental, and Ice Harbor combined, thousand short tons, 1994–2012**



Source: U.S. Army Corps of Engineers, DEIS and Report on Civil Works Activities

In 2009 wheat growers in the region faced low harvests from an unusually cool and dry spring as well as weak demand, both contributing to a decline in grain shipments.<sup>3</sup>

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. Information for total Snake River freight traffic for 2012 is not yet available from the Corps. But, statistical estimates based on shipping reports from the Port of Lewiston indicate that total Snake River freight traffic for 2012 will be reported to be approximately 4.6 million tons, which represents a 50 percent increase over 2010–11 average traffic.<sup>4</sup> Grain traffic for 2012 is estimated to be approximately 3.5 million tons.

Figure 2 confirms the statistical estimates. The figure provides the amount of lock traffic on the Snake River from 1994 through 2012.<sup>5</sup> As with total volume, lock traffic volume for 2012 was 50 percent higher than 2010–11 average traffic.

In short, there is no evidence that commercial navigation on the Lower Snake River is undergoing a long-run decline. In fact, recent shipping volumes show a steep increase in river traffic in 2012 and indicate that river traffic is returning to pre-recession levels. Recent forecasts by the U.S. Department of Agriculture project that on the demand side, Chinese imports of wheat in 2013–14 will be the highest since the 1990s.<sup>6</sup> On the supply side, this year's harvest is forecast to be above average. As a result, it is likely that Lower Snake River traffic volumes will continue their upward trend into the foreseeable future.

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<sup>3</sup> U.S. Department of Agriculture (2009). Tennessee news release. National Agricultural Statistics Service, May 12. ENP Newswire (2009). Good news continues to elude agricultural sector, October 9.

<sup>4</sup> Snake River freight traffic has a strong statistical relationship with Port of Lewiston shipments. Applying this statistical relationship (a technique known as *regression analysis*) to information from the Port of Lewiston, one may accurately estimate total Snake River freight traffic for 2012.

<sup>5</sup> DEIS, Table 3-13 and U.S. Army Corps of Engineers (various). Report of the Secretary of the Army on civil works activities. Lock traffic is counted differently from total Snake River traffic in that lock traffic is subject to double counting. Because of the differences in collection, lock traffic is approximately twice the size of total river traffic; this approximately 2-to-1 relationship is relatively stable over time. In general, Figure 1 is a more accurate representation of total Snake River traffic. Figure 2 includes some double counting, but has more current data. In addition, statistically speaking, the double counting in Figure 2 is not relevant in evaluating percentage changes over time.

<sup>6</sup> Terazono, E. and Farchy, J. (2013). Wheat rallies on raised China demand forecast. *Financial Times*, July 11. See also: U.S. Department of Agriculture (2013). World agricultural supply and demand estimates. WASDE-520, July 11.

### The benefits to grain shippers alone is sufficient to justify the costs of dredging

The Niemi Comments (p. 16) incorrectly assert that the costs of dredging would be \$2 million a year, while the benefits to grain shippers would only amount to \$500,000 to \$1 million a year. According to Mr. Niemi's calculations, the costs of dredging are greater than the benefits to grain shippers. However, my review of the approach employed by Mr. Niemi demonstrates that it is fundamentally flawed and cannot be relied upon to reach any conclusions regarding the benefits or costs associated with maintenance dredging.

The Niemi Comments fail to account for inflation, use both an incorrect measure of dredging costs and an incorrect measure of barge traffic, and fail to account for the impact of barge competition on rail prices.

Notwithstanding the above, were we to apply the methodology used by Mr. Niemi and correct only for inflation and transportation volumes, the costs of discontinuing dredging and thus closing the Lower Snake River to commercial navigation would be \$4.1 million to \$10.2 million.<sup>7</sup> *By this measure alone – cost savings on grain shipments – the benefits of dredging are roughly two times to four times greater than the costs of dredging.*

	Low Benefit	High Benefit	Source
<b>Costs</b>			
Costs of dredging, 2005-06 dollars	\$2,000,000	\$2,000,000	Niemi Report, p. 16
Inflation	15%	15%	GDP deflator
Costs of dredging, 2013 dollars	\$2,300,000	\$2,300,000	
<b>Benefit</b>			
Additional costs, per ton	\$0.96	\$2.35	BST Associates, Tables 19 and 20
Inflation	24%	24%	GDP deflator
Additional costs, per ton, 2013 dollars	\$1.19	\$2.91	
Snake River grain volume, thousand tons	3,536	3,536	Statistical forecast
Benefit: Avoidance of additional costs, 2013 dollars	\$4,207,840	\$10,289,760	
<b>Net benefit: Benefit less costs, 2013 dollars</b>	<b>\$1,907,840</b>	<b>\$7,989,760</b>	

The Niemi Comments (p. 16) assume annualized dredging costs of \$2 million. However, 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, which provides an eight year interval between dredging activities. Before that, the last dredging occurred in 1999.

<sup>7</sup> The Niemi Comments appear to have relied on BST Associates (2003). Lower Snake River transportation study final report. [http://act.americanrivers.org/site/DocServer/lsr\\_transportation\\_study\\_final\\_report.pdf?docID=661](http://act.americanrivers.org/site/DocServer/lsr_transportation_study_final_report.pdf?docID=661), retrieved July 22, 2013. Tables 19 and 20.



The table below provides two alternative scenarios. The first scenario assumes dredging would occur every three years, for an annualized cost of \$2.17 million. The second scenario assumes dredging would occur every eight years, for an annualized cost of \$812,500. *Using the correct measure of the costs of dredging as budgeted by the Corps indicates that the benefits to grain shippers alone of dredging can be as much as 12 times greater than the costs of dredging.*

	High Cost Low Benefit	Low Cost High Benefit	Source
<b>Costs</b>			
Cost of dredging	\$6,500,000	\$6,500,000	Corps budget
Number of years	3	8	Niemi Report, p. 16
Average annual cost	\$2,166,667	\$812,500	
<b>Benefit</b>			
Additional costs, per ton	\$0.96	\$2.35	BST Associates, Tables 19 and 20
Inflation	24%	24%	GDP deflator
Additional costs, per ton, 2013 dollars	\$1.19	\$2.91	
Snake River grain volume, thousand tons	3,536	3,536	Statistical forecast
Benefit: Avoidance of additional costs, 2013 dollars	\$4,207,840	\$10,289,760	
<b>Net benefit: Benefit less costs, 2013 dollars</b>	<b>\$2,041,173</b>	<b>\$8,123,093</b>	

### **The benefits to container shippers and the cruise ship industry and tourists provide additional justification for dredging**

The Niemi Comments do not address the benefits of dredging to container shippers or the cruise ship business and its customers. Instead, the comments by American Rivers (p. 23) and the Niemi Comments incorrectly assert that container volume at the Port of Lewiston has steadily and permanently declined.

In fact, much of the decline in container volume 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.<sup>8</sup>

As the economy continues to improve, container volume at the Port of Lewiston continues to steadily increase. *In 2012, container volume at the port was 28 percent higher*

<sup>8</sup> U.S. Department of Agriculture and U.S. Department of Transportation (2010). Study of rural transportation issues, Chapter 12: Barge transportation.

*than the year before. Staff at the port have indicated that 2013 is projected to have greater volume than last year.*

In light of the above, a review of the information relied upon by Mr. Niemi indicates that the benefits of dredging would be approximately \$179 to \$214 per container in 2013 dollars.<sup>9</sup> Applying the methodology used in the Niemi Comments and correcting for inflation and 2012 transportation volume, *the annual benefits of dredging the Lower Snake River to enable commercial navigation would be \$838,000 to \$999,000 for container shippers.*

	High Cost Low Benefit	Low Cost High Benefit	Source
<b>Benefit to Container Shippers</b>			
Additional costs, per container	\$144.44	\$172.22	BST Associates, p. 65
Inflation	24%	24%	GDP deflator
Additional costs, per container 2013 dollars	\$179.11	\$213.56	
Lewiston container shipments, TEU	4,676	4,676	Port of Lewiston
Benefit: Avoidance of additional costs, 2013 dollars	\$837,518	\$998,607	

The Niemi Comments omit any discussion of logs and wood chips, petroleum products, and other goods which also benefit from dredging. For example, Tidewater Barge Lines reports that it routinely ships fertilizer by barge into Central Ferry on the Snake River for local distribution to area farms. In addition to grain, Tidewater picks up at the Port of Lewiston and delivers to the Port of Portland thousands of export cargo containers annually. These containers are mainly agricultural and wood products. Tidewater also delivers thousands of tons of woodchips and sawdust by barge into and out of the Ports of Wilma and Lewiston and moves heavy equipment and project cargoes into these Ports. Tidewater is currently engaged in developing two projects that would bring fertilizer (liquid and dry) by barge into the Port of Wilma. Mr. Niemi does not address any of these activities and how they benefit from dredging.

In addition, not only do transportation costs increase when shippers are forced to use an alternative to barge shipping, but as port profits decrease, employment opportunities and other economic activities are similarly adversely affected. A complete cost/benefit analysis would account for how this increased activity through dredging induces additional economic benefits for the surrounding communities.

<sup>9</sup> The Niemi Comments appear to have relied on BST Associates (2003). Lower Snake River transportation study final report. [http://act.americanrivers.org/site/DocServer/lstr\\_transportation\\_study\\_final\\_report.pdf?docID=661](http://act.americanrivers.org/site/DocServer/lstr_transportation_study_final_report.pdf?docID=661), retrieved July 22, 2013.

In the years prior to the most recent recession (2005 through 2007), the Port of Clarkston reported an annual average of six cruise lines carrying approximately 26,000 passengers and staff. Since the recession (2008 through 2012), some cruise lines exited and some entered the market. On average, five lines were operating with an annual average of 11,500 passengers and staff. This year, as the economy slowly improves, another cruise ship is anticipated to enter the market to meet increasing demand.

Cruise ships benefit from the same infrastructure maintenance and improvements as maritime cargo. In addition, the volume of passengers carried on cruise ships on the Columbia River and Snake River system provide additional economic benefits to the surrounding communities. Based on earlier studies, it is estimated that in 2013 dollars, cruise ship tourism will add \$2.6 million to \$5.3 million to the communities in the Columbia River and Snake River system.<sup>10</sup> *The economic benefits of cruise ship operations alone can be more than two times greater than the costs of dredging.*

### **Competition from barge transportation disciplines rail transport prices and relieves congestion on the region's rail network**

The Niemi Comments note that competition between barge and rail has induced railroads to maintain lower rates than would otherwise result if there were no competition from barges.

Yet, Mr. Niemi fails to account for the fact that competition supplied by truck-barge transportation results in a 20 percent reduction in rail rates for grain shipments.<sup>11</sup> This is consistent with prior 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.<sup>12</sup> All of this demon-

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<sup>10</sup> Northwest Resource Information Center (2002). Idaho economic effects of breaching/not breaching the Army Corps of Engineers' Snake River Dams in S.E. Washington. Adjusted for inflation using GDP deflator and assuming cruise ship volume of one-half the volume assumed in the NRIC analysis.

<sup>11</sup> 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.

<sup>12</sup> 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>.

strates that barge transportation on the Columbia and Snake Rivers competes with rail transportation and disciplines the rates that can be charged for rail transportation.<sup>13</sup>

*Dredging benefits shippers—and ultimately consumers—by ensuring competitive transportation pricing among the various modes of transportation.*

Increasing demand for coal from China and increasing production of oil in North Dakota's Bakken oil field are likely to increase rail traffic and add congestion to the Pacific Northwest's rail network. Several terminal projects are currently undergoing complex permitting processes. Freight trains already encounter bottlenecks along the same route coal trains will use from the Idaho Panhandle to the coast.<sup>14</sup> Three proposals for Northwest coal export terminals would generate nearly 7,000 coal train trips a year at full capacity on already congested tracks in Spokane and the Columbia River Gorge. If some or all of the proposed oil terminals are built, oil train traffic could hit up to 3,000 loaded trains a year, not counting direct trips to refineries.<sup>15</sup>

*Without a barge shipping option, increasing competition for rail resources from coal and oil shippers could result in steep price increases for grain shipments by rail.*

### **The dredging-as-subsidy myth**

American Rivers (p. 23) assert that costs of dredging amounts to a "subsidy" of \$11,000 for every full barge that leaves the Port of Lewiston. The Niemi Comments (p. 2) similarly characterize this as a "subsidy" to the barge industry. These comments single out the barge industry and do not identify any other river user as a recipient of the so-called "subsidy."

Under Mr. Niemi's definition of "subsidy," public education would be a subsidy to parents, national parks would be a subsidy to hikers, highway maintenance would be a subsidy to trucking companies, and the state-owned Washington Grain Train would be a subsidy to rail shippers. In other words, under Mr. Niemi's approach, every dollar the government spends is a subsidy to someone.

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<sup>13</sup> 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.

<sup>14</sup> Stewart, B. (2013). Northwest railroads will need improvements to handle coal trains. Oregon Public Radio Earthfix, April 1, <http://earthfix.opb.org/communities/article/northwest-railroads-already-congested/>, retrieved July 24, 2013.

<sup>15</sup> Learn, S. (2013). Oil trains – pipelines on wheels—headed to Northwest terminals and refineries from North Dakota fracking. *Oregonian*.

Mr. Niemi's notion of a "subsidy" yields implausible implications that are not supported by fundamental principles of economics. For example, his per-barge "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 his approach, the "subsidy" would be halved if barge traffic doubled.

American Rivers and Mr. Niemi suggest that the "subsidy" is \$11,000 for a full barge leaving the Port of Lewiston. This raises the question:

What would be the "subsidy" for an empty barge leaving the Port of Portland? Or a 7-day cruise? Or a fishing charter? Or a kayak?

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).<sup>16</sup> 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."<sup>17</sup>

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, and through many other ways.

On the other hand, without dredging, the river would be closed to commercial navigation and shippers would have to find alternative—and more costly—modes of transportation. USDA reports that the Columbia/Snaker River system is the top wheat export gateway in the country.<sup>18</sup> Growers and shippers would be disadvantaged because they would have to pay more for transportation and, in turn, earn less income from the crops he or she grew. The barge company would be worse off because it cannot earn any income on the waterway. Owners of non-barge shipping companies may be better off from the increased revenues, but their other customers would be disadvantaged be-

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<sup>16</sup> 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>.

<sup>17</sup> Stigler, G. J. (1966) *The theory of price*, 3rd ed. Macmillan.

<sup>18</sup> U.S. Department of Agriculture (2013). Wheat inspected and/or weighed for export by class, region and port area, January 2012–December 2012.


cause competition from former barge shippers would drive up the prices they pay for transportation. In this way, the failure to dredge would impose what is known as a *deadweight loss* because the decline in economic activity disadvantages many buyers and sellers without any corresponding benefits.<sup>19</sup>

## 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. In fact, my research, summarized in the tables presented in this letter, indicates that the benefits of dredging exceed the costs by at least \$5.5 million. The total net benefits of dredging would be expected to be higher in that I have not examined recreational uses of the river and the additional employment (e.g., port employment) and other economic activities associated with river transportation, which if analyzed, would yield additional benefits.

As demonstrated above, the Niemi Comments cannot be used as a basis to conclude that the costs of dredging outweigh the benefits. In fact, an examination of comprehensive and up-to-date information and an application of widely accepted economics principles show that if properly performed, a cost/benefit analysis would conclusively demonstrate that the benefits of dredging would exceed the costs by a wide margin. .

Respectfully submitted,



Eric Fruits, Ph.D.

Nathan Associates Inc.

Managing Economist

Pacific Northwest Region

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<sup>19</sup> One economics textbook defines a deadweight loss as, "costs to demanders that ... are not benefits to suppliers." Heyne, P. (1991). *The economic way of thinking*, 6th ed. Macmillan.