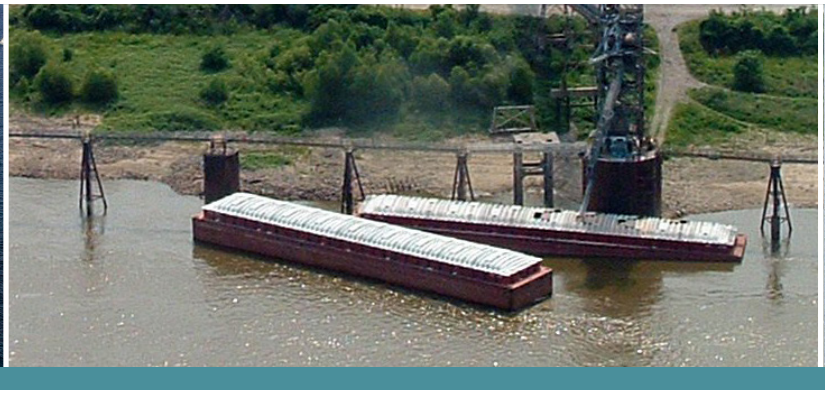
USDA United States Department of Agriculture

Agricultural Marketing Service

Dec 2013

A Reliable Waterway System Is Important to Agriculture

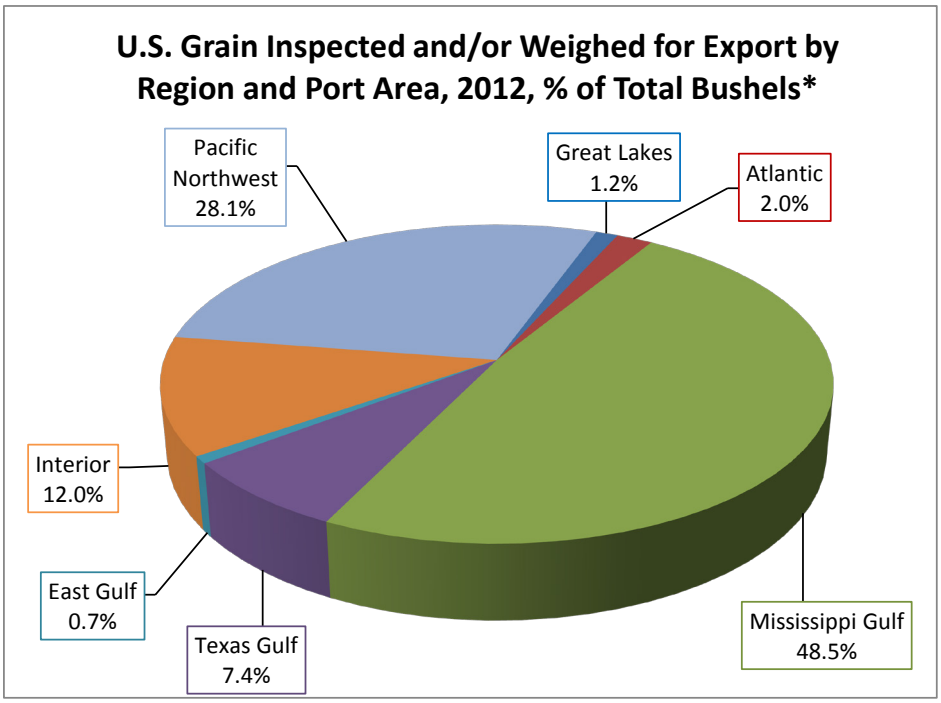

Do You Know Why?

Big Picture Overview

- U.S. agriculture is expected to contribute $27.5 billion to the U.S. balance of trade in fiscal 2014. Exports are forecast to reach $137 billion, while imports are forecast to reach $109.5 billion. (*USDA ERS/FAS Outlook for U.S. Agricultural Trade,* December 2, 2013).
- Forestry and fishery products, and critical farm inputs such as fertilizer, feed, and fuel move on the waterway system as well.
- Agriculture Secretary Tom Vilsack noted that every $1 billion in farm exports supports roughly 8,400 jobs.
- In calendar year 2012, 81 percent of U.S. agricultural exports (138.8 million metric tons) and 72 percent of imports (39.9 million metric tons) were waterborne. (*Census Bureau, U.S. Department of Commerce, and PIERS*).
- Exporters, importers, and domestic shippers depend on authorized port and waterway depths and widths, and locks and dam infrastructure.
- The Harbor Maintenance Tax (HMT) is a 0.125 percent ad valorem tax on the value of imports and certain domestic waterborne cargo deposited in the Harbor Maintenance Trust Fund (HMTF).
- Estimated fiscal 2013 HMT revenues and investment interest are $1.85 billion, while the fiscal 2013 Civil Works Budget requested $882 million from the HMTF, yielding an estimated year-end balance of $7.89 billion *(Budget of the United States Government, Fiscal Year 2014).*
- Estimated fiscal 2014 HMT revenues and investment interest are over $2 billion, while the fiscal 2014 Civil Works Budget request is $890 million from the HMTF, yielding an estimated year-end balance of $8.97 billion.
- In fiscal 2013, commercial vessels engaged in waterborne transportation on the inland waterways system will generate an estimated $95 million in revenues and investment interest from a 20 cents per gallon tax on diesel fuel, deposited in the Inland Waterways Trust Fund (IWTF). Funds in the amount of $94.8 million will be provided from the IWTF to finance one half the Federal costs of authorized locks and dams projects, in addition to $90.3 million from the General Treasury.
- The fiscal 2014 budget requested $94 million from the IWTF, $90 million from the General Treasury, and $80 million from new user fees.

Grain Exports

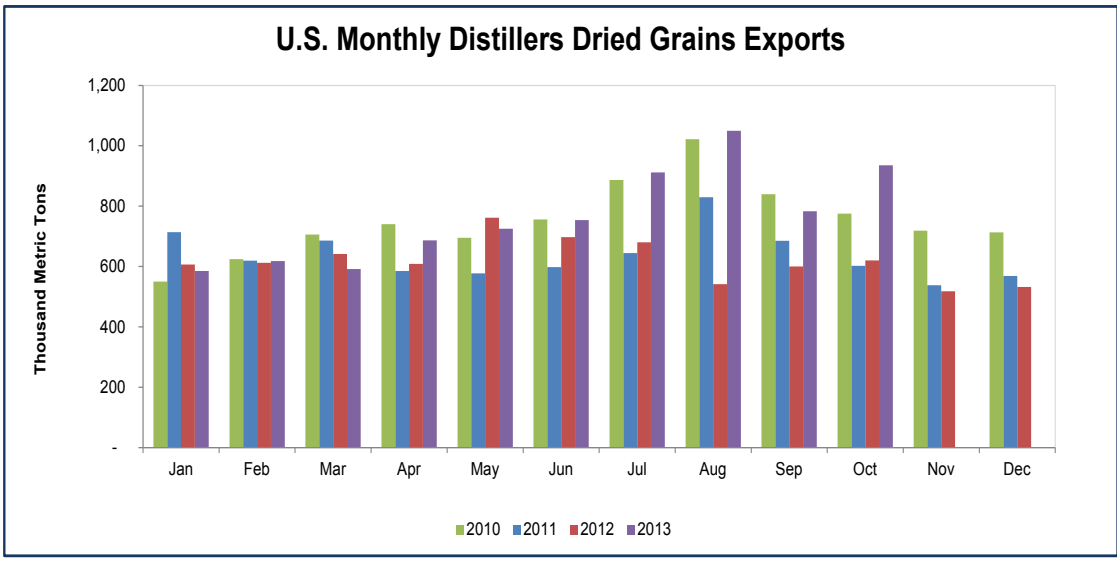
- The United States exports approximately one quarter of the grain it produces. On average, this includes nearly 45 percent of the wheat, 35 percent of the soybeans, and 20 percent of the corn.
- Over 56 percent of grains inspected and/or weighed for export departed from Mississippi, Texas, and East Gulf ports in calendar year 2012, nearly 2.2 billion bushels (*USDA GIPSA*).
- Pacific Northwest (PNW) ports accounted for 28 percent of grains inspected and/or weighed for export, nearly 1.1 billion bushels.
- The December 10, 2013, *USDA World Agricultural Supply and Demand Estimates* projections for 2013/14 U.S. exports includes:
    - Corn—1.45 billion bushels (40.6 million short tons)
    - Soybeans—1.475 billion bushels (44.25 million short tons)
    - Wheat—1.1 billion bushels (33 million short tons)
    - Soybean meal—10.5 million short tons
    - Rice—100 million hundredweight (5 million short tons)
    - Sorghum—180 million bushels (5.04 million short tons)
    - Soybean oil—1.15 billion pounds (0.58 million short tons)



Source: USDA Market News, *Grain Inspected and/or Weighed for Export by Region and Port Area*, January 9, 2013

Ethanol, DDG, Corn Production, Fertilizer, and Barge Traffic

- U.S. ethanol production capacity at 188 operating refineries is nearly 13.7 billion gallons per year. (*Renewable Fuels Association, Biorefinery Locations, November 30, 2013).*
- Over 739.7 million gallons of ethanol were exported in calendar year 2012, compared to nearly 283.5 million gallons in calendar year 2011, a 160 percent increase (*Census Bureau, U.S. Department of Commerce*).
- Major multimodal ethanol terminals include Albany, NY, Baltimore, MD, Chicago, IL, Houston, TX, Linden, Newark, New Orleans, LA, Sauget, IL, Sewaren, NJ, Providence, RI, and Tampa, FL.
- Barges move an estimated 5 percent of ethanol.
- Barges also move some of the fertilizer needed to grow corn for the production of ethanol, as well as some of the distillers dried grains (DDGS), an ethanol by-product used for animal feed.
- For every gallon of corn ethanol, about 6.34 pounds of DDGS are produced. Over 7.4 million metric tons of DDGS were exported in calendar year 2012, and 7.6 million metric tons have been exported through October 2013, a 19 percent increase compared to same period last year. (*Census Bureau*, *U.S. Department of Commerce*).



Source: Census Bureau, U.S. Department of Commerce

- USDA projects a corn harvested area of 87.2 million acres, yielding 160.4 bushels per acre, with 4.95 billion bushels to be converted to ethanol and by-products in 2013/14 (December 10, 2013, *USDA World Agricultural Supply and Demand Estimates*).
- Corn uses about 240 pounds of fertilizer per planted acre, as it has high nitrogen requirements.
- The United States imported 41 million short tons of fertilizer in calendar year 2012. This included nearly 20 million short tons of nitrogen. (*Census Bureau, U.S. Department of Commerce*).

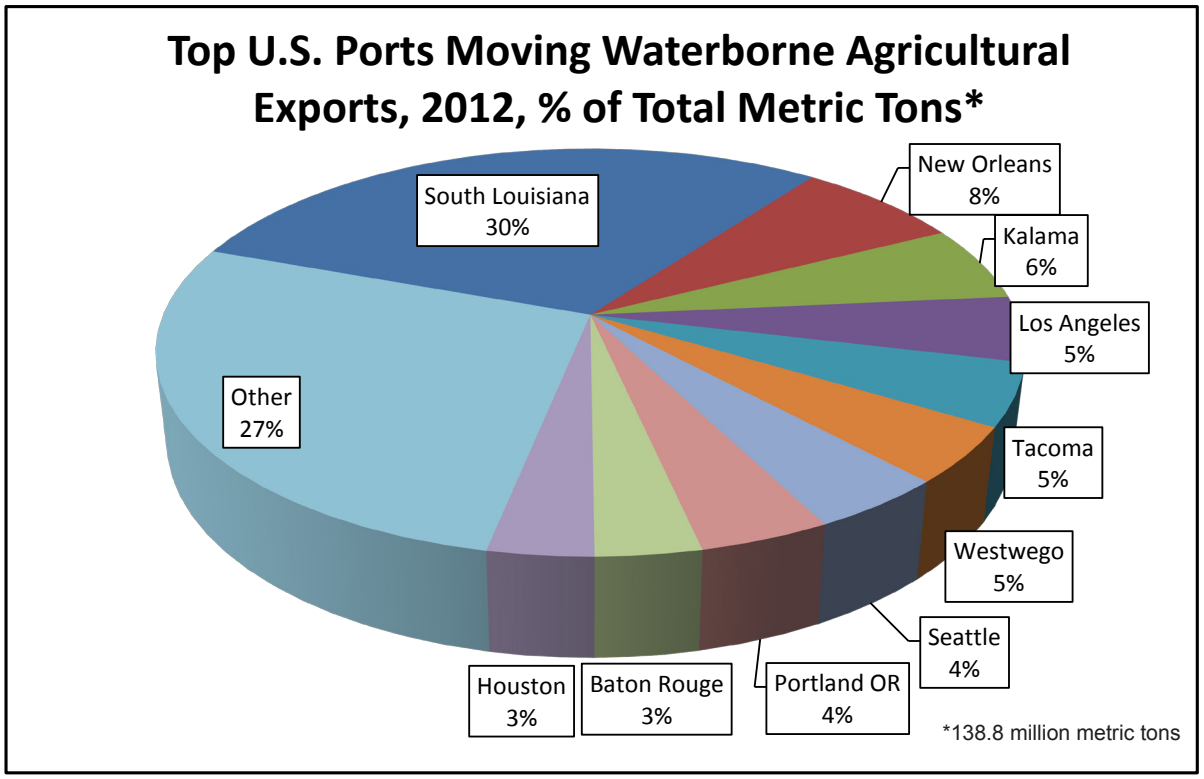


Barge and Rail Competition

- In calendar year 2012, total food and farm product barge tonnage (upbound and downbound) at Mississippi Locks 27, Ohio Locks and Dam 52, and Arkansas Lock and Dam 1 was 37.7 million short tons (*U.S. Army Corps of Engineers, Locks by Waterway, Tons Locked by Commodity Group, Calendar Years 1993-2012*).
- A substantial amount of export grain enters the Mississippi River below Mississippi River Locks 27, Ohio River Locks and Dam 52, and Arkansas Lock and Dam 1 (*U.S. Army Corps of Engineers and USDA GIPSA*).
- In 2012, 18,917 downbound grain barges passed through Locks 27, 52, and 1, with nearly 29.5 million short tons of grain.
- In comparison, 29,798 grain barges were unloaded in the New Orleans region during the period, a difference of 10,881 barges.
- Railroads originate approximately 29 percent of U.S. grain shipments and sent 287,462 carloads (an estimated 31.9 million short tons) to ports in 2012.
- Railroads take into account barge rates and the spread between U.S. Gulf and Pacific Northwest ocean vessel freight rates, and price their services accordingly.
- USDA *Transportation of U.S. Grains, A Modal Share Analysis, 1978-2011 Update*, shows that barges moved 43 percent and railroads moved 41 percent of all grain exports in 2011.
    - Barges moved 54 percent of corn to ports and 1 percent of corn to processors, feed lots, and dairies in 2011. Rail shares were 34 percent for exports and 20 percent for domestic moves.
    - Barges moved 49 percent of soybeans to ports and 2 percent of soybeans to processors in 2011. Rail shares were 31 percent for exports and 14 percent for domestic moves.
    - Barges moved 26 percent of wheat to ports and 2 percent of wheat to processors in 2011. Rail shares were 63 percent for exports and 63 percent for domestic moves.
    - Barges moved 11 percent of sorghum to ports in 2011. Rail shares were 21 percent for exports and 8 percent for domestic moves.
- Additional studies[1] have shown that without barge competition, agricultural shippers pay higher rail transportation costs, the farther they are from an inland waterway.

Top U.S. Ports for Agricultural Exports

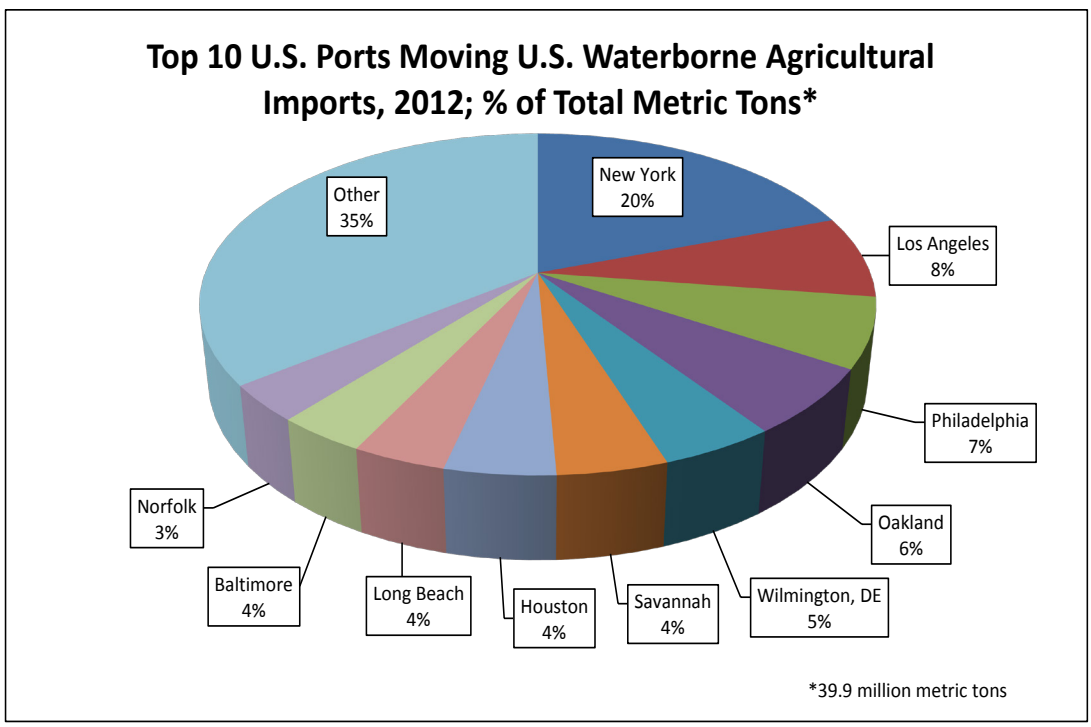
- In calendar year 2012, U.S. waterborne agricultural exports totaled 138.8 million metric tons, 25 percent were moved in containers (*PIERS).*
- During the same period, containers were used to transport 8 percent of total waterborne grain exports and 11 percent of U.S. grain exports to Asia.
- The top five U.S. ports for bulk and containerized agricultural exports were South Louisiana, New Orleans, Kalama, Seattle, and Los Angeles, and Tacoma. In terms of containerized movements, the top five ports were Los Angeles, Long Beach, Oakland, Seattle, and Tacoma.



Source: (PIERS)

Top U.S. Ports for Agricultural Imports

- In calendar year 2012, U.S. bulk and containerized waterborne agricultural imports totaled 39.9 million metric tons, 73 percent were moved in containers (*PIERS*).
- The port of New York brought in more agricultural cargo than Los Angeles, Long Beach, and Oakland, CA combined—nearly 7.8 million metric tons.
- The top five U.S. ports for bulk and containerized agricultural imports were New York, Los Angeles, Philadelphia, Oakland, and Wilmington, DE.



Source: (PIERS)

Harbor Channel and Inland Waterway Draft Issues

- Inadequate channel depths and widths due to drought and sedimentation can lead to higher transportation costs.
- Barges and vessels may be loaded to less than capacity and more barges and vessels may be required to ship the same amount of commodities, and one-way, or day time only traffic restrictions may be imposed.
- There have been extended periods where low river levels and reduced channel widths impeded grain barge movements and access to shallow draft ports.
- When river levels are low, barges must be loaded lighter than normal and the number of barges in a tow may be reduced to the available channel width.
- At a 9-foot draft, a barge has 1,500 short tons of capacity; for each foot of reduced draft, the barge loses about 200 short tons of capacity.
- When harbor channels are at less than authorized depths, S-Class container vessels lose 3,840 tons of cargo capacity per foot, Panamax bulk grain carriers lose 2,148 tons per foot, and Great Lakes ocean-bound vessels lose 1,389 tons per foot.
- Low water on the Great Lakes and unfunded dredging requirements has increased the risk of vessel groundings, reduced vessel carrying capacity by at least 10 percent, and increased shipping costs by $40 million a year. (*2012-13 U.S. Army Corps of Engineers Water Basin Common Operating Picture*)



Effects of Temporary Closures on Costs, Receipts, and the Federal Budget

- U.S. exporters compete on the basis of world prices.
- Temporary closures[2] and restrictions on traffic in harbors and channels due to flooding, drought, sedimentation, groundings, natural disasters, man-made disasters, strikes, and lockouts can lead to delays, spoilage, diversion to other modes and ports, higher transportation costs, and lost sales.
- Higher transportation costs can result in lower cash bids in interior markets. As cash prices fall, USDA loan deficiency payments may increase[3].
- U.S. exporters may be unable to pass on higher transportation costs, as customers can purchase similar products from other countries.
- In contrast, U.S. importers may be able to pass on higher transportation costs to their customers.
- Users of railroads and highways face congestion, constrained capacity, and driver and equipment shortages.
- Authorized channel depths and widths, and locks and dams maintained by the U.S. Army Corps of Engineers moderate the effects of congestion, provide resiliency, and enhance recovery after transportation disruptions.
- The Corps works to maintain operable navigation channels through accelerated dredging, rock removal, river training structures to remove sediment, strategic management of water releases from reservoirs, routinely scheduled surveys, and close collaboration with channel users and the U.S. Coast Guard on river conditions.
- Other important partners in a reliable waterway system include:
    - U.S. Coast Guard, which provides security, vessel traffic safety restrictions, and aids to navigation.
    - National Oceanic and Atmospheric Administration which provides nautical charts and maps, marine weather and river level information, surveys after disruptions, and marine debris removal.
    - Maritime Administration which promotes the development and maintenance of an adequate, well-balanced, United States merchant marine and marine highways.
    - Saint Lawrence Seaway Development Corporation which promotes use of the Seaway and maintains and operates the two U.S. Seaway locks and vessel traffic control in areas of the St. Lawrence River and Lake Ontario, in collaboration with its Canadian partner, the St. Lawrence Seaway Management Corporation.
    - Federal Maritime Commission which regulates oceanborne transportation in U.S. foreign commerce for the benefit of exporters, importers, and the American consumer.



Want to Know More? Try These Publications:

[1]Studies and reports on modal share, competition, and infrastructure investment

Prater, Marvin E. and Adam Sparger, *Grain and Oilseed Shipment Sizes and Distance Hauled by Rail.* U.S. Department of Agriculture, Agricultural Marketing Service. Washington, DC. December 2013. http://dx.doi.org/10/9752/TS059.12-2013

U.S. Department of Agriculture, Agricultural Marketing Service. Mexico Transport Cost Indicator Reports. December 2013. Web. http://dx.doi.org/10.9752/TS054.12-2013

Panama Canal Expansion Study Phase 1 Report: Developments in Trade and National and Global Economies. November 2013. U.S. Department of Transportation. Maritime Administration.

Salin, Delmy. Brazil Soybean Transportation Indicator Reports. November 2013. U.S. Department of Agriculture, Agricultural Marketing Service. Web. http://dx.doi.org/10.9752/TS052.11-2013

Taylor, April, *Profiles of the Top U.S. Agricultural Ports*. U.S. Department of Agriculture, Agricultural Marketing Service, September 2013. Web. http://dx.doi.org/10.9752/TS092.09-2013

U.S. Department of Agriculture, Agricultural Marketing Service. *The Shift to Larger Railcars for the Shipment of Grain*. August 2013. Web. http://dx.doi.org/10.9752/TS087.08-2013

U.S. Department of Agriculture, Agricultural Marketing Service. The Effects of Increased Shuttle-Train Movements of Grain and Oilseeds. August 2013. Web http://dx.doi.org/10.9752/TS088.08-2013

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Salin, Delmy. Soybean Transportation Guide: Brazil. May 2013. U.S. Dept. of Agriculture, Agricultural Marketing Service. Web. http://dx.doi.org/10.9752/TS048.05-2013

Sparger, Adam, and Nick Marathon. Transportation of U.S. Grains: A Modal Share Analysis, May 2013. U.S. Dept. of Agriculture, Agricultural Marketing Service. Web. http://dx.doi.org/10.9752/TS049.05-2013

Denicoff, Marina. "U.S. Grain Shipments Improve as the Mississippi River Navigation Threat Dissipates." U.S. Dept. of Agriculture, Agricultural Marketing Service. Grain Transportation Report. February 7, 2013. pp. 2-3 .Web: http://dx.doi.org/10.9752/TS056.02-07-2013

"New Approaches for U.S. Lock and Dam Maintenance and Funding." January 2013. Center for Ports and Waterways, Texas Transportation Institute (prepared for United Soybean Board).

Keith, Kendell W. December 2012. "Maintaining a Track Record of Success, Expanding Rail Infrastructure to Accommodate Growth in Agriculture and Other Sectors." TRC Consulting Ltd.

"Failure to Act: The Economic Impact of Current Investment Trends in Airport, Inland Waterways, and Marine Ports Infrastructure." September 2012. Economic Development Research Group. (prepared for American Society of Civil Engineers).

"Farm to Market, A Soybean's Journey from Field to Consumer." July 2012. Informa Economics (prepared for United Soybean Board, U.S. Soybean Export Council, and Soy Transportation Coalition).

"Study of U.S. Inland Containerized Cargo Moving Through Canadian and Mexican Seaports." July 2012. Federal Maritime Commission.

"Cost of Project Delays: An Estimate of Foregone Benefits and Other Costs Related to Schedule Delays of Inland Waterways Projects." June 2012. HDR Decision Economics. (prepared for National Waterways Foundation).

"Diagnosing the Marine Transportation System, Measuring Performance and Targeting Improvement." June 26-28, 2012. Transportation Research Board.

"U.S. Port and Inland Waterways Modernization: Preparing for Post-Panamax Vessels." June 20, 2012. Institute for Water Resources, U.S. Army Corps of Engineers.



Charles V. Stern. “Inland Waterways: Recent Proposals and Issues for Congress.” Congressional Research Service. April 12, 2012.

“A Modal Comparison of Domestic Freight Transportation Effects on the General Public, 2001-2009.” February 2012. Center for Ports and Waterway, Texas Transportation Institute. (prepared for National Waterways Foundation.)

“America’s Locks & Dams: A Ticking Time Bomb For Agriculture?” December 2011. Center for Ports and Waterways, Texas Transportation Institute. (prepared for United Soybean Board)

“Panama Canal Expansion: Impact on U.S. Agriculture.” September 2011. Informa Economics (prepared for United Soybean Board, U.S. Soybean Export Council, and Soy Transportation Coalition).

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“Study of Rural Transportation Issues.” April 2010. U.S. Dept. of Agriculture and U.S. Dept. of Transportation. Web.

[2]Temporary closures

Meyer, Seth, Luis Fellin, and Peter Stone, December 2007. “Impact of a Lock Failure on the Mississippi or Illinois Rivers.” Food and Agricultural Policy Research Institute.

“Effects on Agriculture of a Closure of West Coast Port Facilities,” United States District Court for the Northern District of California, San Francisco Headquarters, United States of America, Plaintiff, v. Pacific Maritime Association, and International Longshore and Warehouse Union, Defendants, Declaration of Ann M. Veneman, Secretary of Agriculture, October 7, 2002.

[3]Higher transportation costs, lower cash bids

Denicoff, Marina. “Carry and Basis: Grain Market Signals and Transportation Implications.” Grain Transportation Report. pp. 2-3. U.S. Dept. of Agriculture, Agricultural Marketing Service. *Grain Transportation Report*. December 23, 2010. pp. 2-3.Web.

Nibarger, Daniel, Pierre Bahizi. “Commodity Basis, Price Spreads, and Transportation Cost.” U.S. Dept. of Agriculture, Agricultural Marketing Service. *Grain Transportation Report*. September 2, 2010. pp. 2-3.Web.

“Transportation and The Farmer’s Bottom Line.” June 2010. O’Neil Commodity Consulting (on behalf of the Soy Transportation Coalition and the United Soybean Board).

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3) Wikimedia Commons



Preferred Citation

McGregor, Brian. A Reliable Waterway System Is Important to Agriculture. December 2013. U.S. Dept. Of Agriculture, Agricultural Marketing Service. Web. <http://dx.doi.org/10.9752/TS050.12-2013>