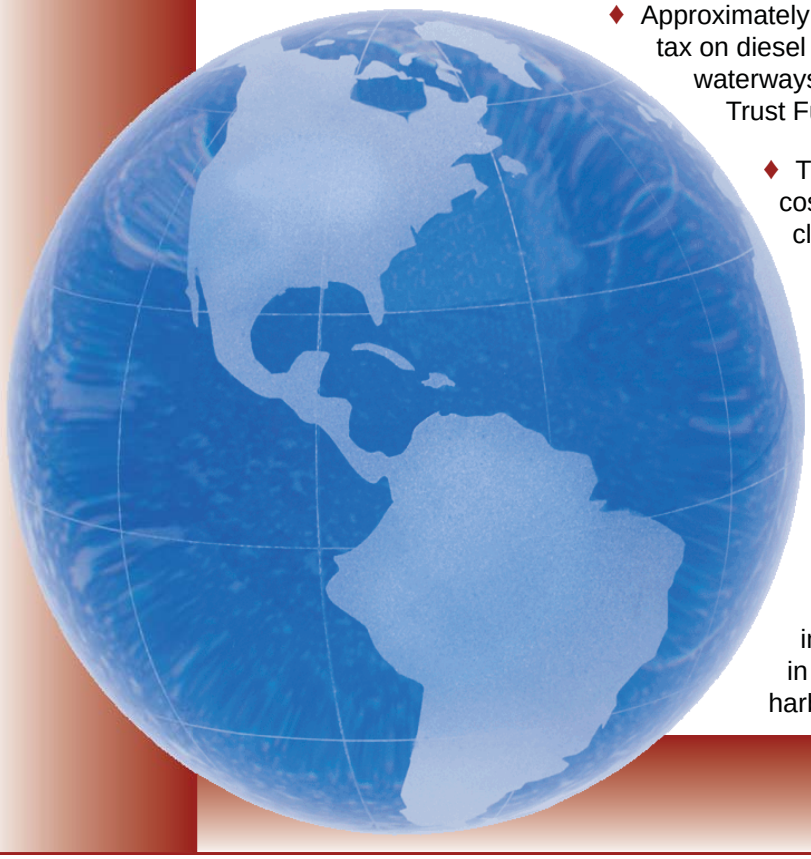
January 2009

# A Reliable Waterway System Is Important to Agriculture

## Do You Know Why?

### Big Picture Overview

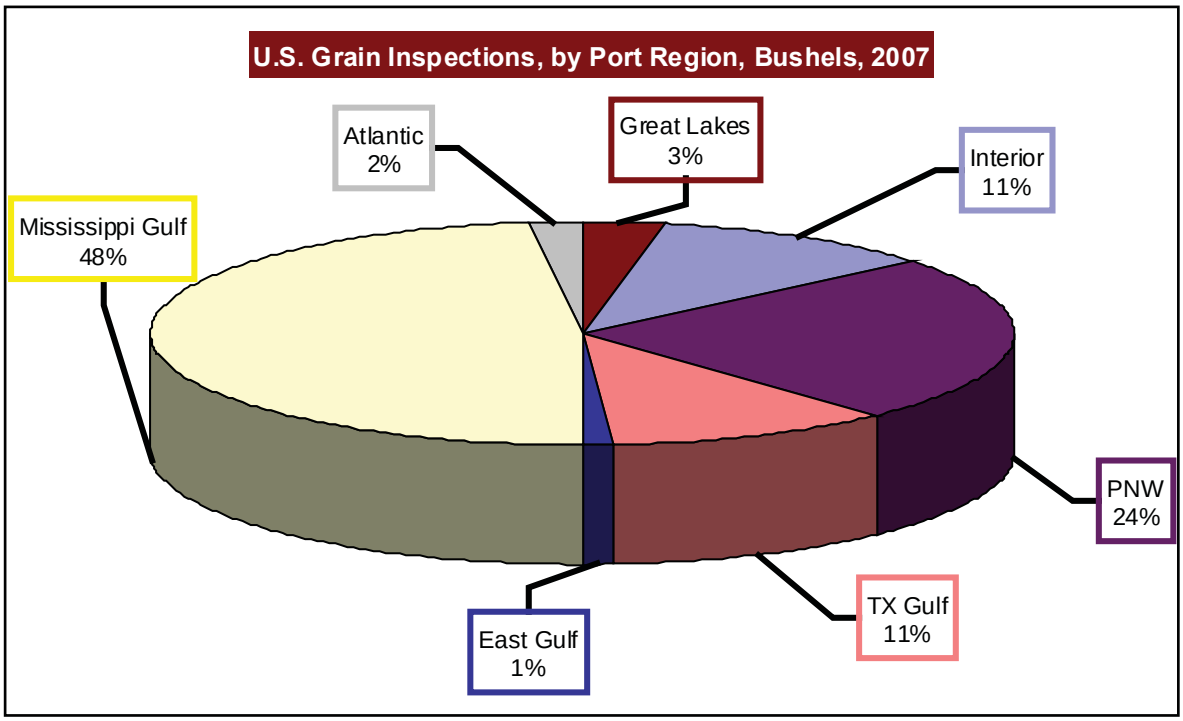
- U.S. agriculture is expected to contribute $17.5 billion to the U.S. balance of trade in fiscal 2009 (December 1, 2008, *USDA ERS/FAS Outlook for U.S. Agricultural Trade*).
- Exports are forecast to reach $98.5 billion.
- Imports are forecast to reach $81 billion.
- In calendar year 2007, 79.4 percent of U.S. agricultural exports (146 million metric tons), and 84.5 percent of imports (46.3 million metric tons) were waterborne (*U.S. Census Bureau and Journal of Commerce PIERS*).
- Exporters, importers, and domestic shippers depend on authorized port and waterway depths and widths, and locks and dam infrastructure.
- U.S. importers and certain domestic shippers pay the Harbor Maintenance Tax (HMT), a 0.125 percent ad valorem tax on the value of the cargo.
- Fiscal 2009 HMT receipts including investment interest will reach an estimated $1.5 billion; requested appropriations are $765 million, yielding a Harbor Maintenance Trust Fund balance of $5.5 billion.



- Approximately $90 million per year from a 20 cents per gallon tax on diesel fuel for commercial vessels engaged in inland waterways transportation goes into the Inland Waterways Trust Fund.
- The fund, used to finance one half the Federal costs of authorized locks and dams projects, was close to being depleted by the end of 2008.
- The fiscal 2009 budget request of $326 million for inland and intracoastal waterways projects includes $167 million from the fund, derived in part from $140 million in proposed lock usage fees, designed to raise additional revenues, reduce the fuel tax to 10 cents per gallon in 2009, (5 cents per gallon in 2010, with elimination in 2011), and yield a balance of $40 million in 2009.
- In addition to the trust funds, non-Federal interests will contribute an estimated $400 million in fiscal 2009 for improvements of rivers and harbors.

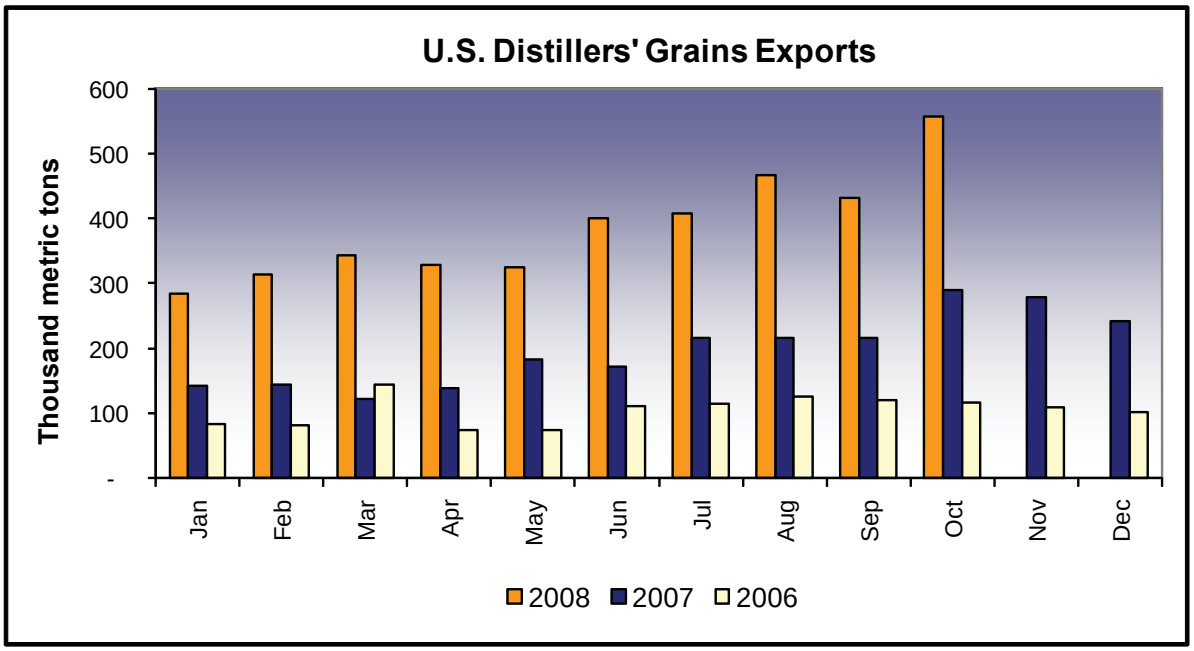
## Grain Exports

- The United States exports approximately one-quarter of the grain it produces, including nearly 45 percent of the wheat, 35 percent of the soybeans, and 20 percent of the corn.
- Approximately 48 percent of total grain exports departed from the Mississippi Gulf in 2007. The Mississippi Gulf normally handles or inspects over 2 billion bushels of grain annually (*USDA GIPSA*).
- The Pacific Northwest (PNW) ports accounted for 24 percent of U.S. grain exports in 2007. The PNW handled over 1 billion bushels of grain in 2007.
- The December 11, 2008, *USDA World Agricultural Supply and Demand Estimates* for 2008/09 U.S. exports includes:
    - Feed grains—49.5 million metric tons (54.6 million short tons)
    - Corn—1,800 million bushels (50.4 million short tons)
    - Soybeans—1,050 million bushels (31.5 million short tons)
    - Wheat—1,000 million bushels (30 million short tons)
    - Soybean meal—8.4 million short tons
    - Rice—106 million hundredweight (5.3 million short tons)
    - Sorghum—130 million bushels (3.6 million short tons)
    - Soybean oil—2,050 million pounds (1 million short tons)



## Ethanol, DDGS, Corn Production, Fertilizer, and Barge Traffic

- U.S. ethanol production capacity at 172 operational plants is over 10.1 billion gallons per year as of December 9, 2008. U.S. capacity will reach nearly 12.7 billion gallons when 21 plants under construction and several expansions are completed (*Renewable Fuels Association).*
- Barges move an estimated 5 percent of ethanol. Main terminals include Chicago, IL, New Orleans, LA, Houston, TX, and Albany, NY.
- Barges also move some of the fertilzer needed to grow corn for the production of ethanol, as well as some of the distillers dried grains with solubles (DDGS), an ethanol co-product used for animal feed.
- Gateway Terminal LLC on the Mississippi at Sauget, IL, is capable of storing 400,000 barrels of ethanol and loading barges, 100-car unit trains, and trucks.
- For every gallon of corn ethanol, about 6.34 pounds of DDGS are produced.
- About 10 percent of DDGS are exported. January to October 2008 exports were over 4.2 million metric tons — exceeding calendar year 2007 exports by nearly 64 percent.

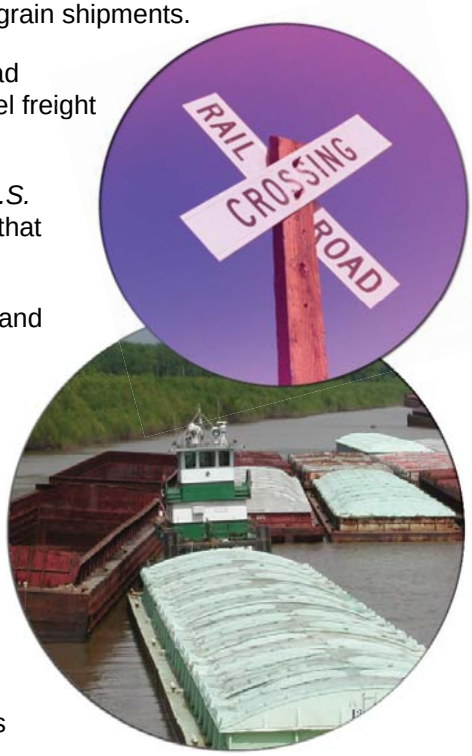



- Increased ethanol production means increased corn acreage devoted to it, and transportation of fertilizer to grow the corn.
- U.S. farmers expect to harvest 78.2 million acres of corn, 9.6 percent less than 2007.
- During 2008/09, an estimated 3.7 billion bushels of corn will be used for ethanol, 674 million more than 2007/08 (December 11, 2008, *USDA World Agricultural Supply and Demand Estimates*).
- Corn uses about 240 pounds of fertilizer per planted acre. Corn has high nitrogen fertilizer requirements.
- In fiscal 2008, the United States imported 45.9 million short tons of fertilizer, including 25.3 million short tons of nitrogen, 12.4 million short tons of potassium, and 8.1 million short tons of phosphate. (*USDA ERS Foreign Agricultural Trade of the United States*).

## Barge and Rail Competition

- In calendar year 2008, total upbound and downbound traffic at Mississippi Lock 27, Ohio Lock 52, and Arkansas Lock 1 (*USACE OMNI RPT 06 Waterway Traffic Report)* included:
  - Corn—20 million short tons
  - Oilseeds—soybeans, flaxseed, and others—7.8 million short tons
  - All chemical fertilizers—7.2 million short tons
  - Animal feed, grain mill products, processed grain—5.5 million short tons
  - Wheat—1.7 million short tons
  - Rye, barley, rice, sorghum, and oats—0.6 million short tons

- 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 2008, over 18 thousand downbound grain barges passed through Locks 27, 52, and 1, with 27.8 million short tons of grain.
- In comparison, over 27.5 thousand grain barges were unloaded in the New Orleans region in 2008, a difference of 9.5 thousand barges, with an estimated 14.7 million short tons of grain.
- Railroads originate approximately 35 percent of U.S. grain shipments.
- 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.

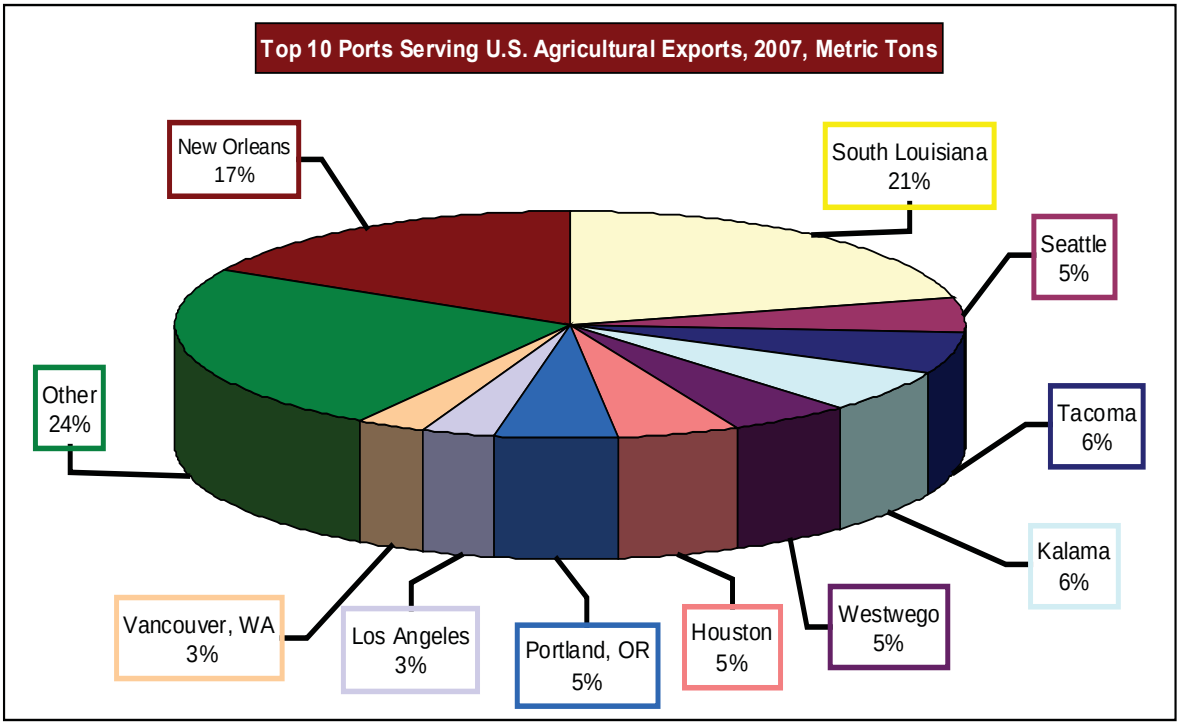



- Preliminary 2006 data from USDA *Transportation of U.S. Grains, A Modal Share Analysis, 1978-2006*, showed that barges moved 44 percent of all grain exports.
  - Barges moved 50 percent of corn to ports and 1 percent of corn to processors, feed lots, and dairies in 2006. Rail shares were 44 percent for exports and 29 percent for domestic moves.
  - Barges moved 49 percent of soybeans to ports and 2 percent of soybeans to processors in 2006. Rail shares were 46 percent for exports and 14 percent for domestic moves.
  - Barges moved 29 percent of wheat to ports and 1 percent of wheat to processors in 2006. Rail shares were 71 percent for exports and 63 percent for domestic moves.
  - Barges moved 14 percent of sorghum to ports in 2006. Rail shares were 56 percent for exports and 13 percent for domestic moves.

- Studies[1] have shown that without barge competition, agricultural shippers pay higher rail transportation costs, the further they are from an inland waterway.

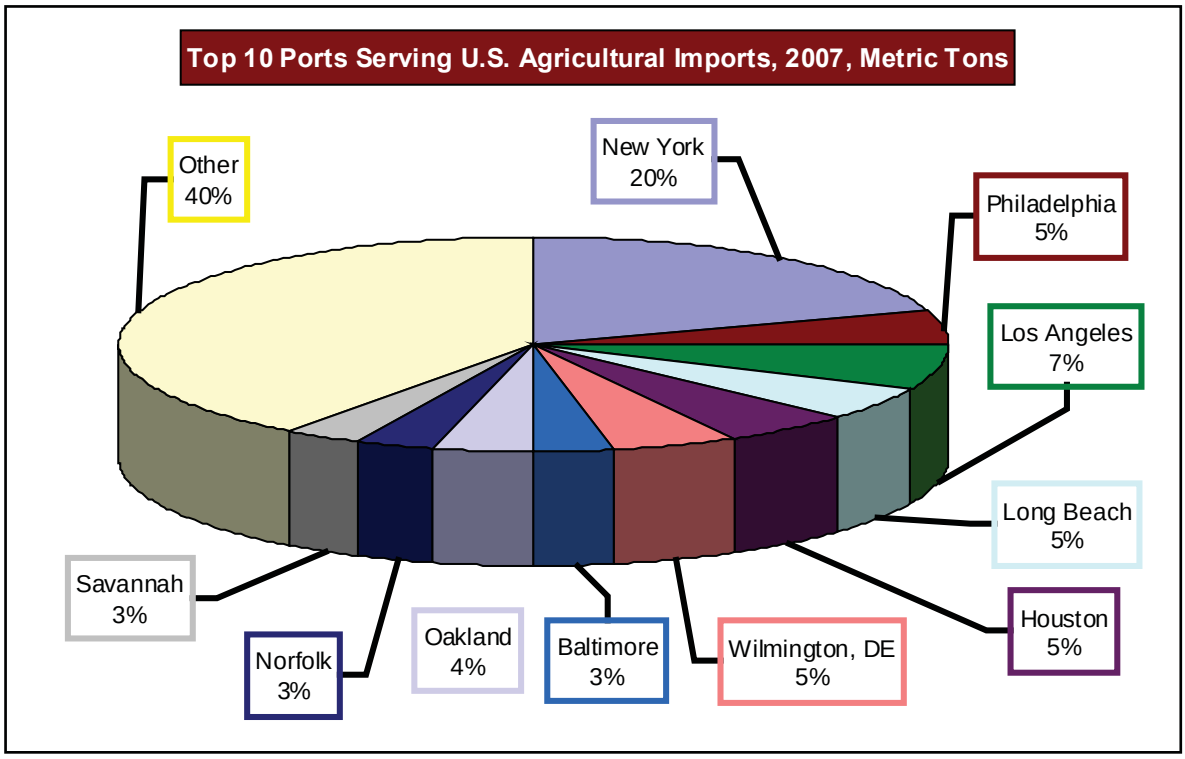
## Top U.S. Ports for Agricultural Exports

- In calendar year 2007, U.S. bulk and containerized waterborne agricultural exports totaled more than 146 million metric tons (*Journal of Commerce PIERS).*
- During the same period, containers were used to transport 5 percent of total waterborne grain exports and 9 percent of U.S. grain exports to Asia.
- The top 5 U.S. ports for bulk and containerized agricultural exports were, South Louisiana, New Orleans, Tacoma, Kalama, Seattle, and Houston. In terms of containerized movements, the top 5 ports were Los Angeles, Long Beach, Oakland, Tacoma, and Seattle.




## Top U.S. Ports for Agricultural Imports

- In 2007, U.S. bulk and containerized waterborne agricultural imports totaled more than 39 million metric tons (*Journal of Commerce PIERS*).
- In terms of container movements, the port of New York brought in more agricultural cargo than Los Angeles, Long Beach, and Oakland, CA combined.
- The top 5 U.S. ports for bulk and containerized agricultural imports were New York, Los Angeles, Long Beach, Philadelphia, and Wilmington, DE.




## Harbor Channel and Inland Waterway Draft Issues

- Inadequate water depths can lead to higher transportation costs as 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.
- In recent years there have been several extended periods when river levels in certain areas were low and impeded grain barge movements. When river levels are low, barges must be loaded lighter than normal and the number of barges in a tow may be reduced.
- At a 9-foot draft, a barge has 1,500 short tons of capacity; for each inch of reduced draft, the barge loses about 16.7 short tons of capacity.
- When harbor channels are at less than authorized depths, S-Class container vessels lose 320 tons of cargo capacity per inch, Panamax bulk grain carriers lose 179 tons per inch, and Great Lakes ocean-bound vessels lose 115 tons per inch.

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

- U.S. exporters compete on the basis of world prices.
- Temporary closures[2] of channels due to low water conditions, groundings, natural disasters, manmade 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. “Farm producers are price takers not price makers”[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.

- Railroads and highways are facing congestion, constrained capacity, and equipment shortages.
- Authorized port and waterway depths, and locks and dam infrastructure are maintained by the U.S. Army Corps of Engineers in partnership with U.S. Coast Guard, and NOAA, which moderate the effects of congestion, provide resiliency, and enhance recovery after transportation disruptions.

## Want to Know More? Try These Publications:


**[1]Studies on rail competition**

Salin, Delmy. April 2008. "U.S. Grain and Soybean Exports to Mexico—a Modal Share Transportation Analysis." USDA Agricultural Marketing Service, Transportation Services Division.

"A Modal Comparison of Domestic Freight Transportation Effects on the General Public." November 2007. Texas Transportation Institute, Center for Ports and Waterways.

Harbor, Anetra. 2007. "Competition in the U.S. Railroad Industry: Implications for Corn, Soybean, and Wheat Shipments." Presented at Transportation Research Forum, Fort Worth, Texas, March 16-19, 2008.

"Trends in Freight Railroad Rates and Competition (GAO-07-292SP), an E-supplement to GAO-07-291R". United States General Accountability Office, Washington, DC, August 15, 2007.

"Freight Railroads: Industry Health Has Improved, but Concerns about Competition and Capacity Should Be Addressed." GAO-07-94. United States General Accountability Office, Washington, DC, October 6, 2006.

Vachal, Kimberly, John Bitzan, Tamara VanWechel, and Dan Vinje. 2006. "Differential Effects of Rail Deregulation in the U.S. Grain Industry." Presented at the International Association of Agricultural Economists, Gold Coast, Australia, August 12-18, 2006.

Koo, Won W., Denver D. Tolliver, and John D. Bitzen. 1993. "Railroad Pricing in Captive Markets: An Empirical Study of North Dakota Grain Rates." *Logistics and Transportation Review:* 29, pp 123-137.

Burton, Mark L. 1993. "Railroad Deregulation, Carrier Behavior, and Shipper Response: A Disaggregated Analysis." *Journal of Regulatory Economics:* 5, 417-434.

Thompson, S.R., R.J. Hauser, and B.A. Coughlin. 1990. "The Competitiveness of Rail Rates for Export-Bound Grain. *Logistics Transportation Review:* 26, pp. 35-52.

MacDonald, James M. 1987. "Competition and Rail Rates for the Shipment of Corn, Soybeans, and Wheat." *Rand Journal of Economics:* Vol. 18, No. 1, Spring 1987, pp. 151-163.

**[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, USDA payments increase**

Whiteside, Terry. June 8, 2007 "Rail Overview: A Spirit of Hope and A Story of Survival" Agriculture Transportation Coalition, 2007 Annual Meeting Presentations.

Review of the Current Impact of Mississippi River Transportation on Agricultural Markets, Hearing Before the Committee on Agriculture, House of Representatives, One Hundred Ninth Congress, First Session, October 26, 2005 Serial No. 109–18.