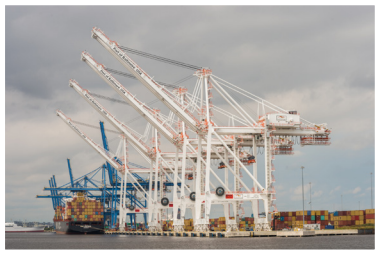
USDA Agricultural Marketing Service
U.S. DEPARTMENT OF AGRICULTURE



A Reliable Waterway System Is Important to Agriculture

A publication of the Agricultural Marketing Service • www.ams.usda.gov/services/transportation-analysis • JANUARY 2024

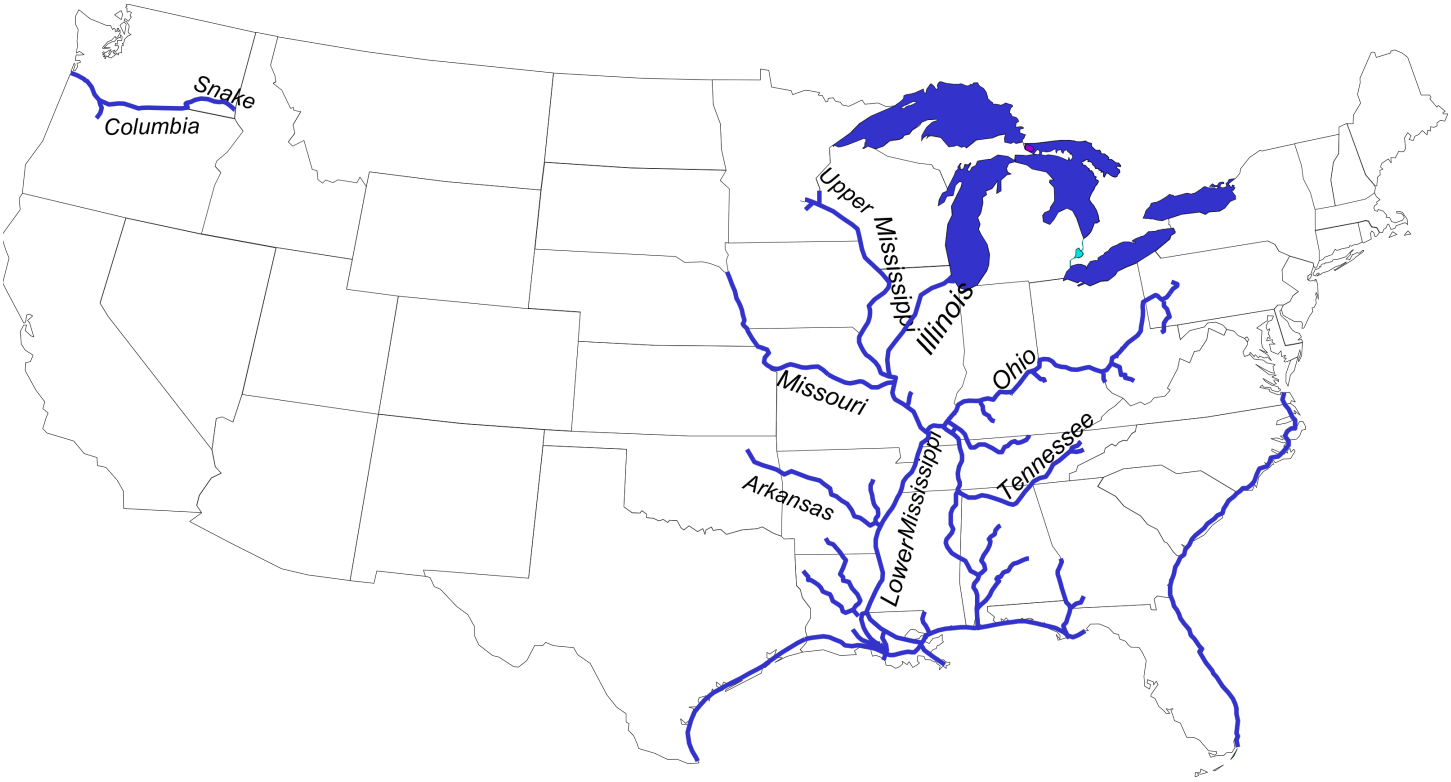
Introduction

Barge transportation, along with trucks, railroads, ocean vessels, and pipelines, form part of an integral network responsible for the efficient movement of commodities domestically and abroad. Annually, over 4 percent of the Nation's freight tonnage (and 8 percent of the ton-miles) uses a waterway. For some commodities like grain, coal, and petroleum, these shares are much higher.[1]

A *Reliable Waterway System Is Important to Agriculture* uses data to show the importance of barge transportation to agriculture. Agricultural exports are a key driver of farm income and rural economic activity, and the waterway system is an essential component of U.S. agricultural export infrastructure. For instance, barges moved about half of the grain destined to export in 2020. In addition to other agricultural products, such as forestry and fishery products, critical farm inputs, such as fertilizer, feed, and fuel move on the waterway system. The waterway system is the most cost-effective and environmentally-friendly mode of transportation for moving agricultural products for export. A 15-barge tow can hold about 875,000 bushels—equivalent to almost 1,000 trucks.[2]

There are two major river systems in the United States: the Mississippi River System comprises the Mississippi, Arkansas, Illinois, Ohio, and Tennessee Rivers, and Gulf Intracoastal Waterway, and the Columbia-Snake River System comprises the Columbia and Snake Rivers. In total, there are about 12,000 miles of rivers, canals, and other inland and costal waterways, depicted in the map below. The United States Army Corps of Engineers (USACE) maintains the system through Federal appropriations and taxes on cargo and vessels using the waterway system.

Agriculturally Significant Waterways



Source: USDA, Agricultural Marketing Service.

Agricultural and Grain Trade

In fiscal year 2024 (October 1, 2023, through September 30, 2024), all agricultural exports are forecast to reach $169.5 billion; imports are forecast to reach $200.0 billion.[3]

In calendar year 2021, U.S. agricultural exports of $177.3 billion generated $190.5 billion in additional economic activity, for a total of $367.8 billion in economic activity and supported 1,230,300 jobs. The farm sector's share of the income supported by agricultural exports was 25.9 percent.[4]

In 2021, every $1 billion of U.S. agricultural exports required approximately 6,939 full-time civilian jobs throughout the economy.[5]

In 2022, 149.5 million metric tons (mmt) of agricultural exports and 60.8 mmt of agricultural imports were waterborne.[6]

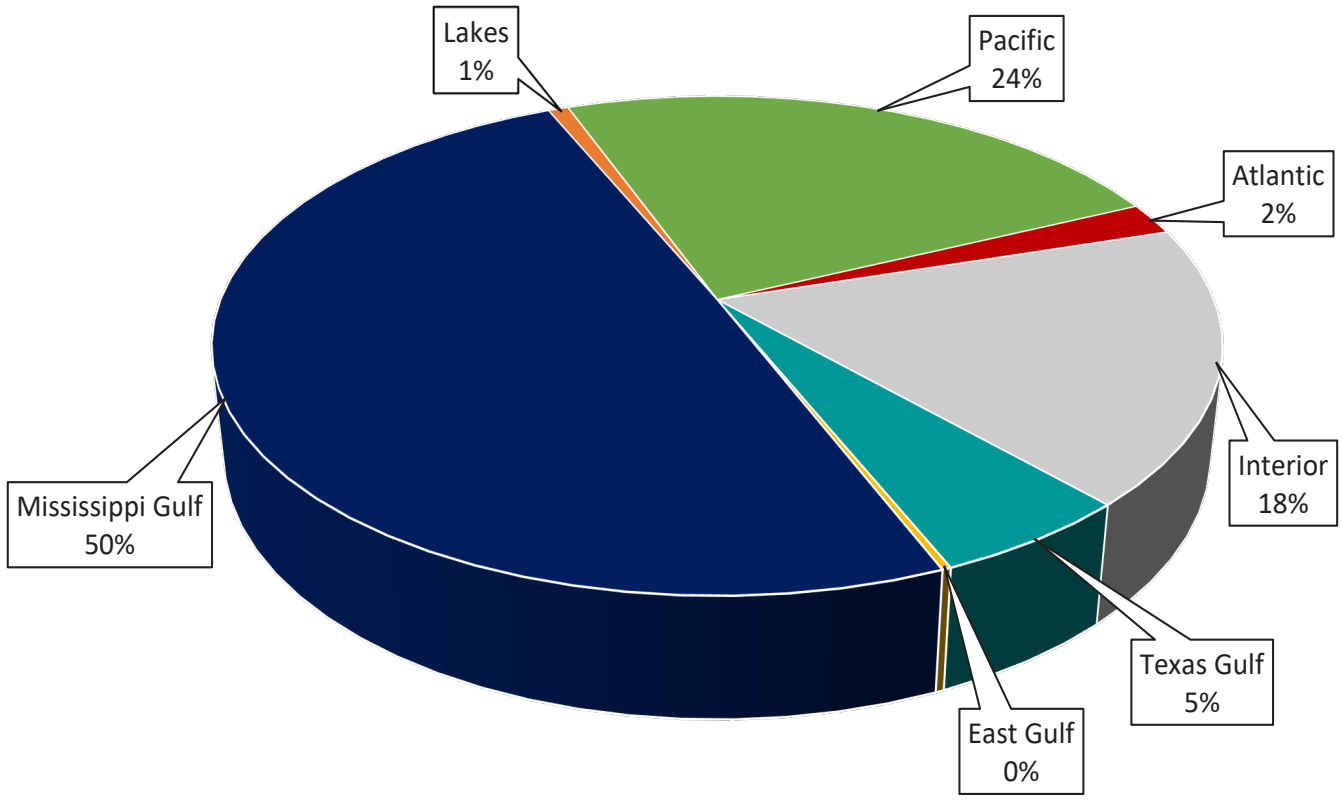
The Mississippi River, Texas Gulf and East Gulf ports, in total, accounted for 55 percent (nearly 60.1 mmt) of grains inspected and/or weighed for export in calendar year 2023.[7]

Pacific Northwest (PNW) ports accounted for 24 percent (25.9 mmt) of grains inspected and/or weighed for export in 2023.[8]

Based on December 2023 estimates by the World Agricultural Outlook Board for marketing year (MY) 2023/2024, the United States is projected to export 18 percent of the grain it will produce. This will include 39 percent of wheat, 43 percent of soybeans, 39 percent of rice, and 14 percent of corn.[9] In terms of volume, the United States is projected to export:

- Corn – 53.34 mmt
- Soybeans – 47.76 mmt
- Wheat – 19.73 mmt
- Soybean meal – 13.87 mmt
- Rice – 4.35 mmt
- Soybean oil – 0.16 mmt

Grains Inspected and/or weighed for export by region and port area, 2023, by share of total metric tons*



*108.5 million metric tons
Source: USDA, Agricultural Marketing Service.

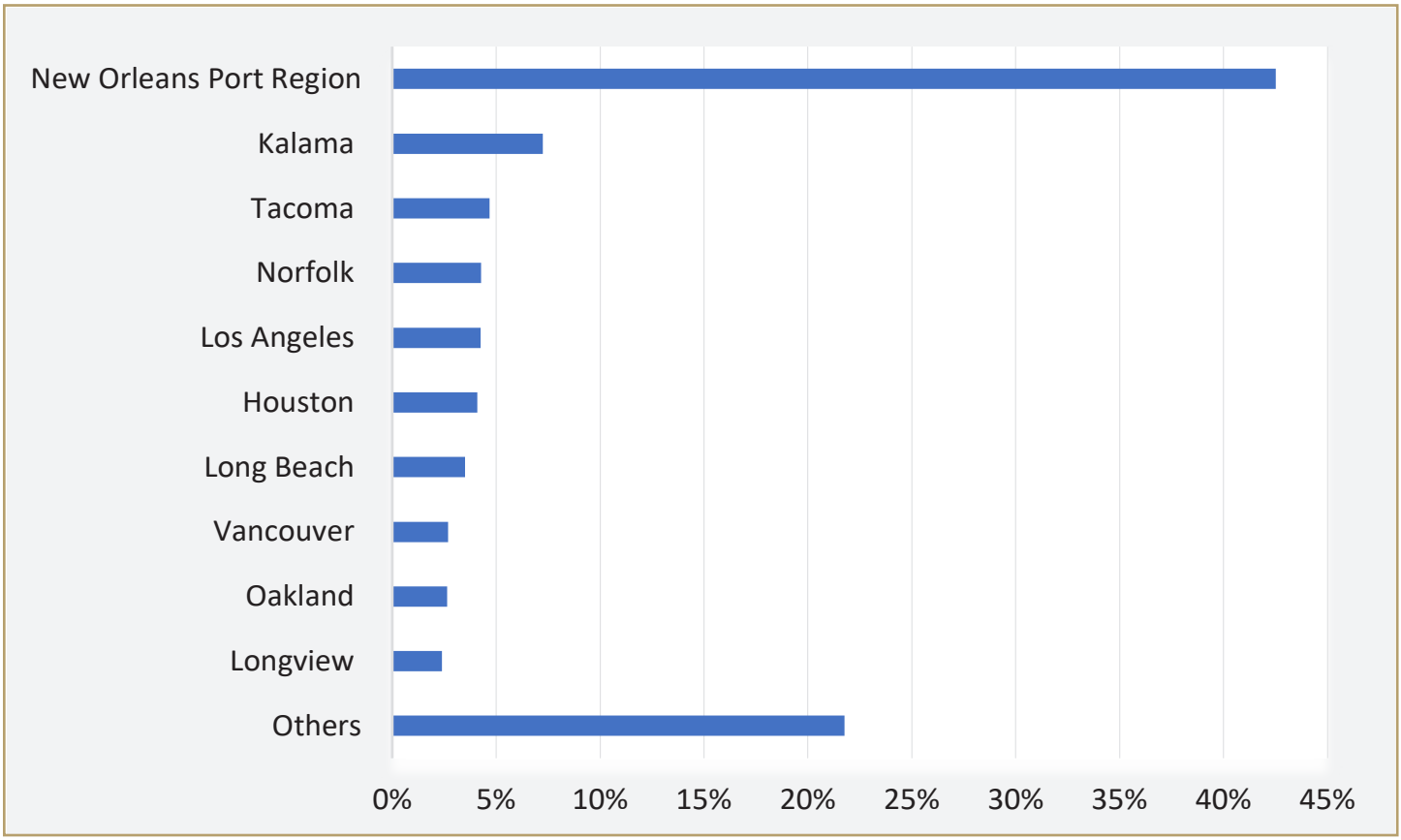
Top U.S. Ports for Waterborne Agricultural Exports

In calendar year 2022, U.S. bulk and containerized waterborne agricultural exports totaling 149.5 mmt were valued at $143.0 billion. Of the total exports, 24 percent (37.1 mmt), was moved in containers. During the same period, containers were used to transport 7.5 percent of total U.S. waterborne grain exports.

The top five U.S. ports for bulk agricultural exports in 2022 were the New Orleans Port Region, LA; Kalama and Tacoma, WA; Norfolk, VA; and Los Angeles, CA. In terms of containerized exports, the top five ports were Los Angeles, Long Beach, and Oakland, CA; Norfolk, VA; and Savannah, GA.

In 2022, the top five U.S. bulk agricultural export destination countries were China, Mexico, Japan, Columbia, and Egypt.

Top U.S Ports for Waterborne Agricultural Exports, 2022



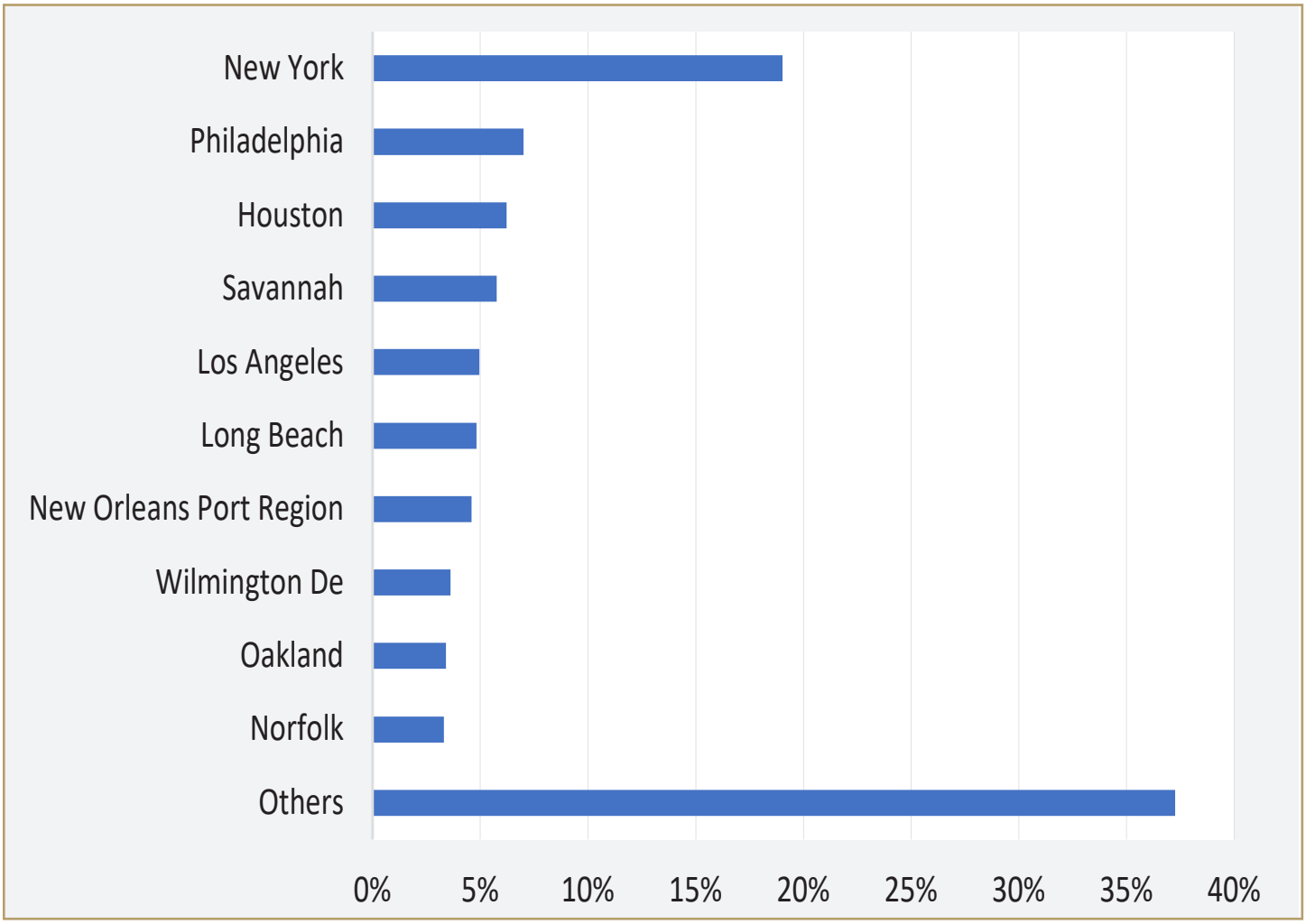
Source: IHS Markit PIERS.

Top U.S. Ports for Waterborne Agricultural Imports

In calendar year 2022, U.S. bulk and containerized waterborne agricultural imports totaled 60.8 mmt valued at $164.1 billion, of which 75 percent (45.7 mmt) of total imports was moved in containers.

The top five U.S. ports for bulk and containerized agricultural imports in 2022 were New York, NY; Philadelphia, PA; Houston, TX, Savannah, GA, and Los Angeles, CA. In terms of containerized imports, the top five ports were New York, NY; Philadelphia, PA; Los Angeles and Long Beach, CA; and Houston, TX.

Top U.S. Ports for Waterborne Agricultural Imports, 2022



Source: IHS Markit PIERS.

Barge's Role in Fertilizer and Ethanol Shipments

Barges move some of the fertilizer needed to grow corn, which in turn is used to produce feed, ethanol, and distillers' dried grains (an ethanol byproduct used for animal feed).[10] Corn is the largest user of nitrogen in terms of application rates per acre, total acres treated, and total applications.[11]

In 2020, over 3.0 million tons (2.7 mmt) of fertilizer were shipped along the Mississippi River System and over 3.6 million tons (3.3 mmt) of fertilizer were shipped along the Columbia River System.[12]

USDA estimates 87.1 million acres of corn to be harvested in MY 2023/24, 173.0 bushels per acre. This crop will be converted to ethanol and byproducts including distillers' grains, corn gluten feed, corn gluten meal, and corn oil.[13] A bushel of corn yields 2.7 gallons of ethanol and 17.5 pounds of distillers' grain.[14]

U.S. ethanol production at 199 refineries is over 17.9 billion gallons per year.[15]

More than 1.35 billion gallons of ethanol were exported in calendar year 2022.[16]

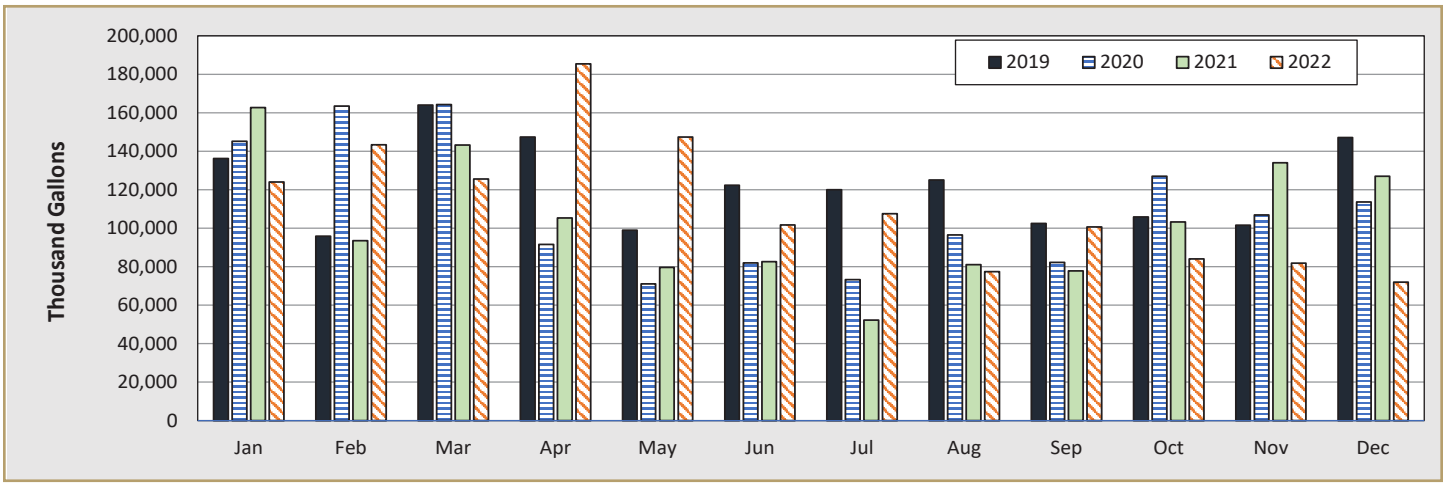
Major multimodal ethanol terminals include Albany, NY; Baltimore, MD; Chicago, IL; Houston, TX; Linden, Newark, and Sewaren, NJ; Mount Vernon, IN; New Orleans, LA; Sauget, IL; Providence, RI; and Tampa, FL.[17]

About 90 percent of ethanol is transported by train or truck. The remaining 10 percent is transported by barge.[18]

Over 325 million gallons of ethanol were moved by tanker and barge between Petroleum Administration for Defense Districts (PADD) in calendar year 2022, from PADD 2 Midwest to PADD 3 Gulf Coast and from PADD 3 to PADD 1C Lower Atlantic.[19]

Over 11.0 mmt of distillers' gain were exported in calendar year 2022.[20]

U.S. Monthly Ethanol Exports



Source: U.S. Energy Information Administration.

Barge and Rail Competition

In 2021, the U.S. waterways carried 348.5 million tons (348.8 mmt) of food and farm products.[21]

In calendar year 2023, barges carried over 26.2 million short tons (23.8 mmt) of corn, wheat, and soybeans downbound through Mississippi Locks 27, Ohio Locks and Dam 52, and Arkansas Lock and Dam 1.[22]

In 2023, a total of 31,672 grain barges were unloaded in the New Orleans port region (9 percent fewer than 2022), showing that an additional 14,689 grain barges entered the river below these locks (5 percent more than 2022).[23]

Railroads consider barge rates and the spread between U.S. Gulf and Pacific Northwest ocean vessel freight rates, and price their services accordingly.[24]

USDA's Transportation of U.S. Grain, A Modal Share Analysis, 1978-2020 Update shows.[25]

- Barges moved 46 percent of grain exports in 2020, and railroads moved 38 percent.
- Barges moved 53 percent of corn, 53 percent of soybeans, and 28 percent of wheat destined for export in 2020.
- Railroads moved 34 percent of corn, 31 percent of soybeans, and 53 percent of wheat to all export locations.

Harbor Channel and Inland Waterway Funding

The Harbor Maintenance Tax (HMT) was created by the Water Resources Development Act of 1986. HMT is a 0.125 percent tax on the value of imports and certain domestic waterborne cargo deposited in the Harbor Maintenance Trust Fund (HMTF) for harbor maintenance and dredging.[26]

In FY 2022, the balance in the HMT was $9.5 billion. Congressional appropriations from the HMTF were $2.05 billion in accordance with the new policies on full use of annual receipts and an increase of $600 million in surplus funds.[27]

Commercial vessels engaged in waterborne transportation in the inland waterways system generate revenues and investment interest from a tax on diesel fuel of 29 cents per gallon. The tax is deposited in the Inland Waterways Trust Fund (IWTF) to finance the Federal costs of authorized locks and dams projects.[28]

At the end of FY 2022, the balance in the IWTF was $202.5 million, including $125.4 million of revenues collected and $74.4 million appropriated.[29]

During FY 2023, the funding for the U.S. Army Corps of Engineers (USACE) was $8.31 billion from annual appropriations and $1.48 billion from the FY2023 Work Plans and FY2023 Disaster Relief Spend Plans.[30]

Harbor Channel and Inland Waterway Draft Issues

Inadequate channel depths and widths due to drought and sedimentation (shoaling) can lead to higher transportation costs, as barges and vessels may be loaded to less than capacity because of low water.[31]

The number of barges in a tow may be reduced to the available channel width, and one-way, or daytime-only traffic restrictions may be imposed.[32]

In these cases, more barges and vessels and additional time may be required to ship a given weight of commodities.[33]

There have been extended periods in which low river levels, shoaling, and reduced channel widths impeded barged grain movements and access to shallow draft ports.[34]

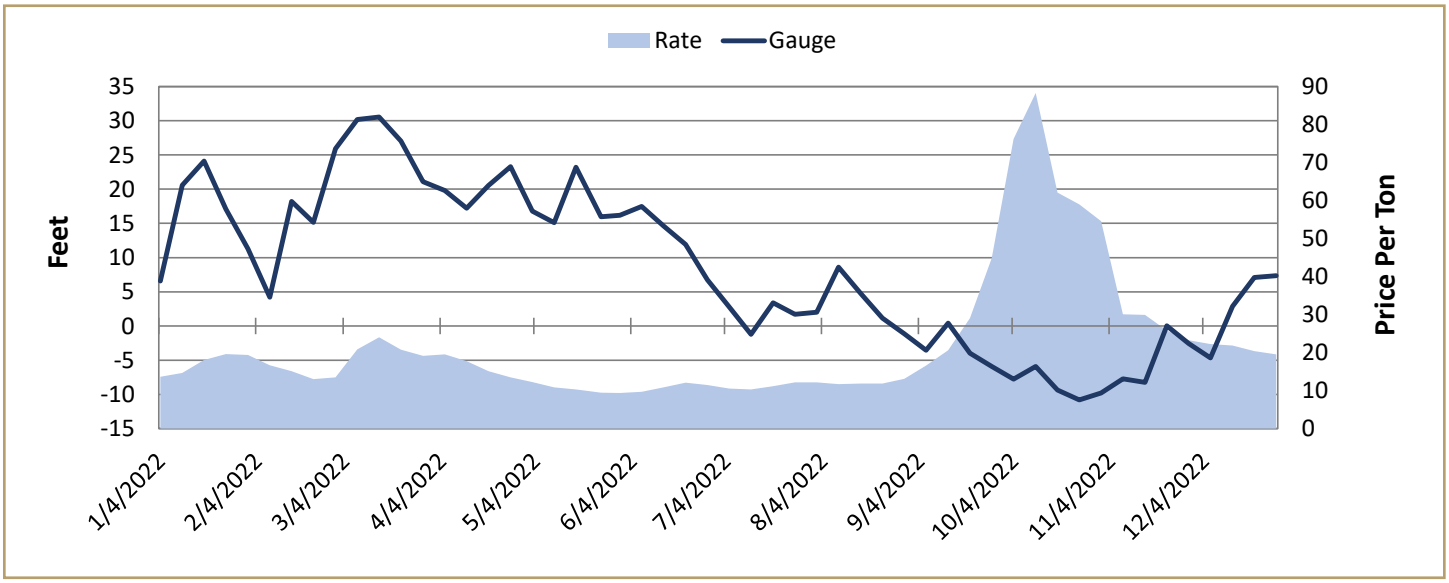
At a 9-foot draft, a typical U.S. barge size is 195 feet by 35 feet, which holds up to 1,500 short tons (1,360.8 metric tons (mt)) of cargo; 45 for each foot of reduced draft, the barge loses about 200 short tons (181.4 mt) of capacity.[35]

In fall 2022, the Mississippi River System experienced one of the worst droughts on record. By early October, barge draft sizes had been reduced to 9 feet, 6 inches reducing barge capacity by 20 to 27 percent. Barge tow size was reduced to 25 barges, reflecting a 17 to 38 percent reduction in tow size.[36]

On October 21, 2022, the water gauge at Memphis, TN reached a record low of -10.81 feet.[37]

On October 11, 2022, the spot freight rate for a barge at Memphis, TN reached a record high of $88.31 per ton.[38]

Memphis, TN Spot Freight Rate and Water Gauge Level



Source: USDA, Agricultural Marketing Service and U.S. National Oceanic and Atmospheric Administration.

Effects of Temporary Closures

Temporary closures and restrictions on traffic in harbors and channels can occur because of high water, storm debris, drought, shoaling, groundings, natural disasters, human-made disasters, slowdowns, strikes, and lockouts. These impediments can lead to congestion, delays, spoilage, diversion to other modes and ports, higher transportation costs, reduced farm income, and lost sales.[39,40,41,42]

U.S. exporters compete based on world prices and may be unable to pass on higher transportation costs, as customers can purchase similar products from other countries.[43,44] Therefore, higher transportation costs can result in lower cash bids in interior markets.[45]

In contrast, U.S. importers may be able to pass on higher transportation costs to their customers.[46,47]

Users of railroads and highways face congestion, constrained capacity, and driver and equipment shortages.[48,49,50]

Federal Partners for a Reliable Waterway System

USACE maintains authorized depths and widths of channels, locks, and dams. This maintenance moderates the effects of congestion, provides resiliency, and enhances recovery after transportation disruptions.[51]

USACE 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.[52]

Additional important partners in a reliable waterway system include:

- U.S. Coast Guard, which provides security, aids to navigation, and implements vessel traffic safety restrictions.[53]
- National Oceanic and Atmospheric Administration, which provides nautical charts and maps, marine weather and river level information, surveys after disruptions, and marine debris removal.[54]
- Maritime Administration, which promotes the development and maintenance of an adequate, well-balanced, U.S. 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 (FMC), which regulates oceanborne transportation to ensure a competitive and reliable international ocean transportation supply system that supports the U.S. economy. FMC also protects the public from unfair and deceptive practices.

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Preferred Citation

Henderson, Richard, Jesse Gastelle, and Peter Caffarelli. A Reliable Waterway System Is Important to Agriculture. January 2024. U.S. Dept. of Agriculture, Agricultural Marketing Service.
Web. <http://dx.doi.org/10.9752/TS050.01-2024>

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