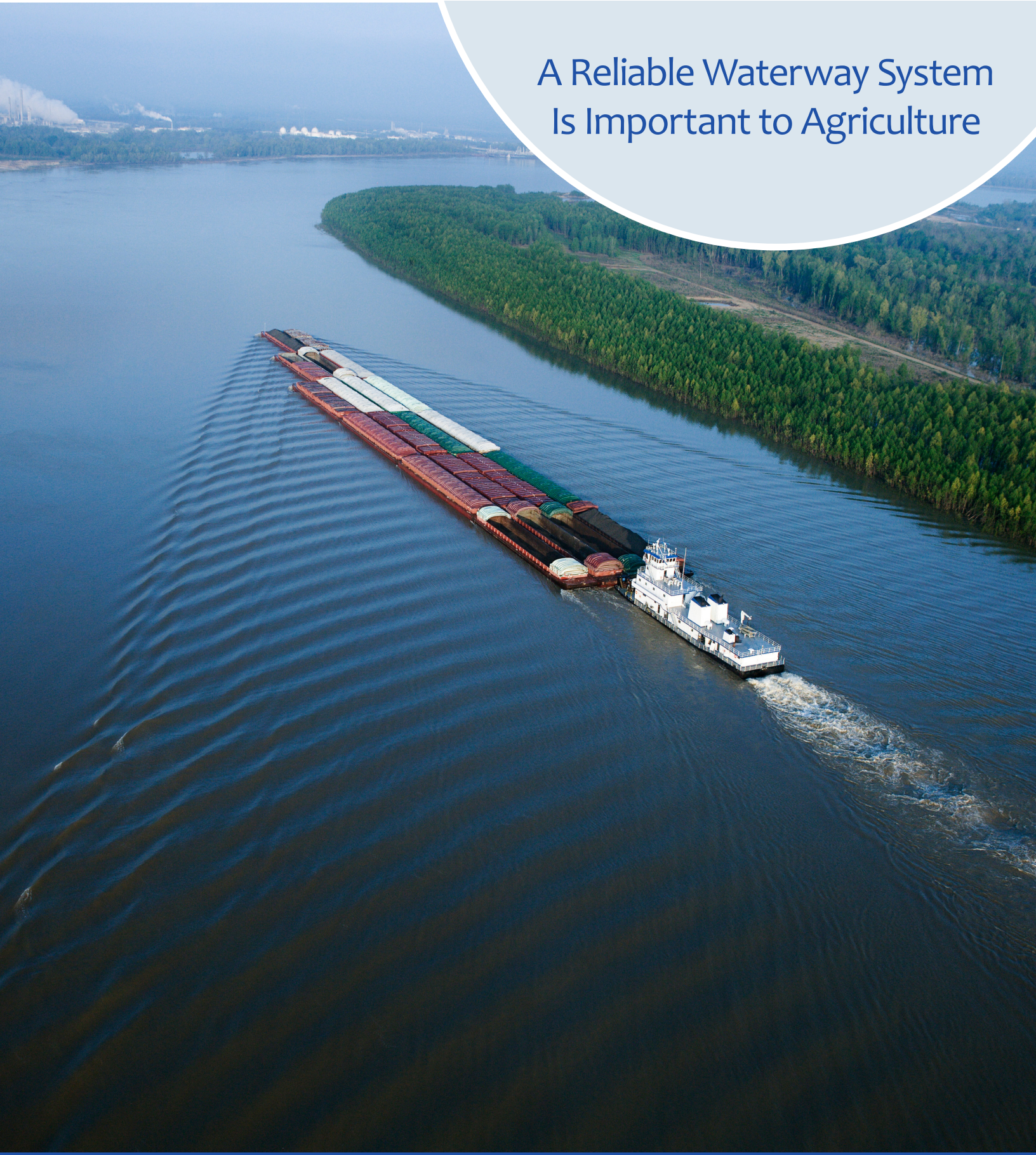
USDA Agricultural Marketing Service
U.S. DEPARTMENT OF AGRICULTURE

A Reliable Waterway System Is Important to Agriculture



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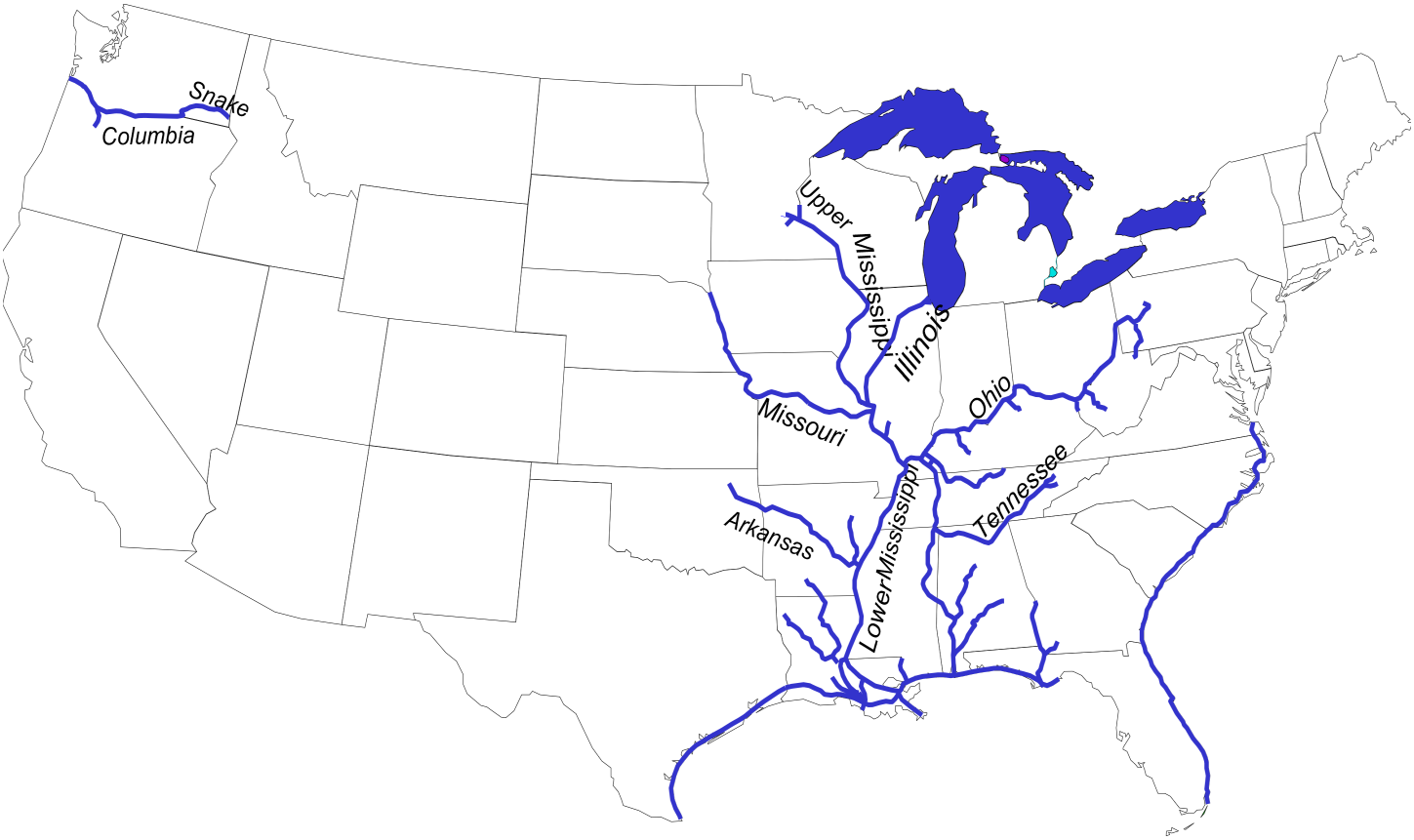
Introduction

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—as barges move about half of the grain destined to export. 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. In total, barges carried 291.0 million tons (264.0 mmt) of food and farm products in 2023.[1] This publication provides a summary of topics illustrating the importance of barge transportation to agriculture.

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 (fig. 1). 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.

Figure 1: Agriculturally Significant Waterways



Source: USDA, Agricultural Marketing Service.

Agricultural and Grain Trade

In fiscal year 2025 (October 1, 2024, through September 30, 2025), all agricultural exports are forecast to reach $170.5 billion; imports are forecast to reach $219.5 billion.[2]

In calendar year 2022, U.S. agricultural exports of $197.4 billion generated an additional $214.6 billion in economic activity, for a total of $412.0 billion in economic output and supported 1.25 million jobs. This translates to approximately 6,300 jobs for every $1 billion of agricultural products exported. The farm sector's share of the income supported by agricultural exports was 35.7 percent.[3]

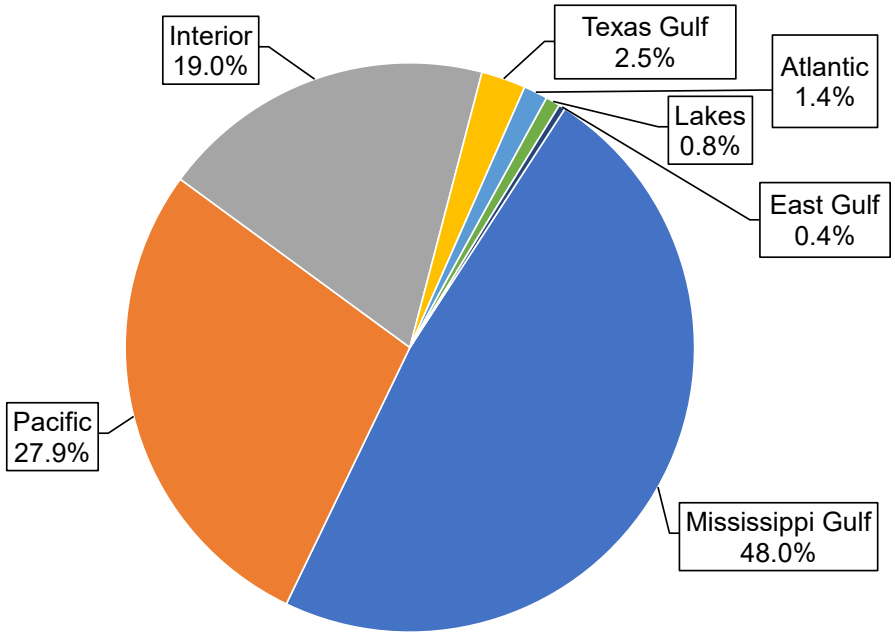
In 2024, 144.2 million metric tons (mmt) of agricultural exports, up 20 percent from 2023, and 63.1 mmt of agricultural imports, up 11 percent from 2023, were waterborne.[4]

As shown in figure 2, the Mississippi River, Texas Gulf and East Gulf ports, in total, accounted for 51 percent (65.4 mmt) of grains inspected and/or weighed for export in calendar year 2024.[5] Pacific Northwest (PNW) ports accounted for 28 percent (35.9 mmt) of grains inspected and/or weighed for export in 2024.[6]

Based on March 2025 estimates by the World Agricultural Outlook Board for marketing year (MY) 2024/2025, the United States is projected to export 20 percent of the grain it will produce. This will include 42 percent of wheat, 42 percent of soybeans, 44 percent of rice, and 16 percent of corn.[7] In terms of volume, the United States is projected to export:

- Corn – 62.23 mmt
- Soybeans – 49.67 mmt
- Wheat – 22.72 mmt
- Soybean meal – 15.79 mmt
- Rice – 5.43 mmt
- Soybean oil – 0.82 mmt

Figure 2: Grains Inspected and/or Weighed for Export by Region and Port Area, 2024, by Share of Total Metric Tons



Note: 128.5 million metric tons of grain were inspected for export in 2024.
Source: USDA, Agricultural Marketing Service.

Barge's Role in Grain Shipments

In calendar year 2024, barges carried over 29.6 million short tons (26.8 mmt) of corn, wheat, and soybeans downbound through Mississippi Locks 27, Ohio Locks and Dam 52, and Arkansas Lock and Dam 1.[8]

In calendar year 2024, barges carried 3.5 million short tons (3.2 mmt) of wheat downbound through Columbia River Lock 1.[9]

In 2024, a total of 33,715 grain barges were unloaded in the New Orleans port region (6 percent more than 2023), showing that an additional 14,120 grain barges entered the river below these locks (4 percent fewer than 2023).[10]

The waterway system is the most cost-effective mode of transportation for moving agricultural products for export. A 15-barge tow can hold about 875,000 bushels—equivalent to almost 216 rail cars or 1,000 trucks.[11]

Railroads consider barge rates and the spread between U.S. Gulf and Pacific Northwest ocean vessel freight rates, and price their services accordingly.[12]

USDA's *Transportation of U.S. Grain, A Modal Share Analysis, 1984-2022 Update* shows:[13]

- Barges moved 44 percent of grain exports in 2022, and railroads moved 45 percent.
- Barges moved 48 percent of corn, 48 percent of soybeans, and 32 percent of wheat destined for export.
- Railroads moved 44 percent of corn, 38 percent of soybeans, and 58 percent of wheat to all export locations.

Barge's Role in Fertilizer 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).[14] Corn is the largest user of nitrogen in terms of application rates per acre, total acres treated, and total applications.[15]

In 2024, 22.5 mmt of fertilizer moved northbound through the locks on the Mississippi River System, up 9 percent from 2023.[16]

In 2024, 10.7 mmt of fertilizer were imported at the Ports of New Orleans, up 14 percent from 2023.[17]

In 2024, less than 0.1 mmt of fertilizer moved up through the Bonneville Lock and Dam on the Columbia River.[18]

In 2024, 0.4 mmt of fertilizer was imported along the Columbia-Snake River System, up 40 percent from 2023.[19]

Barge's Role in Ethanol and Biodiesel Shipments

USDA estimates 82.9 million acres of corn will be harvested in MY 2024/25, 179.3 bushels per acre.[20] A portion of this crop will be converted to ethanol and byproducts including distillers' grains, corn gluten feed, corn gluten meal, and corn oil.[21] A bushel of corn yields 2.7 gallons of ethanol and 17.5 pounds of distillers' grain.[22]

U.S. ethanol production at 187 refineries totaled over 18.0 billion gallons per year.[23] Monthly production peaked in April 2024 (fig. 3).

More than 1.43 billion gallons of ethanol, worth $3.82 billion, were exported in calendar year 2023.[24]

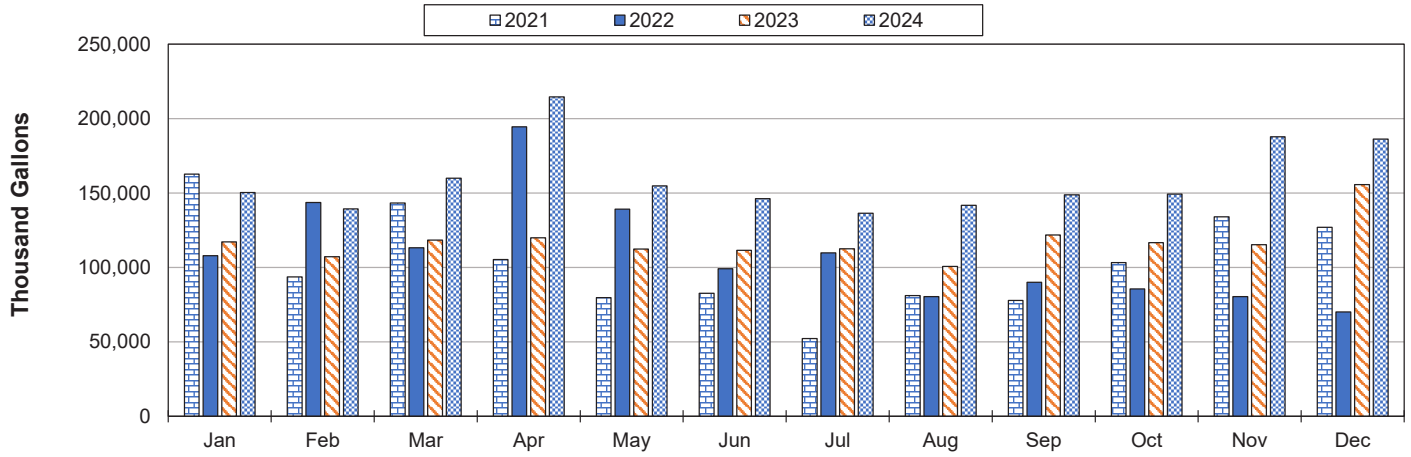
Major multimodal ethanol terminals include Albany, NY; Baltimore, MD; Chicago, IL; Houston, TX; Linden, Newark, and Sewaren, NJ; Mount Vernon, IN; New Orleans, LA; Sauget, IL; Providence, RI; and Tampa, FL.[25]

About 90 percent of ethanol is transported by train or truck. The remaining 10 percent is transported by barge.[26]

Over 249 million gallons of ethanol were moved by tanker and barge between Petroleum Administration for Defense Districts (PADD) in calendar year 2024, from PADD 2 Midwest to PADD 3 Gulf Coast.[27]

Over 12.2 mmt of distillers' grain were exported, representing 37 percent of domestic production, in calendar year 2024.[28]

Figure 3: U.S. Monthly Ethanol Exports



Source: U.S. Energy Information Administration.

Approximately 50 percent of soybeans are crushed at soybean processing plants.[29]

Soybean crush yields about 80 percent soybean meal and 20 percent soybean oil.[30]

Production of biodiesel has grown significantly over the past 2 decades (fig. 4). Almost 50 percent of the domestic use of soybean oil is in the production of biodiesel.[31]

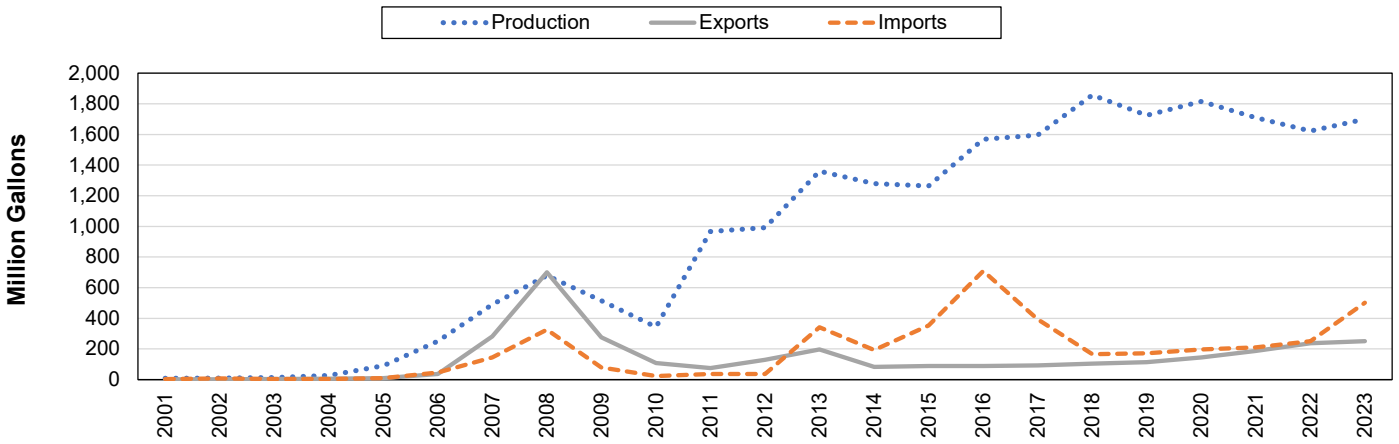
Soybean oil accounts for more than 40 percent of total feedstocks used for biodiesel production.[32] U.S. biodiesel production at 56 plants was 5.9 mmt (almost 1.7 billion gallons) in 2023.[33,34]

Almost 0.87 mmt of biodiesel, worth over $1.5 billion, were exported in calendar year 2023.[35]

USDA estimates 13.0 mmt (28.7 billion pounds) of soybean oil to be produced in MY 2024/25, worth over $12 billion.[36]

In 2022, almost 426,377 mmt of vegetable oil were shipped along the Mississippi River System.[37]

Figure 4: U.S. Biodiesel Production and Trade



Source: U.S. Energy Information Administration.

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.[38]

In FY 2024, total net investments of the HMT were $10.0 billion. Congressional appropriations from the HMTF were $2.77 billion in accordance with the new policies on full use of annual receipts and an increase of $800 million in surplus funds.[39,40]

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.[41]

At the end of FY 2024, the balance in the IWTF was $326.4 million (up 83 percent from the year before), including $123.4 million of revenues collected, which would support over $1 billion in spending with matching funds from the General Treasury.[42]

During FY 2024, the funding for the U.S. Army Corps of Engineers (USACE) was $8.68 billion from annual appropriations and $1.46 billion from previous unobligated appropriations.[43]

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.[44]

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.[45]

In these cases, more barges and vessels and additional time may be required to ship a given weight of commodities.[46]

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.[47]

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 mt) of cargo;[48] for each foot of reduced draft, the barge loses about 200 short tons (181.4 mt) of capacity.[49]

In fall 2024, like the fall of 2022 and 2023, the Mississippi River System experienced one of the worst droughts on record. By early September, 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.[50]

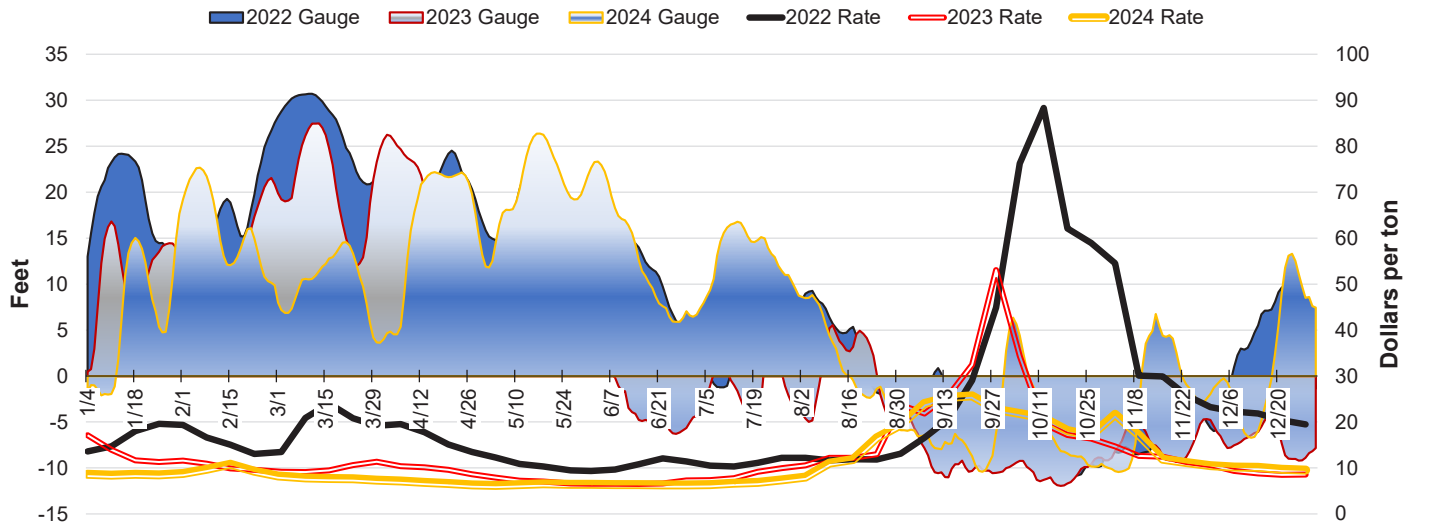
In 2024, the water gauge at Memphis, TN, reached its lowest point of -10.44 feet on November 3, above the lowest point of 2022 (-10.81 feet on October 22) and 2023 (-11.95 feet on October 17) (fig. 5).[51]

In 2024, the peak spot rate for a barge at Memphis, TN, reached $25.68 per ton on September 17, well below the peak rate of $88.31 per ton in 2022 and the peak rate of $53.03 in 2023 (fig. 5).[52]

Precipitation from several hurricanes in the fall of 2024 helped mitigate some of the low water issues and helped keep spot prices lower than 2023 despite higher export demand.

In 2023, despite record low water levels, spot rates were lower than 2022 when they reached their all-time high due to lower export demand in 2023 compared to 2022.[53]

Figure 5: 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.[54,55,56,57]

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.[58,59] Therefore, higher transportation costs can result in lower cash bids in interior markets.[60]

In contrast, U.S. importers may be able to pass on higher transportation costs to their customers.[61,62]

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.[63]

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.[64]

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.[65]
- National Oceanic and Atmospheric Administration, which provides nautical charts and maps, marine weather and river level information, surveys after disruptions, and marine debris removal.[66]
- Maritime Administration, which promotes the development and maintenance of an adequate, well-balanced, U.S. merchant marine and marine highways.[67]
- 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.[68]
- Federal Maritime Commission (FMC), which regulates ocean-borne 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.[69]

Endnotes

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