



July 2017

# INLAND HARBORS

The Corps of  
Engineers Should  
Assess Existing  
Capabilities to Better  
Inform Dredging  
Decisions

## Why GAO Did This Study

Inland ports on the Mississippi River between St. Louis and Baton Rouge enable shippers to move millions of tons of agricultural and other bulk commodities. However, these ports' harbors can accumulate sediment that reduces their depth, width, and length, making it difficult for vessels to move. To address this, the Corps routinely dredges the harbors.

Congress included a provision in statute for GAO to review dredging issues for ports in this region. This report addresses: (1) freight traffic of selected ports since 2010; (2) stakeholders' views on any challenges presented by the current federal funding approach to dredging inland harbors; and (3) the benefits and challenges of alternative options to fund dredging.

GAO reviewed Corps' 2010–2015 port traffic data for 13 of 18 inland ports in the region. Data for 2015 were the most recent available. GAO also interviewed Corps officials, industry stakeholders, and officials from 11 of 13 ports selected to include a range in terms of cargo handled, location, and dredging history. GAO conducted a literature search and interviewed 52 industry, port, and other stakeholders and experts about alternative options to fund dredging.

## What GAO Recommends

The Corps should inform Congress whether it can adapt its existing tools to address factors for allocating funds from the Harbor Maintenance Trust Fund, and the resources needed to do so. The agency concurred with the recommendation, with comment, and provided technical comments that were incorporated, as appropriate.

View [GAO-17-635](#). For more information, contact Susan Fleming at (202) 512-2834 or [flemings@gao.gov](mailto:flemings@gao.gov).

## INLAND HARBORS

### The Corps of Engineers Should Assess Existing Capabilities to Better Inform Dredging Decisions

## What GAO Found

From 2010 through 2015, 13 Mississippi River ports that GAO selected for review varied individually in terms of the amount, type, and trends in traffic handled. As a group, these ports primarily moved a mix of agricultural commodities (corn, soybeans, and rice); petroleum products; and crude materials (such as sand and gravel, among others). However, the ports varied individually, with some primarily moving agricultural commodities, and others moving a variety of commodities. These ports also varied in the quantity of goods transported through them, ranging from less than 1-million tons to more than 10-million tons per year. The amount of freight moved through each port tended to fluctuate each year due to various factors, such as weather, crop yields, and export markets.

A majority of the stakeholders GAO interviewed, as well as U.S. Army Corps of Engineers (Corps) officials, stated that funding constraints limit the Corps' ability to fully dredge the 13 ports' harbors, which can affect freight movement. According to local Corps officials, they received about \$13.1 million of the \$20.6 million needed to fully dredge the 13 ports' harbors in fiscal year 2016. Some stakeholders told GAO that smaller ports are negatively affected by the Corps' emphasis on the amount of cargo moved (measured in tons) when making decisions about which harbors to dredge. Congress has directed the Corps to consider harbors' significance and to conduct an assessment of harbors' use and benefits—considering factors beyond tonnage—to inform its allocation of dredging funds. Corps officials said they have not conducted such an assessment due to funding constraints, and raised concerns about the cost-effectiveness of conducting such assessments. However, the Corps has developed some tools that may help it assess inland harbors' significance, use, and benefits. For example, Corps officials explained that they have a tool that allows them to track the amount and type of cargo moving through harbors and to estimate the value of cargo at risk if a harbor loses depth. However, a Corps official noted the cargo-at-risk metric was based on deep coastal harbors and would need to be adapted for inland harbors. A senior Corps official agreed that it could be useful to inform Congress of the Corps' existing tools and capabilities and the resources needed to adapt these tools and capabilities to address the statutory requirements related to allocating dredging funds.

Many of the stakeholders GAO interviewed said that before considering alternative-funding options, the federal government should make more use of the current mechanism for funding dredging: the Harbor Maintenance Trust Fund. With regard to three other potential options for funding dredging—user fees, state and local contributions, and use of the Inland Waterways Trust Fund (which currently funds new construction and major rehabilitation of locks and dams as well as other channel and waterway improvements)—stakeholders identified challenges to their use. In particular, they noted the financial effects of these options on users, state and local governments, and the Inland Waterways Trust Fund. However, some stakeholders identified benefits related to these options, such as benefits from industry paying user fees for its infrastructure use, and state and local governments contributing funds to meet the dredging needs of harbors in their jurisdiction.

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## Abbreviations

Corps U.S. Army Corps of Engineers  
CRS Congressional Research Service  
ERDC Engineer Research and Development Center  
OMB Office of Management and Budget  
USDA United States Department of Agriculture

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July 26, 2017

The Honorable Lamar Alexander  
Chairman  
The Honorable Dianne Feinstein  
Ranking Member  
Subcommittee on Energy and Water Development  
Committee on Appropriations  
United States Senate

The Honorable Mike Simpson  
Chairman  
The Honorable Marcy Kaptur  
Ranking Member  
Subcommittee on Energy and Water Development, and Related Agencies  
Committee on Appropriations  
House of Representatives

In 2015, nearly 316 million tons<sup>1</sup> of domestic freight moved on the Mississippi River, representing 35 percent of all domestic waterborne commerce in the United States. Inland waterway transportation allows shippers to inexpensively transport large quantities of bulk commodities. Nearly all of this freight is carried on barges, which are non-motorized vessels that are pushed by towboats. One standard barge can carry about 1,500 tons of freight, while one rail car can carry 100 tons of freight and a semi-trailer can carry 26 tons of freight.<sup>2</sup> The ports located on the Mississippi River are commonly referred to as “inland ports,” and they are part of a tributary system that moves U.S. agricultural products downriver to be exported from the nation’s coastal ports. The inland ports also help transport other types of commodities, such as raw materials used in manufacturing or construction; petroleum products; and fertilizer used in the agricultural communities surrounding the Mississippi River.

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<sup>1</sup> This amount is based on the U.S. measure for a ton (2,000 pounds), which is sometimes referred to as a “short ton.” Data is from the U.S. Army Corps of Engineers’ Waterborne Commerce Statistics Center.

<sup>2</sup> There are different barge types, and the number of tons a barge actually carries depends on the weight of the commodity it is transporting, the amount of the commodity loaded, and the conditions of the waterways the barge is traveling on.

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The harbors of some inland ports on the Mississippi River are subject to natural shoaling—the accumulation of deposited sediment (sand and silt) along the banks and bottom of the harbor. Shoaling can reduce the depth, width, and length of these harbors, and can often make it difficult for vessels to move in and out of the port. This situation is problematic for ports located on the Mississippi River between St. Louis, Missouri, and Baton Rouge, Louisiana, in part due to the high amounts of sediment carried by the Mississippi River. Shoaling has presented problems in the past for these ports. For example, extreme weather events and river fluctuations in 2011 and 2012 led to significant shoaling problems at ports in this section of the river running from St. Louis to Baton Rouge.

The U.S. Army Corps of Engineers (Corps) is responsible for dredging, or removing sediment, from federal harbors and channels, to ensure that they remain navigable for commerce.<sup>3</sup> There are over 900 federal harbors and channels across the United States, and their dredging needs vary greatly. Regular dredging is essential for harbors on the Mississippi River because the river's depth can quickly and significantly fluctuate. Such fluctuations can cause flooding and shoaling. To fund dredging of eligible harbors and channels, Congress appropriates funds to the Corps through certain Corps appropriation accounts, which are usually reimbursed from the Harbor Maintenance Trust Fund. The trust fund is funded by a tax collected on imports, domestic shipments, Foreign-Trade Zone admissions, and passengers primarily at coastal ports.<sup>4</sup>

The Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2016,<sup>5</sup> contained a provision for us to study freight flows, dredging, and funding of dredging with respect to the harbors of

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<sup>3</sup> Federal harbors and channels refer to those harbors and channels that the Corps is responsible for maintaining. The Corps refers to these as “projects.” For the purposes of this report, we focused on projects that provide direct access to a port, and refer to these projects as “harbors” or “ports’ harbors.” We did not include projects on the main channel of the Mississippi River in the scope of this report.

<sup>4</sup> A Foreign-Trade Zone is a designated location in the United States declared to be outside the normal customs territory of the United States. When imported cargo is unloaded from a commercial vessel at a U.S. port and admitted into a foreign trade zone, the applicant for admission of that cargo into the zone may be subject to the harbor maintenance fee. Pub. L. No. 73-397, 48 Stat. 998 (1934), as amended, codified at 19 U.S.C. §§ 81a-81u.

<sup>5</sup> Joint Explanatory Statement, Division D, 162 Cong. Rec. H 10,056 (Dec. 17, 2015) accompanying the Consolidated Appropriations Act, 2016, Pub. L. No. 114-113, 129 Stat. 2242 (2015).

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inland shallow-draft<sup>6</sup> ports on the Mississippi River between St. Louis and Baton Rouge. This report addresses three objectives:

1. what is known about the freight traffic (including types of freight and trends in traffic) of selected inland ports on the Mississippi River between St. Louis and Baton Rouge since 2010;
2. stakeholders' views on any challenges that the current federal approach to funding dredging presents for inland ports and on the reported effect on the movement of freight at these ports; and
3. stakeholders' views on the potential benefits and challenges of using alternative options for funding dredging of inland harbors.

The 13 selected ports included in this review are (listed in geographic order, southbound): Southeast Missouri Regional Port Authority, Missouri; Hickman-Fulton County Riverport Authority, Kentucky; New Madrid County Port Authority, Missouri; Pemiscot County Port Authority, Missouri; Osceola Port Terminal, Arkansas; International Port of Memphis, Tennessee; Helena-West Helena/Phillips County Port Authority, Arkansas; Port of Rosedale, Mississippi; Yellow Bend Port, Arkansas; Port of Greenville, Mississippi; Port of Lake Providence, Louisiana; Madison Parish Port, Louisiana; and Port of Vicksburg, Mississippi.<sup>7</sup>

To determine what is known about freight traffic of the selected 13 inland ports between St. Louis and Baton Rouge since 2010, we reviewed and analyzed data from the Corps' Waterborne Commerce Statistics Center for these 13 ports. Specifically, we analyzed the types and amount of freight transported through these ports annually, as measured by weight,

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<sup>6</sup> Draft refers to the depth of a vessel's keel below the water line. Shallow-draft channels and harbors have depths less than or equal to 14 feet.

<sup>7</sup> The Corps identified 20 projects that receive federal funding for dredging in this section of the river. These 20 projects provide river access to 16 ports (in addition, one port in this section of the river is not dredged, because it is on the main channel of the river and does not have dredging needs). Of those 16 ports, we eliminated 3 ports from our scope: two ports that did not have enough traffic to be included in the Corps' data sets, and Baton Rouge (because the relevant harbor serves one area of the much larger and deeper Port of Baton Rouge complex).

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from 2010 through 2015.<sup>8</sup> To assess the reliability of the data, we reviewed a 2009 GAO report that discussed the reliability of Corps tonnage data and then interviewed Corps officials at the Waterborne Commerce Statistics Center about any changes that had occurred in the data collection, receipt, handling, and storage processes since that review, as well as their current processes for ensuring the reliability of the data.<sup>9</sup> We also interviewed port officials to discuss any concerns they had about the data, and companies responsible for filing the reports that the Corps uses to assess port tonnage to discuss their methods for ensuring the accuracy of the data. We found the data sufficiently reliable for our purposes.

To determine stakeholders' opinions on whether the current federal-funding approach for dredging presents any challenges for inland ports and reported effects on freight movement at these ports, we interviewed port directors and in some cases port tenants, at 11 of the 13 inland ports. We also conducted site visits at 7 of the 13 selected ports<sup>10</sup> to interview port directors, harbor services companies,<sup>11</sup> and tenants in person, and to gain an in-depth understanding of how shoaling can affect their harbors. We selected ports for site visits and interviews to ensure diversity in total tonnage, the percentage of inbound and outbound freight traffic at the port, the types of commodities most frequently handled, geographic location (including which Corps District they were located in), the funding

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<sup>8</sup> We selected this time frame as it allowed us to efficiently review recent trends in freight occurring after the recession. In addition, this time frame captured a period during which Congress changed the use of line-item appropriations to fund dredging of harbors; an extreme weather event occurred that affected harbors, and the Office of Management and Budget (OMB) issued new guidance that affected budgeting for dredging (discussed later in this report). The most recent Corps data available on port traffic was for calendar year 2015.

<sup>9</sup> GAO, *Missouri River Navigation: Data on Commodity Shipments for Four States Served by the Missouri River and Two States Served by Both the Missouri and Mississippi Rivers*, [GAO-09-224R](#) (Washington, D.C.: Jan. 15, 2009).

<sup>10</sup> The ports visited included the ports of Vicksburg, Mississippi; Lake Providence, Louisiana; Madison Parish, Louisiana; Osceola, Arkansas; New Madrid County, Missouri; Southeast Missouri, Missouri; and Hickman-Fulton, Kentucky.

<sup>11</sup> Harbor services companies are responsible for moving barges in and out of harbors.



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source for dredging,<sup>12</sup> and prior dredging history, based on information provided by the Corps. In addition, we interviewed industry stakeholders such as barge companies, trade associations, and shippers, as well as academic experts.<sup>13</sup> We also interviewed officials at the United States Department of Agriculture (USDA) Agricultural Marketing Service's Transportation Services Division to discuss their research on agricultural transportation. We selected industry and academic stakeholders based on a review of our prior reports on waterway transportation, as well as through recommendations from other interviewees. In addition, we reviewed relevant statutes and Corps' budget guidance documents, and interviewed Corps officials to understand how the Corps budgets and implements dredging activities. We received data from the Corps on the prior dredging history for each port, for 2010 through 2016. To determine the reliability of the dredging history data, we compared these data to publicly available documents, such as the Corps' work plans that outline the dredging plan for each year, and we crosschecked the data against what port stakeholders told us in terms of prior dredging activities. We followed up with Corps officials to discuss the data and obtain supplementary information as necessary to get the most complete, reliable information possible. Except where otherwise noted, we found the data sufficiently reliable for our purposes.

To determine stakeholders' opinions about any potential benefits and challenges of using alternative-funding methods for dredging inland harbors, we identified funding options through a literature search and through 14 initial interviews with 11 stakeholders representing industry, including representatives of some of the ports we previously described, and 4 experts. The three types of options that were most commonly discussed were:

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<sup>12</sup> Although dredging for the selected harbors is usually funded by the Harbor Maintenance Trust Fund, Congress provides funds either through an operations and maintenance appropriation, or a Mississippi River and Tributaries appropriation, which are usually reimbursed by the trust fund. We selected ports to ensure diversity in regard to the type of appropriation that funds their harbor dredging because stakeholders expressed in interviews a perception that the appropriation type affects a harbor's likelihood of receiving dredging funds. The Corps later clarified for us that the type of appropriation does not affect whether a harbor receives funding for dredging.

<sup>13</sup> See appendix I, tables 4 and 5 for a list of stakeholders and experts interviewed for this review.

- 
- a new user fee or tax,
  - a state or local contribution, and
  - expanding the use of the Inland Waterways Trust Fund for dredging.<sup>14</sup>

We then interviewed 33 stakeholders representing ports, tenants, shippers, and barge companies, and state transportation agencies to collect their opinions on the benefits and challenges of each of the three types of options. We selected stakeholders to interview based on a review of related reports and suggestions from other interviewees, and we included port tenants and representatives from the ports we interviewed. In addition to these stakeholders, we interviewed five experts on their views of the benefits and challenges of the alternative-funding options.<sup>15</sup> The experts were identified through a literature search and our prior related reports on inland waterways and surface transportation's funding and financing.

With respect to research objectives 2 and 3, because we asked stakeholders for their opinions and did not conduct a survey in which every stakeholder could provide a response as to whether a certain issue was relevant for them, we do not enumerate responses in the report. Instead, we analyzed the responses and reported on common themes that arose in multiple interviews. In addition, considering the number of inland ports outside of this section of the river, and the fact that we selected a non-generalizable sample of stakeholders, ports, tenants, and experts to discuss dredging issues and funding options related to the selected ports in this section of the river, the information cannot be used to make inferences about a population. However, the description of the Corps' budget development process is representative of its process for all dredging projects. Appendix I provides additional information about our objectives, scope, and methodology.

We conducted this performance audit from July 2016 to July 2017 in accordance with generally accepted government auditing standards.

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<sup>14</sup> The Inland Waterways Trust Fund is used to fund new construction and major rehabilitation of locks and dams as well as other channel and waterway improvements, but it is not authorized to fund maintenance dredging or other operational and maintenance activities. It is funded through a 29-cent excise tax on diesel fuel used by towboats, tugboats, and other vessels.

<sup>15</sup> One expert was interviewed in both rounds of interviews; meaning 8 experts were interviewed in total.

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Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### Waterway Transportation and the 13 Inland Ports

Inland ports along the section of the Mississippi River between St. Louis, Missouri, and Baton Rouge, Louisiana, provide “on and off ramps” for shippers using the river, such as agricultural or chemical-processing companies, that need to move a large amount of bulk commodities. The 13 ports selected for our review vary in size, ranging from the Port of Memphis, Tennessee, the 5th largest inland port in the United States, to small ports, such as the Port of Osceola, Arkansas, that may serve one or two companies. Inland ports may be located on the banks of the river, or in harbors that are located off the main channel of the river. See figure 1 for the locations of inland ports on the Mississippi River, including the 13 ports we selected for this review (the starred ports in the figure).

**Figure 1: Inland Ports on the Mississippi River, between St. Louis, Missouri, and Baton Rouge, Louisiana**



Source: Map Resources and GAO. | GAO-17-635

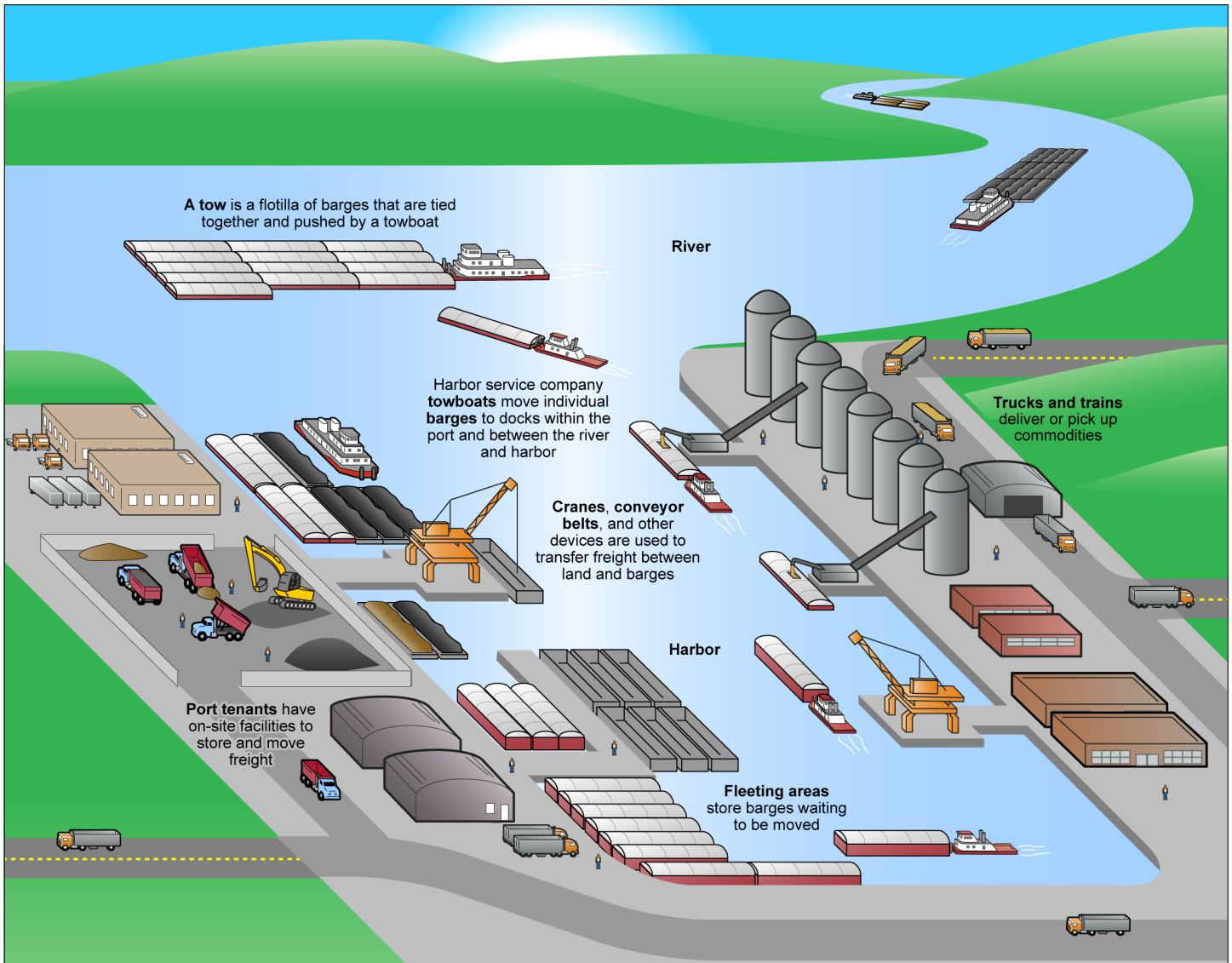
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As shown in figure 2, a number of entities are involved in moving commodities through ports. Shippers may have facilities, such as grain silos, inside the port, or they may be located offsite and simply use the port to receive or ship commodities.<sup>16</sup> Shippers enter into contracts with barge companies to move commodities along the river. If the shipper is sending cargo, then a barge company will drop off empty barges that the shippers load. The barge company then picks up the loaded barges, lashes them to a flotilla or “tow” (a number of barges or vessels), and transports the barges along the river to their destination. Within the port, a harbor services/fleeting company will move individual barges to docks within the port for loading or unloading, use “fleeting areas” along the sides of the harbor to store barges waiting to be moved, and take the barge back out to the river when it is ready to be added to a tow. On the landside of the port, trucks and trains deliver or pick up commodities, and a variety of port tenants, such as grain and fertilizer companies, have on-site facilities to store and move freight.

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<sup>16</sup> Shippers may also locate their private facilities (often referred to as “terminals”) outside of ports’ harbors, but along the river, and load and unload at their own location. There are hundreds of privately owned terminals operating along the Mississippi River between St. Louis, Missouri, and Baton Rouge, Louisiana, but for the purposes of this review, we are focusing on inland ports’ harbors and the terminals using those harbors, because of the Corps’ responsibility for dredging those harbors.

Figure 2: Example of Freight Movement within an Inland Harbor



Source: GAO. | GAO-17-635

## Dredging and the Corps

The Mississippi River carries a large amount of sediment, which travels downstream and can accumulate in various spots (shoaling) within the river's main channel and harbors. If the shoaling is too high or the river level drops, these spots can become impassable for fully loaded barges.

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See figure 3 for an example of shoaling at the mouth of a harbor. To help maintain navigable waters, some inland harbors require dredging. A vessel called a “dredge” removes sediment from the bottom of the harbor and deposits it elsewhere. Dredging needs vary among ports. For example, industry and port officials told us that harbors located off the main stem of the river provide port and tenant infrastructure some protection from the river’s current and large debris in the river, but these harbors also tend to accumulate more sediment, particularly at the mouth, or entrance, of the harbor. Finally, flooding events can deposit large amounts of sediment in the channels and harbors, which becomes more problematic as water levels fall.

**Figure 3: Example of Shoaling at the Entrance of a Harbor**



Source: GAO analysis of photo provided by Hickman-Fulton County Riverport Authority. | GAO-17-635

The Corps is responsible for dredging the nation’s federally authorized inland waterways, harbors, and channels, which are those that Congress defined in statute as federal projects and approved their construction and maintenance by the Corps to certain dimensions (depth, width, and

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length).<sup>17</sup> To maintain the harbors and channels, the Corps may hire contractors or use its own vessels to dredge the harbors.<sup>18</sup> The Corps does not dredge outside of the federally authorized areas, but ports and their tenants may dredge around their private docks and in other areas not maintained by the Corps. Dredging is part of the Corps' Civil Works navigation mission, which includes the provision of safe, reliable, efficient, effective, and environmentally sustainable waterborne transportation systems for the movement of commerce, national security needs, and recreation in the United States. The Corps is also responsible for the operation and maintenance of locks and dams, as well as a number of other missions, such as flood risk management and hydropower.

The Corps is organized into three tiers: a national headquarters in Washington, D.C.; 8 regional divisions; and 38 Civil Works districts nationwide. District offices are generally responsible for managing dredging projects located within their district boundaries, including planning, awarding, and administering maintenance-dredging contracts with industry. Regional oversight is provided through the division. All three tiers are involved in the budget development process. For example, districts will compile a list of funding requirements for work packages in the districts (for example, dredging an inland harbor).<sup>19</sup> These work packages are ranked and reviewed by the division and headquarters, and the approved packages become the basis for the President's Budget proposal for the Corps' Civil Works program.<sup>20</sup> The Corp's fiscal year appropriation, as passed by Congress, may provide more or less funding than what was requested in the President's Budget proposal.

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<sup>17</sup> Each project varies in its dimensions. However, all of the selected harbors have authorized depths of either 9 feet or 12 feet.

<sup>18</sup> In addition, the Corps uses "river training structures," such as dikes and revetments, to help control the movement and deposition of sediment. Revetments are concrete matting or graded stone placed on riverbanks to stabilize them and prevent erosion.

<sup>19</sup> The Office of Management and Budget, the Assistant Secretary of the Army for Civil Works, and Corps headquarters provide budget development guidance.

<sup>20</sup> The budget request for the Corps is reviewed by the Assistant Secretary of the Army for Civil Works and the Office of Management and Budget.



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## Methods for Funding Dredging and Other Transportation Needs

The federal government uses a variety of methods to fund transportation networks. The Corps pays the dredging costs for federally authorized harbors and channels with funds appropriated by Congress and generally reimbursed from the Harbor Maintenance Trust Fund.<sup>21</sup> The trust fund is supported through collections of the Harbor Maintenance Tax, which is a tax collected on imports, domestic shipments, Foreign-Trade Zone admissions,<sup>22</sup> and passengers primarily at coastal ports.<sup>23</sup> The annual cost to fully dredge the harbors at each of the 13 selected inland ports<sup>24</sup> varies by harbor, with one harbor requiring about \$300,000 to be fully dredged, and another requiring over \$3 million (although this could also change each year, based on flows from the Mississippi River and the conditions of each harbor). Prior to 2010, Congress used line-item appropriations to provide dredging funds for the harbors of specific

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<sup>21</sup> Corps officials explained that according to their General Counsel, the appropriations must contain specific language authorizing use of the Harbor Maintenance Trust Fund. For instance, the fiscal year 2017 appropriations contains the following language: “of which such sums as are necessary to cover the Federal share of eligible operation and maintenance costs for inland harbors shall be derived from the Harbor Maintenance Trust Fund.” Corps officials noted that the American Recovery and Reinvestment Act of 2009 and some supplemental appropriations have not included this language.

<sup>22</sup> A foreign-trade zone is a designated location in the United States declared to be outside the normal customs territory of the United States. When imported cargo is unloaded from a commercial vessel at a U.S. port and admitted into a foreign trade zone, the applicant for admission of that cargo into the zone may be subject to the harbor maintenance fee. Pub. L. No. 73-397, 48 Stat. 998 (1934), codified as amended at 19 U.S.C. §§ 81a-81u.

<sup>23</sup> According to Corps officials, the Harbor Maintenance Trust Fund has a balance of approximately \$8.8 billion as of the start of fiscal year 2017. Congress, to balance competing priorities among government programs and meet budgetary spending caps, may choose to appropriate less to an agency than is available in the fund. See, e.g., GAO, *Federal Buildings: Improved Transparency and Long-Term Plan Needed to Clarify Capital Funding Priorities*, [GAO-12-646](#) (Washington, D.C.: July 12, 2012) and *Federal Trust and Other Earmarked Funds: Answers to Frequently Asked Questions*, [GAO-01-199SP](#) (Washington, D.C.: January 2001). We have previously reported on the trust fund balance, see: *Federal User Fees: Substantive Reviews Needed to Align Port-Related Fees with the Programs They Support*, [GAO-08-321](#) (Washington, D.C.: February 22, 2008).

<sup>24</sup> The 13 selected ports are: Southeast Missouri Regional Port Authority, Missouri; Hickman-Fulton County Riverport Authority, Kentucky; New Madrid County Port Authority, Missouri; Pemiscot County Port Authority, Missouri; Osceola Port Terminal, Arkansas; International Port of Memphis, Tennessee; Helena-West Helena/Phillips County Port Authority, Arkansas; Port of Rosedale, Mississippi; Yellow Bend Port, Arkansas; Port of Greenville, Mississippi; Port of Lake Providence, Louisiana; Madison Parish Port, Louisiana; and Port of Vicksburg, Mississippi.

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ports.<sup>25</sup> In contrast to the Harbor Maintenance Tax—which is paid by shippers primarily using coastal ports (and thus, is not directly linked to use of the inland ports)—the maintenance of other transportation networks, such as highways, is paid by users through a fee or tax. In addition, state and local governments are required to match federal funds for transportation infrastructure, such as highways and landside infrastructure at ports.<sup>26</sup>

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## Selected Ports Varied in Terms of Type and Amount of Freight Moved, and Did Not Show a Consistent Traffic Trend from 2010 through 2015

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### Types of Freight

From 2010 through 2015, the 13 selected ports we reviewed moved the following types of freight: agricultural commodities (primarily soybeans, corn, and rice); petroleum products; crude materials (sand, gravel, and similar materials); chemicals; coal; and primary manufactured goods (such as lime and concrete).<sup>27</sup> As shown in figure 4, the bulk of the freight tonnage moved through these ports was composed of agricultural commodities, petroleum products, and crude materials.<sup>28</sup>

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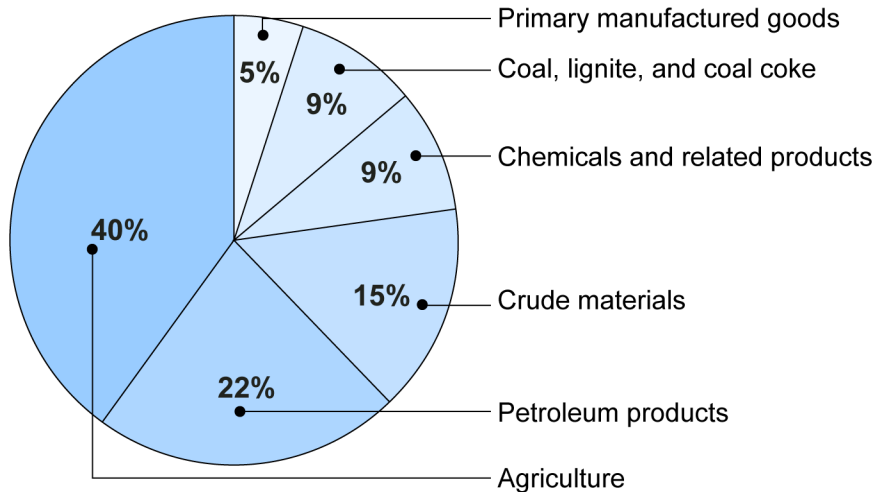
<sup>25</sup> Corps officials noted Congress still provides additional “pots” of money for specific types of projects, such as funds for inland navigation or for small, remote, or subsistence harbors, which the Corps can use to dredge certain harbors.

<sup>26</sup> Corps officials noted that they do not manage landside infrastructure at ports.

<sup>27</sup> Unless otherwise noted, years refer to calendar year.

<sup>28</sup> While recognizing that tons and tonnage are both measures of weight, for purposes of this report, we refer to the number of tons transported through a port (i.e., inbound and outbound freight) in a year as the amount of freight transported.

**Figure 4: Types of Freight Moved through 13 Selected Inland Ports along the Mississippi River, from 2010 through 2015 (Percentage of Total Tons)**



Source: GAO analysis of U.S. Army Corps of Engineers data. | GAO-17-635

With respect to the contribution of the selected ports to the total tonnage moved on the Mississippi River, the 13 ports included in our review represented 15 percent of all agricultural freight; 9 percent of all crude materials; 8 percent of all primary manufactured goods; and 9 percent of all tonnage moved on the river from 2010 through 2015. The vast majority (99 percent) of the agricultural freight departing from the selected ports went downriver to deep-draft coastal ports primarily used for export purposes, such as Baton Rouge, South Louisiana, New Orleans, and Houston.

However, individual ports varied with respect to the type of freight moved through the port, with some ports specializing in certain commodities. For example, as shown in table 1, eight ports primarily transported agricultural commodities from 2010 through 2015, and the remaining five ports transported a range of types of commodities.<sup>29</sup>

<sup>29</sup> On average, 75 percent or more of the annual tonnage each year from 2010 to 2015 was agricultural products at the ports of Hickman-Fulton County (Kentucky); Helena (Arkansas); Osceola (Arkansas); Rosedale (Mississippi); and Yellow Bend (Arkansas), although in 2010, the amount of petroleum and crude materials moved at Yellow Bend was a larger percentage than in later years, and in 2015 the percentage of crude materials moved in Osceola was larger than usual.

**Table 1: Freight Types Transported through 13 Selected Inland Ports along the Mississippi River, from 2010 through 2015 (Percentage of Total Tons by Port)**

Port <sup>a</sup>	Agriculture	Petroleum	Crude materials	Chemicals	Primary manufactured goods	Coal
Osceola (AR)	90%	1%	8%	1%	0%	0%
Helena (AR)	89%	0%	3%	8%	1%	0%
Yellow Bend (AR)	88%	5%	6%	0%	0%	0%
Rosedale (MS)	83%	0%	4%	13%	0%	0%
Hickman-Fulton County (KY) <sup>b</sup>	83%	0%	5%	5%	3%	4%
Lake Providence (LA)	65%	0%	19%	13%	0%	0%
Greenville (MS)	58%	20%	12%	8%	2%	0%
New Madrid (MO)	51%	1%	1%	46%	0%	0%
Madison Parish (LA)	35%	0%	47%	14%	5%	0%
Southeast Missouri (MO)	33%	0%	47%	16%	4%	0%
Pemiscot County (MO) <sup>c</sup>	28%	56%	3%	14%	0%	0%
Memphis (TN)	23%	27%	16%	9%	7%	18%
Vicksburg (MS)	12%	47%	21%	6%	14%	0%

Source: GAO analysis of U.S. Army Corps of Engineers data. | GAO-17-635

<sup>a</sup>Not all rows add to 100 percent due to rounding.

<sup>b</sup>In data, the Corps refers to the associated project as Elvis Stahr, but port representatives refer to it as Hickman-Fulton County Riverport.

<sup>c</sup>In data, the Corps refers to the associated project as Caruthersville, but port representatives refer to it as Pemiscot County.

The industries located in a port’s geographic area tend to influence the products handled by that port. For example, port stakeholders told us and our review of Corps data confirmed that a number of ports primarily serve the local farming industry by shipping out agricultural commodities and bringing in fertilizer through the port. In addition, through site visits and document reviews, we found that the Port of Southeast Missouri has a lead facility in its region and a substantial amount of the freight moved through that port is lead concentrate, classified as crude materials.

## Amount of Freight

As shown in table 2, the amount of tonnage transported through individual ports can fluctuate significantly from year to year; however, the 13 selected ports fell into three broad groups. For the purposes of this report, we will describe these groups in relation to the Corps’ definition of low-,

moderate-, and high-use ports, which is based on the 5-year average of annual tonnage transported through the port.<sup>30</sup> While tonnage fluctuated annually, based on the 5-year averages, 6 ports transported less than 1-million tons; 6 ports transported 1-million tons to less than 10-million tons; and 1 port consistently transported over 10-million tons.

**Table 2: Tons of Freight Transported through 13 Selected Inland Ports along the Mississippi River, 2010–2015**

Tonnage by year (1000s)							5-Year average
Port	2010	2011	2012	2013	2014	2015	(2011–2015)
<b>10-million tons or more per year (5-year average)</b>							
Memphis (TN)	12,155.0	12,611.5	13,564.1	14,243.3	14,748.6	12,025.5	13,438.6
<b>1-million to less than 10-million tons per year (5-year average)</b>							
Greenville (MS)	2,715.0	2,529.4	3,071.2	3,474.2	3,644.0	2,968.0	3,137.4
Vicksburg (MS)	3,350.2	2,622.7	2,601.6	2,345.0	2,720.4	2,965.3	2,651.0
Helena (AR)	1,385.2	1,437.5	1,979.8	2,231.7	2,001.4	1,804.3	1,890.9
Rosedale (MS)	1,452.4	1,364.5	1,184.3	1,340.0	1,380.1	1,277.6	1,309.3
Lake Providence (LA)	1,348.7	895.9	732.8	1,595.3	1,242.8	1,158.5	1,125.1
Pemiscot County <sup>a</sup> (MO)	300.8	334.7	460.1	2,599.5	974.7	645.3	1,002.9
<b>Less than 1-million tons per year (5-year average)</b>							
Hickman-Fulton <sup>b</sup> County (KY)	1,048.5	856.3	847.3	932.6	872.1	1,025.4	906.7
Southeast Missouri (MO)	890.3	932.2	877.1	830.9	871.5	1,047.6	911.9
Madison Parish (LA)	734.6	560.8	433.3	445.6	407.0	305.8	430.5
Osceola (AR)	632.2	409.0	286.0	378.7	308.5	613.1	399.1
New Madrid (MO)	181.1	193.9	294.5	424.8	519.8	458.9	378.4
Yellow Bend (AR)	224.8	215.0	402.5	477.2	350.5	266.0	342.2
<b>Total<sup>c</sup></b>	<b>26,418.8</b>	<b>24,963.4</b>	<b>26,734.6</b>	<b>31,318.8</b>	<b>30,041.4</b>	<b>26,561.3</b>	<b>27,923.9</b>

Source: GAO analysis of U. S. Army Corps of Engineers, Waterborne Commerce Statistics Center's data. | GAO-17-635

Note: The three categories (10-million tons or more per year, 1-million tons to less than 10-million tons per year, and less than 1-million tons per year) in the table are based on U.S. Army Corps of Engineers' (Corps) definitions, which are based on the 5-year annual average tonnage at each port.

<sup>a</sup>In data, the Corps refers to the associated project as Caruthersville, but port representatives refer to it as Pemiscot County.

<sup>30</sup> The Corps defines high-use ports as those moving 10-million tons or more per year; moderate-use ports as those transporting 1-million to less than 10-million tons per year; and low-use ports as those moving less than 1-million tons per year.

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<sup>b</sup>In data, the Corps refers to the associated project as Elvis Stahr, but port representatives refer to it as Hickman-Fulton County Riverport.

<sup>c</sup>Columns may not add up due to rounding.

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## Freight Trends

The total annual amount of freight transported through the 13 selected ports fluctuated substantially at the individual selected ports, making it difficult to identify a consistent trend (see table 2).<sup>31</sup> None of the 13 selected ports consistently experienced a year-to-year increase or decrease throughout the 6-year time period. Stakeholders we interviewed told us that some of the fluctuations in the total amount of tonnage moved at individual ports is due to increases and declines in specific commodities handled by the port. For example, at the Port of Pemiscot County, total tons of freight increased by about 465 percent from 2012 to 2013, because of a large spike in crude petroleum shipments. The port's total tonnage declined in later years as those shipments declined. According to stakeholders, changes in individual commodities are also sometimes related to changes in export market demand or crop yields, or situations in which freight movement is impeded by harbor conditions (discussed later in the report). For example, stakeholders told us that if export market conditions improve for American agricultural commodities due to a drought in another country, farmers may sell more of their product, as opposed to storing it when prices are low.<sup>32</sup> In addition, crop yield per acre determines the amount of crop harvested, and can be affected by weather, seed quality, and other factors. Stakeholders also told us that individual businesses decide where and by which mode to transport their commodities based on many different long-term and short-

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<sup>31</sup> From 2010 through 2015, total tonnage on the Mississippi River was more consistent, with fluctuations of about 1 percent to 3 percent from year to year, with the exception of a 9 percent fluctuation from 2013 to 2014. In contrast, during the same time period the selected ports experienced less consistent fluctuations, both within and across the selected ports. For example, from 2010 to 2015, one port experienced year-to-year fluctuations ranging from 63 percent reduction to a 465 percent increase. During this time period, total tonnage across these selected ports experienced fluctuations ranging from a 12 percent reduction to a 19 percent increase. However, it is important to note that because the ports move a much smaller amount of tons than the river as a whole, a small fluctuation in a port's tonnage can lead to a high percentage change in the amount of goods moved from one year to another.

<sup>32</sup> Stakeholders told us that, due to a small amount of storage space in this region, corn is generally the only harvested crop that is stored.

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term factors, such as transportation time and cost, and market demand, among others.<sup>33</sup>

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## Stakeholders Identified Challenges That Funding Constraints Pose to Dredging Inland Harbors and Concerns about the Corps' Fund Allocation Process

### Funding Constraints Limit the Corps' Ability to Fully Dredge Harbors, Which Negatively Affects Freight Movement

A majority of the stakeholders we interviewed, as well as officials from USDA and the Corps, cited funding constraints as a challenge that prevents the Corps from fully dredging all inland harbors, including the harbors at the selected ports. Port stakeholders told us that their harbors generally need annual dredging, particularly at the entrance to the harbor, where sediment flowing down the river tends to accumulate. Corps officials in one district agreed that the dredging needs for the ports are fairly consistent, although weather events and river levels can affect the amount of dredging needed.<sup>34</sup> According to Corps officials, the Corps has dredged most of the 13 selected ports' harbors most years from 2010 through 2016 (see table 3). However, port authorities we interviewed and Corps officials noted that the Corps does not dredge all of the harbors to their authorized dimensions (length, width, or depth) primarily due to funding constraints.<sup>35</sup> According to local Corps officials, the Corps needed

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<sup>33</sup> Identifying the range of interacting factors influencing fluctuation in the amount of freight transported through the ports was out of the scope of this review.

<sup>34</sup> As previously noted, the annual cost to fully dredge the harbors at each of the 13 selected inland ports varies by harbor, with one harbor requiring about \$300,000 to be fully dredged, and another requiring over \$3 million (although the cost will also change each year, based on flows from the Mississippi River and the conditions of each harbor).

<sup>35</sup> An official from the Department of the Army, Office of the Assistant Secretary (Civil Works), noted that while this information is accurate, dredging to authorized dimensions is often not justified or needed to enable safe project operations.

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approximately \$20.6 million, and received approximately \$13.1 million to dredge all of the harbors and channels associated with the 13 selected ports to their full dimensions in fiscal year 2016. While Congress provided much more than this for the Corps to address operations and maintenance needs, the Corps must allocate operation and maintenance funds among hundreds of harbors and waterway projects.<sup>36</sup> Nonetheless, according to Corps officials in one district, the Corps has been able to distribute the funds so that it can dredge enough of each harbor in that district to keep barges moving. Some stakeholders echoed this sentiment, stating that the Corps does a good job working with the funds that it receives.

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<sup>36</sup> An official from the Department of the Army, Office of the Assistant Secretary (Civil Works), noted that operations and maintenance funds must be allocated across more than just port and waterway projects. The official also noted that both the budget and final appropriations make allocations across the whole program, so operations and maintenance-dredging needs must compete against other needs, such as construction, regulatory activities, and so forth.



**Table 3: Dredging Funded by the U.S. Army Corps of Engineers at 13 Selected Inland Ports along the Mississippi River between St. Louis, Missouri, and Baton Rouge, Louisiana, 2010–2016**

Port Projects	Dredging History						
	2010	2011 <sup>a</sup>	2012	2013 <sup>a</sup>	2014	2015	2016
<b>10-million tons or more per year (5-year average)</b>							
Memphis (TN)	X	X	X	X	X	X	X
<b>1-million to less than 10-million tons per year (5-year average)</b>							
Greenville (MS)	X	—	X	—	X	X	X
Helena-Phillips (AR)	X	—	X	—	X	—	X
Helena (AR)	X	—	X	—	X	X	—
Lake Providence (LA)	X	—	X	—	X	X	X
Rosedale (MS)	X	—	X	*	X	X	X
Vicksburg (MS)	X	—	X	—	X	X	—
Pemiscot County (MO)	X	—	X	—	X	X	X
<b>Less than 1-million tons per year (5-year average)</b>							
Hickman-Fulton County (KY)	—	—	X	—	X	X	X
Madison Parish (LA)	X	—	X	X	X	X	X
New Madrid (MO)	X	—	X	—	—	X	X
New Madrid County (MO)	X	X	X	—	X	X	X
Osceola (AR)	X	—	X	—	X	X	X
Southeast Missouri (MO)	—	—	X	—	X	X	X
Yellow Bend (AR)	X	—	X	—	X	X	X

Legend:

X = indicates that the port received some dredging that was paid for by the U.S. Army Corps of Engineers (Corps). However, it is not meant to indicate that the port was fully dredged to its authorized width, depth, or length.

\* = indicates data was not sufficiently reliable to determine the status of dredging for that time period.

Source: U.S. Army Corps of Engineers. | GAO-17-635

Notes: Some of the ports listed as single entities by the Corps for the purposes of calculating tonnage are actually separate federal projects, in terms of funding for dredging. If the multiple projects that correspond to one port as defined by the Corps' Waterborne Commerce Statistics Center did not have identical dredging histories, then they are listed separately.

Tonnage can fluctuate significantly each year. The three categories (10-million tons or more per year, 1-million tons to less than 10-million tons per year, and less than 1-million tons per year) in the table are based on Corps' definitions, which are based on the 5-year annual average tonnage at each port.

<sup>a</sup>A Corps official said that a lack of dredging in 2011 was related to flooding in 2011 and that the lack of dredging in 2013 was related to extensive dredging that occurred in 2012 in response to a drought. Another official stated that other ports were not able to be dredged during the regular 2013 season due to flooding in 2013.

As shown in table 3, the Corps has dredged most of the 13 selected ports' harbors most years from 2010 through 2016. However, port

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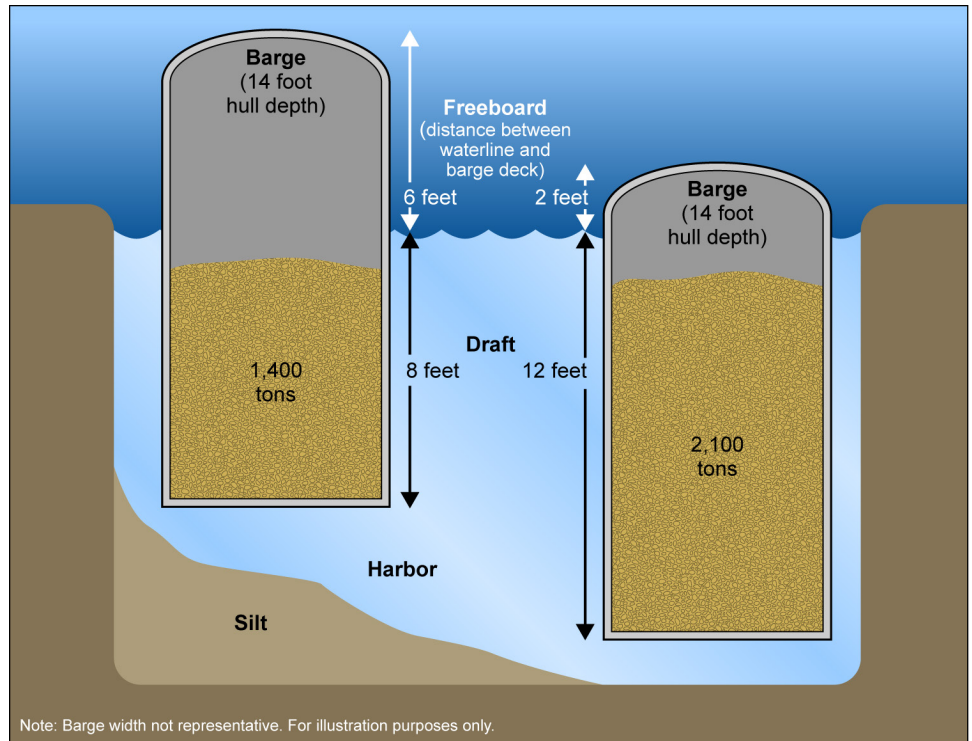
stakeholders provided some examples of how unmet dredging needs have negatively affected freight movement at these ports, particularly with respect to limiting the amount of freight moved per barge or creating temporary harbor closures. Some of these stakeholders noted that these situations can further lead to increased transportation costs and freight congestion, which can have negative consequences for the industries reliant on these ports, particularly agricultural industries.

- **Light-loading:** Light-loading refers to situations in which shippers cannot load a barge to its full capacity (see figure 5). Shippers have to light load a barge when a harbor is experiencing shoaling because a fully loaded barge would not have enough clearance for the bottom of the barge to pass over the shoaled areas of the harbor. Light-loading may refer to loading a barge so that it sits anywhere from several inches to a few feet higher above the water; but stakeholders explained that every inch taken off the barge's draft corresponds to about 15 to 18 fewer tons of cargo on the barge. Light loading was the negative effect most commonly cited by port stakeholders when discussing the effects of unmet dredging needs. Since light-loaded barges carry less cargo than fully loaded barges, shippers must use more barges to move the same amount of product, an outcome that may lead to increased transportation costs. For example, one shipper explained that its agreement with a barge company requires that the shipper pay as if the barge is carrying a certain amount of tonnage, regardless of the load size. Thus, during a period of light-loading, the shipper would have to pay the barge company to move seven barges, instead of six, and the shipper would be required to pay as if the barges were carrying full loads.<sup>37</sup> In addition to increased transportation costs, stakeholders said that since light-loading requires the use of more barges to move the same amount of freight; barge shortages can occur if light-loading is widespread. One port stakeholder told us that during periods of light-loading, it takes more time to load the same amount of product onto barges (because of the need to use multiple barges and the time it takes to switch each barge out), which can lead to long lines of trucks waiting to unload their cargo at the port.

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<sup>37</sup> According to a barge company representative, contracts between barge companies and shippers generally stipulate whether extra shipping costs are borne by the shipper or the barge company. Sometimes the costs can be passed on to producers, such as by a grain company paying farmers less due to increased transportation costs.

**Figure 5: Example of Reduced Barge Capacity Caused by a Buildup of Sediment on a Harbor's Bottom**



Source: GAO, based on information provided by barge company representative. | GAO-17-635

- **Harbor closures:** Port stakeholders provided examples in which their ports were shut down due to unmet dredging needs. Several stakeholders, as well as the Corps, cited the 2012 drought as being particularly problematic. Over the course of 15 months, the Mississippi River fluctuated from historic flood stages in 2011 to record lows in 2012, dropping over 50 feet in some places. A significant amount of sediment from the 2011 flood settled along the river and in harbors, and as the water level fell, numerous harbors along the river were shoaled in and needed dredging. In this case, the shoaling occurred during the harvest season, which is the busiest time of year for the agricultural ports. Representatives from two ports told us they were shut down for 2 to 3 months, with barges full of grain stuck inside the harbor. Stakeholders said that grain silos at ports filled because barges could not get out of the harbors and farmers were at risk of

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losing grain due to spoilage in the field.<sup>38</sup> Corps officials told us that initially, four of the ports' harbors in one district were closed during the 2012 drought; so the Corps worked to dredge two of those ports' harbors so that agricultural shippers could move cargo from some ports. Harbor shutdowns led to increased costs as companies began trucking product to other ports. (One company estimated it lost \$5 million.) Some companies said that the increased costs led to downward pressure on the prices paid to farmers for grain. Port shutdowns affected non-agricultural stakeholders as well. For example, one port representative said that the area surrounding the port ran out of gas and diesel fuel three times because temporary harbor closures made it difficult to bring in fuel by barge. The 2012 drought was an unusual event, but the experiences at ports during that time provide useful insight into the critical nature of dredging at inland harbors. Moreover, port and tenant representatives provided other examples in which ports were temporarily shut down for a few weeks to as much as a month in more typical years. For example, a tenant told us that due to harbor shoaling at its port, the company spent \$98,000 to reroute 14 incoming barges to another location on the river, unload the cargo at that location, and truck the cargo into its port.

Port and industry representatives explained that the increased transportation costs created by light-loading and harbor closures are of particular concern because the affected industries operate on very small profit margins. In particular, agricultural companies and trade associations noted that one of the main reasons that their exports can compete in the global market is because of their low transportation costs. Some industry representatives raised concerns about their ability to switch to shipping cargo by truck or rail, explaining that shipping by barge is far more economical.<sup>39</sup>

In addition, port stakeholders noted that funding constraints that limit the Corps' ability to fully dredge their ports have led to increased costs for them. Although port stakeholders varied in their financial ability to pay for dredging, some stakeholders reported that they took their own steps to

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<sup>38</sup> Industry representatives told us that southern farms tend to have less storage assets than northern farms, and there is a particular sense of urgency related to harvesting crops before they are damaged by storms.

<sup>39</sup> In addition, some stakeholders noted that they did not have access to rail at their facility and raised concerns about the ability of truck and rail transportation to handle the volume of cargo moved by barges.

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open their harbor by hiring a dredge or excavating part of the harbor themselves. For example, one port representative said that his port recently spent an additional \$75,000 to further dredge the harbor because the Corps did not have enough funding to fully dredge it.<sup>40</sup> In addition, another port used funds from other sources to pay to dredge its harbor in 2010, 2011, and 2013.

Port and industry stakeholders also told us that the uncertainty related to the annual decisions made in the federal budget process and whether the Corps will have enough funding to dredge their harbors creates challenges in attracting tenants.<sup>41</sup> The Corps and the ports are not sure of how much funding will be provided in a given year until Congress passes the Corps' annual appropriation, as is the case with any activity funded through the annual federal budget process. Once the funding amounts and allocations are known, the Corps releases a work plan outlining which harbors will be dredged and the amount of funding allocated to each harbor. Port stakeholders stated that the funding uncertainty can affect their ability to attract tenants, which need clarity about the reliability of dredging when determining whether to spend millions of dollars to build facilities, such as grain silos, that will last decades at the port. One port provided an example in which a new tenant faced significantly increased costs because the harbor was not dredged and the tenant had to light-load its cargo. Corps officials and researchers echoed these concerns, noting the importance of reliable dredging when ports are attempting to attract new tenants.

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<sup>40</sup> As noted, this was to partially dredge the harbor, and the port representative stated that it was able to fund this work due to a tenant's paying extra fees for storage at the time. The port representative stated that without those fees, the port would not have been able to fund the dredging.

<sup>41</sup> The Congressional Research Service (CRS) has noted the uncertainty inherent in the federal budget process, due in part to the fact that agencies develop budgets over a year before the start of the fiscal year to which the budget pertains, and are developing the budget while being unsure of the pending economic conditions, presidential policies, and congressional actions. CRS, *Introduction to the Federal Budget Process* (Dec. 3, 2012) 98-721.

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## The Corps' Prioritization Process for Allocating Funds to Dredge Harbors Creates Challenges for Low Tonnage Ports

According to Corps officials, within current funding levels, the Corps must make decisions about which harbors to dredge, and the amount of dredging each harbor should receive. Based on interviews with Corps officials and our reviews of budget guidance documents, when assessing which projects to fund during the annual budget process, the Corps uses a risk-based matrix that considers condition versus consequence, and based on each value, assigns the project an overall risk score. With respect to dredging inland harbors, the anticipated condition is based on the expected level of shoaling,<sup>42</sup> and the consequence is based on the average annual tonnage moved by the port over the past 5 years, and other factors, such as imminent life-safety impacts. Consequence is rated on a scale of 1 to 5, with 1 being the most severe.<sup>43</sup> For example, ports that move less than 1-million tons of freight are ranked as “4,” or “low economic impact.” In interviews, Corps officials identified other factors that they consider when allocating funds for dredging, such as whether nearby ports will be dredged, but several Corps officials pointed to tonnage shipped as the primary factor they use to make dredging decisions. In addition, Corps officials noted that funding for low-commercial use ports—ports that on average ship less than 1-million tons per year—was reduced in the fiscal year 2012 budget and subsequent

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<sup>42</sup> Corps officials told us that the Corps conducts surveys each year to assess the conditions of the harbors, and uses the results of the surveys and historic knowledge to predict the extent to which the harbors will need dredging later in the year.

<sup>43</sup> Corps' budget guidance documents define these rankings from 1 to 5 as follows: (1) highest economic impact (or more than 10-million tons of freight moved annually); imminent life safety impact; court-decree-mandated action; DOD strategic port; or shutdown of energy distribution facility with no alternative modes of transportation; (2) high economic impact (or 5- to 10-million tons of freight moved annually); probable life safety impact; or alternate modes of transportation exist for energy distribution facilities, but at a higher cost than waterborne transportation; (3) moderate economic impact (or 1- to 5-million tons of freight moved annually); or possible life safety impact; (4) low economic impact (or less than 1-million tons of freight moved annually); no life safety impact; and (5) very low economic impact (recreational harbor or no commercial activity); no life safety impact.

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budgets, in response to a 2010 Memorandum from the Office of Management and Budget.<sup>44</sup>

Stakeholders, including representatives of smaller ports as well as a barge operator and industry associations that we spoke to, raised concerns about the Corps' emphasis on tonnage and its effects on which ports are selected for dredging, with some stating that other factors should be considered (such as economic impact or cargo value). Some stakeholders and an expert stated that if ports do not receive dredging and barges moving through that harbor have to light-load or temporarily cannot move through the port, then industries may leave the port; the cost of dredging may increase as sediment builds, and the port may face more difficulties meeting the 1-million-ton threshold. Corps officials acknowledged stakeholders' concerns related to the low-commercial use ports' ability to compete in the prioritization process and stated that they have worked to request more funding for these ports since funding was cut in fiscal year 2012. However, a senior Corps official also noted that the inland ports make up a very small percentage of the Corps' overall national navigation project portfolio and therefore competition for constrained resources is very keen.

Congress has taken steps to try to address this issue, such as requiring the Corps to allocate a minimum amount of the funds to be reimbursed from the Harbor Maintenance Trust Fund on low tonnage ports.<sup>45</sup> In addition, Congress has emphasized the importance of considering factors

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<sup>44</sup> In 2010, the Office of Management and Budget directed agencies to identify low priority discretionary programs and subprograms in the fiscal year 2012 budget for potential spending reductions. One option offered was to identify cuts amounting to a least 50 percent of total funding within a program or subprogram. Corps officials stated that the administration used this option to identify reduced funding for low commercial use projects, i.e. harbors and channels at ports that move less than 1-million tons of commerce per year and waterways that move less than 1-billion ton miles per year. According to Corps officials, these reductions were reflected in the President's Fiscal Year 2012 Budget. OMB Memorandum, M-10-20 (June 8, 2010).

<sup>45</sup> Pub. L. No. 113-121, 128 Stat. 1193 (2014) codified at 33 U.S.C. § 2238, included language that specified that not less than 10 percent of baseline funding, which is the amount made available for fiscal year 2012 to pay the eligible operations and maintenance costs assigned to commercial navigation of all harbors and ports within the United States, and at least 10 percent of priority funds (defined as the difference between the funds made available from the Harbor Maintenance Trust Fund in the current fiscal year and the amount of funds that were made available in fiscal year 2012) should be used for harbors that transport less than 1-million tons of cargo annually. According to Corps officials, the administration has submitted budget and work-plan submissions that would enable Congress to meet these targets.

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beyond tonnage. For example, when allocating funds from the Harbor Maintenance Trust Fund among eligible harbors and channels, the Corps is directed by statute not to base its allocation of funds solely on the amount of tonnage transiting through the harbors.<sup>46</sup> In addition, in determining an equitable allocation, the Secretary of the Army is required to consider:

- the national and regional significance of harbor operations and maintenance; and
- a biennial assessment of the needs and uses of the harbors, which should include, to the extent practicable, the national, regional, and local benefits of such uses, including the use of harbors for: commercial navigation and the movement of goods; domestic and international trade; commercial fishing; subsistence; harbors of refuge; transportation of persons; domestic energy production; use by the Coast Guard or Navy; emergency response; recreation purposes; and other authorized uses.<sup>47</sup>

When providing appropriations for the Corps, Congress has also suggested the Corps consider issues beyond tonnage when allocating funds for dredging.<sup>48</sup> Based on our reviews of budget guidance documents and interviews with Corps officials, the Corps does collect data on many of the factors identified by Congress in law and in the language accompanying the appropriations act. For example, the Corps collects information on whether the harbor is used for some of the purposes outlined in the statute (for example; commercial fishing, transportation of persons, whether the harbor is used by the Coast Guard); however, a senior Corps official noted that many of these factors are more applicable to the coastal harbors and channels and are not as applicable to the inland harbors. In addition, Corps officials told us they may note specific circumstances about the regional importance of a port when submitting a budget package to dredge its harbor (for example, if

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<sup>46</sup> 33 U.S.C. § 2238(c)(2)(B).

<sup>47</sup> 33 U.S.C. §§ 2238(c), (e).

<sup>48</sup> For example, the explanatory statement accompanying the 2016 appropriations for the Corps states that when allocating funds for operations and maintenance activities, the Corps should include factors such as the extent to which the work will enhance national, regional, or local economic development, as well as the dollar value of cargo handled and savings over alternative transportation methods, among other factors. Joint Explanatory Statement, Division D. 162 Cong. Rec. H10,056 (Dec. 17, 2015) accompanying Pub. L. No. 114-113 div D. tit 1 § 102, 129 Stat. 2241, 2402 (2015).



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industries in the port lack access to other modes of transportation). However, Corps officials told us that due to funding limitations, they have not conducted the statutorily required assessments of the national and regional significance of the harbor operations and maintenance, or of the local, regional, and national benefits from the use of the harbors. A senior Corps official noted that the cost to do an in-depth economic analysis of a port may be equivalent to the cost of dredging some of these harbors, and the results of the economic analyses may not change which harbors are ultimately prioritized for dredging.<sup>49</sup>

However, the Corps has developed some internal tools that might help it assess data related to some of the factors that Congress has required the Corps to consider when allocating funds from the Harbor Maintenance Trust Fund, such as the national and regional significance of harbor operations and maintenance, and the use and benefit of the harbor for domestic trade. For example, a Corps official from the Corps' Engineer Research and Development Center (ERDC)<sup>50</sup> explained that ERDC developed a web-based "channel portfolio tool" that collates, summarizes, and visualizes detailed data from the Corps' Waterborne Commerce Statistics Center to help district officials understand the direct role of dredging on the movement of cargo through coastal ports and the inland waterway system. The tool is scalable, meaning that users can view the data for the entire river system, for specific combinations of harbors, or for specific harbors. Corps officials using the tool can select specific harbors and quickly access annualized data on how many tons of various commodities moved through the location, the depths of loaded barges (which can be compared to present shoaling conditions), and the origin and destination of the cargo. Further, the official explained that the Corps has also used the tool to generate metrics on the amount and the dollar value of cargo at risk when harbors lose 5 feet of depth. The official further added that these metrics capture the cargo most at risk during periods of shoaling or low water conditions, thereby enabling objective

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<sup>49</sup> In addition, Corps officials noted that before each port is constructed with federal funds, the Corps conducts economic analyses to ensure that the project is justified for construction and maintenance.

<sup>50</sup> As the research organization of the Corps, ERDC conducts research and development in support of the soldier, military installations, and civil works projects (water resources, environmental missions, etc.) as well as for other federal agencies and state and municipal authorities, and with U.S. industry through innovative work agreements. According to ERDC staff, requests for research and analyses from the Corps drive the work at ERDC.

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comparisons across harbors. In addition, according to a Corps official, the Corps' Institute for Water Resources<sup>51</sup> has a tool that provides a detailed model that uses a variety of data about the coastal harbors, including their ship depths and cargo value, to better inform budgetary decisions. The official added that this tool potentially could be expanded to inland harbors.

The tools described above suggest that the Corps has tools already available that may help it better assess the additional factors that Congress required it by statute to consider when allocating dredging funds. For example, information about vessel depths, barge traffic, cargo value, and destination used in the channel portfolio tool could help the Corps assess the needs, use, and significance of harbor operations and maintenance by demonstrating the effects from unmet dredging needs (e.g., the frequency and duration of light-loading and the estimated impact on shipping costs), and comparing the relative effects among inland ports. However, Corps officials told us that additional work would be needed to develop useful metrics for inland ports, since the existing analyses have focused on coastal ports. For example, as previously noted, one tool estimates impacts from a loss of 5 feet of draft at a deep-draft coastal harbor, but an official stated it would be rare for an inland harbor to lose that much depth. Furthermore, the value of using the existing tools in this new context would depend on the reliability and the costs of this new approach, which are currently unknown.<sup>52</sup> As noted above, Corps officials stated that funding constraints have prevented them from conducting the statutorily required assessments of the significance of harbor operations and maintenance. However, we developed a framework for examining agencies' efforts to manage declining resources, and a key sub-theme within that framework is the importance of consulting with Congress to consider how budget decisions align with congressional goals, constituent

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<sup>51</sup> The Institute for Water Resources was created in 1969 to analyze and anticipate changing water resources management conditions and to develop planning methods and analytical tools to address economic, social, institutional, and environmental needs in water resources planning and policy.

<sup>52</sup> Federal internal control standards state that quality information is vital to achieving agency objectives and that management should use quality information to make informed decisions. These standards further define quality information as being appropriate, current, complete, accurate, and accessible. GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

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needs, and industry concerns.<sup>53</sup> A senior Corps official agreed that it may be beneficial for the Corps to provide Congress with information on the extent to which the Corps' existing tools could be adapted to allow it to consider factors beyond tonnage when allocating dredging funds, the limitations of using these tools, as well as the amount of additional resources that may be needed to pursue such an approach.<sup>54</sup>

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## Many Stakeholders Favored Continued Use of the Harbor Maintenance Trust Fund and Identified Potential Challenges of Alternative-Funding Options

### Stakeholders Preferred the Harbor Maintenance Trust Fund for Funding Dredging

Many stakeholders and experts we interviewed said that the federal government should make more use of the current mechanism for funding dredging—the Harbor Maintenance Trust Fund—before considering alternative-funding options. Stakeholders representing shippers, as well as a state department of transportation official stated that dredging inland harbors is in the national interest as it promotes U.S. exports and transports freight through coastal ports such as New Orleans and Baton

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<sup>53</sup> GAO, *Declining Resources: Selected Agencies Took Steps to Minimize Effects on Mission but Opportunities Exist for Additional Action*, [GAO-17-79](#) (Washington, D.C.: Dec. 20, 2016).

<sup>54</sup> However, an official from the Department of the Army, Office of the Assistant Secretary (Civil Works), noted that expanding the existing tools or developing new tools might result in shifting resources between dredging projects, but would not likely result in more resources being allocated to dredging, since dredging projects must compete with other needs.

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Rouge.<sup>55</sup> Stakeholders also noted that the fund has a balance that is available for such projects.<sup>56</sup> However, the money from this fund is only available for these purposes if Congress makes an appropriation out of the Harbor Maintenance Trust Fund. Congress has taken steps to increase spending from the Harbor Maintenance Trust Fund; however, other factors may affect the use of the trust fund.<sup>57</sup> For example, to balance competing priorities among government programs and meet budgetary spending caps, Congress may choose to appropriate more or less funding from a trust fund than requested by an agency.<sup>58</sup> In addition, as we have previously reported, due to fiscal pressures imposed by the nation's budget deficit, any decisions about the Harbor Maintenance Trust Fund would need to be considered within the context of all major federal spending and tax programs.<sup>59</sup>

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<sup>55</sup> There are differing opinions on the use of the tax to fund inland harbor dredging. For example, some experts note that there could be equity issues if those that do not pay into the fund receive benefits from the fund, and as noted earlier, the trust fund collects revenues from a tax collected primarily at coastal ports, not inland ports. A Supreme Court ruling prohibits shippers who export products through inland ports from paying the tax. *United States v. U.S. Shoe Company*, 523 U.S. 360 (1998). In the case, the U.S. Supreme Court held that the Harbor Maintenance Tax is a tax not a user fee and, as such, violates the Export Clause of the U.S. Constitution, Art I, § 9, cl.5 which prohibits a tax on articles exported from any State. Others argue that inland ports serve as a feeder system for the larger coastal ports and should receive dredging funds from the trust fund.

<sup>56</sup> As previously noted, according to Corps officials, the Harbor Maintenance Trust Fund had a balance of approximately \$8.8 billion at the beginning of fiscal year 2017.

<sup>57</sup> Pub. L. No. 113-121, title II, § 2101, 128 Stat. 1193, 1272 (2014) codified at 33 U.S.C. § 2238b provides for a graduated increase in spending from the Harbor Maintenance Trust Fund until 2025 and thereafter when the target appropriations reach 100 percent of the total amount of harbor maintenance taxes received in the previous fiscal year subject to annual appropriations.

<sup>58</sup> We have previously reported that although trust funds are created to account for the receipt and expenditure of monies that are dedicated for a specific purpose, the designation of a trust fund does not itself impose a greater commitment on the government to carry out the activity for which the trust fund was created than other government activities. GAO, *Federal Trust and Other Earmarked Funds: Answers to Frequently Asked Questions*, [GAO-01-199SP](#) (Washington, D.C.: January 2001).

<sup>59</sup> *Federal User Fees: Substantive Reviews Needed to Align Port-Related Fees with the Programs They Support*, [GAO-08-321](#) (Washington, D.C.: Feb. 22, 2008).

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## Stakeholders Cited Potential Challenges Related to Alternative Funding Options

We asked selected stakeholders and experts about three options for funding inland harbors' dredging:

- contributions from state and local governments;<sup>60</sup>
- expanding the use of the Inland Waterways Trust Fund (currently used for new construction and major rehabilitation of locks and dams as well as other channel and waterway improvements) to include maintenance dredging;<sup>61</sup> and
- a new user fee or tax.<sup>62</sup>

Stakeholders and experts identified challenges, some of which apply to multiple options and some of which apply to specific options. Additional details on the challenges are below:

*Financial effects on users and local governments:* Stakeholders raised concerns that a user fee or tax<sup>63</sup> or a state and local contribution would negatively affect users and those governments. For example, stakeholders representing port tenants, shippers, and trade associations

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<sup>60</sup> As previously mentioned, the federal government currently pays for 100 percent of operations and maintenance, including dredging, at inland harbors.

<sup>61</sup> The Inland Waterways Trust Fund is currently funded through a fuel tax on barge operators, and Congress is authorized to appropriate funds from it for new construction and major rehabilitation of locks and dams as well as other channel and waterway improvements but not for operations and maintenance activities, such as maintenance dredging. Stakeholders discussed expanding the use of the trust fund to include dredging.

<sup>62</sup> The legal distinction between a "fee" and a "tax" can be complicated and depends largely on the context of the particular assessment. Generally, a tax arises from the government's sovereign power to raise revenue, need not be related to any specific benefit, and its payment is not optional, whereas a user fee is typically related to some voluntary transaction or request for government goods or services above and beyond what is normally available to the public. For more information see [GAO-08-386SP](#) and GAO, A Glossary of Terms Used in the Federal Budget Process, [GAO-05-734SP](#) (Washington, D.C.: September 2005).

<sup>63</sup> Stakeholders discussed the use of a new user fee or tax to fund dredging; however, there was no consensus on which users of the waterways would pay. We have reported that there are various ways to design user fees to encourage greater equity, efficiency, revenue adequacy and administrative burden on the agency and payers of the fees. These criteria interact and are often in conflict with each other; as such, there are tradeoffs to consider among the criteria when designing a fee. GAO, *Federal User Fees: A Design Guide*, [GAO-08-386SP](#) (Washington, DC: May, 29, 2008).

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stated that a user fee could raise waterborne transportation costs and negatively affect shippers. State department of transportation officials stated that there could be a shift to alternative transportation modes if barge rates increased, which could lead to more congestion and surface degradation on roads. However, experts noted that alternative modes are more costly than water transportation, so any diversion to these modes would depend on the extent of the increase in water transportation costs. Stakeholders such as ports, port tenants, and state departments of transportation officials also stated that many of the selected ports in our review do not have the financial resources to provide a funding contribution, and that it may be difficult to secure state or local funds from rural, low income counties and states where a number of the inland ports are located. More generally, we have reported that state and local governments face long-term fiscal pressures, which may limit their ability to contribute to dredging costs for harbors in their jurisdiction.<sup>64</sup>

*Impact on Inland Waterways Trust Fund:* Stakeholders representing ports, port tenants, and state department of transportation officials stated that the Inland Waterways Trust Fund has a backlog of lock and dam projects that need funding, and any expanded use (absent an increase in the fuel tax) of the fund's revenues on maintenance dredging would reduce available funds for locks and dams. In addition, port tenants, ports, and a state department of transportation official noted that directing funds to locks and dams, many of which are decades old and in need of repairs, may be a better use of funds than for dredging. For example, a port tenant noted that a lock failure would have more significant effects to more users than shoaling at one harbor.

*Alternative funding options may not result in more predictable funding for dredging:* Stakeholders and a state department of transportation official stated that requiring a state or local contribution may not result in more consistent funding given state and local budget processes and priorities. A state department of transportation official noted that funds for dredging could compete with other local needs, such as schools. When discussing alternative options generally, a Corps official said that since there is an existing mechanism that collects funds that can be appropriated for dredging—the Harbor Maintenance Tax—other options may not be

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<sup>64</sup>GAO, *State and Local Governments Fiscal Outlook 2016 Update*, [GAO-17-213SP](#) (Washington, D.C.: 2017).

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feasible. This official noted that any new funding option may impose administrative burdens that might outweigh additional revenue collection.

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Stakeholders Cited  
Potential Benefits Related  
to Alternative Funding  
Options

The majority of experts and a number of stakeholders we spoke to identified potential benefits related to users directly paying for their infrastructure use and using state and local revenues for dredging instead of devising an entirely new funding mechanism.

*Users pay for infrastructure use:* Some of the experts noted that many benefits of dredging inland harbors are local and that a state or local contribution from their budgets or a fee or tax paid by port users may be more appropriate than other funding options as those who benefit most from a project would pay for it.<sup>65</sup> The Congressional Budget Office, Congressional Research Service, and the Transportation Research Board have also noted the benefits of maritime users paying more for their infrastructure use.<sup>66</sup> State department of transportation officials as well as experts noted that a new user fee may be more appropriate than a tax as it would mean one is paying for their use rather than paying a general tax. However, experts and some of the state departments of transportation officials cautioned that any alternative funding option imposed on just one section of the inland waterways would likely raise equity concerns and could put those inland ports at a competitive disadvantage. Thus, they

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<sup>65</sup>We have reported that freight costs are not fully passed on to consumers across all transportation modes and that infrastructure costs attributable to commercial freight transported over the waterways and by trucks exceed the revenue that these freight transportation providers pay governments to fund that infrastructure. GAO, *Surface Freight Transportation: A Comparison of the Costs of Road, Rail, and Waterways Freight Shipments that Are Not Passed on to Consumers*, [GAO-11-134](#) (Washington, D.C.: January 2011).

<sup>66</sup> Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (Washington, DC: March 2011); Congressional Research Service, *Inland Waterways: Financing and Management Options in Federal Studies* (Washington, D.C.: June 7, 2013); Transportation Research Board, *Funding and Managing the U.S. Inland Waterway System: What Policy Makers Need to Know*, National Academies of Sciences, Engineering, and Medicine (Washington, D.C.: 2015)

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emphasized that any alternative funding option should be applied to all U.S. inland waterways and not just those in the scope of this report.<sup>67</sup>

*Use of state and local revenues for dredging:* Some stakeholders, including port tenants and shippers, believe that they already pay for dredging through state, local, and port taxes and fees. Some of these stakeholders gave reasons why a state or local contribution could be warranted. First, one port tenant, one state department of transportation official and two experts noted that state and local governments benefit from operating ports, which contribute to their economies. In addition, stakeholders representing port tenants and a state department of transportation agency, as well as one expert, noted that state and local governments and ports have provided funding for landside investments at ports, and it is therefore in their interest to maintain port access to the river. We have previously reported that investments being made in maritime infrastructure should be considered as part of state and national freight planning.<sup>68</sup> In addition, some stakeholders noted that using state and local revenues to fund dredging could be an option if it could be used to match federal government funds. A Corps official noted that it is currently possible for non-federal entities to provide “contributed funds” to the Corps for dredging, but none has done so yet for this particular segment of the Mississippi River.<sup>69</sup> However, Corps officials stated that they have received contributed funds for dredging in other regions, and as previously noted, some ports have paid for their own dredging in certain cases and port tenants are already financially responsible for dredging around their docks.

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<sup>67</sup> We have reported that understanding the tradeoffs associated with different aspects of a fee’s design can provide decision makers with better information about user-fee financing. For example, the extent to which a program benefits the general public versus users could direct the proportion of total program costs that are paid for by general revenues versus user fees. The cost of providing the benefits to each user could then be determined and assigned through user fees. We have also reported that user fees, while promoting a beneficiary-pays principle, may also run contrary to the ability to pay principle which could be taken into consideration when designing a fee. See, [GAO-08-386SP](#).

<sup>68</sup>In 2012, we recommended that the Federal Highway Administration inform the development of the National Freight Strategic Plan with information from the U.S. Army Corps of Engineers’ planned investments in the nation’s navigable waterways. This recommendation is currently open. GAO, *Maritime Infrastructure: Opportunities Exist to Improve the Effectiveness of Federal Efforts to Support the Marine Transportation System*, [GAO-13-80](#) (Washington, D.C.: Nov. 13, 2012).

<sup>69</sup> As previously noted, a number of port and tenant representatives we interviewed noted that the ports in this section of the river are in low income areas, which may make it more difficult for these local governments to contribute funds for dredging.



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Stakeholders representing shippers said that they might be more inclined to consider an alternative-funding option if the benefits of a particular option outweighed the costs. In addition, some stakeholders also said that they would be more willing to consider a funding option for emergency dredging as opposed to routine dredging and would be more willing if there were a cost-share with the federal government.

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## Conclusions

The Mississippi River and its inland ports are important to the movement of freight, particularly agricultural goods destined for export. However, natural shoaling in many of these ports' harbors negatively affect vessel operations, potentially resulting in freight congestion and increased shipper costs. The Corps, responsible for dredging these particular harbors as well as hundreds of other harbors and channels around the country, operates in a federally constrained budgetary environment and will likely continue to do so. It therefore must choose which harbors to dredge, with what frequency, and to what depth and width. In making these decisions, the Corps primarily relies on tonnage data—a potentially reasonable approach. The Corps is statutorily required to consider other factors such as the harbors' national, regional, and local benefits when allocating funding for dredging inland harbors. Although the Corps has cited funding constraints as the reason for being unable to fulfill the statutory requirements, it has tools available that could potentially be adapted to help it consider all the factors Congress identified in statute and better inform its decisions regarding inland harbor dredging. However, some of these tools were developed for coastal harbors, and the feasibility, potential limitations, and costs of adapting the Corps' existing analytical tools and capabilities will need to be assessed before these tools could be successfully utilized.

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## Recommendation

We recommend the Assistant Secretary of the Army for Civil Works direct the Director of Civil Works to determine whether existing tools and capabilities (such as the Corps' analyses and models related to inland harbors' conditions and freight traffic, as well as shoaling effects at coastal ports) can be adapted to help evaluate other factors when allocating funds from the Harbor Maintenance Trust Fund. The Corps should report to Congress on the feasibility, limitations, and potential costs and on an estimate of any additional funds needed to use such an approach to meet the statutory requirements.

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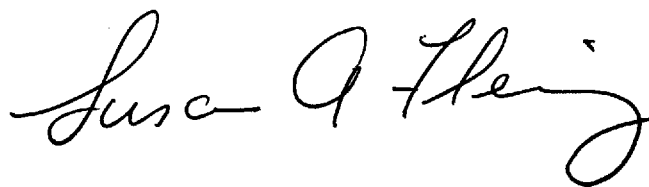
## Agency Comments

We provided a draft of this report to the Department of Defense for review and comment. In comments, reproduced in appendix II, the Department of the Army, Office of the Assistant Secretary (Civil Works), stated that it concurred with the recommendation; with comment, and that it would work with the Corps to address the recommendation. The office also provided comments that focused on the recommendation in the broader context of the development of the Corps' overall Civil Works budget, which we considered and incorporated as appropriate. In addition, the Department of the Army, Office of the Assistant Secretary (Civil Works) and the Corps of Engineers provided technical comments, which we considered and incorporated as appropriate.

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We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, and other interested parties. In addition, the report is available at no charge on our website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or [Flemings@gao.gov](mailto:Flemings@gao.gov). Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.



Susan A. Fleming  
Director,  
Physical Infrastructure Issues

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# Appendix I: Objectives, Scope, and Methodology

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The Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2016,<sup>1</sup> contained a provision for us to study freight flows, dredging, and funding of dredging with respect to the harbors of inland shallow-draft<sup>2</sup> ports on the Mississippi River between St. Louis and Baton Rouge. This report addresses three objectives: (1) what is known about the freight traffic (including types of freight and trends in traffic) of selected inland ports on the Mississippi River between St. Louis and Baton Rouge since 2010; (2) stakeholders' views on any challenges that the current federal approach to funding dredging presents for inland ports and the reported effect on the movement of freight at these ports; and (3) stakeholders' views on the potential benefits and challenges of using alternative options for funding dredging of inland harbors.

The 13 selected ports included in this review are (listed in geographic order, southbound): Southeast Missouri Regional Port Authority, Missouri; Hickman-Fulton County Riverport Authority, Kentucky; New Madrid County Port Authority, Missouri; Pemiscot County Port Authority, Missouri; Osceola Port Terminal, Arkansas; International Port of Memphis, Tennessee; Helena-West Helena/Phillips County Port Authority, Arkansas; Port of Rosedale, Mississippi; Yellow Bend Port, Arkansas; Port of Greenville, Mississippi; Port of Lake Providence, Louisiana; Madison Parish Port, Louisiana; and Port of Vicksburg, Mississippi.<sup>3</sup>

To determine what is known about freight traffic of selected inland ports between St. Louis and Baton Rouge since 2010, we reviewed and analyzed data from the U.S. Army Corps of Engineers' (Corps) Waterborne Commerce Statistics Center for the 13 inland ports included in our review. Specifically, we analyzed the types and amount of freight

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<sup>1</sup> Joint Explanatory Statement, Division D, 162 Cong. Rec. H 10,056 (Dec. 17, 2015) accompanying The Consolidated Appropriations Act, 2016, Pub. L. No. 114-113, 129 Stat. 2242 (2015).

<sup>2</sup> Draft refers to the depth of a vessel's keel below the water line. Shallow-draft channels and harbors have depths less than or equal to 14 feet.

<sup>3</sup> The Corps identified 20 projects that receive federal funding for dredging in this section of the river. These 20 projects provide river access to 16 ports (in addition, one port in this section of the river is not dredged, because it is on the main channel of the river and does not have dredging needs). Of those 16 ports, we eliminated 3 ports from our scope: two ports that did not have enough traffic to be included in the Corps' data sets, and Baton Rouge (because the relevant harbor serves one area of the much larger and deeper Port of Baton Rouge complex).

transported through these ports annually, as measured by weight, from 2010 through 2015.<sup>4</sup> These data are referred to as annual tonnage data, and include total waterborne tonnage, whether the tonnage was moving into or out of the port, and the amount and types of commodities moved through the port.<sup>5</sup> We analyzed these data to determine whether we could identify any trends in the movement of freight in these ports. To assess the reliability of the data, we reviewed a 2009 GAO report that discussed the reliability of Corps' tonnage data and then interviewed Corps officials at the Waterborne Commerce Statistics Center about any changes that had occurred in the data collection, receipt, handling, and storage processes since that review, as well as their current processes for ensuring the reliability of the data.<sup>6</sup> We also interviewed port officials to discuss any concerns they had about the data and companies responsible for filing the reports that the Corps uses to assess port tonnage, to discuss their methods for ensuring the accuracy of the data. We found the data to be reliable for the purposes of our review.

To determine stakeholders' opinions on whether the current federal-funding approach for dredging presents any challenges for inland ports and on the reported effects on freight movement at these ports, we interviewed port directors and in some cases port tenants at 11 of the 13 inland ports. We also conducted site visits at 7 of the 13 selected ports<sup>7</sup> to interview port directors, harbor services companies,<sup>8</sup> and tenants in person, and to gain an in-depth understanding of how shoaling can affect

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<sup>4</sup> We selected this time frame as it allowed us to efficiently review recent trends in freight occurring after the recession. In addition, this time frame captured a period during which Congress changed the use of line-item appropriations to fund dredging of harbors, an extreme weather event occurred that affected harbors, and OMB issued new guidance that affected budgeting for dredging. The most recent Corps data available on port traffic were for calendar year 2015.

<sup>5</sup> Tonnage refers to the weight of the cargo carried by vessels moving through the ports. Vessel operators are required to file reports with the Corps' Waterborne Commerce Statistics Center specifying the weight and type of commodity moved, as well as its origin and destination.

<sup>6</sup> GAO, *Missouri River Navigation: Data on Commodity Shipments for Four States Served by the Missouri River and Two States Served by Both the Missouri and Mississippi Rivers*, [GAO-09-224R](#) (Washington, D.C.: Jan. 15, 2009).

<sup>7</sup> The ports visited included the ports of Vicksburg, Mississippi; Lake Providence, Louisiana; Madison Parish, Louisiana; Osceola, Arkansas; New Madrid County, Missouri; Southeast Missouri, Missouri; and Hickman-Fulton, Kentucky.

<sup>8</sup> Harbor services companies are responsible for moving barges in and out of harbors.

their harbors. To select the ports we interviewed and visited, we used information provided by the Corps on relevant federal dredging projects and the corresponding inland shallow-draft ports in this section of the river. Through initial research and interviews, we determined which factors may contribute to variations in ports' dredging needs, extent of dredging received, and the effect of unmet dredging needs. Based on those factors, we selected ports for site visits and interviews to ensure diversity in total tonnage, the percentage of inbound and outbound freight traffic at the port, the types of commodities most frequently handled, geographic location (including which Corps District they were located in), the funding source for dredging,<sup>9</sup> and prior dredging history, based on information provided by the Corps. In addition to interviewing port directors and tenants, we also conducted interviews with industry stakeholders such as barge companies, trade associations, and shippers as well as academic experts. We also interviewed officials at the United States Department of Agriculture (USDA) Agricultural Marketing Service's Transportation Services Division to discuss their research on agricultural transportation. See tables 4 and 5 for a list of stakeholders and experts we interviewed. We selected industry and academic stakeholders based on a review of our prior reports on waterway transportation, as well as through recommendations from other interviewees.

In addition, to understand how the Corps budgets and implements dredging activities and the role of the federal budget process, we reviewed relevant statutes, the Corps' budget guidance documents, as well as prior President's Budget requests and congressional appropriations, and interviewed Corps officials from the headquarters, division, and district offices.<sup>10</sup> We reviewed statutes, regulations, and legislation to understand what factors Congress has directed the Corps to consider when allocating funds for dredging harbors. We also used prior frameworks developed by GAO to assess the Corps' actions with respect

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<sup>9</sup> Although dredging for the selected ports' harbors is generally funded by the Harbor Maintenance Trust Fund, Congress provides funds either through an operations and maintenance appropriation, or a Mississippi River and Tributaries appropriation, which are generally reimbursed by the trust fund. We selected ports to ensure diversity in regard to the type of appropriation that funds their harbor dredging because stakeholders expressed in interviews a perception that the appropriation type affects a harbor's likelihood of receiving dredging funds. The Corps later clarified for us that the type of appropriation does not affect whether a harbor receives funding for dredging.

<sup>10</sup> The district offices responsible for the 13 selected inland ports are the Vicksburg, Mississippi; Memphis, Tennessee; and St. Louis, Missouri, offices. Regional oversight is provided through the Mississippi Valley Division located in Vicksburg.

to collecting and analyzing data to help inform its budgeting decisions. We received data from the Corps on the prior dredging history for each port, for 2010 through 2016. To determine the reliability of the dredging history data, we compared these data to documentation publicly available, such as Corps work plans that outline the dredging plan for each year, and cross-checked the data against what port stakeholders told us in terms of prior dredging activities. We followed up with Corps officials to discuss the data and obtain supplementary information as necessary to get the most complete, reliable information possible. Except where otherwise noted, we found the data sufficiently reliable for our purposes.

To determine stakeholders' opinions about the potential benefits and challenges of using alternative funding methods for dredging inland harbors, we identified funding options through a literature search and conducted 14 initial interviews with 11 stakeholders representing industry, including representatives of some of the ports we previously described, and 4 experts. We used these initial interviews to collect the stakeholders' general views on potential alternative-funding options, as well as the benefits and challenges of those options. From these interviews and literature searches, we identified the three types of options that were most commonly discussed: a new user fee or tax, a state or local contribution, and expanding the use of the Inland Waterways Trust Fund for dredging.<sup>11</sup> We then interviewed 33 stakeholders representing ports, tenants, shippers, barge companies, and state transportation agencies to collect their opinions on the benefits and challenges of each of the three types of options. We selected stakeholders to interview based on a review of related reports and suggestions from other interviewees, and we included port tenants and representatives from the ports we interviewed. In addition to these stakeholders, we interviewed five experts on their views of the benefits and challenges of the alternative funding options.<sup>12</sup> The experts were identified through a literature search and our prior, related reports on inland waterways and surface transportation funding and financing. We selected these experts based on their

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<sup>11</sup> The Inland Waterways Trust Fund is used to fund new construction and major rehabilitation of locks and dams, as well as other channel and waterway improvements, but is not authorized for operations and maintenance activities, such as maintenance dredging. It is funded through a 29-cent excise tax on diesel fuel used by towboats, tugboats, and other vessels.

<sup>12</sup> One expert was interviewed in both rounds of interviews; meaning 8 experts were interviewed in total.

knowledge of the inland waterways and/or infrastructure funding and judgmentally chose at least two individuals from academia and consulting firms. See tables 4 and 5 for a list of stakeholders and experts we interviewed

With respect to research objectives 2 and 3, because we asked stakeholders for their opinions and did not conduct a survey in which every stakeholder could provide a response as to whether a certain issue was relevant for them, we do not enumerate responses in the report. Instead, we analyzed the responses and reported on common themes that arose in multiple interviews. In addition, considering the number of inland ports outside of this section of the river and the fact that we selected a non-generalizable sample of stakeholders, ports, tenants, and experts to discuss dredging issues and funding options related to the selected ports in this section of the river, the information cannot be used to make inferences about a population. However, the description of the Corps' budget development process is representative of its process for all dredging projects.

We conducted this performance audit from July 2016 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Table 4: List of Stakeholders GAO Interviewed**

<b>Company</b>	<b>Type</b>
Agrium, Inc. (New Madrid)	Fertilizer manufacturer
American Commercial Barge Line	Barge line
American River Transportation Co. LLC.	Barge line
Big River Rice and Grain (Lake Providence)	Grain distributor
CAM2 International, LLC (Vicksburg)	Petroleum products manufacturer
Cargill (Hickman-Fulton)	Grain distributor
CHS, Inc. (Lake Providence)	Agricultural cooperative
Continental Rail (Madison Parish)	Railroad
David J. Joseph, Inc.	Scrap metals distributor
The Doe Run Company (Southeast Missouri)	Lead concentrate manufacturer

**Appendix I: Objectives, Scope, and Methodology**

<b>Company</b>	<b>Type</b>
Dredging Contractors of America	Industry association
Ergon Biofuels, LLC. (Vicksburg)	Ethanol manufacturer
Ergon Marine and Industrial Supply, Inc. (Vicksburg)	Harbor services
Falco Chemical, Inc. (Vicksburg)	Chemicals manufacturer
Helena Chemical Company (various locations)	Chemical distributor
Inland Rivers, Ports and Terminals, Inc.	Industry association
Girardeau Stevedores and Contractors, Inc. (Southeast Missouri)	Harbor services
Kirby Corporation	Barge line
Midwest Grain and Barge (Southeast Missouri)	Grain distributor
National Corn Growers Association	Industry association
Riceland Foods (New Madrid)	Grain distributor
Sanders (Madison Parish)	Farm supply distributor
Soy Transportation Coalition	Industry association
Terral River Service, Inc. (various locations)	Harbor services
Waterways Council, Inc.	Industry association
Wepfer Marine, Inc. (various locations)	Harbor services
<b>Port representatives</b>	
Port of Greenville	
Hickman-Fulton County Riverport Authority	
Port of Lake Providence	
Madison Parish Port	
International Port of Memphis	
New Madrid County Port Authority	
Osceola Port Terminal	
Pemiscot County Port Authority	
Port of Rosedale	
Southeast Missouri Regional Port Authority	
Warren County Port Commission	
<b>State Departments of Transportation and Regional Authority</b>	
Arkansas Waterways Commission	
Delta Regional Authority	
Kentucky Transportation Cabinet	
Louisiana Department of Transportation and Development	
Mississippi Department of Transportation	



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**Appendix I: Objectives, Scope, and Methodology**

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<b>Company</b>	<b>Type</b>
Missouri Department of Transportation	
Tennessee Department of Transportation	

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Source: GAO. | GAO-17-635

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**Table 5: List of Experts GAO Interviewed**

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Larry Bray, Ph.D., University of Kentucky
Mark Burton, Ph.D., University of Kentucky
Joseph Crabtree, Ph.D., University of Kentucky <sup>a</sup>
Bryan Gibson, Ph.D., University of Kentucky <sup>a</sup>
Brian Grote, Mercator Advisors LLC. <sup>a</sup>
Jim Kruse, Texas A&M University <sup>a</sup>
Alan Meyers, WSP USA <sup>a</sup>
Sharon Younger, Ph.D., Younger Associates

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Source: GAO. | GAO-17-635

<sup>a</sup>Indicates which experts we interviewed for their opinions on three specific options for funding dredging. Other experts were interviewed to collect information about the issues in general.

# Appendix II: Comments from the Department of the Army



DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
CIVIL WORKS  
108 ARMY PENTAGON  
WASHINGTON DC 20310-0108

Ms. Susan Fleming  
Director  
Physical Infrastructure  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, D.C. 20548

Dear Ms. Fleming:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-17-635, "INLAND PORTS: The Corps of Engineers Should Assess Existing Capabilities to Better Inform Dredging Decisions," dated June 7, 2017 (GAO Code 100987).

The DoD concurs with comment on the recommendation in the GAO report. Specific comments on the report are embedded in the enclosed summary and Adobe report. The DoD appreciates this opportunity to address the GAO recommendation for determining whether existing tools can be adapted to evaluate a variety of factors when making annual funding allocations from the Harbor Maintenance Trust Fund and to determine the resources needed to further develop the tools.

Sincerely,

A handwritten signature in blue ink, appearing to read "Eric V. Hansen", is positioned above the typed name.

Eric V. Hansen  
Deputy Assistant Secretary of the Army  
(Management and Budget)

Enclosure



GAO DRAFT REPORT DATED 7 JUNE 2017  
GAO-17-635 (GAO CODE 100987)

**“INLAND PORTS: THE CORPS OF ENGINEERS SHOULD  
ASSESS EXISTING CAPABILITIES TO BETTER INFORM  
DREDGING DECISIONS”**

**DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION**

**RECOMMENDATION:** GAO recommends that the Corps inform Congress whether it can adapt its existing tools to address factors for allocating funds from the Harbor Maintenance Trust Fund, and the resources needed to do so.

**DoD RESPONSE:** Concur, with comment. The Assistant Secretary of the Army for Civil Works will work with the Corps of Engineers to determine whether existing tools can be adapted to evaluate a variety of factors when making annual funding allocations from the Harbor Maintenance Trust Fund (HMTF) and to determine the resources needed to further develop the tools.

The report recommends that the Secretary of Defense direct the Secretary of the Army direct the Chief of Engineers to take action. We believe that the direction is too high in the chain of command and that the recommendation should be for the Assistant Secretary of the Army for Civil Works to direct the Deputy Commanding General for Civil and Emergency Operations or to direct the Director of Civil Works to take the action.

It should be noted the HMTF-eligible inland ports make up a very small percentage of the overall national navigation project portfolio and needs and competition for constrained resources is very keen. Also, the Corps uses many factors such as the condition of the harbors/channels, Harbors of Refuge, Subsistence Harbors, presence of USCG Search and Rescue, etc., to help prioritize funding for navigation projects nation-wide; however, many of these factors are more applicable to the coastal harbors and channels and are not as applicable/valuable for the inland harbors.

Recommend that the ports and harbors language throughout the report be changed to use "harbors" when referring to the Federal projects and use "ports" when referring to the non-Federal entity or the non-Federal facilities.

The report references 4 experts, but the appendix lists 8.

2

Recommend that the report establish in more detail the basis for the GAO recommendation, and identify specific metrics or tools that could help improve specific outcomes.

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact:

Susan A. Fleming, (202) 512-2834, or [Flemings@gao.gov](mailto:Flemings@gao.gov).

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## Staff

### Acknowledgements:

In addition to the contact named above, Sharon Silas (Assistant Director); Crystal Huggins (Analyst in Charge); Amy Abramowitz; Alexandra Edwards; Carol Henn; Alyssa Hundrup; Delwen Jones; Elke Kolodinski; Hannah Laufe; Maureen Luna-Long; SaraAnn Moessbauer; Joshua Ormond; and Cheryl Peterson made key contributions to this report.

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