

USACE GREAT LAKES NAVIGATION SYSTEM UPDATES

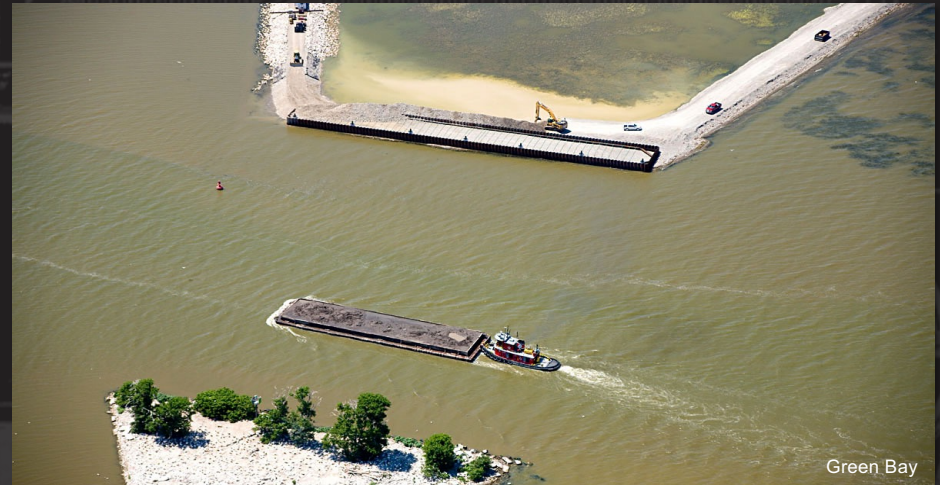
GL Navigation Team

Nick Zager – Great Lakes Nav System Lead &
Operations Chief – Detroit

Paul Mazzeno – Operations Division Chief – Chicago

Dave Swiatek – Operations and Technical Support
Chief – Buffalo

AGLPA – 2024 Annual Conference
Chicago, IL
9 August 2023



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US Army Corps
of Engineers

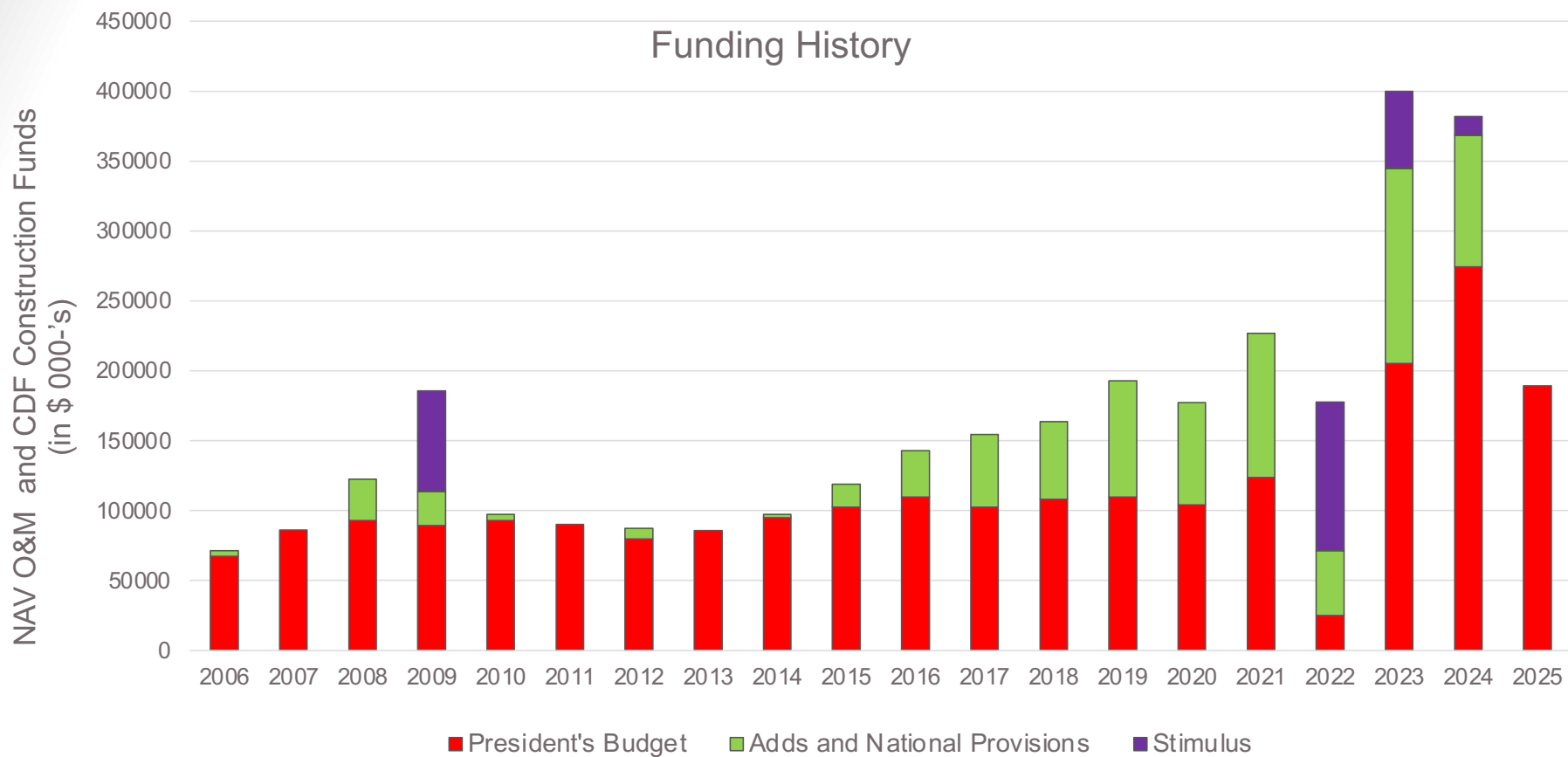


AGENDA

- Dredging Funding Overview
- Dredging Backlog Quantities
- Great Lakes Navigation Structures
- Great Lakes Navigation Focus Areas
- Project Highlights
 - Detroit
 - Buffalo
 - Chicago
- Great Lakes Navigation Website Update



GL NAVIGATION FUNDING HISTORY





FY24 GREAT LAKES NAVIGATION FUNDING

FY24 President's Budget - \$274.18M

\$67.23M Dredging (3.05M CY)

\$97.99M Soo Locks Asset Renewal/Maintenance

\$26.9M Lock Operations

FY24 Work Plan – \$81.52M

\$13.97M Dredging (0.28M CY)

\$37.88M Structure Design, Maintenance, and Repairs

\$29.84M Soo Locks Asset Renewal/Maintenance

FY24 Congressionally Directed Spending – \$12.58M

\$3.24M Dredging (0.24M CY)

\$8.84M Structure Design, Maintenance, and Repairs

\$0.50M Clinton River Dredge Material Management Plan

FY24 Bipartisan Infrastructure Law - \$13.4M

\$0.2M Dredging – Big Suamico

\$13.2M Structure Design, Maintenance, and Repairs

- \$8.22M Lexington – Breakwater Repair
- \$5.0M Black Rock Channel – Construction of Bird Island Pier



FY25 GREAT LAKES NAVIGATION FUNDING

PRESIDENT'S BUDGET

Great Lakes Navigation Operation & Maintenance
\$189.2M

Key O&M Items

\$70.77M in Dredging (24 projects; 3.1M cy)

\$16.48M in Dredged Material Management

\$15.8M Floating Plant Fleet Repair

\$18.6M in Soo Locks Asset Renewal/Maintenance

\$7.0M in Black Rock Lock Asset Renewal

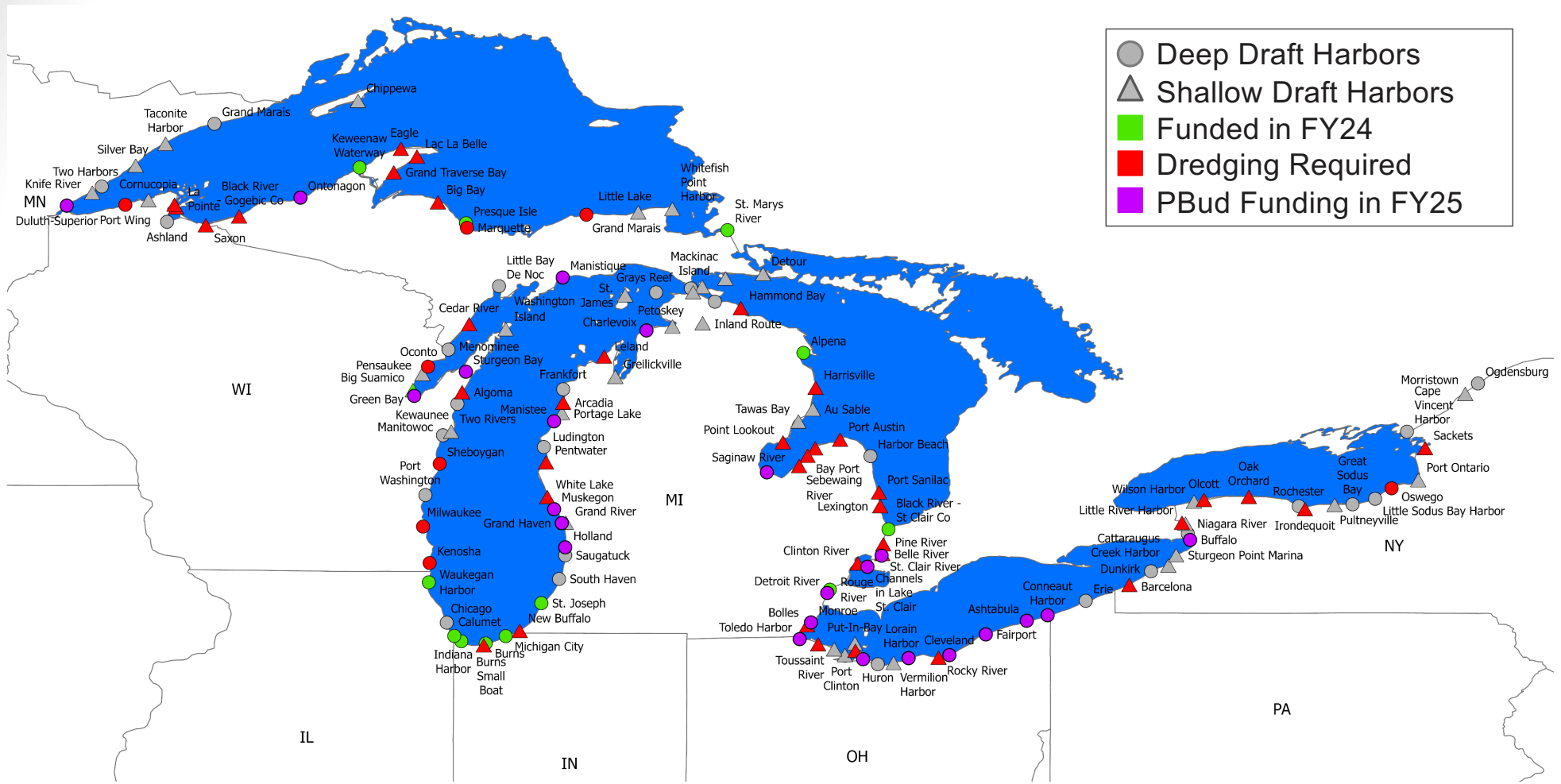
\$28.22M in Lock Operation and Maintenance

\$4.5M in Navigation Structure Maintenance/Repair

\$1.6M in Sediment Sampling for Dredging

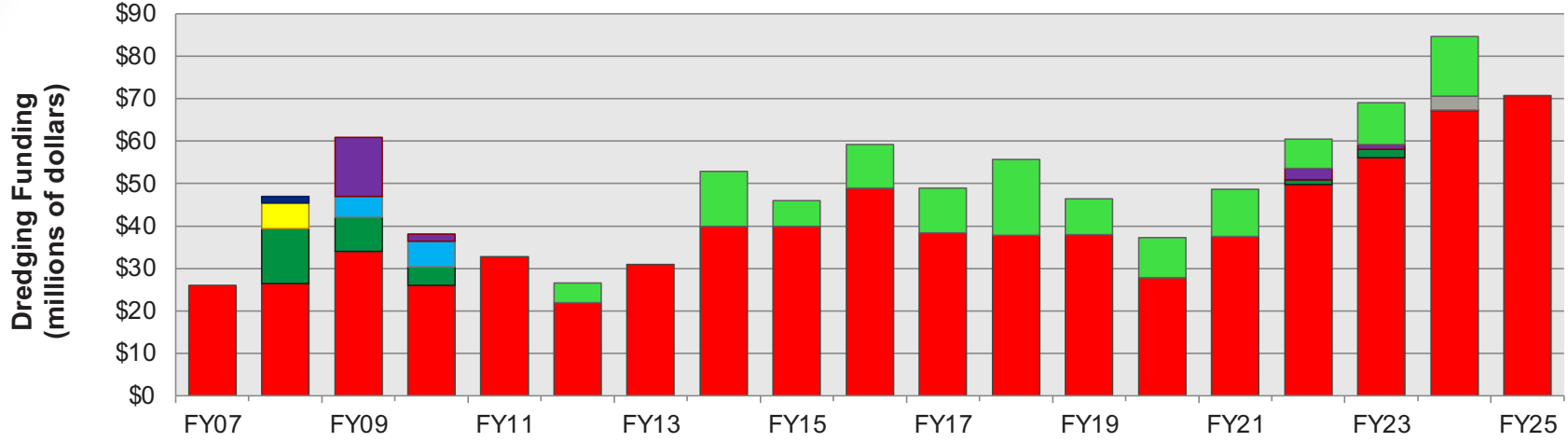
**Awaiting FY 25
Appropriation**

FY25 DREDGING FUNDING AND DREDGING REQUIREMENTS

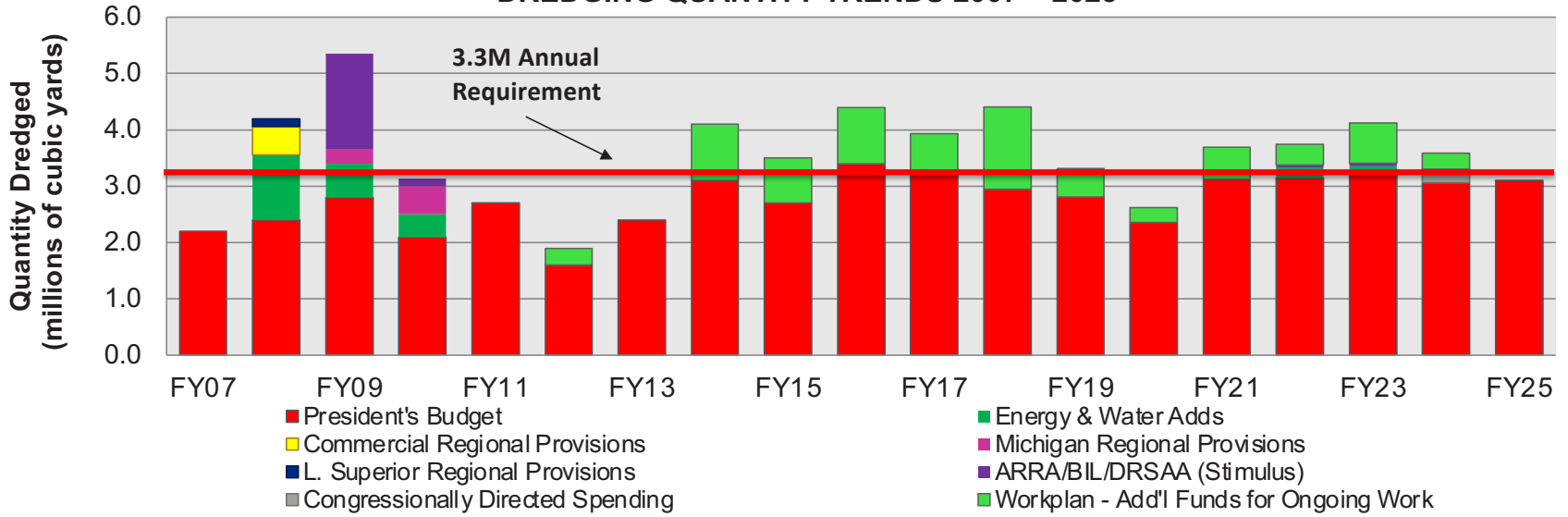




DREDGING FUNDING TRENDS 2007 - 2025



DREDGING QUANTITY TRENDS 2007 - 2025



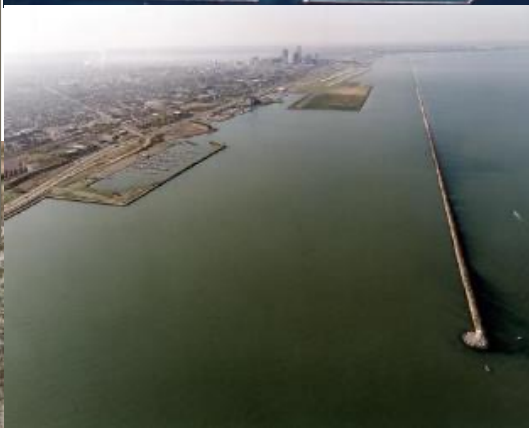
- President's Budget
- Energy & Water Adds
- Commercial Regional Provisions
- Michigan Regional Provisions
- L. Superior Regional Provisions
- Congressionally Directed Spending
- ARRA/BIL/DRSAA (Stimulus)
- Workplan - Add'l Funds for Ongoing Work



GREAT LAKES NAVIGATION STRUCTURES

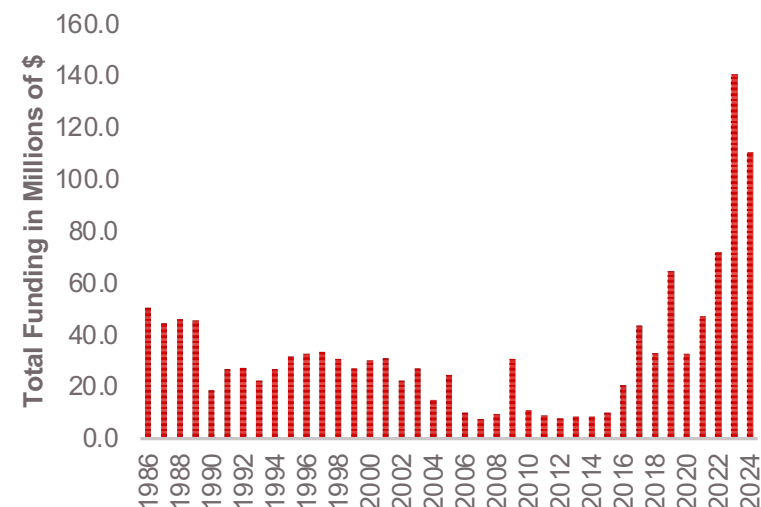
- 104+ miles of navigation structures on the Great Lakes
- Structures include piers, jetties, revetments, and breakwaters
- Most were built between 1860 and 1940
- Jetties and piers were constructed perpendicular to shore to keep the channel open for navigation
- Off-shore breakwaters were constructed to allow safe navigation entry to harbors and channels

- 60% of GL coastal structures were built before WWI
- Over 90% of all coastal structures exceed 60 years of age
- Over 30% of structures have timber crib core sections; past low water levels have accelerated deterioration of the wood
- Over 40% of structure segments are rated C - F; backlog funding need is estimated at \$320M



NAVIGATION STRUCTURES FUNDING

■ Navigation Structures Expenditures (Adjusted to FY07 levels for value prior to FY07)





GREAT LAKES NAVIGATION SYSTEM FOCUS AREAS

- **Dredging and Dredged Material Management** – DMMPs and CDF capacity issues
 - Leverage opportunities for Beneficial Use of Dredged Material
 - Chief of Engineers goal 70% Beneficial Use by 2030
- **Navigation Structures** – continue to prioritize needs of repairs to navigation structures on the Great Lakes that will ensure safe navigation is maintained
- **Asset Renewal** – ensure efficient and reliable navigation through investments in lock structures in the system, leveraging new technologies and minimize risk of unscheduled outages
- **Stakeholder Engagement** – encourage two-way coordination and communication; obtaining stakeholder input on critical system needs and consequences is an important part of helping the Corps make the best investment decisions



USACE Great Lakes Navigation Webpage:

<https://www.lrd.usace.army.mil/Water-Information/Navigation/Great-Lakes/Great-Lakes-Navigation-Dredging/>

DETROIT DISTRICT PROJECTS



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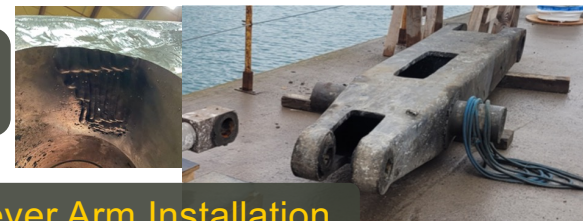
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SAULT STE. MARIE MAINTENANCE – 3D PRINTING

- Cracks discovered in existing Poe Lock ship arrestor lever arm casting during ongoing rehabilitation contract in February 2023. Plan was to reuse existing lever arm. Performed emergency crack repair & put back in service, \$71k.
- New lever arm design optimized for ease of future O&M.
- Supply Contract for 3D Printed Part in September 2023, 12 weeks (prep, build strategy, 3D printing, shipping, joining, stress relief, x-ray testing), \$215k
- GOV supplied to Prime Contractor (Dec '23); machined, painted, & shipped in 4 weeks, \$92k. Installed March 2024.

Total Fab. Time = 16 weeks vs. Traditional Casting = 52 weeks.

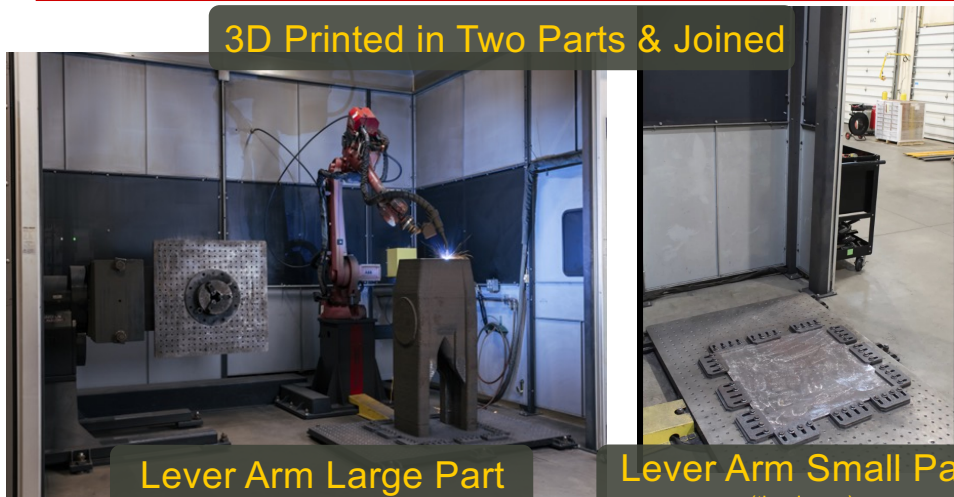
Existing Casting Repair



New Lever Arm Installation



3D Printed in Two Parts & Joined



Lever Arm Large Part

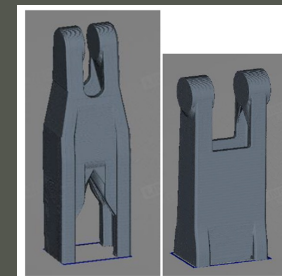
Lever Arm Small Part
(timelapse)

3D Build by Lincoln Electric Additive Solutions

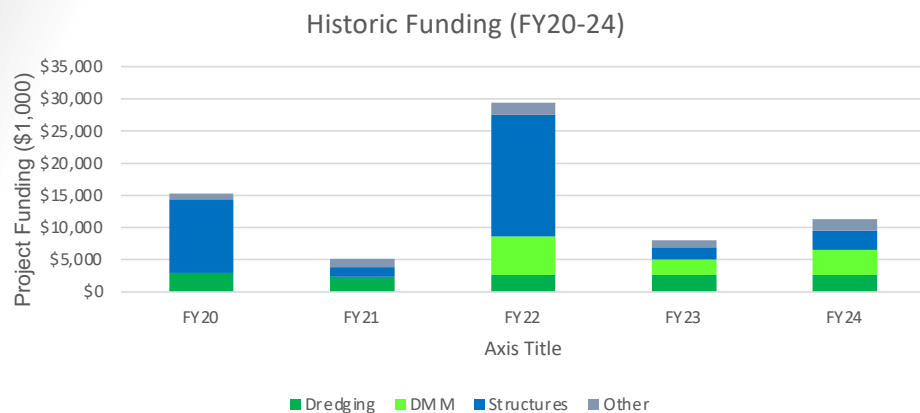
- Print Time - 2 weeks smaller part (2000lb), 4 weeks larger part (4000lb), simultaneous build = 4 weeks.
- Material - High Strength Low Alloy Metal



Joining of Two Parts



DULUTH DREDGE MATERIAL MANAGEMENT



Recent Success & Ongoing Projects

- Maintenance Dredging (FY21, FY22, FY23 & **FY24**)
 - FY24 M/D with Nearshore Placement on WI Point
- Dredged Material Management and Beneficial Use (FY22 & **FY24**)
 - **Funds to remove and beneficially reuse material from Erie Pier CDF and monitor performance of the material**
- Sediment Sampling and Analysis (FY23)
 - Harbor-wide characterization will support identification of future beneficial use opportunities

Future Work & Challenges

- Continued Annual Maintenance Dredging
 - Annual maintenance dredging need exceeds available CDF capacity
 - Currently no implementable beneficial use projects ready to support future dredging projects
- Erie Pier Confined Disposal Facility
 - Continued fill management necessary for placement capacity
 - Over 200,000CY of fine material stockpiled, challenge in identifying shovel-ready projects to receive material
- Nearshore Placement
 - Environmental and cultural resource coordination adds cost and time to project

CHICAGO DISTRICT PROJECTS



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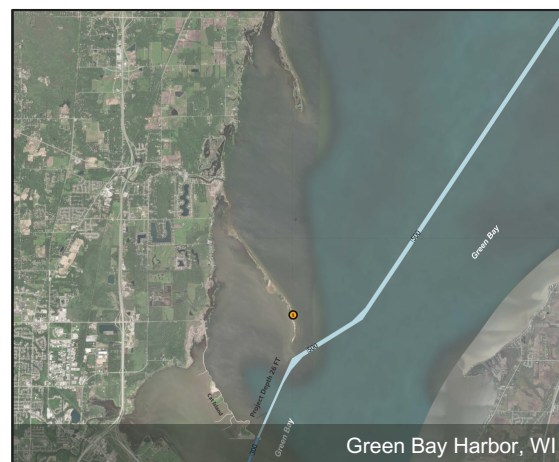
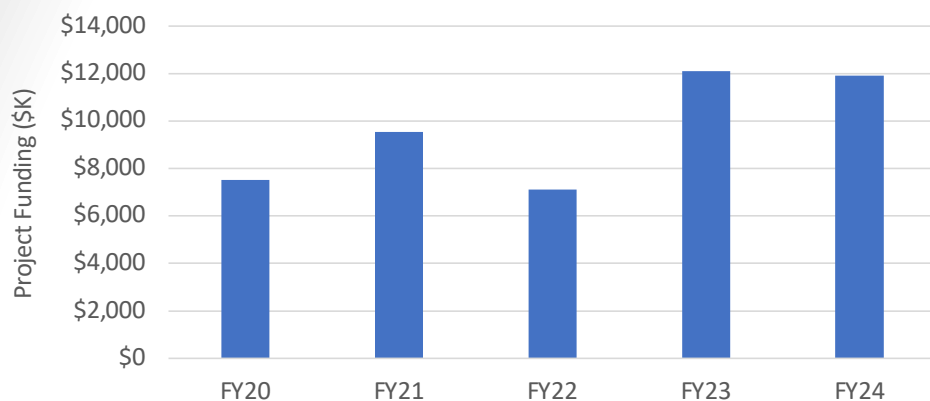


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DREDGED MATERIAL MANAGEMENT

Historic Maintenance Dredging Funding



Recent Success & Ongoing Projects

- Burns Waterway -- Maintenance dredging 40K CY (FY24)
- Green Bay -- Sediment sampling/analysis (FY24); Maintenance dredging 180K CY (FY24)
- Indiana -- Dredged Material Disposal Facility (DMDF) expansion complete; Maintenance dredging to address 78K CY backlog (FY24)
- Milwaukee -- Maintenance dredging 56K CY (FY23)

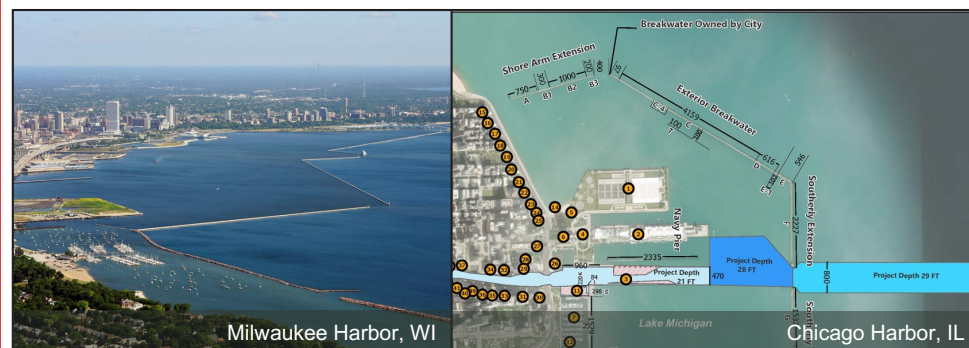
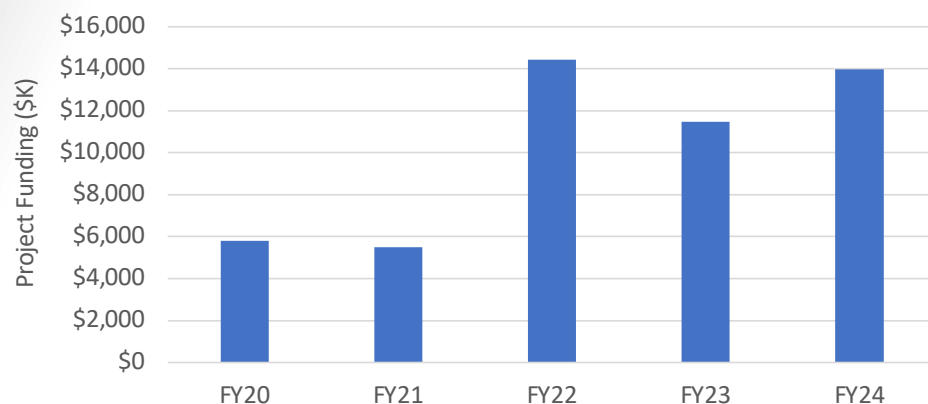
Challenges & Future Work

- Burns Waterway -- Maintenance dredging (FY26)
- Calumet -- Planned DMDF vertical expansion project and future dredging on hold pending court case and State of Illinois permitting
- Indiana -- Maintenance dredging (FY26)
- Green Bay -- Maintenance dredging (FY25/26/27); Operation & Maintenance (O&M) of DMDF (FY25)
- Milwaukee -- Sediment sampling/analysis (FY25); DMMP(FY26)



NAVIGATION STRUCTURE REPAIR

Historic Structure Repair Funding



Recent Success & Ongoing Projects

- Milwaukee Harbor -- South detached breakwater (USACE Fleet, FY24)
- Calumet Harbor -- North breakwater (USACE Fleet, FY24)
- Chicago Harbor -- Southerly extension breakwater grouting (FY24); Shore arm extension breakwater stone placement (FY24)

Challenges & Future Work

- Calumet -- North breakwater (USACE Fleet, FY25/26/27)
- Chicago -- Southerly extension breakwater stone placement (USACE Fleet, FY25)
- Milwaukee Harbor -- South detached breakwater (USACE Fleet, FY25)
- Fluctuating stone prices



INTERCONNECTIVITY BETWEEN GREAT LAKES AND ILLINOIS WATERWAY

INDIANA HARBOR

FAST FACTS

2021 Highlights

Harbor Ranking Great Lakes (6th)
 National (NA)
 Total Tonnage 12 Million

5-Year Averages (2017-2021)

Total Tonnage 12 Million
 Shipments 2.2 Million
 Receipts 9.4 Million
 Thru 0
 Intraport* < 0.01 Million

Top Three Commodities Handled

Asphalt, Tar & Pitch (11%)
 Iron Ore (69%)
 Limestone (8%)

Primary Commodity Shipped

Asphalt, Tar & Pitch (60%)

Primary Commodity Received

Iron Ore (85%)

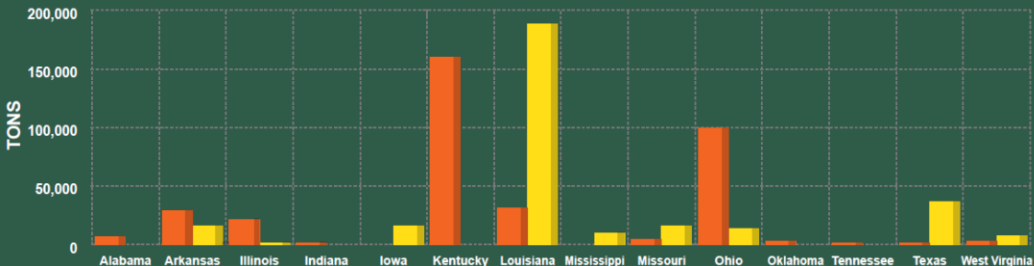


Non-Great Lakes Harbors and Waterways

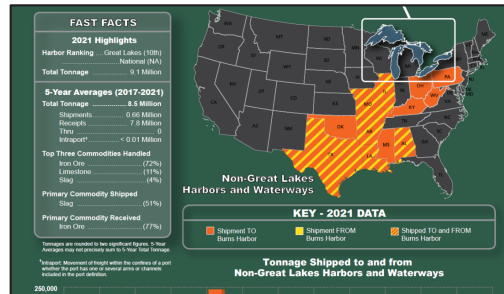
KEY - 2021 DATA

- Shipment TO Indiana Harbor
- Shipment FROM Indiana Harbor
- Shipped TO and FROM Indiana Harbor

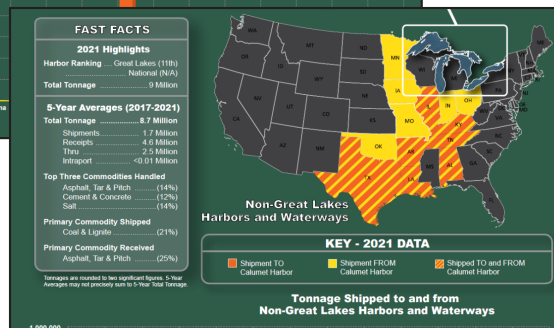
Tonnage Shipped to and from Non-Great Lakes Harbors and Waterways



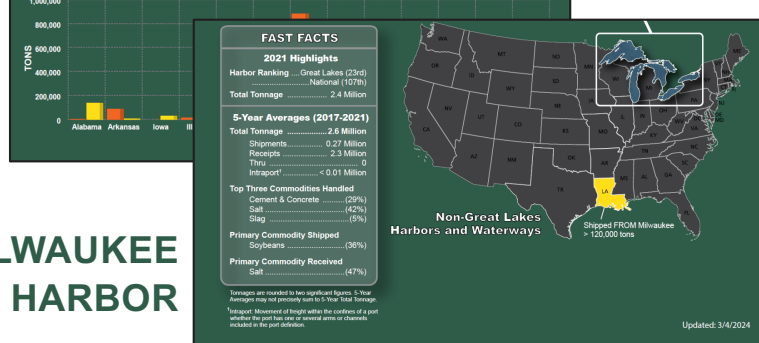
Updated: 3/4/2024



BURNS HARBOR



CALUMET HARBOR



MILWAUKEE HARBOR

Updated: 3/4/2024

BUFFALO DISTRICT PROJECTS



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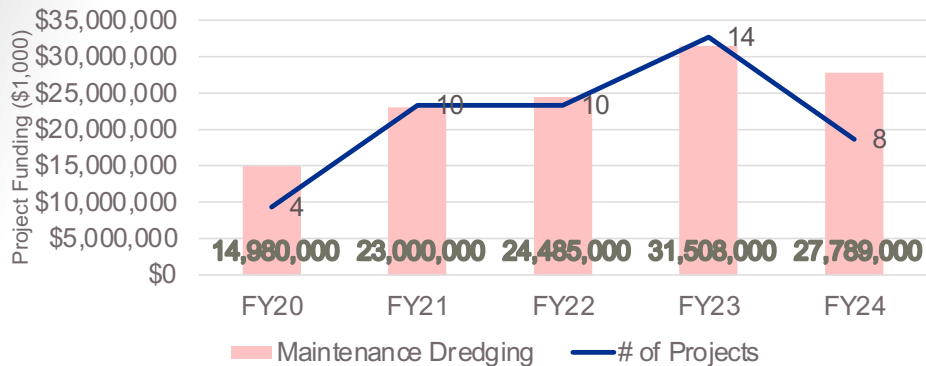


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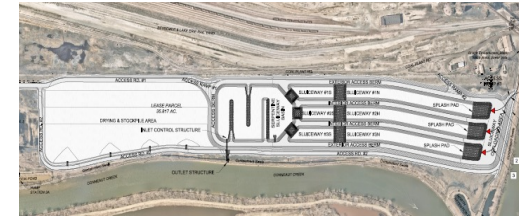
DREDGED MATERIAL MANAGEMENT



Maintenance Dredging Historic Funding



Conneaut



Buffalo



Recent Success

- Conneaut Harbor - Sediment Processing Facility completed in 2024
 - Dredging completed in 2024 for first time since 2019
 - 2024 dredging will place ~80,000 CY of material into facility
- Buffalo Outer Harbor Section 204 Beneficial Use Project
 - Restoration of coastal wetland habitat at an abandoned slip using sediment dredged from the Buffalo River and Harbor.
 - Total capacity of 285,000 CY
 - 2024 dredging will place ~80,000 CY

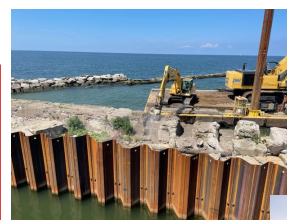
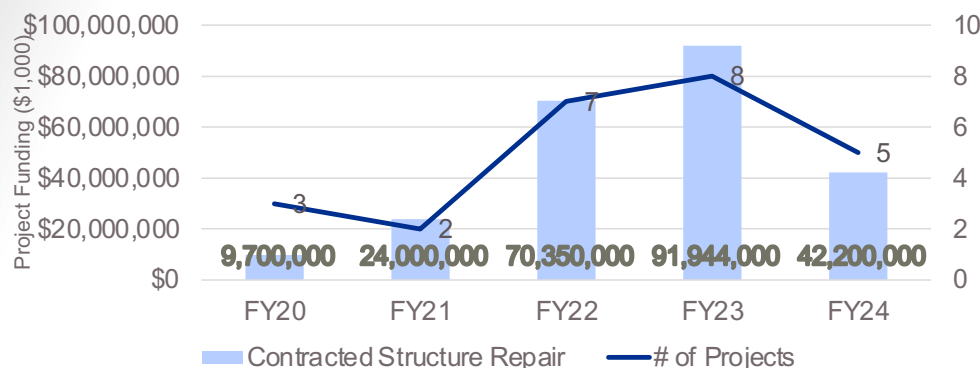
Future Challenges

- Near term (1-5 years)
 - Sandusky – FY24 dredging cancelled due to lack of placement site. Work in the harbor on-hold until new placement site is available
 - Rising dredging and placement costs
 - Availability of contractors
- Long term (5, 10, 20 year)
 - Establishing Section 217 Agreements to set tipping fees
 - Completing DMMPs to ensure 20-year capacity
 - Continuing to identify and implement Beneficial Use (BU) projects to support Chief of Engineers goal of 70% by 2030

CONTRACTED STRUCTURE REPAIR



Structure Repair Historic Funding



Cleveland



Oswego



Vermilion

Successes

- Completed (10) – Cleveland East Breakwater West End (2021); Cleveland West Breakwater (2023); Great Sodus East Breakwater East End (2021); Vermilion East Pier North End (2021) and West Pier North End (2023); Little Sodus West Pier (2022); Rochester East Pier (2023) Buffalo South Breakwater (2022) and North Breakwater North End (2024) and South End (2024)
- Ongoing (5) – Cleveland West Pier (2024); Erie North Pier (2024); Oswego West Arrowhead Phase 3 (2024) & Phase 4 (2025); Vermilion West Pier South End (2024/25)
- Upcoming (10) – BRL Bird Island Pier Phase 1 & 2 (2025/26); Dunkirk Outer Breakwater East Side and West End (2025/26); Lorain West Breakwater (2025/26); Great Sodus East Breakwater (2025/26); Huron West Pier (2025/26); Oswego Outer West Breakwater (2025/26); Vermilion East Pier South End (2025); Barcelona West Breakwater (2026)

Challenges

- Large workload and limited availability of contractors has stressed existing contractor capacity and material availability resulting in:
 - Higher costs
 - Longer construction windows
 - Reduced repair lengths



GREAT LAKES NAVIGATION TEAM WEBSITE & NEXT MEETING

- NEW website, NEW Look, and NEW GIS portals are here
- <https://www.lrd.usace.army.mil/Water-Information/Navigation/Great-Lakes/Great-Lakes-Navigation-Dredging/>
- For support or questions on the new website please reach out to the Great Lakes Navigation Team at GLNavigation@usace.army.mil
- Nov 14: Annual meeting at the Port of Detroit

The Great Lakes Navigation System (GLNS) is an extensive deepwater navigation network that spans 1,600 miles, encompassing all five Great Lakes and connecting channels from Duluth, Minnesota, to Ogdensburg, New York.

There are 60 commercial and 80 recreational harbors, two operational locks, 104 miles of breakwaters and jetties, and over 600 miles of well-maintained navigation channels. Additionally, the GLNS is intricately linked to several other shallow draft waterways, such as the Illinois Waterway and New York State Barge Canal, forming a crucial waterborne transportation network that extends deep into North America.

The U.S. Army Corps of Engineers maintains the Great Lakes Navigation System by dredging channels and harbors, as well as constructing and maintaining coastal infrastructure.

Harbor & Channel Explorer

Harbor & Channel Dashboard

Hydrographic Survey Data

Notice To Navigation Interests

Great Lakes Navigation System

Navigation System Information	Contract Information	Budgetary & Funding Information	Strategic Communication & Initiatives	Stakeholder Meetings
Structure Risk Communication Meetings		Dredged Material Management		
Great Lakes Navigation Operation & Maintenance (O&M) Final Budget Allocation				
<ul style="list-style-type: none"> • FY25 President's Budget • FY24 Final Allocation • FY24 Bipartisan Infrastructure Law • FY24 President's Budget • FY23 Final Allocation • FY23 Bipartisan Infrastructure Law • FY22 Disaster Relief Supplemental Appropriations Act and Bipartisan Infrastructure Law 				