Great Lakes Navigation System
FY 15 Great Lakes Navigation Program

$115.7M  Great Lakes Navigation Operations & Maintenance

Key Items
- $46.2M in Dredging (21 projects – 3.1M cubic yards)
- $10.3M in Dredged Material Management
- $8.65M in Soo Asset Renewal

$3.1M  Emergency Funding – Oct 31, 2014 Storm
- Dredging – Muskegon, MI
- Pier Repair – Grand Haven, MI

Total FY15 Program $118.8M
FY15 Additional Fund Allocations

Additional Funding for Ongoing Work
- Navigation Maintenance $45M
- Deep-draft harbor and channel $165M
- Small, remote, or subsistence nav $42.5M
- Inland waterways $42M
- Other authorized purposes $35M

Criteria established by Congress for allocation of national O&M funding:

- Complete ongoing work to maintain authorized widths and depths
- Particular emphasis on places with a Coast Guard presence
- Enhance national, regional, or local economic development
- Promote job growth or international competitiveness
- National defense; public health and safety
Historical Shallow Draft/Recreational Harbor Funding

# Projects Funded

Fiscal Year
Dredging Funding Trends 2007 - 2016

- **Dredging Funding (millions of dollars)**
  - **FY07**
  - **FY08**
  - **FY09**
  - **FY10**
  - **FY11**
  - **FY12**
  - **FY13**
  - **FY14**
  - **FY15**
  - **FY16**

- **National Provisions**
- **ARRA (Stimulus)**
- **Lake Superior Regional Provisions**
- **Michigan Regional Provisions**
- **Commercial Regional Provisions**
- **Energy & Water Adds**
- **President's Budget**

- **$40 M Annual Req'mt**
Soo Locks Reliability
70% of the commercial commodities transiting the Soo Locks are limited by size to the Poe Lock
- Aging and deteriorating infrastructure; unscheduled outages increasing
- There is currently no redundancy for the Poe Lock
- The economic impact of a 30-day unscheduled closure of the Soo Locks = $160M

Two major efforts are underway to improve reliability of the Soo Locks
1. Maintain existing infrastructure through Asset Renewal Plan
2. New lock with the same dimensions as the Poe Lock - BCR sensitivity analysis underway
New Poe-Size Lock

- WRDA 2007: Construction at 100% federal expense
- Inconsistent with Administration policy due to BCR of 0.73
- Currently conducting a partial benefits reanalysis to determine if some benefit categories were not captured or if insufficient information was used. If there is a large enough increase in benefits, a BCR revisit may be in order.
Partial Benefits Sensitivity Analysis

- Expert elicitation held with two dozen stakeholders reliant on Soo Locks to determine how lock closures affect business and what their response would be to a significant lock outage.

- It is not possible to move 100% of the commodities in the event of a Poe Lock closure with current infrastructure without additional major capital outlays; only 35% of iron ore and coal could be moved by alternate modes.
  - Lightering is limited due to few available smaller vessels
  - Increased shipments through Escanaba are extremely limited due to rail limitations, storage, and loading capacity
  - Foreign ore is not readily available and requires plant retooling
  - Rail can’t handle the cargo and would not consider it without a 20-year contract
  - Trucking would be very expensive and not realistically feasible due to quantity of trucks needed
Great Lakes Navigation – Key Takeaways

- Interdependent ports delivering raw materials to manufacturing centers in lower lakes
- GL Nav saves US $3.6B each year – for a $120M investment each year
- The Soo Locks is the lynch pin in the system; no alternate mode of transportation; no redundancy
  - Asset Renewal – maintaining existing infrastructure
  - New Lock – assessing benefits to potentially reanalyze BCR
- GLRI - leveraging funds to benefit navigation: dredging and dredged material management
- Continued migration toward cleaner dredged material, more opportunities for beneficial uses and less expensive dredging and disposal
Communication

- Stakeholders Meetings
  - Annual Stakeholder Meeting April 14, 2015
    Chicago, IL

- Web Site:
  www.lre.usace.army.mil/greatlakes/navigation
  - Fact Sheets, Presentations
  - Requests for information, to be added to mailing list, etc:
    glnavigation@usace.army.mil
Questions?
Key Great Lakes Contacts

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www.lre.usace.army.mil/greatlakes/navigation
The Greatest Ships on the Great Lakes

&

GREAT LAKES MARITIME TASK FORCE
TRADE PATTERNS

Great Lakes Shipping

- Mining
  - Iron ore
  - Coal
  - Limestone
  - Grain
- Shipping
  - Steel center
  - Manufacturing center

Map showing trade patterns and cities such as Duluth, Superior, Ashland, Houghton, Marquette, Ironwood, Escanaba, Waukegan, Evanston, Chicago, Gary, Hammond, Racine, Kenosha, Milwaukee, Green Bay, Menominee, Marinette, Sheboygan, Sturgeon Bay, Pizza Lake, Keweenaw Waterway, 1873, Sault Ste Marie, Soo Locks, 1855, Port Huron, Welland Ship Canal, 1932, Buffalo, Erie Canal, 1825, St Lawrence River (Seaway opened 1959).
WATERBORNE TRANSPORTATION IS ...

- **Safer**
- **More Fuel-Efficient**
- **Fewer Emissions**

THAN RAIL OR TRUCK TRANSPORTATION

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**Miles 1 Ton of Cargo Carried**

Per Gallon of Fuel

**Tons of CO₂ Produced to Transport**

1,000 Tons of Cargo 1,000 Miles

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1. Source: USDOT Maritime Administration and Minnesota Department of Transportation
2. Assumes US DOE Fuel and Energy Emission Coefficient of 22.38 lbs of CO₂ per gallon (No.1,2,4 Fuel Oils and Diesel) for GL Carrier
3. Based on Aug 12, 2013 price for on-highway diesel of $3.896
LAND-BASED MODES OF TRANSPORTATION DON'T STACK UP TO SHIPS!

70,000 Net Tons

1 Vessel
47 Barges
700 Railroad Cars
2,800 25-Ton Trucks
HP Per Ton

- .2 -.3 Vessel
- 1 Railroad Cars
- 12 - 20 Trucks
Vessel HP/ton equivalent
A lawnmower could move a truck
Great Lakes Navigation System Cargo

- Iron & Steel: 34%
- Coal: 24%
- Aggregates: 20%
- Petrol Products: 3%
- Ores & Minerals: 4%
- Grains: 3%
- Chemicals: 1%
- Other: 11%
GREAT LAKES TRADE

• **U.S.- Flag Trade – 115 Million Tons**
  – Mostly U.S.-to-U.S., primarily within the upper four Lakes.
  – Iron ore, coal and limestone primary cargos.

• **Canadian-Flag – 65 Million Tons**
  – Trade between Duluth/Superior and Sept Iles.
  – Inbound ore from the Gulf of St. Lawrence, grain backhaul.
  – 93% of “Cross-Lake (U.S./Canada) trade.”
  – 52% of their total is to or from the U.S.

• **Oceangoing or “Salty” – 17 Million Tons**
  – Importing specialty and finished steel products, grain back overseas.
  – Canadian-owned, but flagged foreign with international crews.
Laker
One Ton of Cargo Equals....

- Takes 1.5 tons of iron ore to make a ton of steel. (Also 400 pounds of fluxstone, a type of limestone.) In total, takes 2.2 tons of Lake-delivered product to make a ton of steel.

- One mile of 4-lane highway needs 85,000 tons of aggregate as its base.

- A 70,000-ton cargo of low-sulfur coal keeps the power on in Greater Detroit for a day.
THE SELF-UNLOADING SHIP

• Enables a ship to unload at a rate of 6,000 tons of coal per hour or 10,000 tons of iron ore pellets per hour.

• The cargo is fed to the hold tunnel conveyors by means of hydraulically operated hopper gates.

• The cargo is then deposited onto the transfer conveyors which feed it to the loop belt system.

• The cargo is sandwiched between the inner and outer loop belt and elevated to the 250-foot boom conveyor which discharges the cargo to the shore facility.
Current Condition
Below Datum w/Dredging Backlog

Long Term Average Lake Level

'85 Datum

Authorized Project Depth 27'

Available for Navigation << 27'

Dredging Backlog

~ 2'

Current Lake Level
Every Inch Counts!

When inadequate dredging forces the 56 lakers enrolled in LCA to reduce draft by 1 inch, the fleet forfeits more than **8,000 tons of cargo each trip**.

**8,000 Tons is Enough…**

- **Iron ore** to produce the steel to build **6,000 cars** (10 days of work for a major auto plant)
- **Coal** to provide **3 hours of electricity** for Greater Detroit
- **Limestone** to build **24 homes**.
## Impact of Dredging Crisis on Per-Trip Carrying Capacity

### Major Great Lakes Vessel Classes

<table>
<thead>
<tr>
<th>Major Great Lakes Vessel Classes</th>
<th>Vessel Length (feet)</th>
<th>Per-Trip Carrying Capacity (Net Tons)</th>
<th>Capacity per Inch of Draft (Net tons)</th>
<th>Capacity per foot of Draft (Net tons)</th>
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Questions?
LAKE CARRIERS’ ASSOCIATION

The Greatest Ships on the Great Lakes

&

GREAT LAKES MARITIME TASK FORCE
Lake Carriers’ Association

- Represent Great Lakes U.S.-flag vessel operators
- 16 member companies
- 56 “lakers”

http://www.lcaships.com/
Great Lakes Maritime Task Force

- Founded in 1992 in Toledo, Ohio.
- 22 charter members; now 83 strong.
- Represents ship-owners, maritime unions, shippers, port authorities, dredgers, shipyards.... Dredging Focused
- [http://www.glmtf.org](http://www.glmtf.org)
Our Goals

• Establish, restore & sustain the Great Lakes Navigation System

• Increase annual O&M funding to a level sufficient to restore & sustain the Great Lakes Navigation System

• Address high priority national needs: Soo Locks, St. Marys River, connecting channels and major ports
Great Lakes Navigation System

Integral to the U.S. and Canadian Economies

- $3.6 Billion per year – Rate Savings
- 181 million net tons per year
- 227,000 jobs per year
- Supports 440,000 export jobs per year
- $35 Billion business revenue per year
- $14.1 Billion in annual personal income per year
- $6.4 Billion in local purchases per year
- $4.6 Billion in tax revenue per year
Great Lakes Navigation System

WRRDA 2014

• Corps directed to manage GLNS as a single, comprehensive system of interdependent projects

• Priority funding allocation for GLNS

• LCA wants the Corps to recognize this interdependence and connectivity by:
  • PROTECTING AGAINST SINGLE POINTS OF FAILURE
  • Redundancy/Reliability – Poe? Rock Cut?
  • Match connecting channels depths to load/discharge ports they connect
Harbor Maintenance Trust Fund

- 0.0125% of value of cargo
- Historically spends ½ of revenue
- National funding targets
- Great Lakes regional request
- Funding “buckets”
- GLNS bucket?
Great Lakes Dredging Backlog

- Cumulative Backlog (1,000 cu yds) - Green Line
- Cubic Yards Dredged (x1000) - Blue Line

Assume FY17-21 dredging equals FY16
Great Lakes Navigation System Maintenance Backlog

- $250 million needed to repair jetties and breakwaters that protect GLNS harbors (400 year recapitalization rate)

- 17 million cubic yards of sediment in channels, which would cost $200 million to remove (never get there)

- $80 million in needed repairs at the Soo Locks (20 years)
LCA Priorities
($175 m O & M $75m Dredging #1 & 2)

Duluth/Superior
#11

Sault Ste. Marie
Poe Lock & St. Marys River (#3 – 6 & 17)

Indiana/Gary
Burns Harbor #10

Detroit
#8 & 9

#7 – Lake St. Clair

Fairport #16

Ashtabula #15

Conneaut #13

Cleveland #12

#14 Toledo

#14 Toledo

#15

#10

#11

#12

#13

#14

#15

#16
Welcome to the “winter run.”
Ice Delays - Proxy for Lock Outage

- 6 Day trip took 23 days.
- Impacts on power plants and steel mills
- Lack of cargo moved by other modes as a result of ice delays
  - Rail
  - Truck
- Impacts on vessel operating companies
- Cost North American Economy 4,000 jobs and $700 million.
Summary

• The Great Lakes Navigation System (GLNS) is a great national investment.

• To eliminate the GLNS maintenance backlog in less than a decade, we would need $175 million/year funding for GLNS projects, of which $75 million/year is for dredging.

• President’s budget should add a GLNS total amount that aggregates all GLNS project requests.

• Appropriators should include a GLNS “bucket” for additional funding.
QUESTIONS