

# Great Lakes Navigation Update

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Presentation to GLDT  
May 21, 2018



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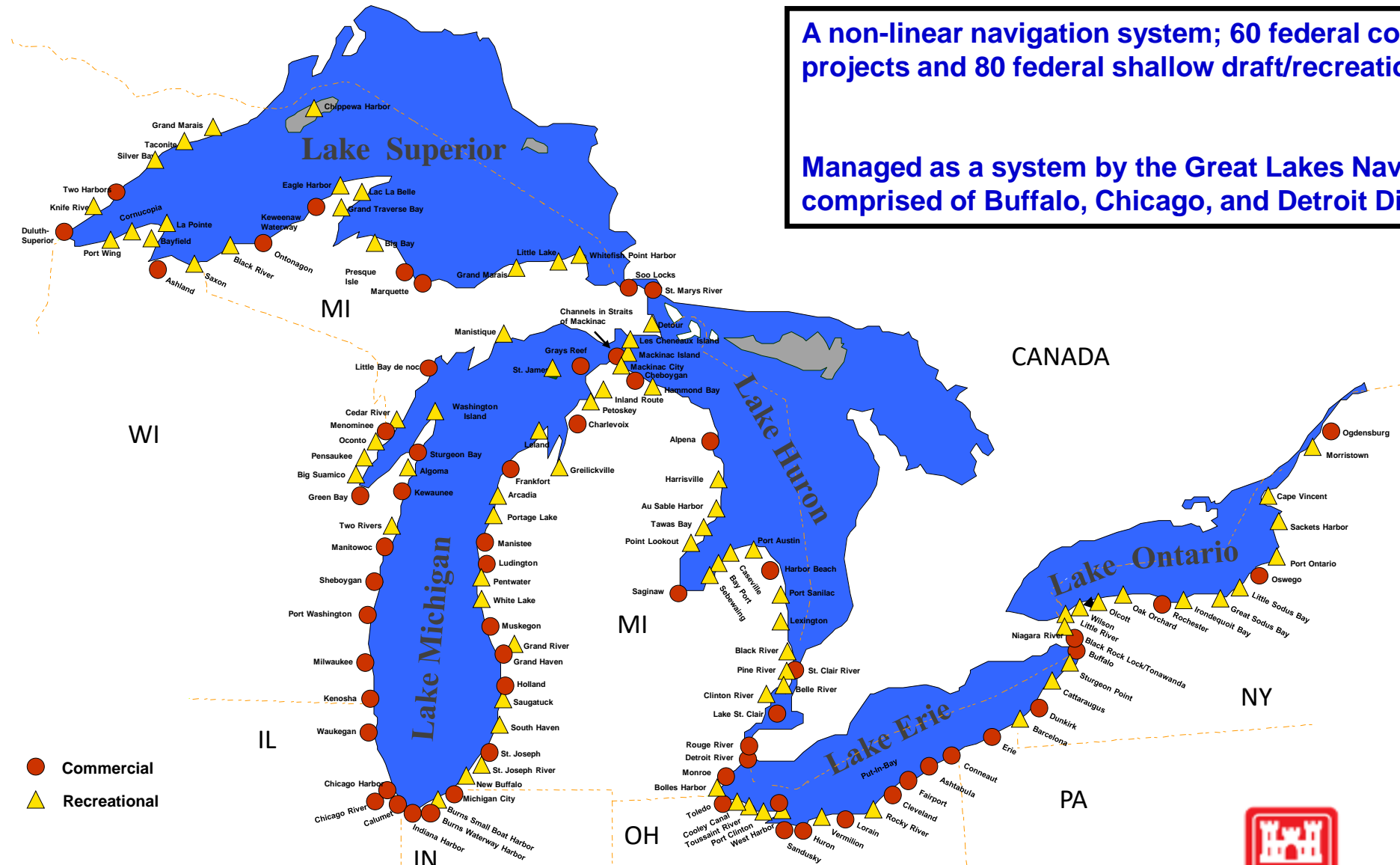
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# Federal Projects on the Great Lakes

A non-linear navigation system; 60 federal commercial projects and 80 federal shallow draft/recreational projects

Managed as a system by the Great Lakes Navigation Team comprised of Buffalo, Chicago, and Detroit District staff.



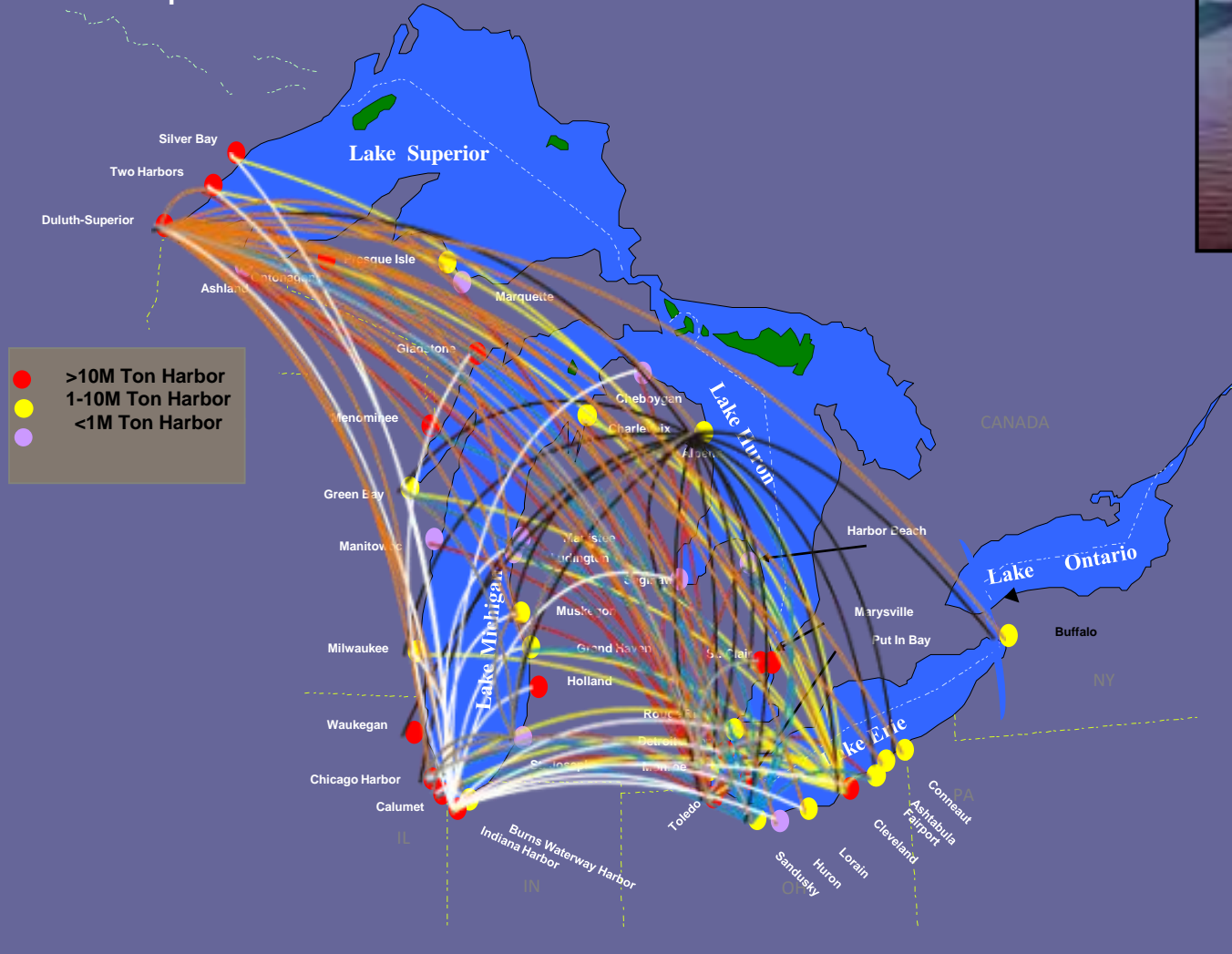
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# GREAT LAKES NAVIGATION SYSTEM



## Interdependent Ports



- Non-linear interdependent system
- Commercial are ports dependent on each other
- 95% of traffic is internal to the Great Lakes
- System saves **\$3.6 Billion per year** over next mode of transportation

# GREAT LAKES PORTS VS. COASTAL PORTS

- The Great Lakes navigation system carries bulk commodities from source locations to users at destination ports.
- On the Great Lakes, commodities cannot be easily moved to the next harbor because power plants and manufacturing plants are located at the destination harbor. In most cases, rail is not available there.
- Coastal ports primarily trade in containerized commodities importing from and exporting to ports overseas. Coastal ports compete with each other for trade. If one port cannot accommodate the traffic, the cargo can easily switch to the next port – because this is container traffic to be loaded onto trucks and rail and transported away from the port.
- O&M for Great Lakes and Coastal ports funded by HMTF



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# Harbor Maintenance Trust Fund

- Prior to 1986, GL dredging was conducted at full federal expense
- WRDA 1986 required users of federal navigation to pay an ad valorem tax (tax on value of cargo) into a harbor maintenance trust fund to pay for maintenance of channels and harbors.
- Tax applied at 0.04% of cargo value in 1986
- Increased in 1990 to 0.125%
- In 1990, Supreme Court struck down tax on exports; now tax is paid only on domestic cargo and imports.
- Collected funds pay for all coastal O&M and Construction of CDFs
  - Dredging
  - Breakwater maintenance
  - Lock operations and maintenance
  - Operations, maintenance, and construction of CDFs



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# Harbor Maintenance Trust Fund

- The fund generates about \$1.7B per year; Corps spends less than that, which has resulted in a growing surplus nearing \$9B.
- Trust fund is not “fenced” – there is no link between the HMTF receipts and Congressional Appropriations. Surplus funds are only on paper.
- WRDA 14 set a path to full use of the HMTF by 2025.



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# Inland Waterway Trust Fund vs. Harbor Maintenance Trust Fund

- IWTF is a fuel tax. Funds are spent on CG – 50% of construction of locks is paid by users through fuel tax.
- All O&M on rivers is paid by Treasury
- HMTF – all O&M in GL is paid by users
- Construction on GL is cost shared with users; there has been little to no construction in past 10 years other than CDFs. CDF construction is paid out of HMTF.

Summary of Trust Fund Expenditures in LRD Pres Bud FY08-FY17 (\$M)		
	Treasury	Industry
Lakes	\$0	\$968
Rivers	\$2,839	\$1,038



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# HARBOR MAINTENANCE FUNDING ROADMAP

## WRRDA 2014 HARBOR MAINTENANCE TRUST FUND SPENDING TARGETS

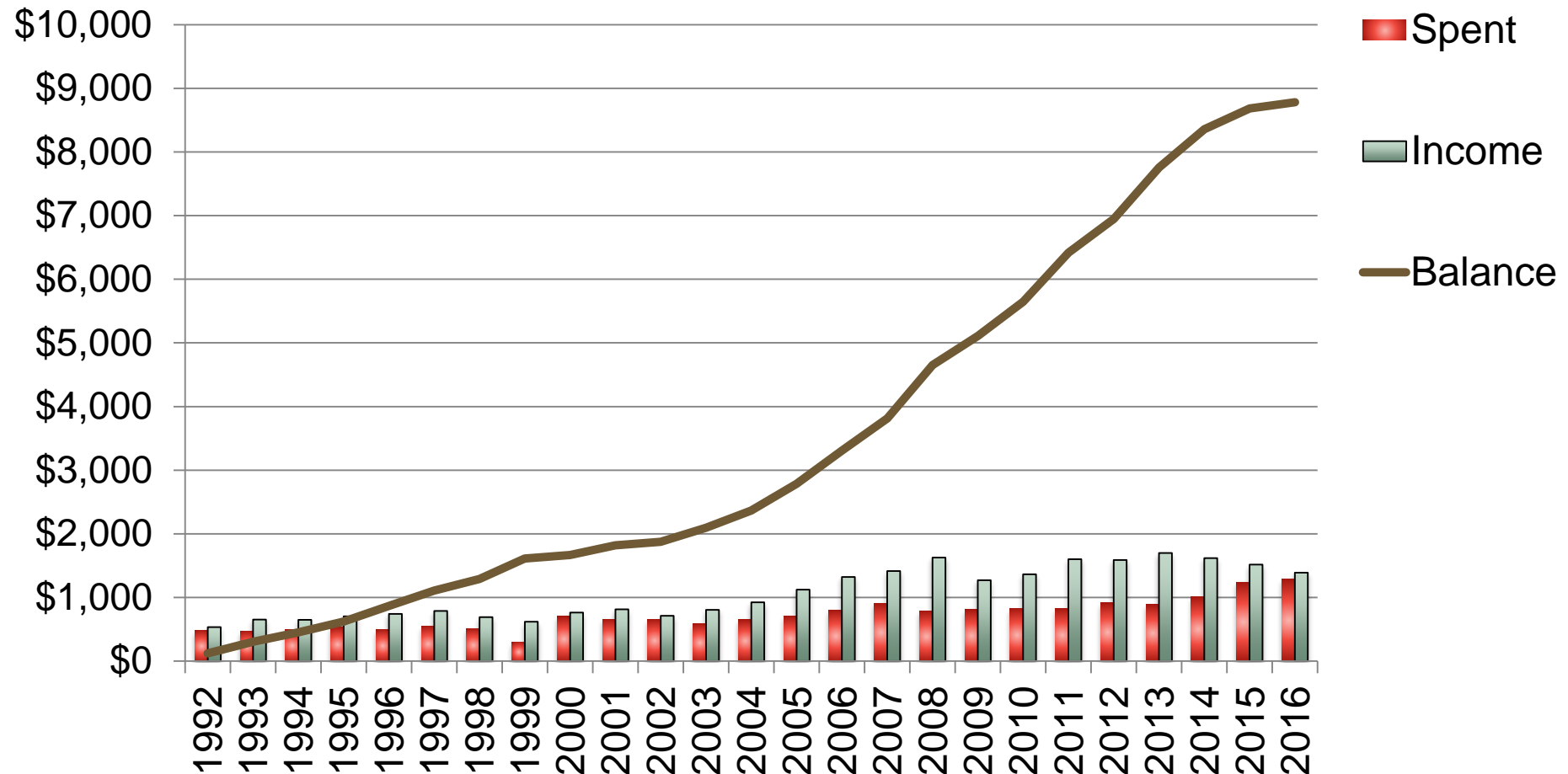
FY2015:	67% of 1.79B = \$1.17B (\$1.11B appropriated) ✓
FY2016:	69% of \$1.81B = \$1.25B (\$1.263B appropriated) ✓
FY2017:	71% of \$1.7B = \$1.2B (\$1.3B appropriated) ✓
FY2018:	74% of the HMT received in 2017 (\$1.4B appropriated) ✓
FY2019:	77% of the HMT received in FY2018
FY2020:	80% of the HMT received in FY2019
FY2021:	83% of the HMT received in FY2020
FY2022:	87% of the HMT received in FY2021
FY2023:	91% of the HMT received in FY2022
FY2024:	95% of the HMT received in FY2023
FY2025:	100% of the HMT received in FY2024



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# HARBOR MAINTENANCE TRUST FUND, 1992-2016



HMT surplus was \$8.8 billion at the end of FY16



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# WATER RESOURCES REFORM & DEVELOPMENT ACT (WRRDA) 2014

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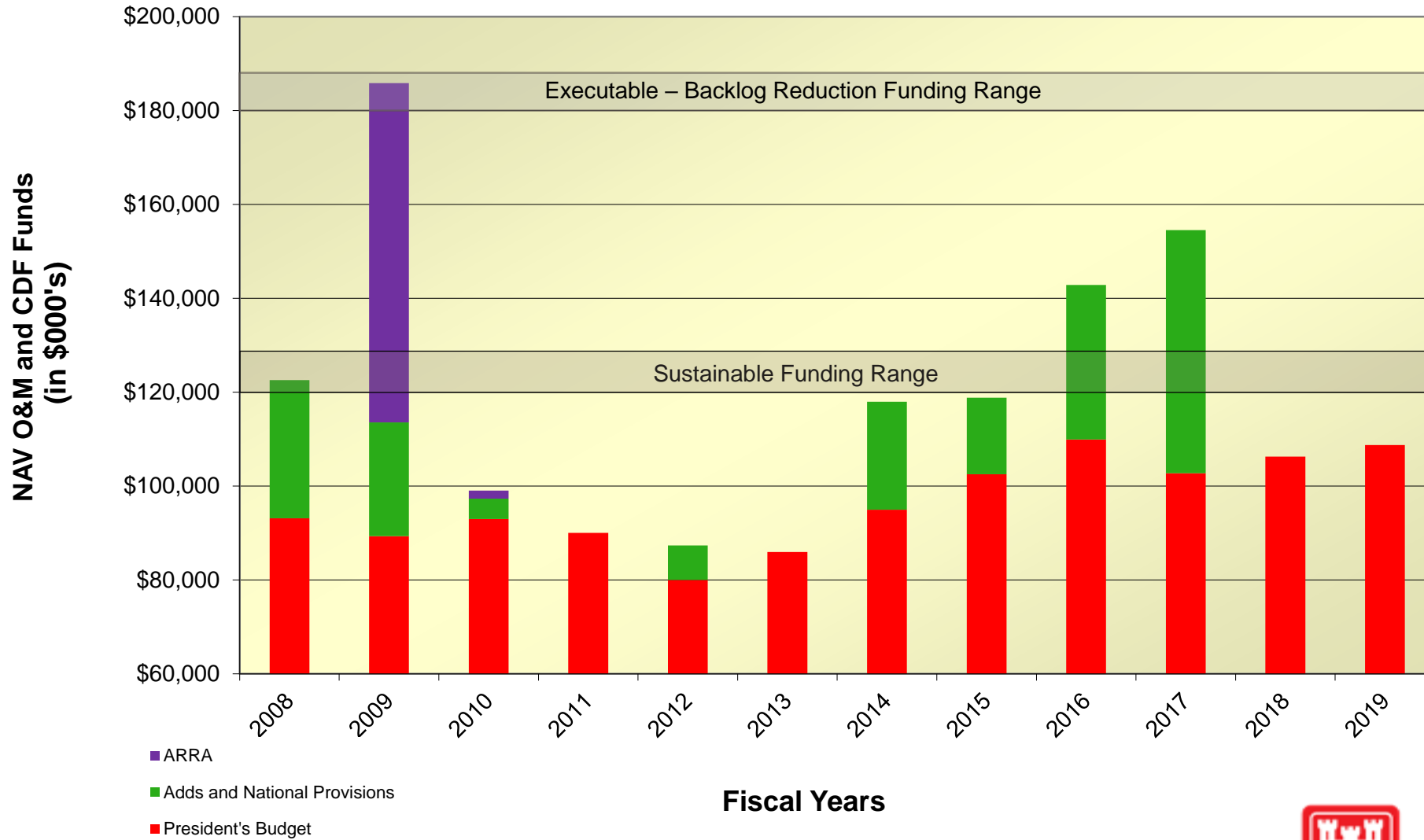
- The Corps must manage all the individually authorized projects in the Great Lakes Navigation System as components of a single, comprehensive system, recognizing the interdependency of ports
- The Corps shall not allocate funds solely on tonnage
- Establishes funding targets for expenditure of HMTF funds for the next 10 years.
- Emerging harbors (less than 1M tons) receive no less than 10% of 2012 HMTF appropriated funds (\$898M)
- In 2018, the nations ports reached an agreement that future HMTF would be allocated 10% to GL, Gulf, NW Pacific, SW Pacific, N. Atlantic, S. Atlantic and that some would be set aside for donor and enerty ports. Need WRDA legislation to solidify this.



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# GL NAVIGATION FUNDING HISTORY



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# FY 18 GREAT LAKES NAVIGATION PRESIDENT'S BUDGET

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Great Lakes Navigation Operations & Maintenance  
**\$106.23M**

## Key Items

\$37.85M in Dredging (16 projects; 2.95M cy)

\$10.9M in Dredged Material Management

\$8.9M in Soo Locks Maintenance



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# FY18 CORPS FUNDING STATUS

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- FY18 Appropriation passed March 23, 2018; awaiting final workplan
- Executing funding based on FY18 President's Budget at this time

If Congress passes an Appropriations Bill, additional funds could be allocated to projects across the country. Funding amounts included in House and Senate markups:

Additional Funding for Ongoing Work	House	Senate
- Navigation Maintenance	\$8.4M	\$23M
- Deep-draft harbor and channel	\$334.4M	\$287M
- Small, remote, or subsistence nav	\$20M	\$51M



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# FY 19 GREAT LAKES NAVIGATION PRESIDENT'S BUDGET

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Great Lakes Navigation Operations & Maintenance  
**\$108.7M**

## Key Items

\$39.8M in Dredging (21 projects; 2.9M cy)

\$10.6M in Dredged Material Management

\$2.0M in Soo Locks Maintenance



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# DREDGING



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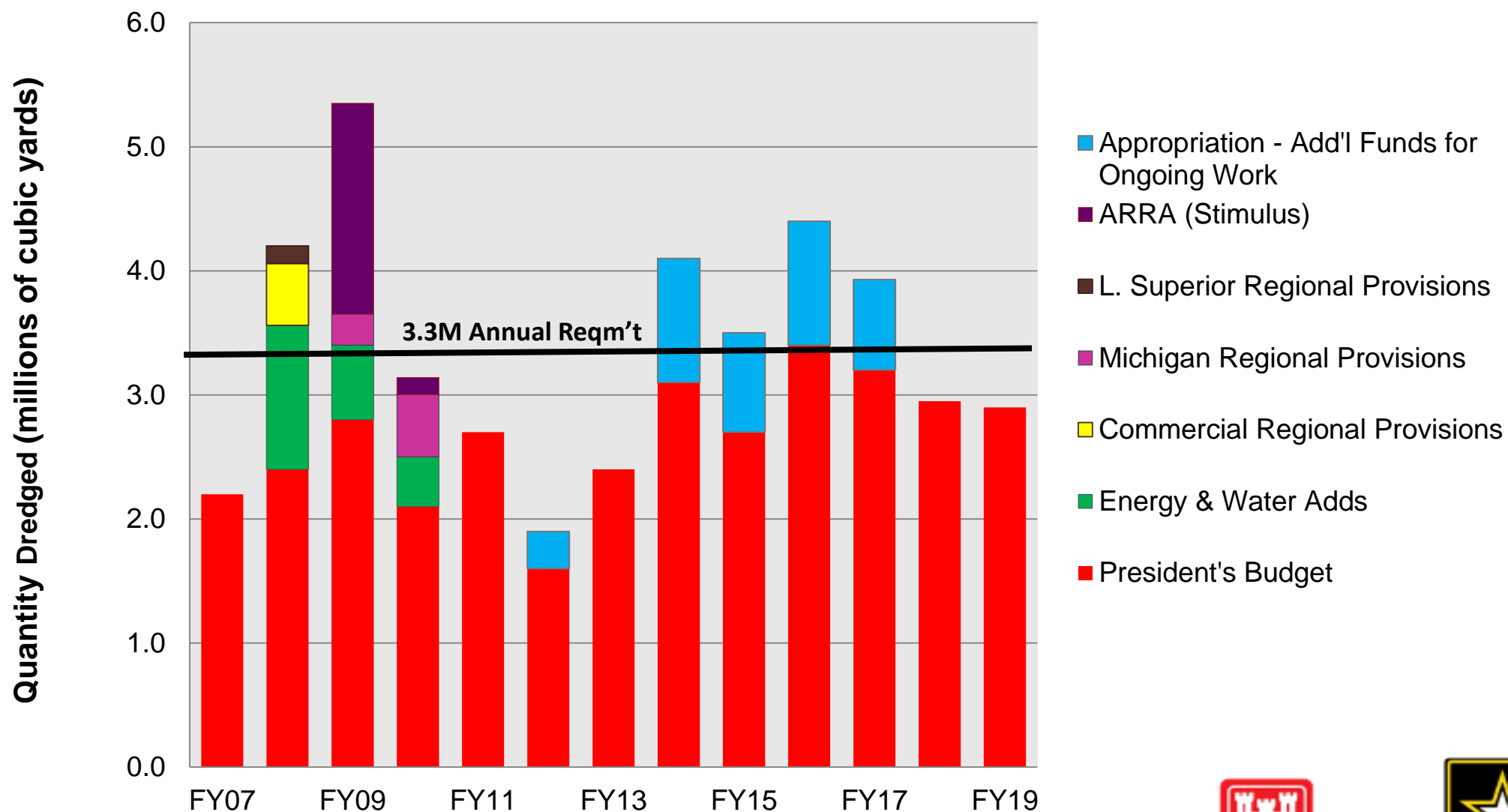


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## FY18 DREDGING FUNDING AND REQUIREMENTS



# DREDGING FUNDING TRENDS 2007 – 2019

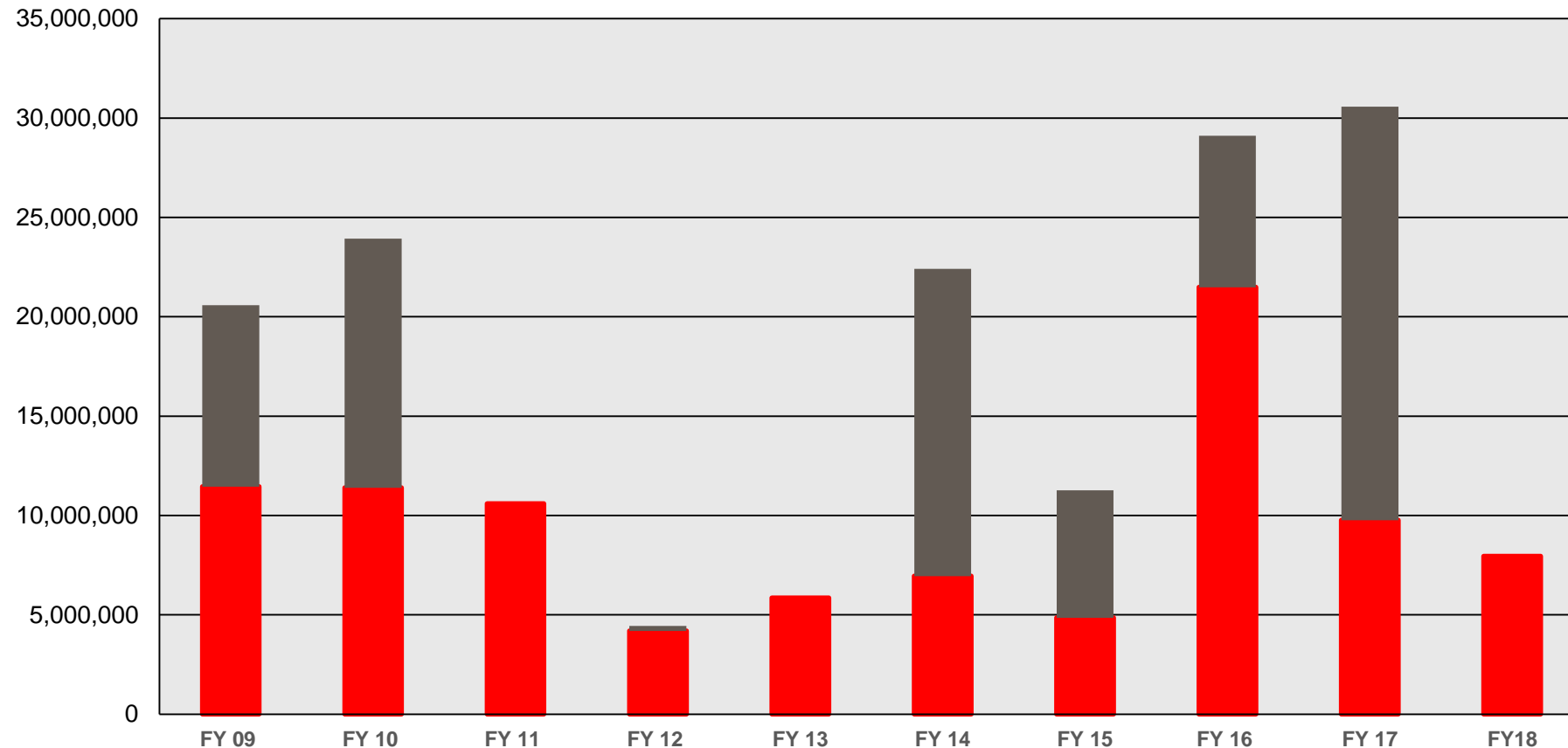


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# HISTORICAL FUNDING

## GREAT LAKES LOW USE PROJECTS (<1M TONS)



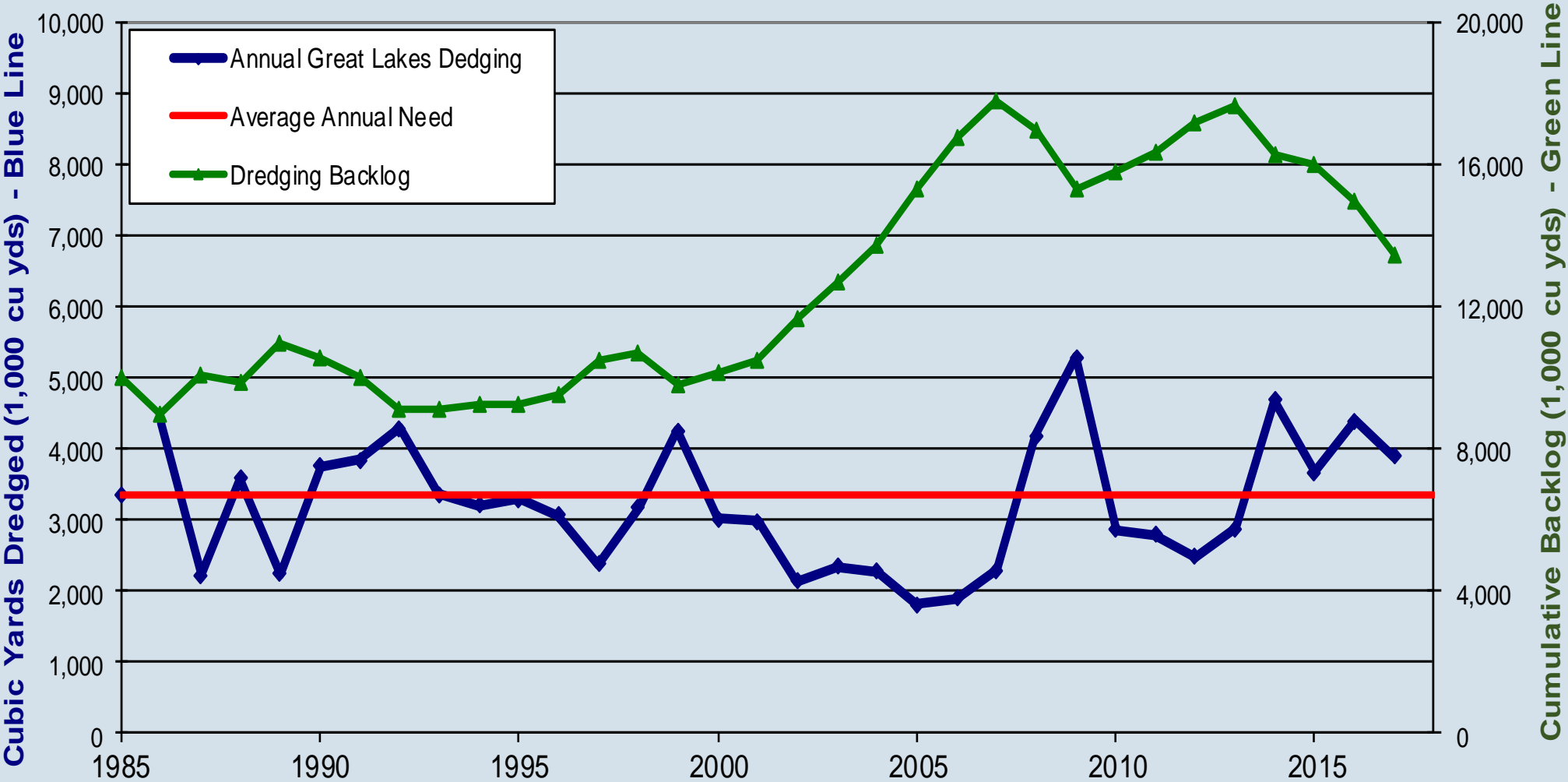
■ President's Budget ■ Workplan/Appropriation



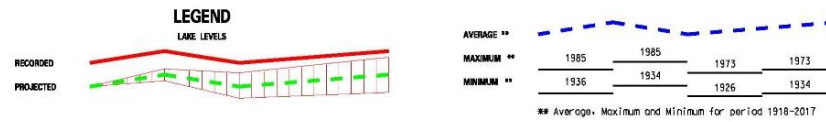
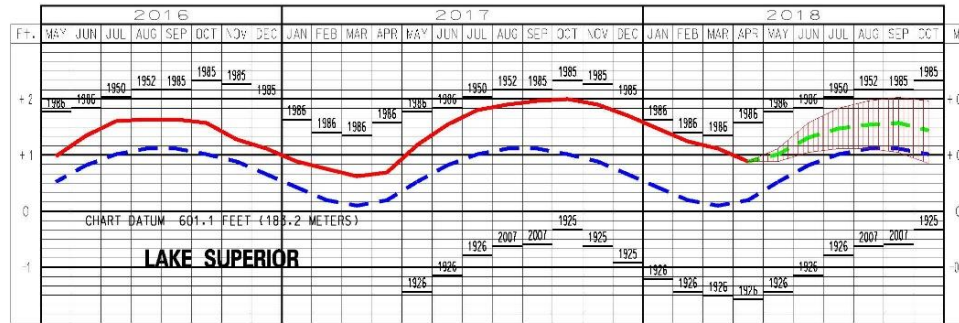
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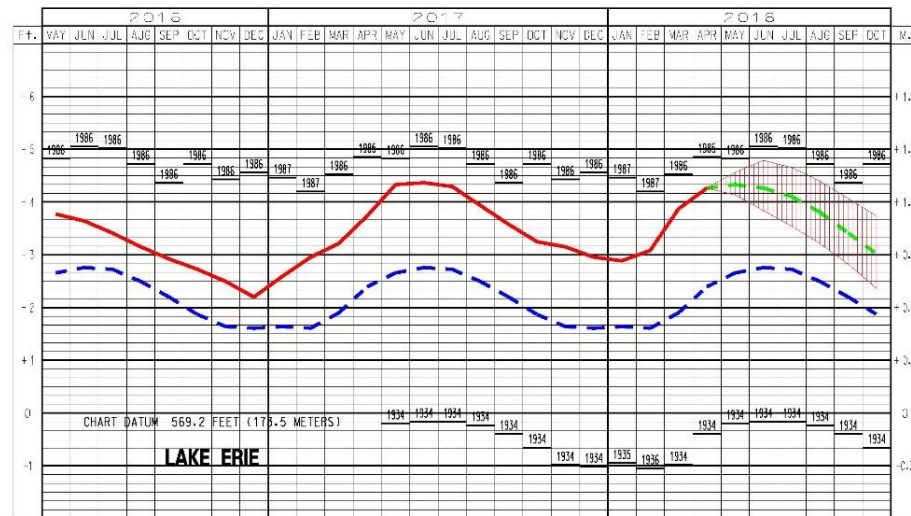
# Great Lakes Dredging Backlog 1985-2017



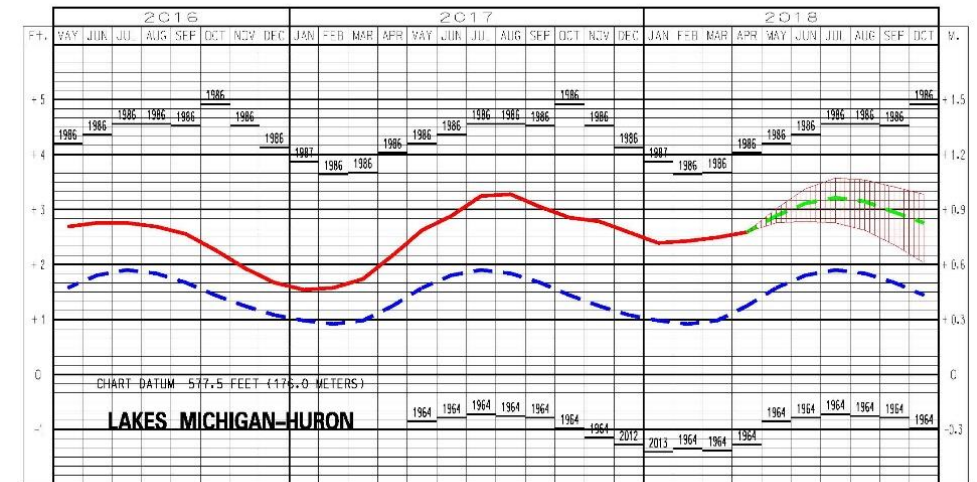
# LAKE SUPERIOR WATER LEVELS - MAY 2018



# LAKE ERIE WATER LEVELS - MAY 2018



# LAKES MICHIGAN-HURON WATER LEVELS - MAY 2018



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# DREDGED MATERIAL MANAGEMENT



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# DREDGED MATERIAL PLACEMENT POTENTIAL BENEFICIAL USES



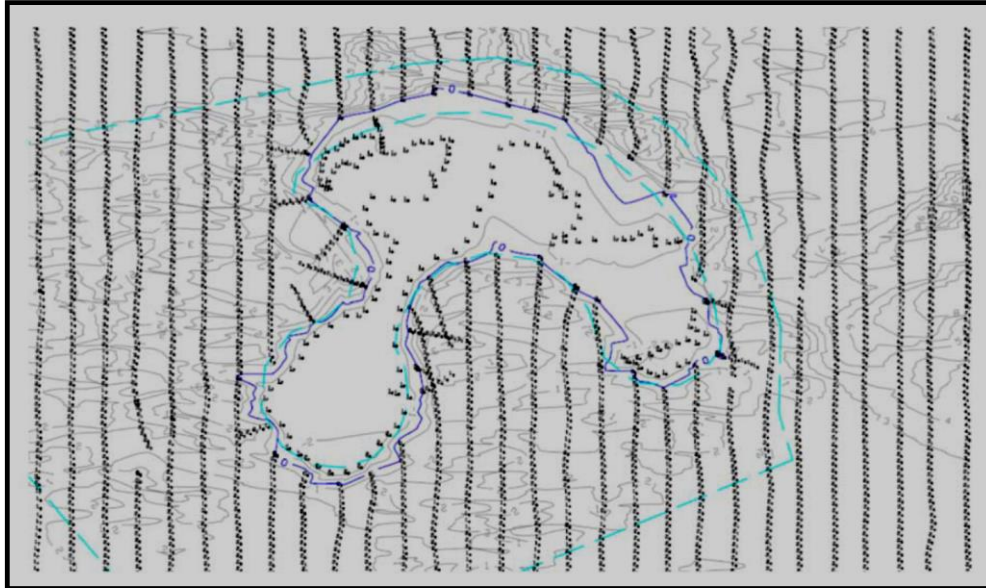
- 21<sup>st</sup> and 40<sup>th</sup> Ave Restoration Sites  
– 886K placed since 2013
- 505K remaining capacity to 2021
- Great potential sites: MN Point, Superior Bay Habitat, WI Piping Plover Site



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# 21<sup>ST</sup> AVENUE SHALLOW WATER HABITAT DEVELOPMENT



- Placement site for routine O&M dredging
- Least cost placement location
- Additional benefit – creating shallow water habitat



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# CORPS DMM INITIATIVES WAY FORWARD

- **Policy constraints** – Revision of PGL-47 to expand definition of O&M activities
- **Limited authorities** – Expansion of authorities to mirror WIIN Section 1122
- **Funding limitations** – Increase and sustain annual CAP Section 204 funding
- **Sediment composition** – Leverage innovation from WIIN Section 1122 projects
- **Perception** – Continue to communicate positive aspects of beneficial use



# LOCK RELIABILITY



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# Soo Locks Chronology

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MacArthur  
1943

Second Poe  
1969

New Poe Sized Lock  
20??

Weitzel  
1881

First Poe  
1896

Davis  
1914

Sabin  
1919

State Lock  
1855



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# WORLD WAR II Lock Protection

- The only activity in the Central Defense Command that involved the use of Army Combat units was the protection of the Soo Locks and the St. Marys River waterway.
- Keeping iron ore moving through the locks was so important to the U.S. during the war that 10,000 soldiers were stationed in Sault Ste. Marie to protect the locks

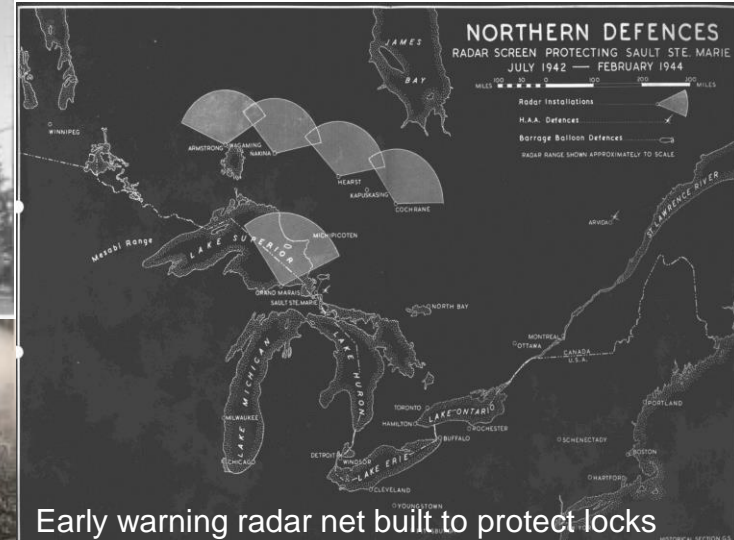
Torpedo nets across locks



ST. MARYS RIVER LOCK  
CO. 10TH INFANTRY, MICHIGAN  
JULY 1942 - FEBRUARY 1944  
REAR GUARD BARRAGE  
ST. MARYS RIVER



MacArthur Lock built in 18 months during WWII

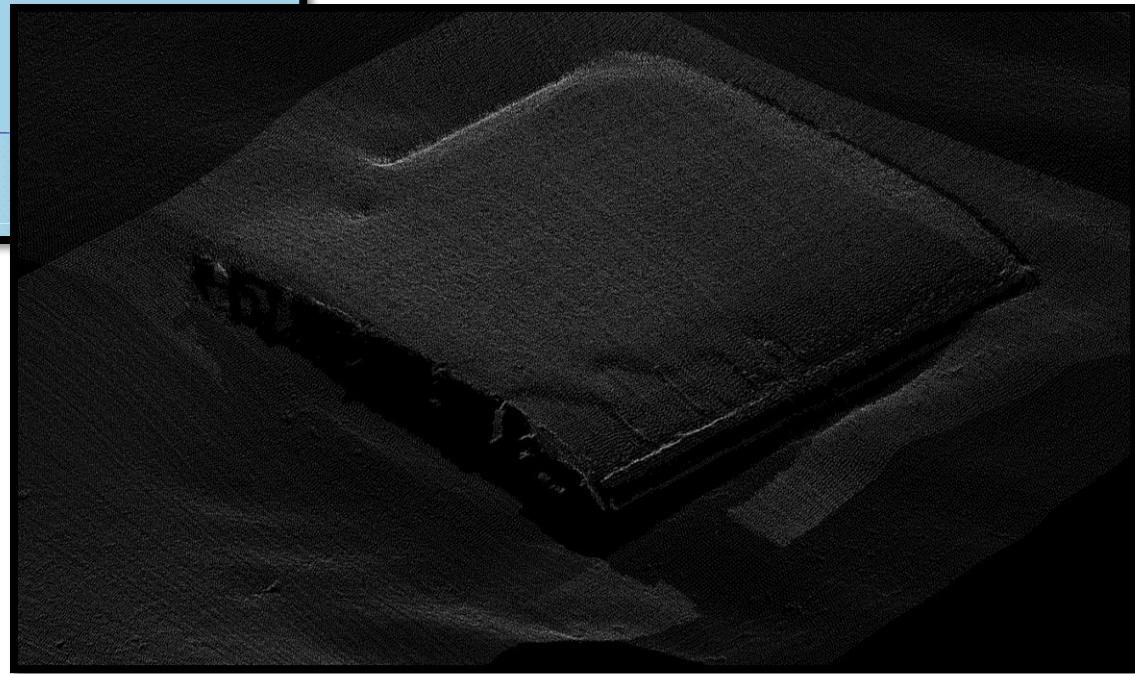
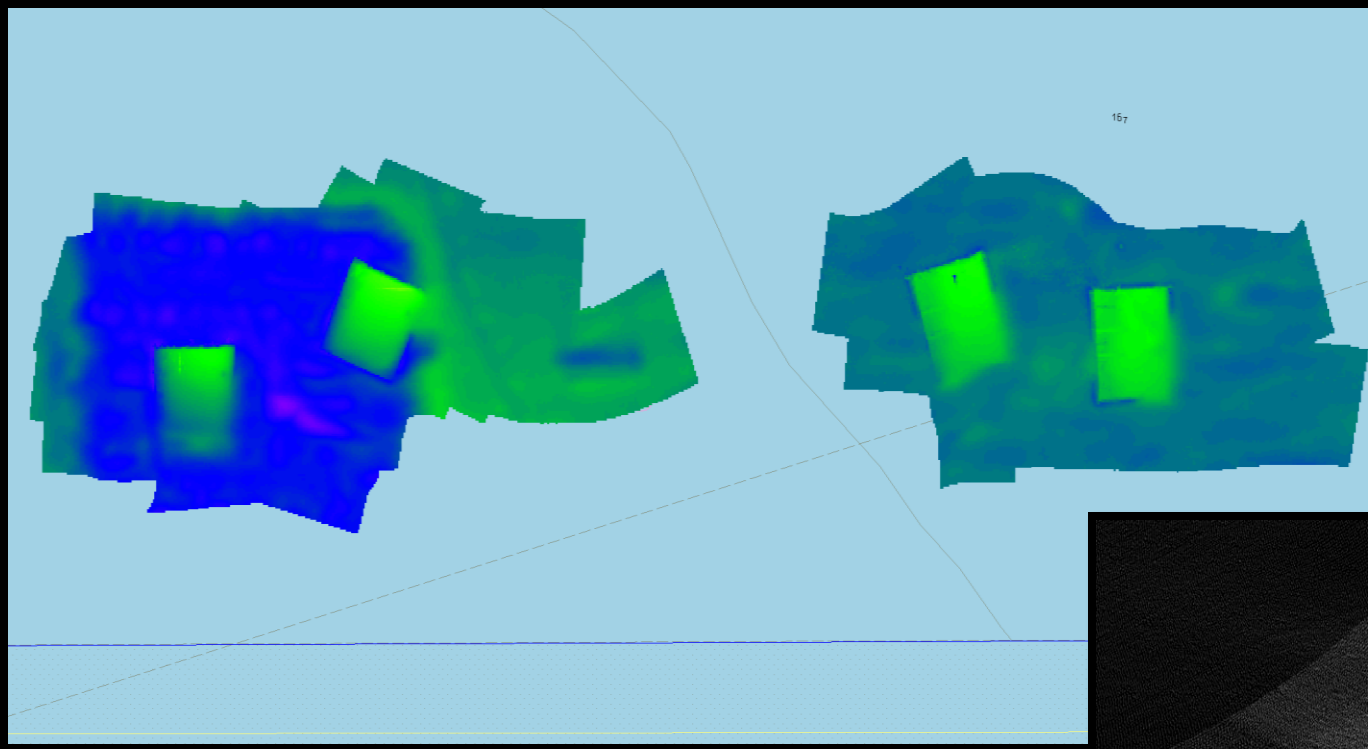


Early warning radar net built to protect locks



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EMERGENCY GATE LOCATIONS

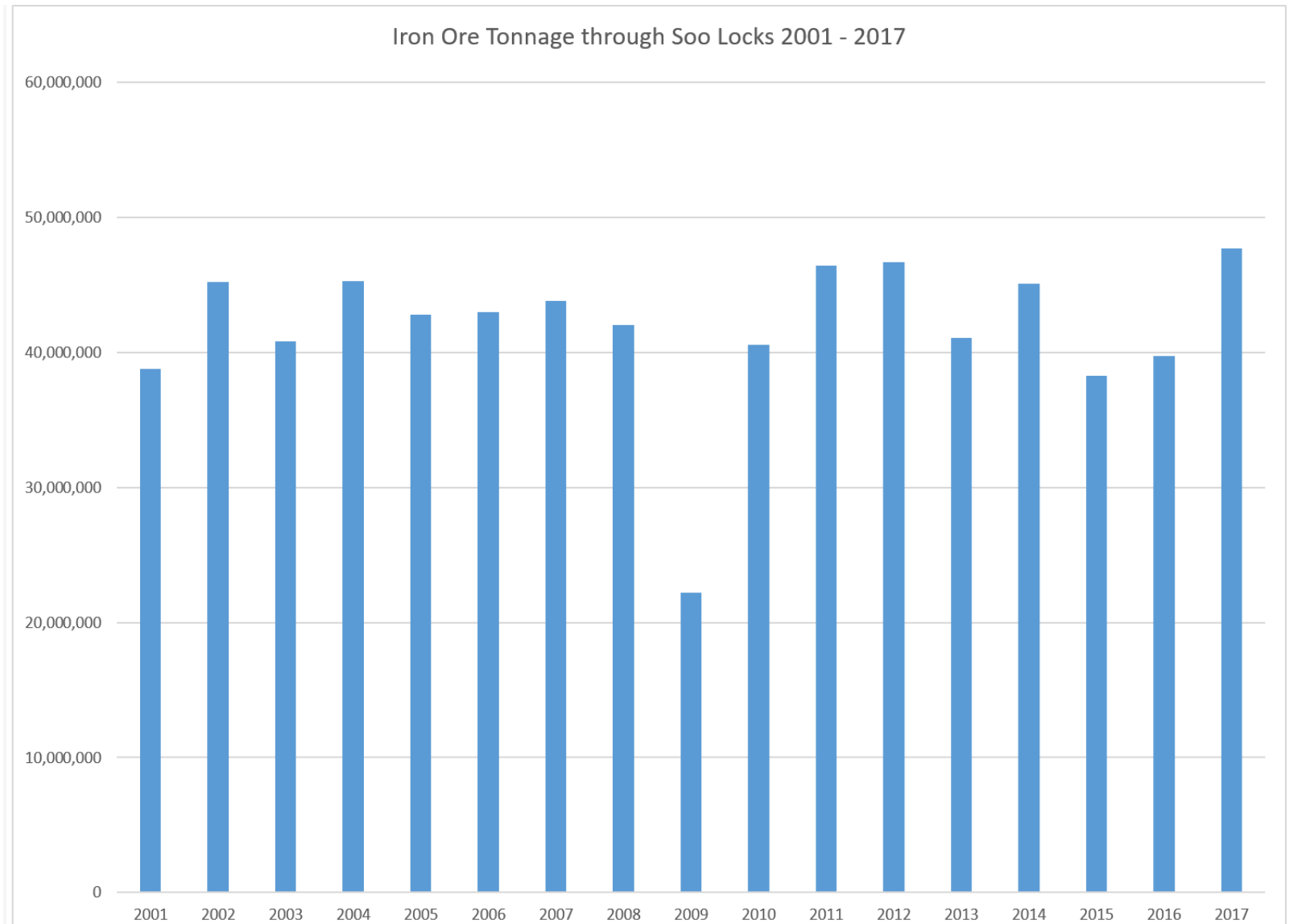


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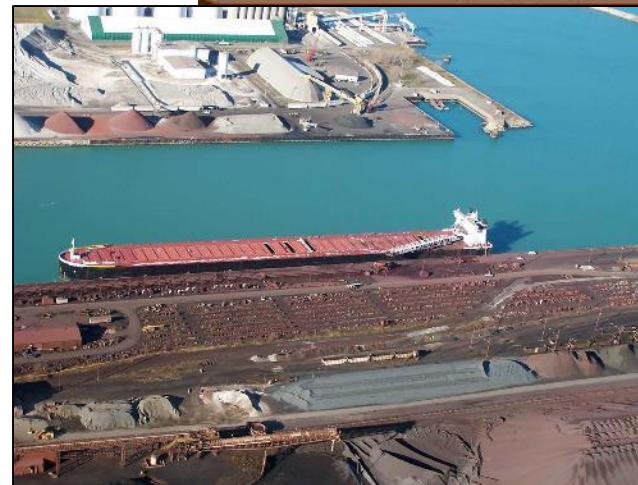
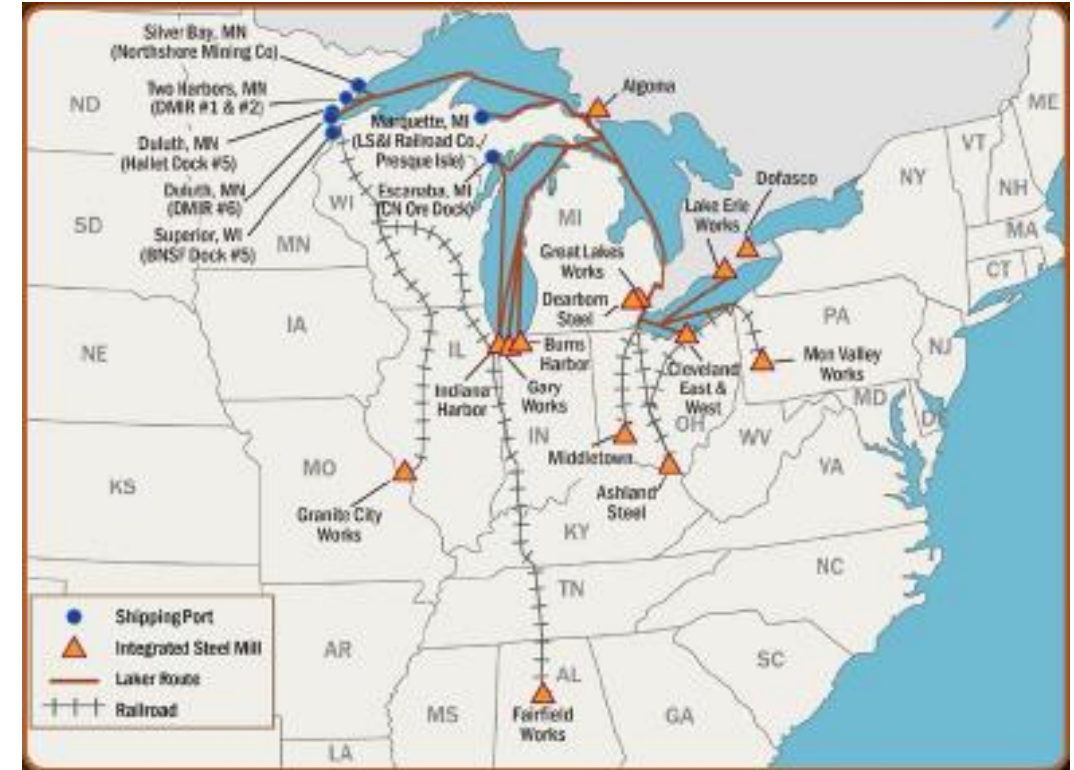
# SOO TONNAGE – 2017 FINAL NUMBERS

- Total tonnage 75.3M, an increase of 12% over 2016
- Iron ore up 20% over 2016
- 95% of US tonnage was Poe-Restricted in 2017
- Set several individual vessel draft records, helped by higher water levels



# INTEGRATED STEEL MILLS

- 13 of 14 North American Mills are dependent on the Soo Locks for transport from Minnesota and Michigan.
- 9 of the 14 mills are on the shores of the Great Lakes
- Likelihood of a primary steel mill being shut down is proportional to its distance from the Great Lakes.
- Advanced high strength steel - specifically required for production of auto, appliance, construction, farm, and mining equipment, rail car and locomotive industries.
- Typical Great Lakes mill layout receives taconite by ship; **most mills do not have infrastructure to receive taconite by rail.**



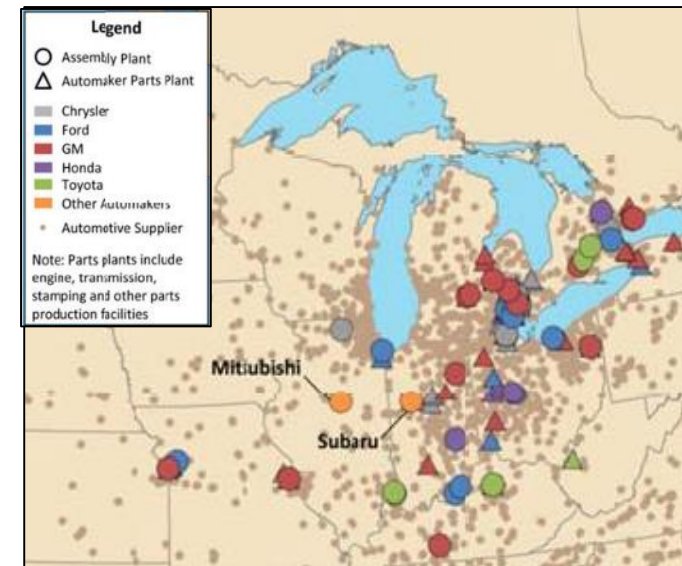
# IMPORTANCE TO U.S. ECONOMY

## U.S. AUTO INDUSTRY

The auto industry is one of the most important industries in the U.S. economy:

- Over 7 million private sector jobs supported by auto manufacturers, suppliers and dealers in the United States
- Every vehicle manufacturer job creates almost 7 other jobs in industries across the economy
- A typical automobile made in North America contains steel from the 9 Integrated Steel Mills that produce automotive quality steel.
- Competition and efficiency have spurred just-in-time delivery (minimized inventories) at every stage in the supply chain.
- Interruptions to any part of the supply chain quickly ripple down to the final product

Source: Center for Automotive Research, Jan 2015

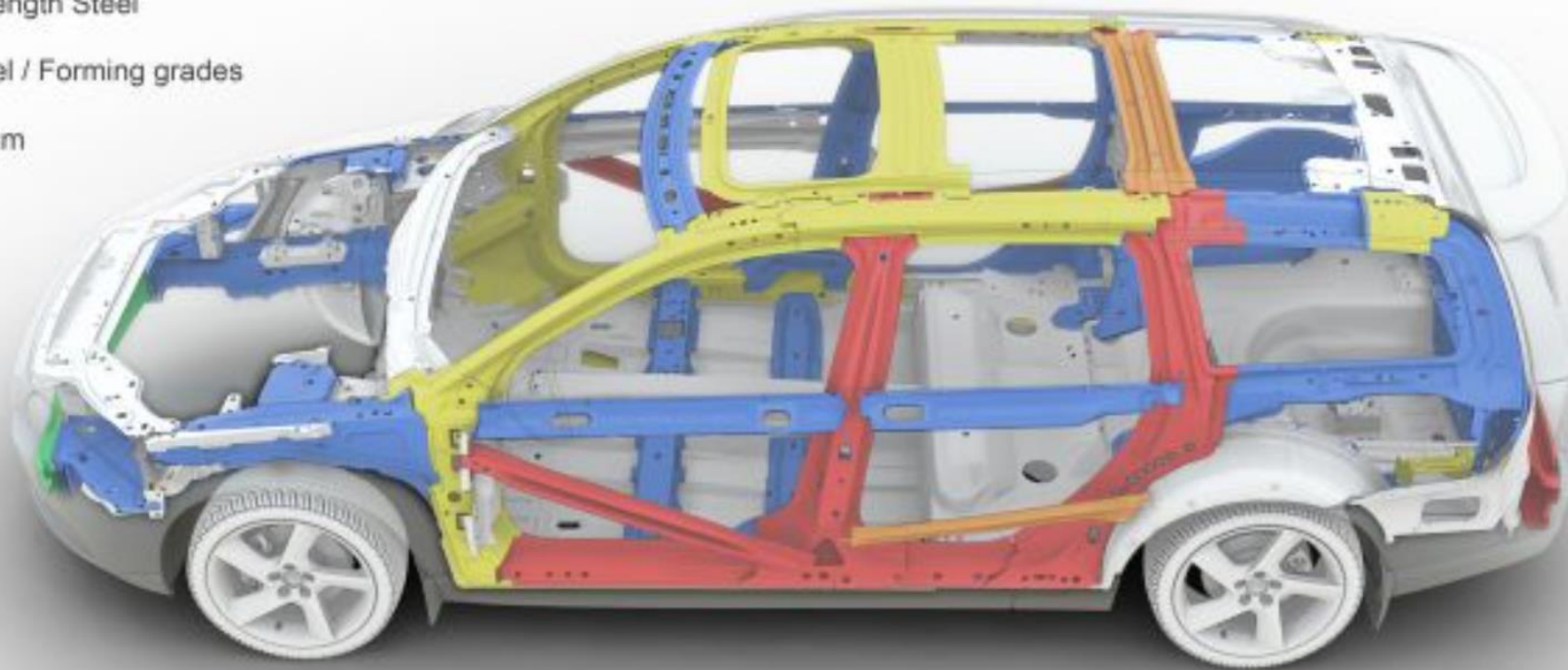


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## ADVANCED HIGH STRENGTH STEEL ESSENTIAL COMPONENT IN AUTOMOBILES

- Ultra High Strength Steel
- Extra High Strength Steel
- Very High Strength Steel
- High Strength Steel
- Mild Steel / Forming grades
- Aluminium



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# THE SOO LOCKS

## LYNCH PIN OF THE GREAT LAKES NAVIGATION SYSTEM

- 85% 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
  - **Only lock in the Corps with no alternate mode of transportation around lock**



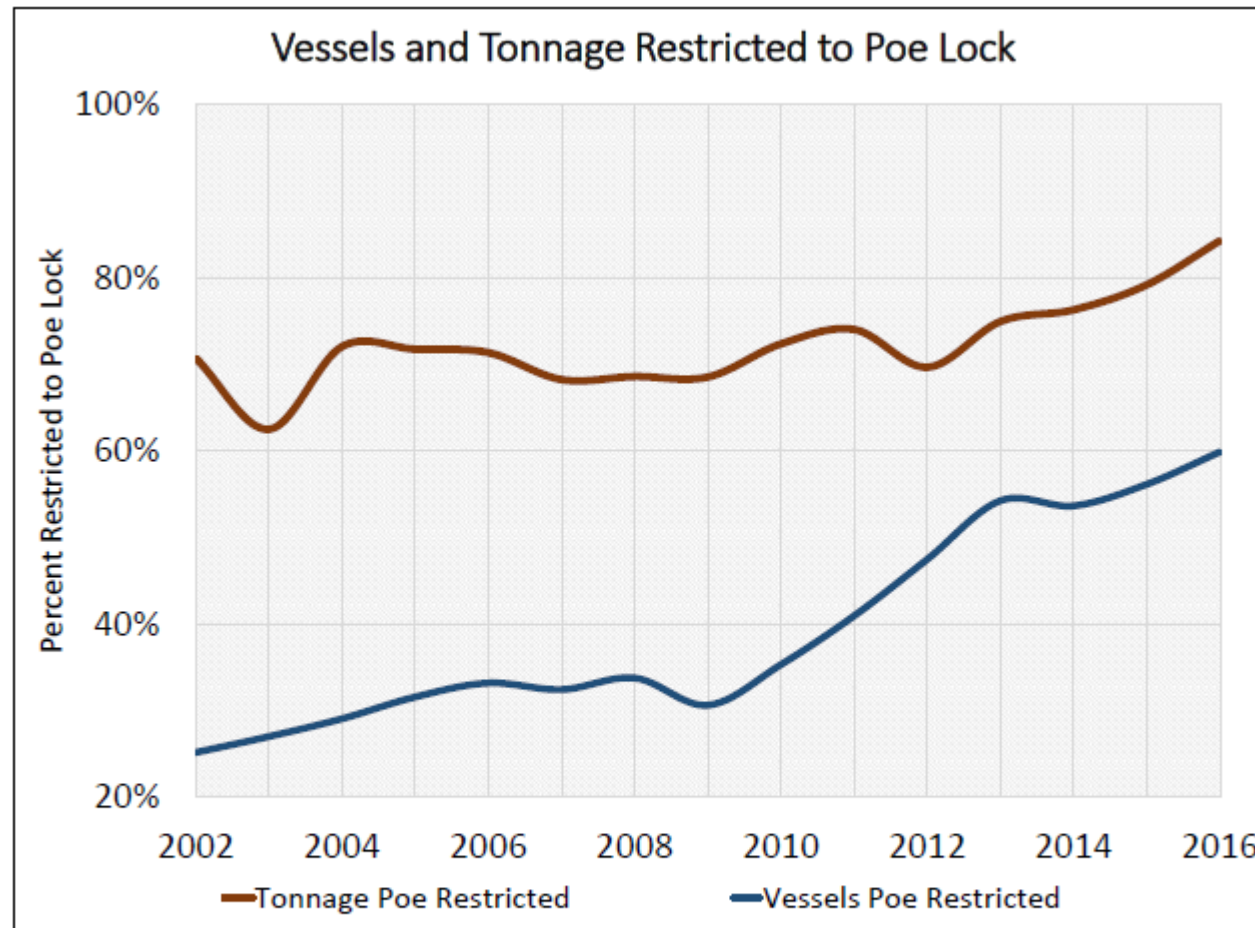
- Two major efforts are underway to improve reliability of the Soo Locks
  1. Maintain existing infrastructure through Asset Renewal Plan
  2. New lock with the same dimensions as the Poe Lock – Economic Validation Study



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# VESSEL SIZE INCREASING – MORE RELIANCE ON POE LOCK



Percentage of vessels and cargo restricted due to size to the Poe Lock continues to increase over time



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# SOO LOCKS ASSET RENEWAL PLAN

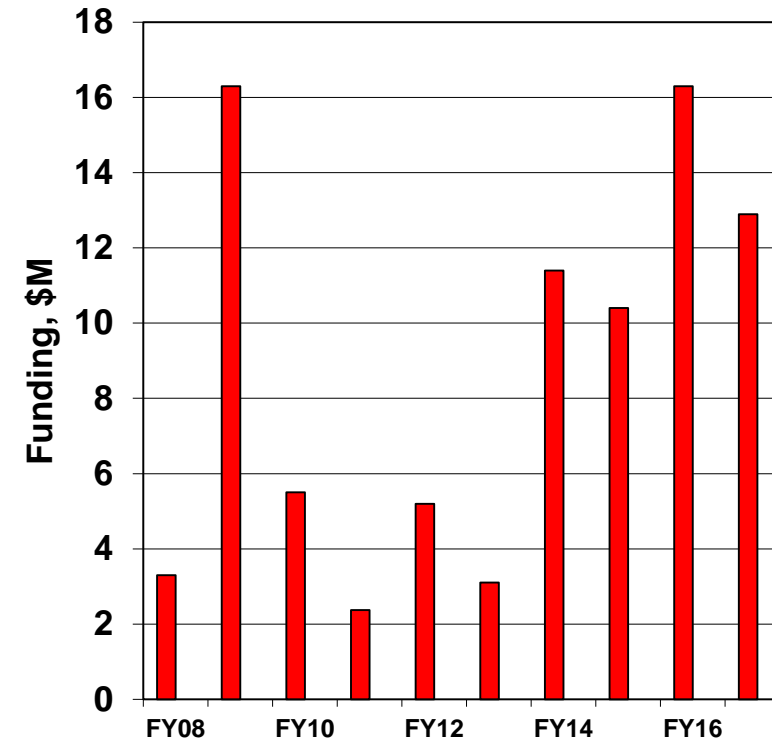
Asset Renewal Plan will maximize reliability and reduce risk through 2035

\$86M funded to date through FY17

- New hydraulics, stop logs, utilities
- Compressed Air System
- Poe Gate Anchorage Replacement
- Mac and Poe Electrical System Replacement
- Poe Miter and Quoin Block Replacement

Remaining key priorities.

- Poe Lock Gate 1 Replacement.
- Pier rehabilitation
- Davis Pump Well



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# PROPOSED NEW LOCK



Existing



Proposed



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## BACKGROUND & CURRENT STATUS

- First authorized in WRDA 1986 with a feasibility level cost of \$241M.
- Current Authorization: WRDA 2007 (PL 110-114, 8 Nov 2007) Section 3091 construction at full federal expense updated to 30% design level cost of \$341M.
- Construct a redundant lock adjacent to the existing Poe Lock and with the same dimensions (1200 ft x 110 ft)
- Approved 1985 feasibility study. An Economic Validation Study is on schedule for HQ approval **June 2018**.
- Construction to date: two cofferdams and downstream deepening.
- Previous funding through Work Plans, Re-programming, and Congressional Adds



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## 2005 BCR VS. 2018 BCR

Assumed delivery of 100% of commodities by alternative modes of transportation; however, rail routes are not available for all commodities

No reliability outages were considered in 2005 – only accidents; current condition assessment and risks indicate probabilities of component failures have increased

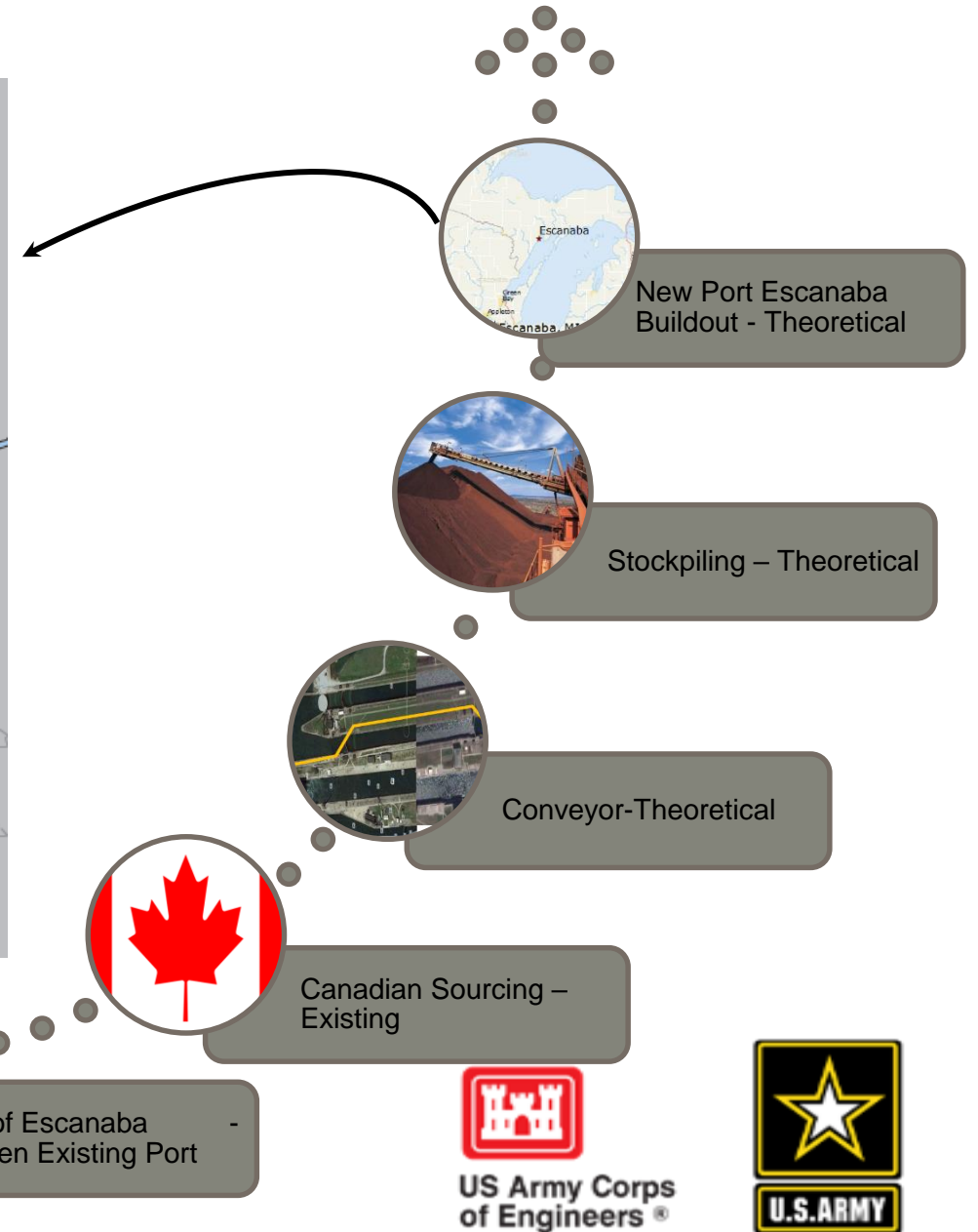
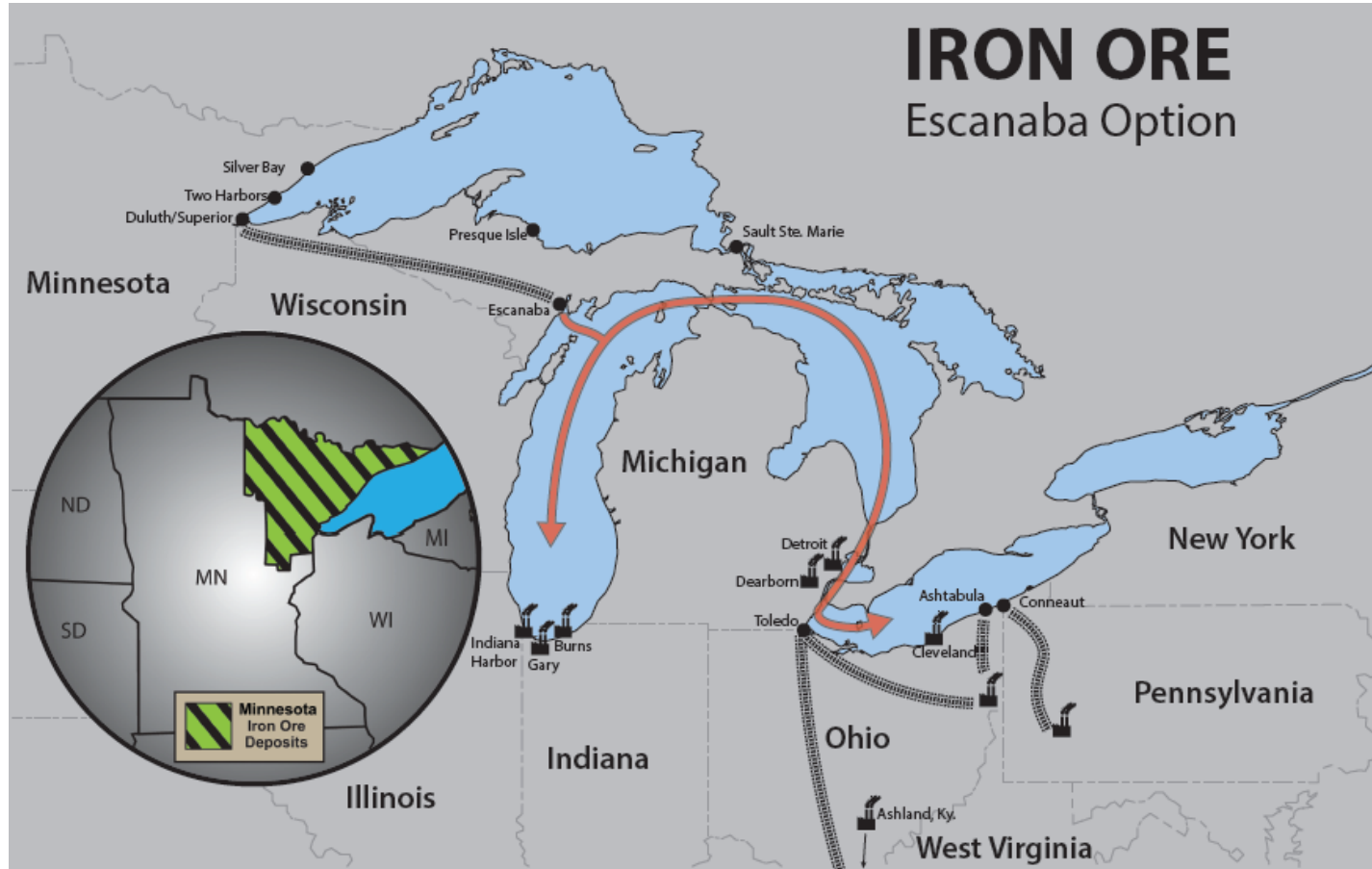
Assumed all new vessels will be Mac Lock sized; however, percentage of Poe-restricted vessels continues to increase



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# PROXY TRANSPORTATION MODES



# ECONOMIC VALIDATION REPORT

- **Reliability:** Information is being leveraged from recent detailed inspections to update reliability and projected outage model
- **Forecast:** A commodity and transportation forecast study was conducted
- **Alternate Modes of Transportation:** Alternate modes were developed for various outage lengths
  - Proxy Modes – modes developed because there is no alternate mode
  - Stockpiling at steel mills, build conveyor belt along Poe, buildout Escanaba port and lay new rail
- **Updated Cost:** The risk-based cost estimate for construction of the new lock will be updated for a new certified construction cost



The report is expected to be complete in June 2018

New authorization by Congress is required for higher construction cost

Pending a budgetable Benefit-to-Cost Ratio, could include construction request for FY20 President's Budget Request



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# Questions?

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