Harbor Maintenance Operations and Funding: Opportunities and Challenges for the Great Lakes Region

Josh Feldmann

U.S. Army Corps of Engineers
Chief, Operations, Buffalo District

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US Army Corps of Engineers
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Great Lakes Navigation System Economic Data

- A non-linear interdependent system of 140 deep and shallow draft projects; commercial ports are dependent on each other for the efficiency and health of the system.

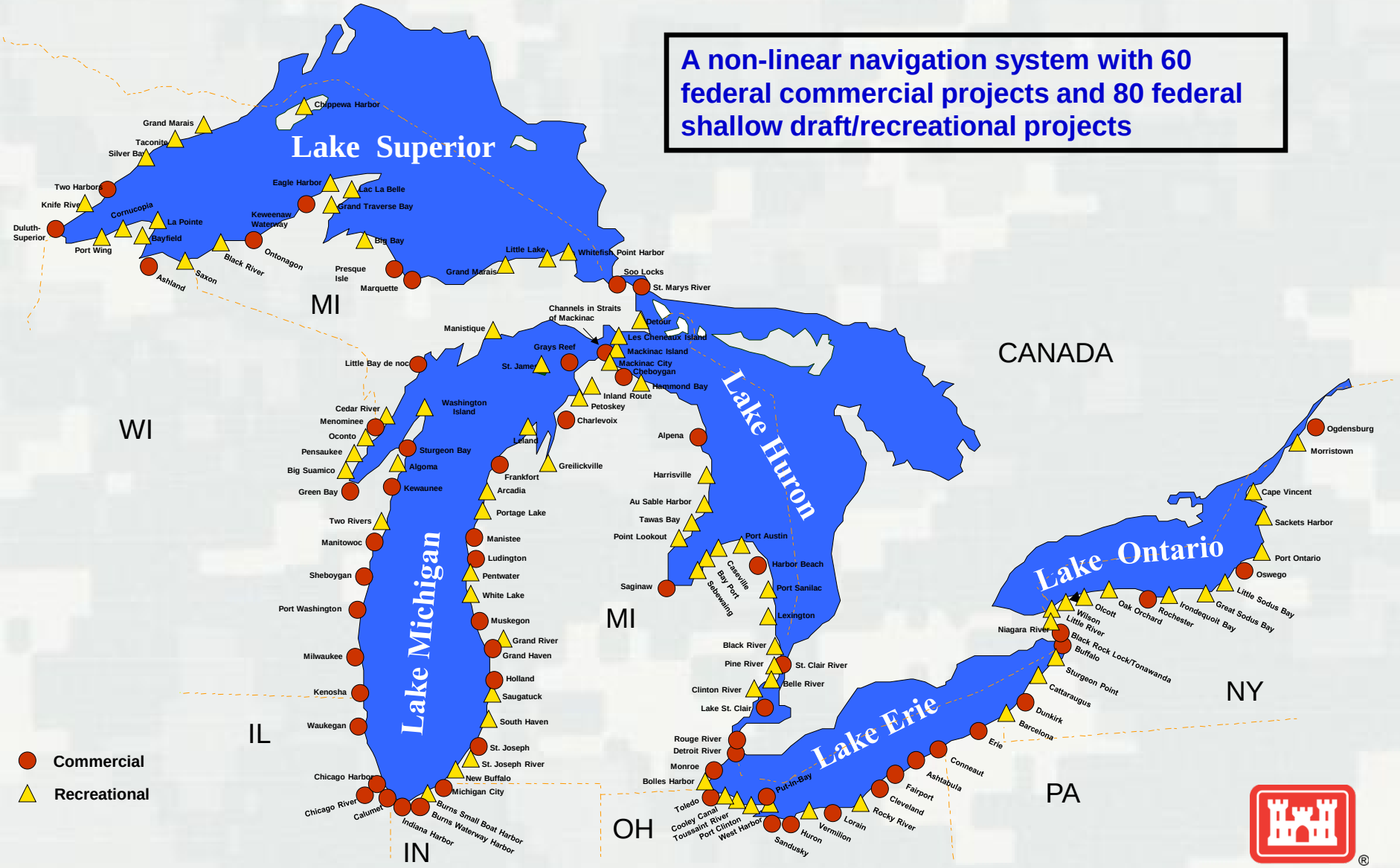
- 145M tons (5-year average) – (USACE Waterborne Commerce Statistics)

- 20% of tonnage is exported – to Canada or overseas (USACE Waterborne Commerce Statistics)

- GLNS saves the country **$3.6 billion** per year compared to the next least costly mode of transportation (USACE Inland Nav Center of Expertise)

Federal Projects on the Great Lakes

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



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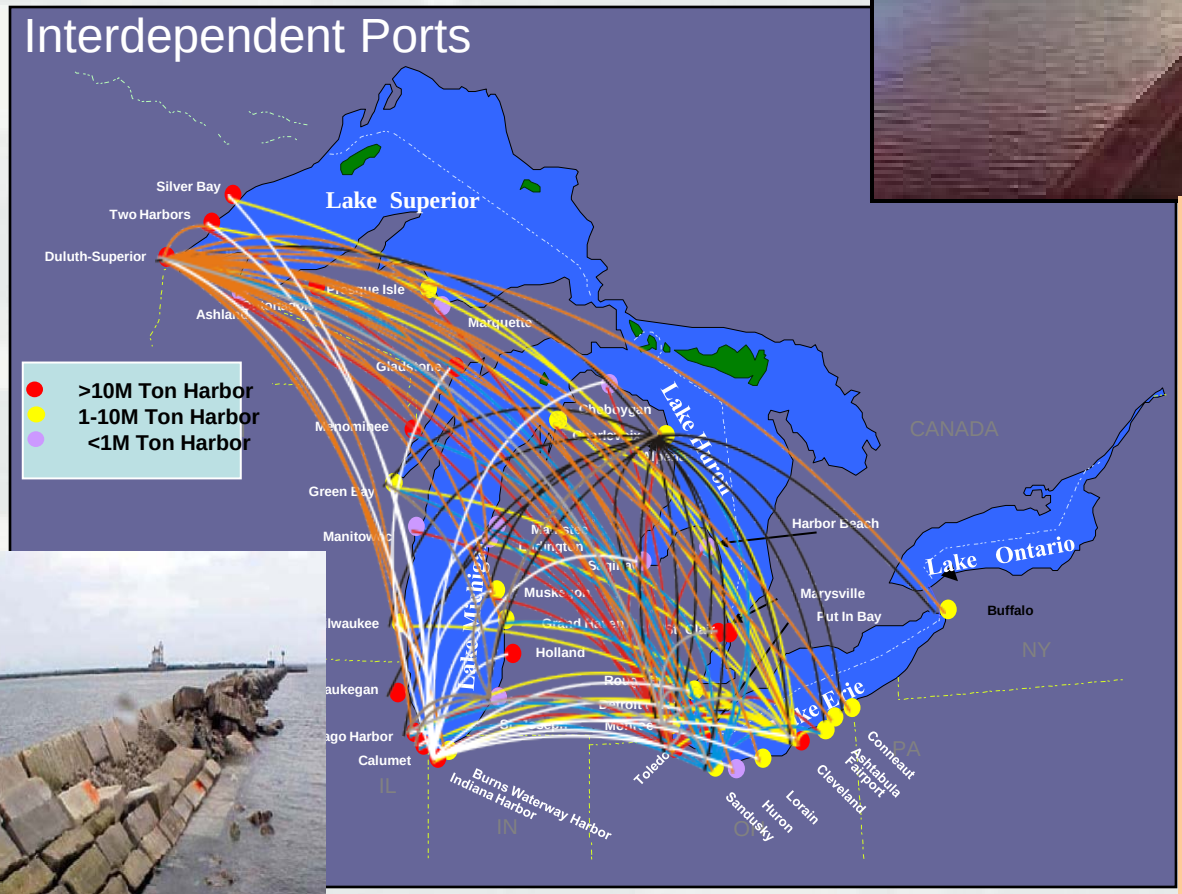
Great Lakes Navigation

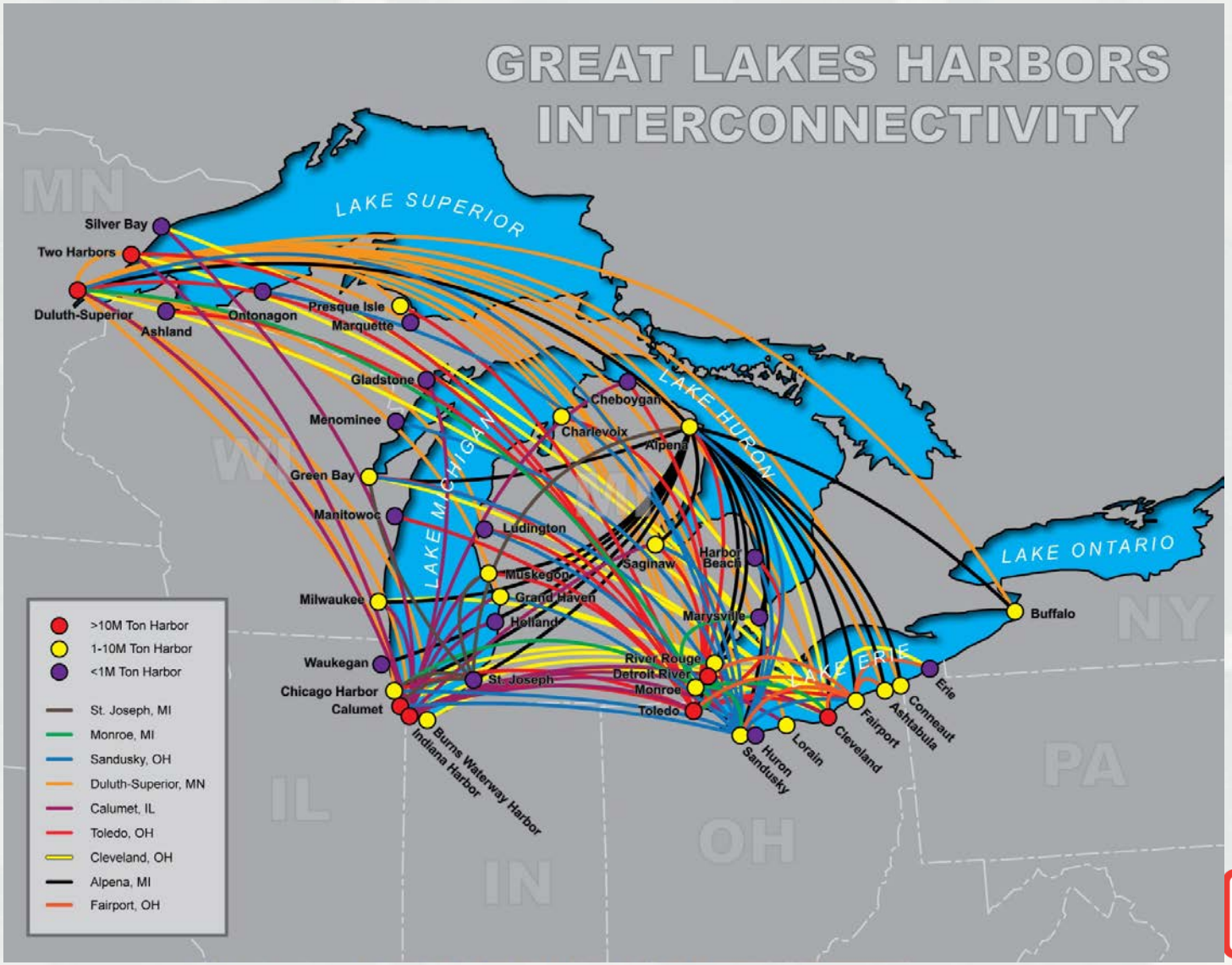


Key Challenges

- Balancing System Requirements
  - Dredging
  - Dredged Material Management
  - Navigation structures
  - Soo Locks

- Interdependency requires using a system approach in prioritizing investments

Great Lakes Navigation System



Dredging

FY15 Dredging Funding and Dredging Requirements

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FY 16 Great Lakes Navigation

$111.6M Great Lakes Navigation Operations & Maintenance

Key Items

$49M in Dredging (25 projects – 3.4M cubic yards)
$8.4M in Dredged Material Management
$3.7M in Soo Asset Renewal

FY16 President's Budget Dredging Projects

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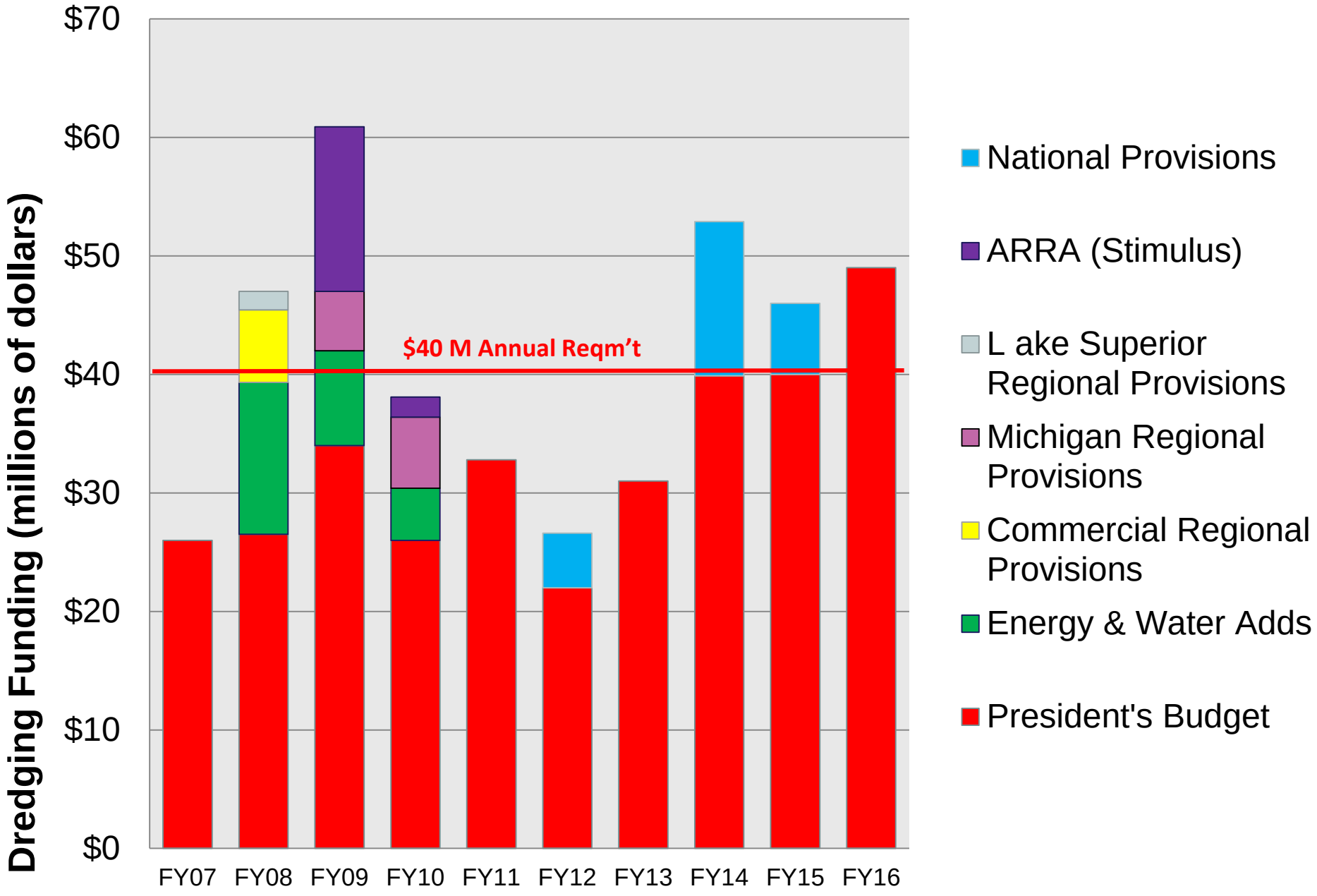
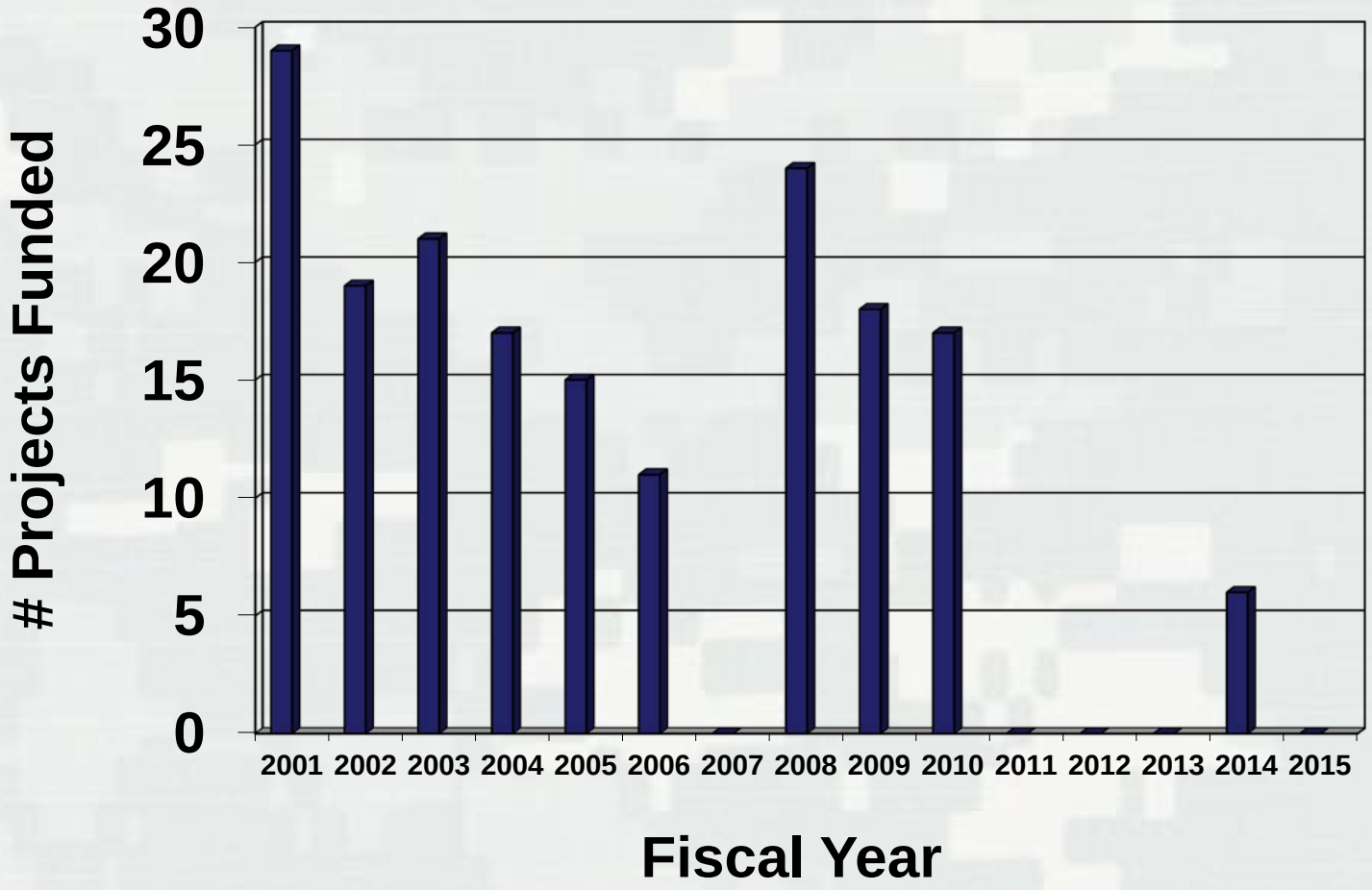
Dredging Funding Trends 2007 - 2016

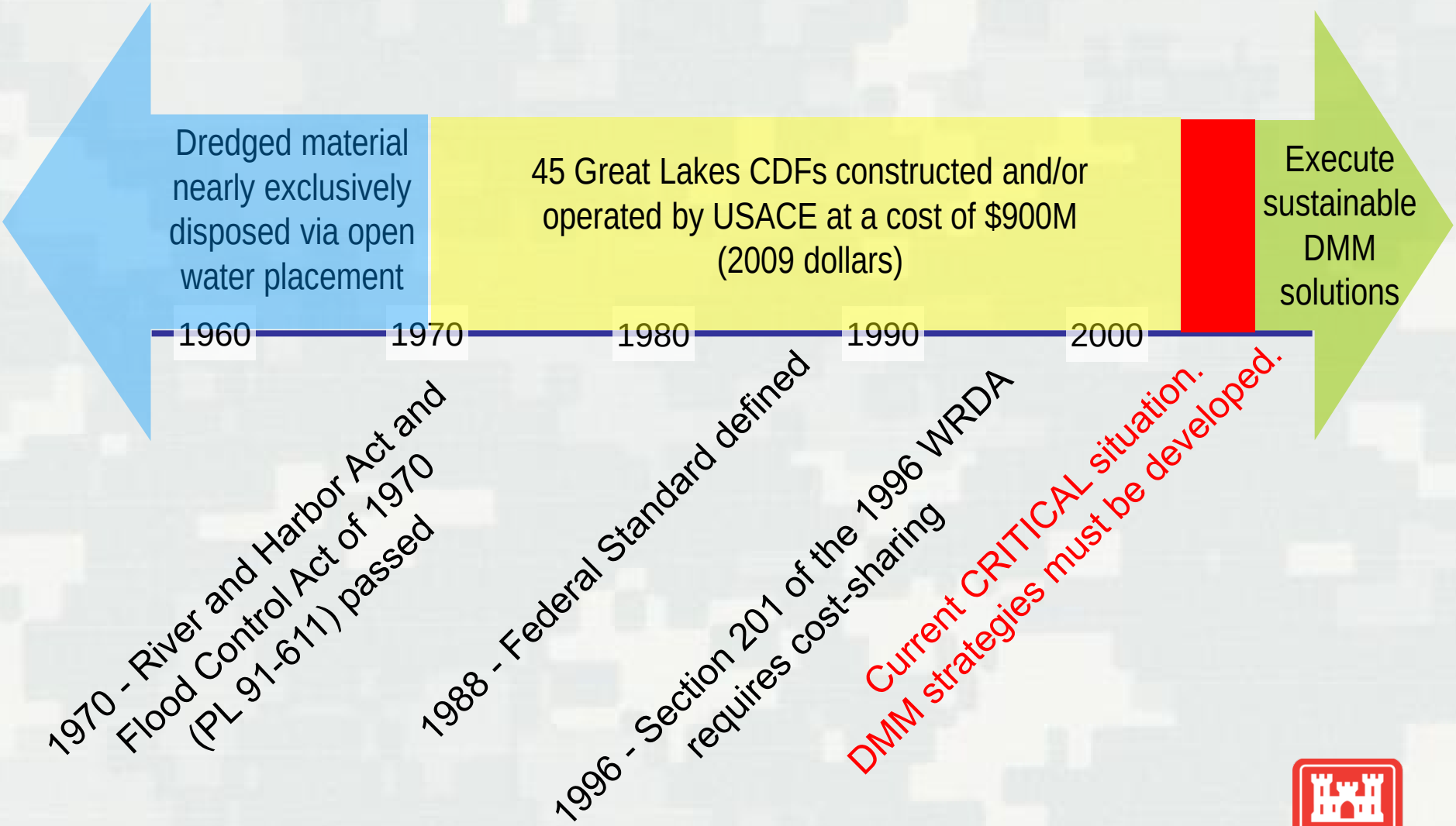


Historical Shallow Draft/Recreational Harbor Funding



Dredged Material Management

Historical Perspective



Navigation Structures

Great Lakes Navigation Structures - Purposes

Navigation structures intended purposes:

- Safeguard navigation from wave and ice damage (GL experience waves over 25 ft)
- Protect navigation channel from sediment shoaling
- Protect navigation channel from wave action (preserve the design wave climate to allow pilots to navigate the channel)

Additional benefits provided:

- Protect other navigation structures within harbor such as CDFs
- Protect critical city infrastructure (buildings, roads, power plants, water/wastewater plants)
- Provide essential flood and storm protection

Control and reduce shoaling in navigation channel

Control wave climate within navigation channel and harbor

Great Lakes Navigation Structure Conditions

- 50% of GL coastal structures were built before WWI
- Over 80% of all coastal structures exceed 50 years of age
- 45% have never undergone any significant repair effort due to funding constraints
- Over 30% of structures have timber crib core sections; recent low water levels have accelerated deterioration of the wood

Harbor Structure Condition Assessments

Cost to Restore Most Critical Harbors to Acceptable Level of Risk:

Ashtabula Harbor
$39.0M

Chicago Harbor
$19.6M

Cleveland Harbor
$10.0M

Fairport Harbor
$28.0M

Lorain Harbor
$14.0M

Milwaukee Harbor
$33.0M

Total: $143.6M

Lake Superior
Grand Marais
Two Harbors
Knife River
Duluth-Superior
Port Wing
Cornucopia
La Pointe
Bayfield
Ashland
Saxon
Eagle Harbor
Keweenaw
Waterway
Black River
Ontonagon
Lac La Belle
Grand Traverse
Big Bay
Presque Isle
Marquette
Grand Marais
Little Lake
Whitefish Point
MI
WI
Manistique
Detour
Mackinac Island
Mackinaw City
Cheboygan
Hammond Bay
Inland Route
Petoskey
Charlevoix
Alpena
Harrisville
Au Sable
Tawas Bay
Point Lookout
Port Austin
Harbor Beach
Port Sanilac
Lexington
Caseville
Lake Huron
Cedar River
Menominee
Oconto
Sturgeon Bay
Algoma
Kewaunee
Two Rivers
Manitowoc
Sheboygan
Port Washington
Milwaukee
Kenosha
Waukegan
Leland
Greilickville
Frankfort
Arcadia
Portage Lake
Manistee
Ludington
Pentwater
White Lake
Muskegon
Grand Haven
Holland
Saugatuck
South Haven
St. Joseph
New Buffalo
Michigan City
Lake Michigan
IL
IN
Chicago Harbor
Chicago River
Indiana Harbor
Burns Small Boat Harbor
Burns Waterway Harbor
Calumet
Clinton River
Detroit River
Bolles Harbor
Cooley Canal
Port Clinton
West Harbor
Vermilion
Huron
Sandusky
Lorain
Rocky River
Cleveland
Fairport
Ashtabula
Conneaut
Erie
Barcelona
Dunkirk
Cattaraugus
Buffalo
Black Rock Lock/Tonawanda
Wilson
Olcott
Oak Orchard
Rochester
Irondequoit Bay
Great Sodus Bay
Little Sodus Bay
Oswego
Port Ontario
Cape Vincent
Lake Erie
Lake Ontario
OH
NY
CANADA

A – Failure Unlikely
B – Low Risk of Failure
C – Medium Risk of Failure
D – High Risk of Failure
F – Failed
Commercial
Recreational

Lock Reliability

The Soo Locks

Lynch Pin of the Great Lakes Navigation System

- 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

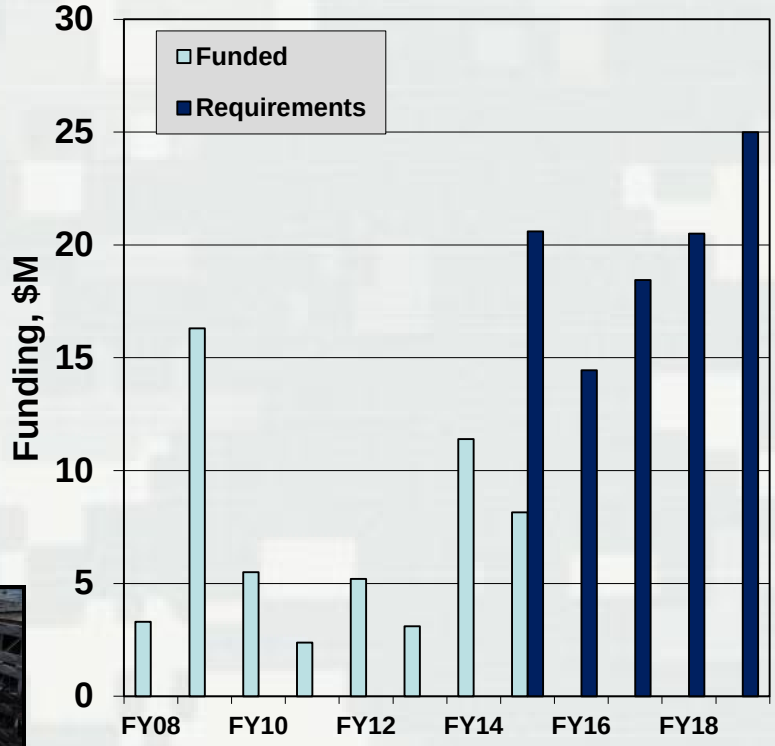
- **Two major efforts are underway to improve reliability of the Soo Locks**
  1. **Maintain existing infrastructure through Asset Renewal Plan**
  2. **New lock with the same dimensions as the Poe Lock - BCR sensitivity analysis underway**

Soo Locks Asset Renewal Long-Term Plan

Asset Renewal Plan will maximize reliability and reduce risk through 2035

- $47.2M funded to date through FY14
  - New hydraulics, stop logs, utilities
  - Compressed Air System
  - Gate Anchorage Replacement
  - Mac Lock Controls Replacement

- Remaining key priorities
  - Poe Miter and Quoin Block Replacement
  - Poe Electrical Rehabilitation
  - Poe Lock Gate 1 Replacement
  - Pier rehabilitation



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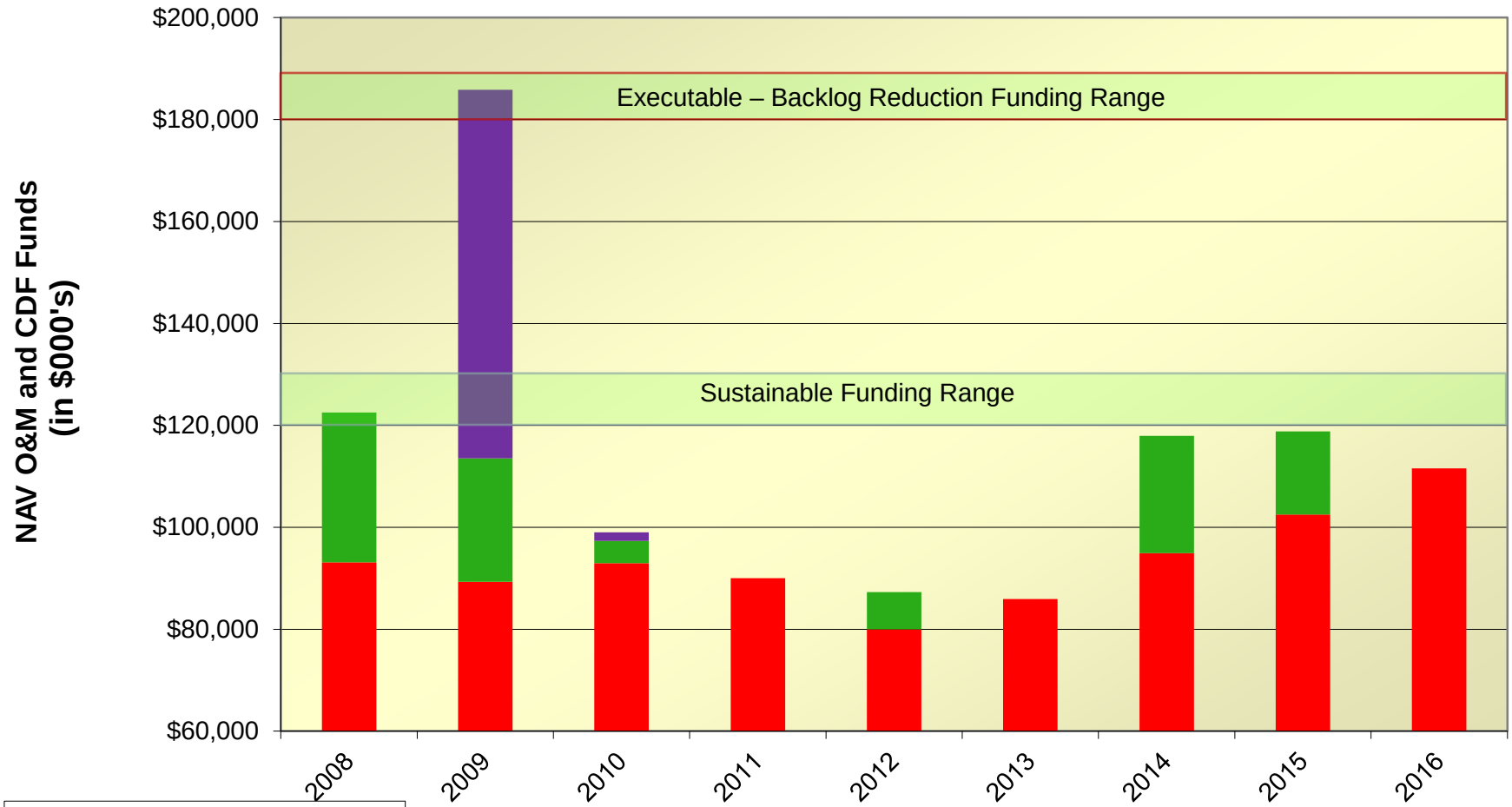
New Poe-Size Lock

- WRDA 2007: Construction at 100% federal expense
- Inconsistent with Administration policy due to BCR of 0.73
- Conducted a partial benefits reanalysis to determine if some benefit categories were not captured or if insufficient information was used. Completed in Dec 2014.

GL Navigation Funding History



Great Lakes Navigation System – A Great Investment

Great Lakes Navigation System's Transporting Rates Savings → $3.6 BILLION/year for a $90 Million/yr total investment!

- ✓ More competitive American steel
- ✓ Lower cost energy
- ✓ Lower cost concrete (construction)
- ✓ More competitive Grain for Export
- ✓ Less fuel consumption and greenhouse gas emissions
- ✓ Less congested highways/rails

Questions