

Great Lakes Navigation System

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US Army Corps of Engineers
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Great Lakes Navigation Stakeholder Meeting

Introductions

Col Chris Drew

Great Lakes Regional Needs & Challenges

- Budget Trends and Key Issues
- Soo Locks Benefits Analysis Status
- FY17 Budget Development
- Stakeholder Input

Mike O'Bryan/Marie Strum

Dave Wright

Case Studies – Low Use Harbors

- Lorain
- Waukegan
- Grand Haven/Holland/St. Joe

Josh Feldmann

Shamel Abou-El-Seoud

Dave Wright

Perspective from System Users

Stakeholders

Update on Legislative Activity

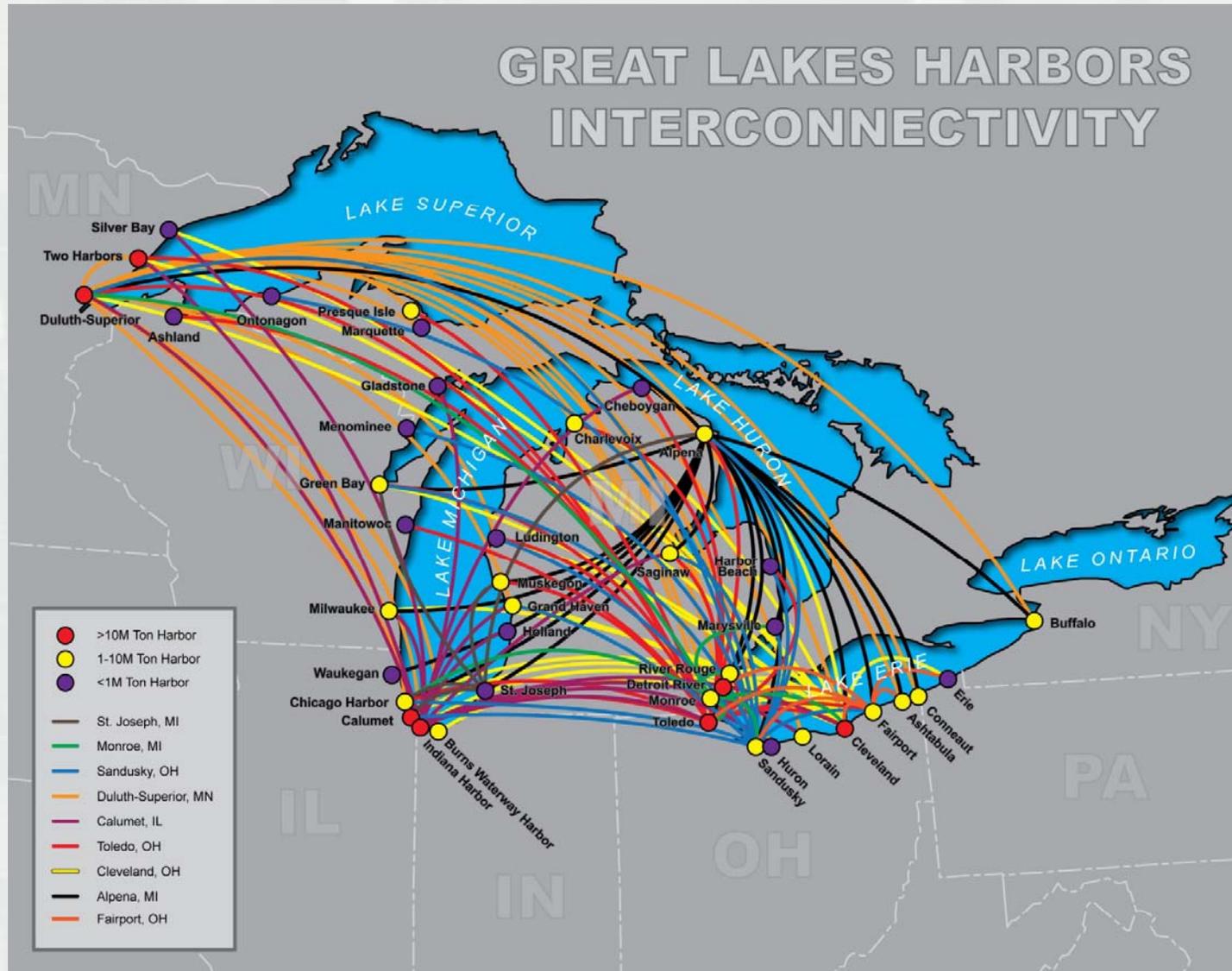
Jim Weakley

Stakeholder Feedback /Open Discussion

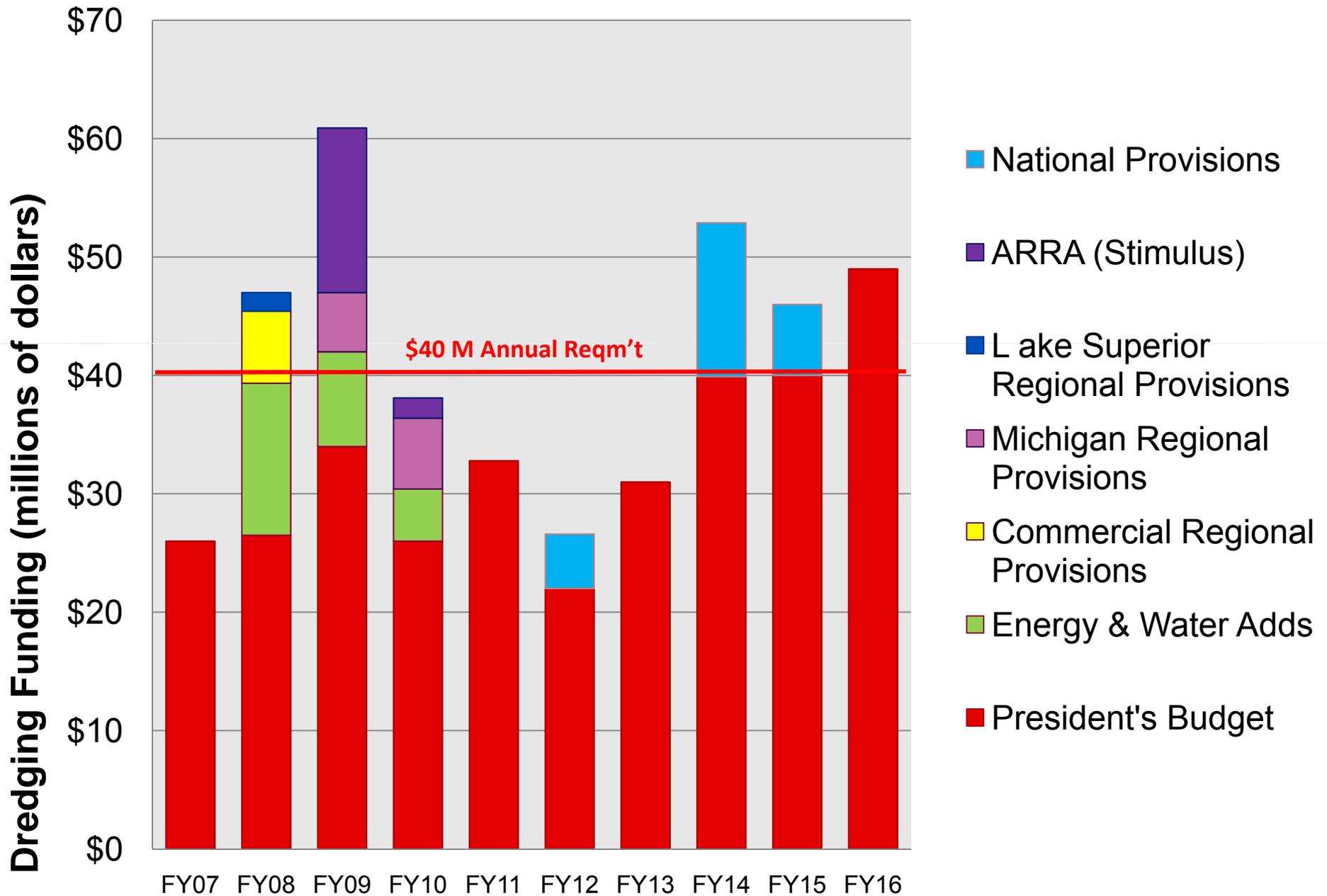
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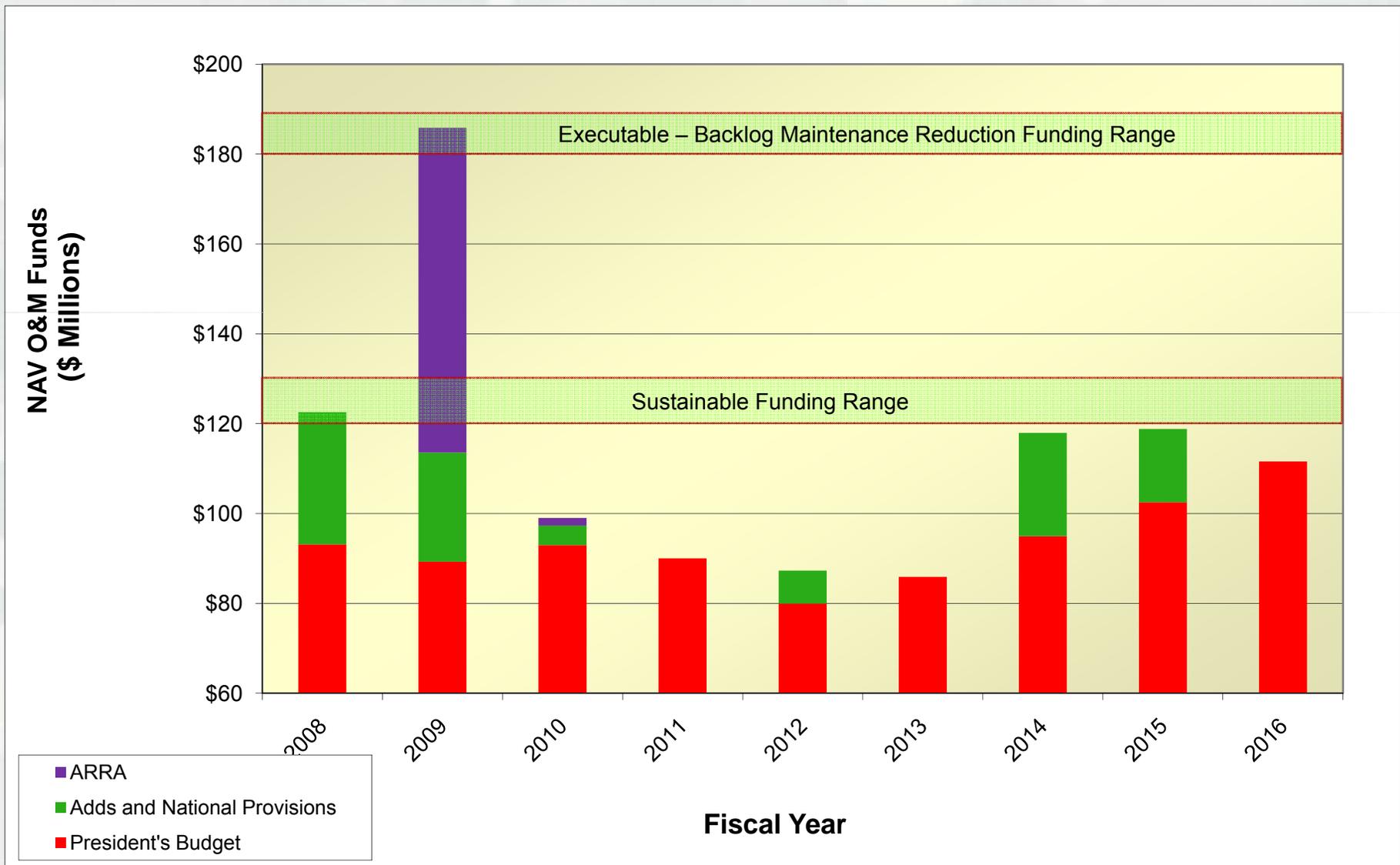
Great Lakes Navigation System



Dredging Funding Trends 2007 - 2016



GL Navigation Funding History



Soo Locks 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

- **Three major efforts are underway to improve reliability of the Soo Locks**
 1. **Maintain existing infrastructure through Asset Renewal Plan**
 2. **Major Rehab Report – could fund through Construction General**
 3. **New lock with the same dimensions as the Poe Lock - BCR sensitivity analysis underway**



Reliability Improvement Paths

- Asset Renewal
 - Maximize reliability and reduce the risk of catastrophic failure through 2035
 - Work began in 2007 and would complete in 2019 with optimal funding
 - O&M funded

- Major Rehabilitation
 - Preparation of a Major Rehab Report (MRR) underway
 - Feasibility study requiring 3 years and \$2M to complete
 - \$500k received in FY14 and \$1.0M FY15
 - Ultimately funded through CG if approved

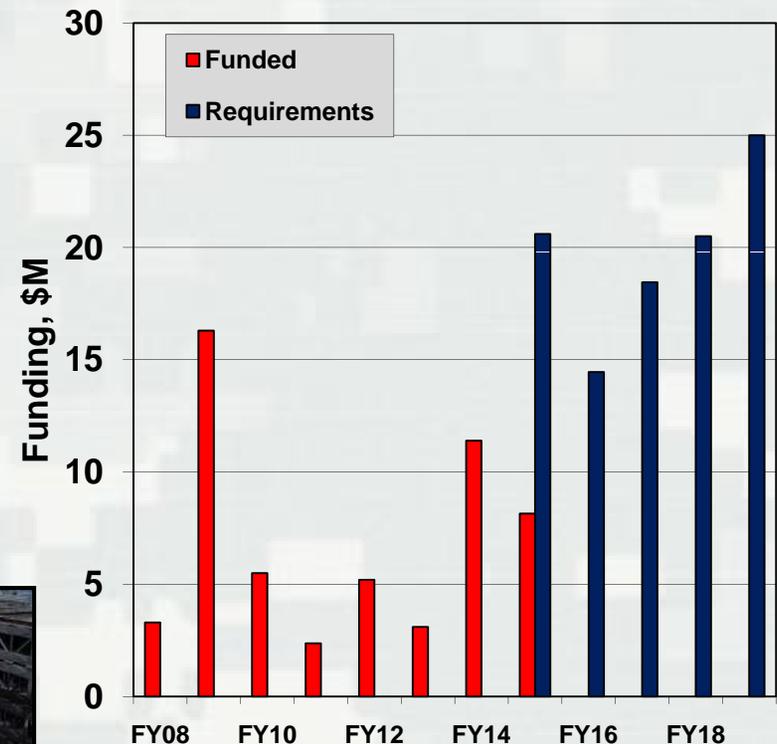
- Construction of a Replacement Lock
 - Originally authorized in 1986
 - 2005 Limited Reevaluation Report (LRR) resulted in BCR of 0.73
 - Sensitivity analysis on benefits; will reanalyze benefits and costs



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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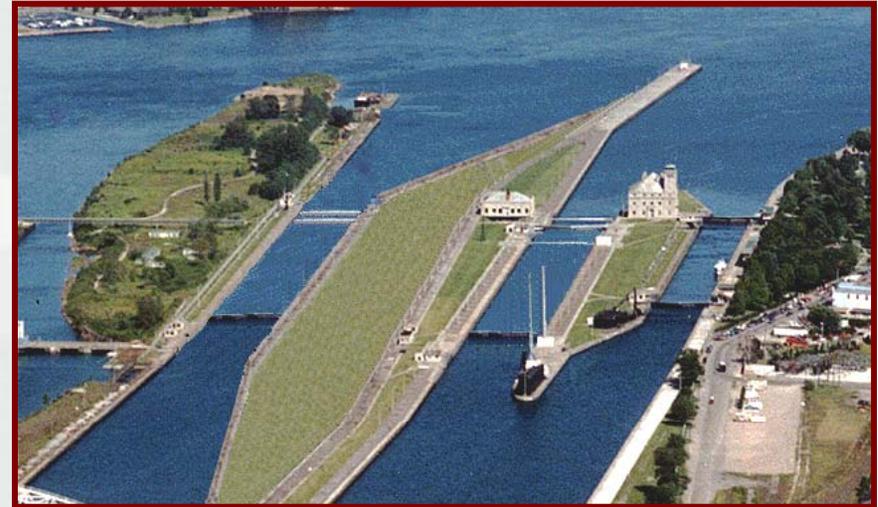
Major Rehab Report Efforts

- First step was SQRA (Semi Quantitative Risk Assessment) - Used for portfolio ranking and determination of whether further and more detailed analysis is necessary
- Conducted Summer 2014
- Purpose is to identify Probable Failure Modes that warrant further analysis
- Four concerns identified:
 - ▶ West Center Pier
 - ▶ Embedded Anchorages
 - ▶ Misoperation of miter gates
 - ▶ Gas line leak or break in deep service tunnel



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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
- 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.



New Soo Lock Partial Benefits 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



2005 New Lock BCR Issues

- Assumption that 100% of commodities are delivered is not true
- Rail capacity was assumed as sufficient which is not true
- Assumption of major overhaul in 2017 not accurate
- Probabilities of component failures have increased
- Gate failure outage days grossly underestimated
- Assumption of new vessels being Mac Lock sized is not true
- Climate change was not considered in terms of possible year round shipping
- National security implications need to be reviewed



Path Forward

- Asset Renewal
 - Continue to fund asset renewal through normal O&M budget procedures
- Major Rehabilitation Report (MRR)
 - Complete necessary further refinement of reliability of critical components and continued economic modeling with FY15 funding
 - Conduct planning charrette in late FY15 once appropriate information is available
- New Lock - Economic Reevaluation Report (ERR)
 - Would take a fresh look at Benefits as well as Costs
 - Would utilize all information prepared during the first two years of MRR work



Corps Great Lakes Navigation FY17 Budget Development



Water Resources Reform & Development Act (WRRDA) 2014

- WRRDA14 is an authorization bill; it provides authority or direction to the Corps, it does not provide funding
- Funding comes from Congressional Appropriations
- We are awaiting implementation guidance from HQ

http://www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/LegislativeLinks/wrrda2014/wrrda2014_impguide.aspx



Water Resources Reform & Development Act (WRRDA) 2014

- 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)



Text from FY17 Budget Engineering Circular

“Emerging Harbor” is a harbor that transits less than one million tons of cargo annually.

Funding is focused on the projects with a high or moderate level of commercial navigation use (coastal projects carrying at least one million tons of cargo and inland waterways with at least one billion ton-miles of traffic), which move 99 percent of the Nation’s waterborne commercial cargo.

Consideration is also given to those projects with high export and import values, condition, contribution to the HMTF, and if appropriate, national security and military readiness.



Characterization of Coastal Projects vs. Great Lakes Projects

	Coastal Nationwide		Great Lakes	
Category	# Projects	% Tonnage	# Projects	% Tonnage
High Use	59	90%	7	59%
Moderate Use	100	9%	20	38%
Low Use	908	1%	28	3%

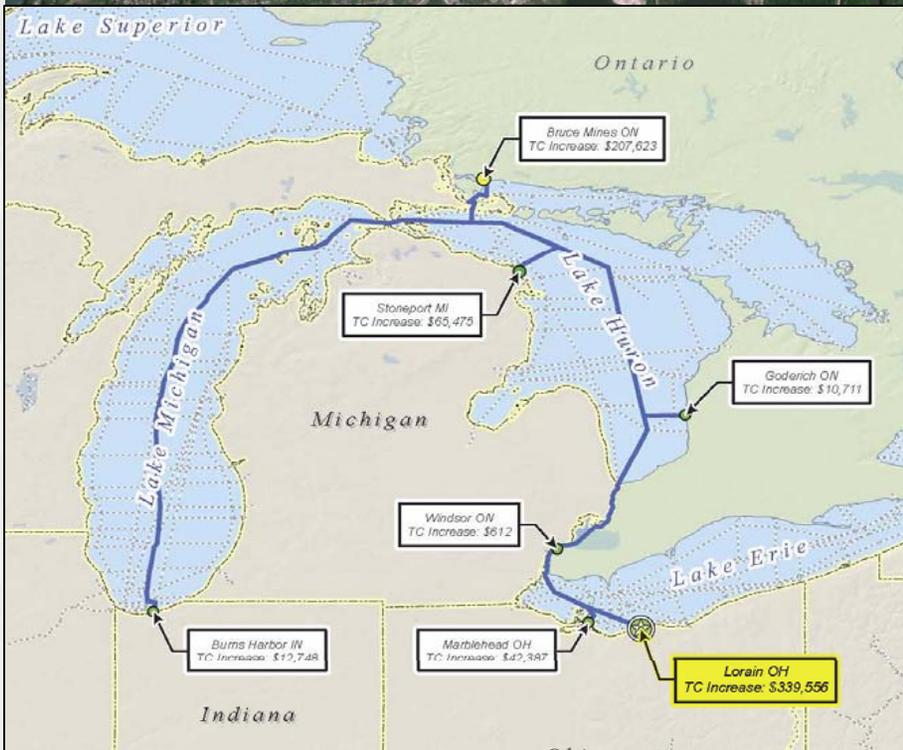
On the Great Lakes, 90% of the tonnage is captured at 2.5M tons and greater as opposed to 10M tons on the Coastal ports nationwide.



Great Lakes Commercial Harbors



Lorain Harbor



Facts:

- Dredging required every three years; provides a return on investment of \$1.1M
- Interconnected with 10 GL Harbors
- Due to lack of commercial activity and limited CDF capacity, upper reaches of the Black River channel are no longer regularly maintained
- Commodities are limestone, salt, fertilizers, sand & gravel, iron ore, slag and non-metal minerals.
- Stakeholders: USCG, American Metal Chemical Corp., Jonick Dock and Terminal, Republic Technologies International, Lorain Tubular Co., and Terminal Ready Mix, Inc.
- Bulk commodities generate approx. \$74M/year in direct revenue, \$27M/year in personal income and supports approx 477 jobs.
- Potential developments: great interest in idled National Gypsum plant, scrap steel by barge to RTI, windmill parts; tonnages continue to rebound
- Black River AOC is a high priority for USEPA to delist in 2016



Waukegan Harbor



Facts:

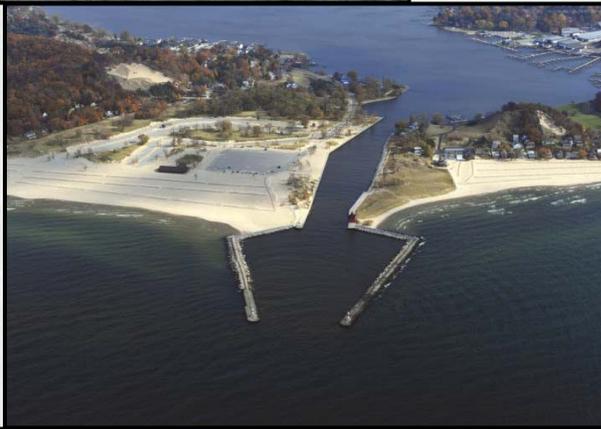
- Dredging required annually, shoaling rate has increased for the approach channel.
- Must dredge annually or the winter storms will cause the port to close to commercial traffic. **Port has been closed 4 times since 2011.**
- Commodities are bulk cement and gypsum rock.
- Stakeholders; National Gypsum, LaFarge Cement, and St. Marys Cement, Inc.
- National Gypsum Drywall Plant and LaFarge Cement Terminal will permanently close if project is not maintained. All three are interested in restarting commercial shipping to the harbor.
- Increased transportation cost to industry - \$2M annually.
- Bulk commodities generate \$9.5M annually in direct revenue and support 313 jobs that produce over \$20.4M in annual personal income.





Grand Haven

- Outer harbor must be dredged annually; inner on a 2-4 yr cycle; increased transportation costs \$1.3 - \$1.9M per year
- Stakeholders: USCG, Verplank Trucking, Meekoff Dock, Construction Aggregate Corp, St. Marys Cement, GH Board of Light and Power, Eagle Group.
- Bulk commodities generate \$33M annually in direct revenue and support jobs that produce over \$57M/yr in personal income; 880 direct jobs; 3,100 jobs due to recreational value of harbor. Sand, gravel, salt, gypsum, coal



Holland

- 35,000 cy/yr must be dredged from the outer & 45,000-65,000cy from the Lake Macatawa channel on a 2-4 year cycle.
- Stakeholders: USCG, Verplank Trucking, Padnos Iron and Metal, Holland Public Works, and Brewers Dock.
- Bulk Commodities generate \$13M annually in direct revenue and support 330 jobs that produce over \$22M/yr in personal income; limestone, coal, sand, gravel



St. Joseph

- Outer harbor must be dredged annually; inner harbor on a 2-4 yr cycle; increased transportation costs \$2.0 - \$2.8M per year.
- Stakeholders: USCG, Lafarge North America, Dock 63, and Central Dock Company.
- Bulk Commodities generate \$12.2M annually in direct revenue and support 324 jobs that produce over \$21M/yr in personal income; limestone, sand, gravel, cement, salt, petroleum products.



Navigation Budget Prioritization

- Corps uses a Risk based approach to budgeting
- Condition and Consequence determine Risk
- Condition is based on fairly straightforward assessment of conditions – channel availability, shoaling, structure condition assessment
- Consequence is based on impact to navigation



Consequence \ Condition		TABLE V-3 Navigation 1-25 Relative Risk Values Matrix				
		Condition Classification				
		F Failed	D Inadequate	C Probably Inadequate	B Probably Adequate	A Adequate
Consequence/Economic Impact	I	1	2	4	7	11
	II	3	5	8	12	16
	III	6	9	13	17	20
	IV	10	14	18	21	23
	V	15	19	22	24	25

Risk Matrix
from
FY17 Budget
EC 10-2-208



Coastal Navigation Channel Condition

TABLE F-11
Navigation Channel Condition Classification

Condition Classification		Condition Description
Good	A	Actual depth and width are sufficiently close to target depth and width resulting in <u>no navigation restriction</u>
Moderate	B	Actual depth and width are fairly close to target depth and width resulting in <u>limited navigation restrictions</u>
Poor	C	Actual depth and width are sufficiently far from target depth and width resulting in <u>significant navigation restrictions</u>
Failing	D	Actual depth and width are far from target depth and width resulting in <u>major navigation restrictions</u> for most vessels
Failed	F	Actual depth and width are very far from target depth and width resulting in <u>closure to navigation</u> for most vessels

Actual Width & Depth....restricting navigation



Coastal Navigation Channel Consequences

TABLE F-12
Navigation Channels and Harbors
Consequence/Economic Impact Category

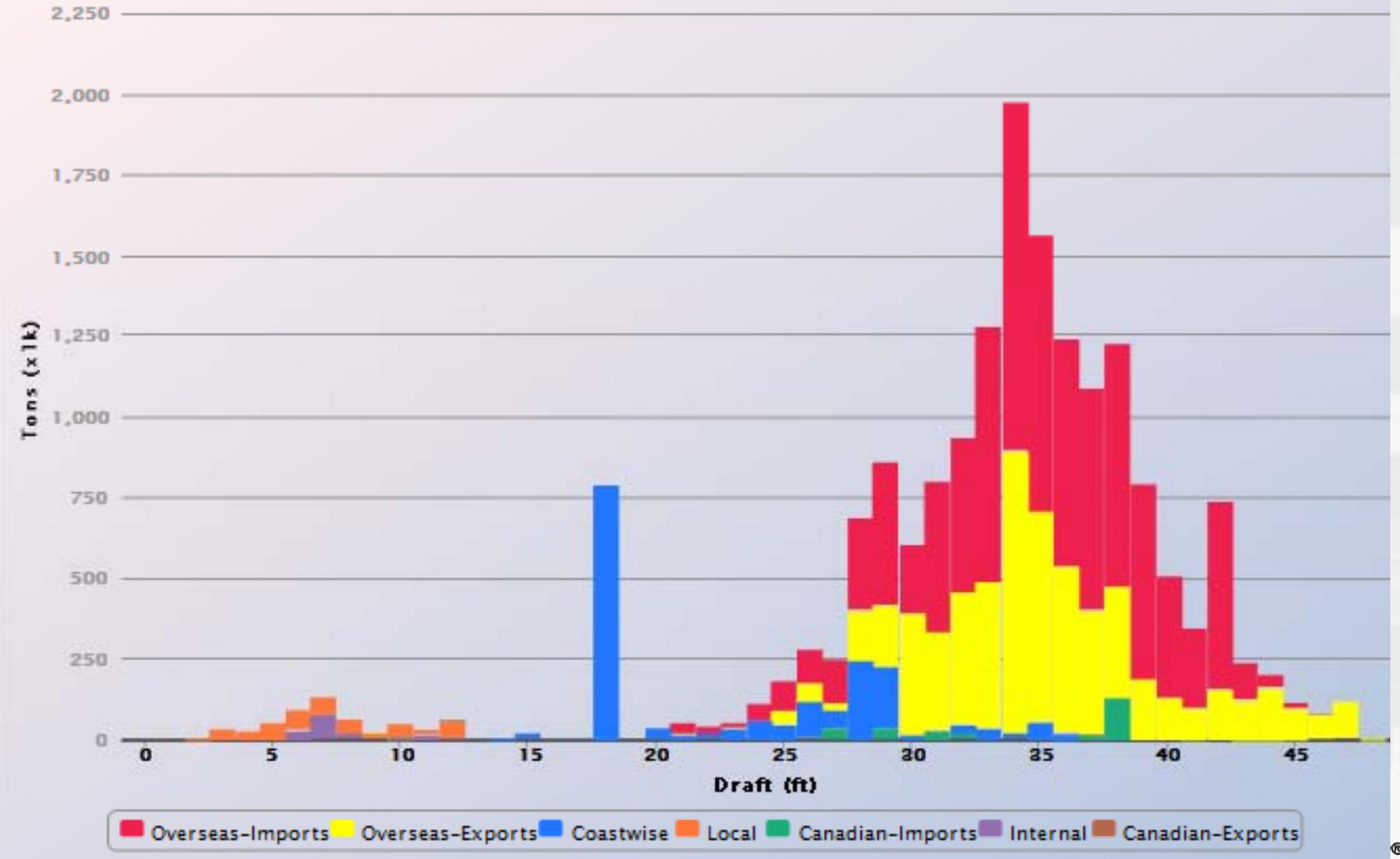
Consequence Category	Consequence Rating Criteria
1	Demonstrated ¹ highest economic impact or >10 million Tons Imminent life safety impact Court Decree Mandated Action (to include environmental) DoD Strategic Ports Shut down of Energy Distribution Facilities with no alternate modes of transportation
2	Demonstrated ¹ high economic impact or 5 - 10 million Tons Probable life safety impact Alternate modes of transportation exist for Energy Distribution Facilities, but at a higher cost than water borne transportation
3	Demonstrated ¹ moderate economic impact or 1 - 5 million Tons Possible life safety impact
4	Low economic impact ¹ or <1 million Tons No life safety impact
5	Very low economics (Recreation Harbors, No commercial Activity) No life safety impact.

¹ Thresholds and basis for economic impact are under development. One measure of economic impact can be demonstrated using rate savings benefits, transportation cost savings, or damages avoided.



CPT/e-Hydro/CSAT Integration

Rollup Reach Traffic Draft vs. Average Yearly Tons for AllShipments



Coastal Navigation Structures Functional Condition Rating

Level of Functionality	<p style="text-align: center;">TABLE F-15 Coastal Navigation Structures Functional Condition Rating (FCR) Table</p>
Full -- A	No notable impact, project performing as designed.
Sufficient – B	(1) Infrequent or <u>periodic limitations on navigability</u> , or (2) minor/periodic increases in dredge quantity
Reduced -- C	(1) <u>Less than 10% of the time</u> , design vessels cannot navigate or operate within authorized limits; (2) O&M dredging requirements in the Entrance and Bar Channel have increased less than 10%, as compared to the long-term average annual rate.
Severely Degraded -- D	(1) <u>10-20% of the time</u> , design vessels cannot navigate or operate within authorized limits; (2) O&M dredging requirements in the Entrance and Bar Channel have increased 10-20%, as compared to the long-term average annual rate.
Completely Degraded -- F	(1) <u>20-40% of the time</u> , design vessels cannot navigate or operate within authorized limits; (2) O&M dredging requirements in the Entrance and Bar Channel have 20-40%, as compared to the long-term average annual rate.

Severely Degraded – D (1) 10-20% of the time, design vessels cannot navigate or operate within authorized limits; (2) O&M dredging requirements in the Entrance and Bar Channel have increased 10-20%, as compared to the long-term average annual rate.



Structure Function/Consequences



Calumet Harbor, IL & IN



St. Joseph Harbor, MI



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Stakeholder/User Feedback – Opportunity for Input to FY17 Budget

- National Team Review/Validation Of Structures With Worst Reported Condition Ratings
- Looking For Documentation Of Stakeholder/User Concerns and Impacts
- Vessel Operators and Local Communities Are Asked To Report When They Encounter Negative Effects Of Deteriorated Structure Condition:
 - Negative Wave Climate
 - Signs Of Accelerated Shoaling
 - Signs Of Material Passing Thru Structures
 - Impacts To Navigation Aides



Great Lakes Navigation – Key Takeaways

- GL Nav saves US \$3.6B each year – for a \$120M investment each year
- WRRDA 14 recognizes the Great Lakes as a system - interdependent ports delivering raw materials to manufacturing centers in lower lakes – includes low, moderate, and high use harbors
- The Soo Locks is the lynch pin in the system; no alternate mode of transportation; no redundancy
 - Asset Renewal – maintaining existing infrastructure
 - MRR – looking at funding major maintenance through CG funds
 - New Lock – assessing benefits to potentially reanalyze BCR
- We need your input on FY17 Budget priorities



Stakeholder Involvement

- ✓ We need your input on critical system requirements at your harbor or project
- ✓ Operations Chiefs from each District are available any time to discuss your particular issues and concerns
- ✓ Webpage is an important mode of communication: meetings, presentations, fact sheets
- ✓ Updated Fact Sheets with FY15 appropriation and FY16 President's Budget are on our website

www.lre.usace.army.mil/greatlakes/navigation



Key Great Lakes Contacts

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Questions?

