

# Great Lakes Navigation System

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**Feb 23, 2012**

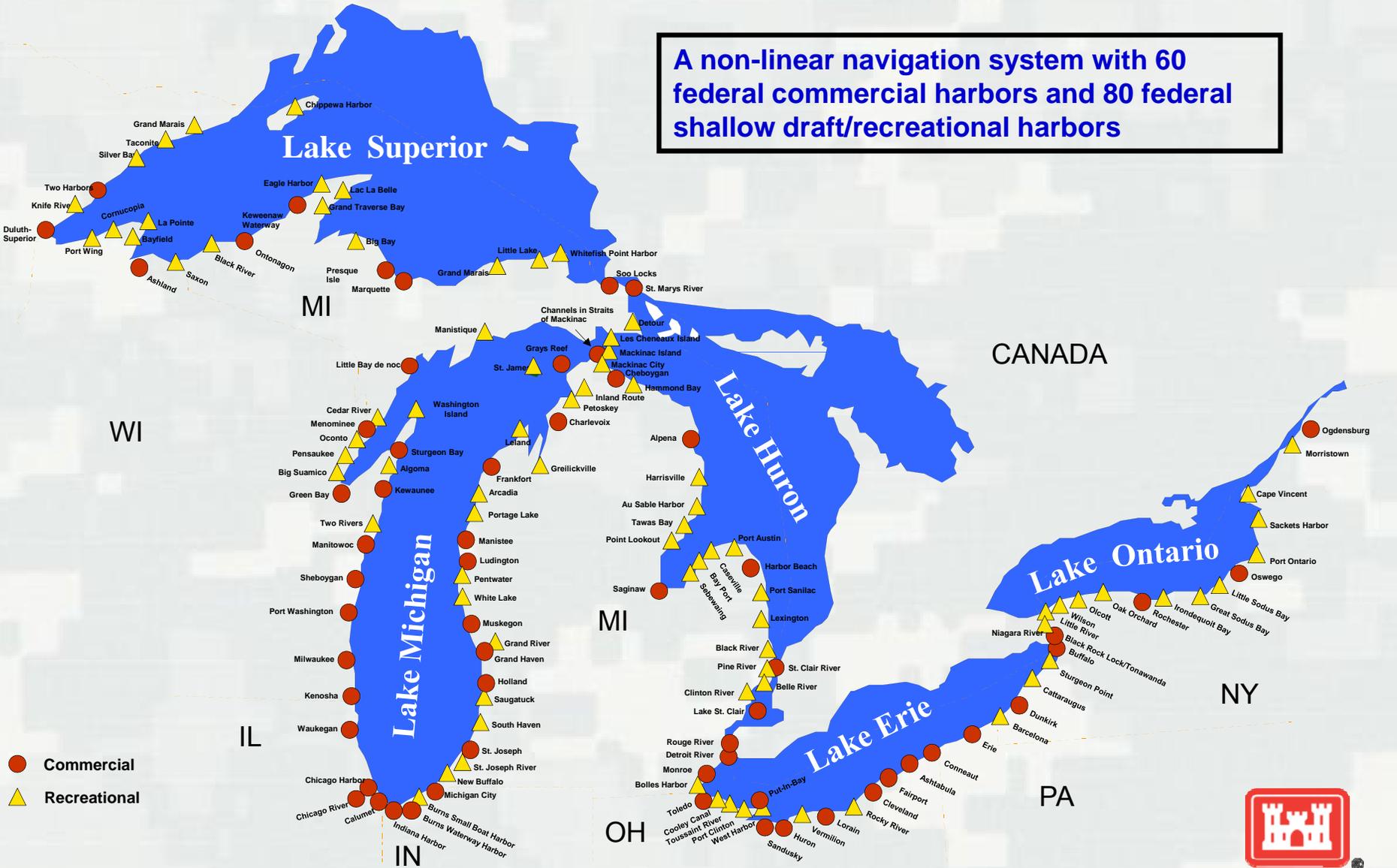


US Army Corps of Engineers  
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# Federal Harbors on the Great Lakes

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



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# System Connectivity for 8 Federal Harbors

Total Tonnage for 8 Harbors  
95.8M tons

Duluth-Superior Harbor  
46.5M tons

Indiana Harbor  
15M tons

St. Joseph Harbor  
12.5M tons

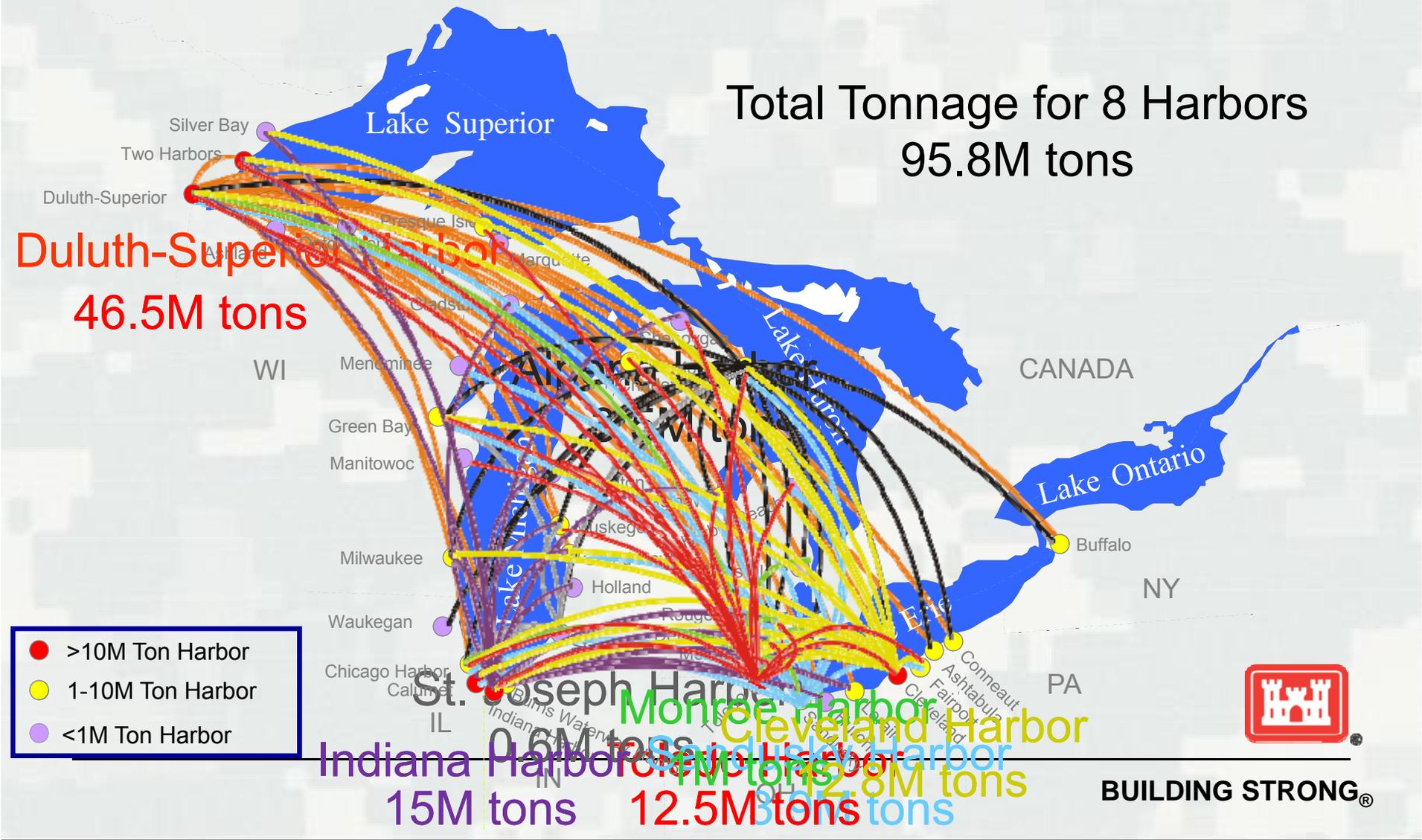
Monroe Harbor  
9.1M tons

Cleveland Harbor  
12.8M tons

- >10M Ton Harbor
- 1-10M Ton Harbor
- <1M Ton Harbor



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# Port Interdependency

- Great Lakes ports are linked in trade with each other in a complex pattern of interdependency.
- If lower use ports are closed, it will affect larger ports, both in tonnage and economic impact
- Duluth Port Director Adolph Ojard stated in Duluth Seaway Port Authority's Fall 2011 report, writing on the effect that harbor closings will have on his own port, the largest on the Great Lakes:
  - ▶ *“These closings will begin a process, if left unchecked, of restricting trade and maritime activity that will reduce jobs at every Great Lakes port. With over 40 million tons of commerce, the Twin Ports of Duluth-Superior will begin to see the negative effects of these budget shortfalls.”*



# Great Lakes Navigation System

- A non-linear interdependent system of 139 deep and shallow draft projects; commercial ports are dependent on each other for the efficiency and health of the system
- 90% of the traffic is internal to the system – U.S. and Canadian ports
- GLNS saves the country \$3.6B per year compared to the next least costly mode of transportation

## The Great Lakes Navigation System Provides Key Economic Benefits\*

In 2010 alone:

- ✓ GLNS generated 226,800 U.S. and Canadian jobs and an additional 447,600 in related user jobs (ex: steel or stone company)
- ✓ \$14.1B in personal wages, salaries, and local expenditures and an additional \$22.7B from related user industries
- ✓ As a result of maritime activity on GLNS, generated \$33.6B in business revenue and an additional \$115.5B from related user industries



\* Data from Martin Associates October 2011 Report

# Corps Great Lakes Navigation Funding Status



## FY12 Corps Funding Status

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- Congress passed the FY12 Consolidated Appropriations Bill; enacted Dec 23, 2011.
- The FY12 Appropriations bill included additional O&M funds for ongoing work – to be allocated by USACE HQ

### Additional Funding for Ongoing Work

- Navigation Maintenance	\$34M
- Deep-draft harbor and channel	\$55M
- Inland waterways	\$30M
- Small, remote, or subsistence nav	\$30M



## FY12 Corps Funding Status (cont'd)

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- 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



# FY12 Corps Funding Allocation

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- Final allocation was announced on February 8.  
\$8.9M was applied to Great Lakes Navigation projects.
  - Dredging:
    - Holland \$585,090
    - Manistee \$495,000
    - Saginaw \$2,079,000
    - St. Joseph \$693,000
    - Waukegan \$788,040
  - Soo Locks Asset Renewal \$2,753,190
  - Repair failing Milwaukee breakwater \$1,485,000



# FY 12 Funding Great Lakes Navigation

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\$78.4M in named projects in FY12 Conference for O&M  
\$ 8.9M allocation from “Additional Funding for Ongoing Work”

**\$87.3M total for GL Nav O&M**

## Key Items in FY12 Appropriation

\$26.6M in Dredging (2.0M cubic yards)

\$11.7M in Dredged Material Management

\$5.2M in Soo Asset Renewal



# FY12 Dredging Projects



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# FY 13 President's Budget Great Lakes Navigation

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\$85.9M O&M

\$7M CG (Green Bay Cat Islands DMDF)

## Key Items in FY13 President's Budget

\$31.0M in Dredging (2.4M cubic yards)

\$12.0M in Dredged Material Management

\$3.1M in Soo Asset Renewal







# Major System Requirements

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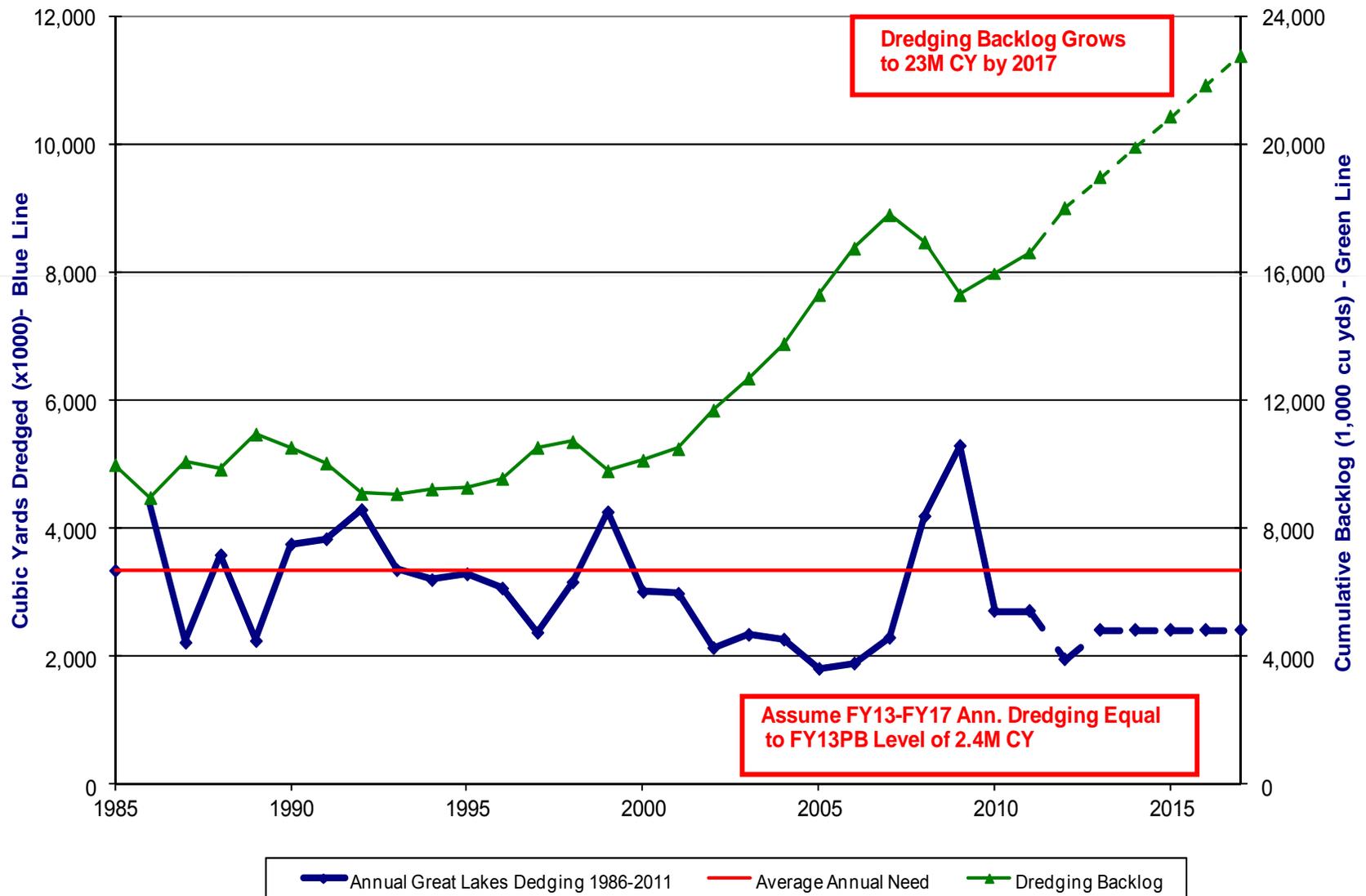
- Dredging
- Dredged material management
- Navigation structures
- Lock reliability



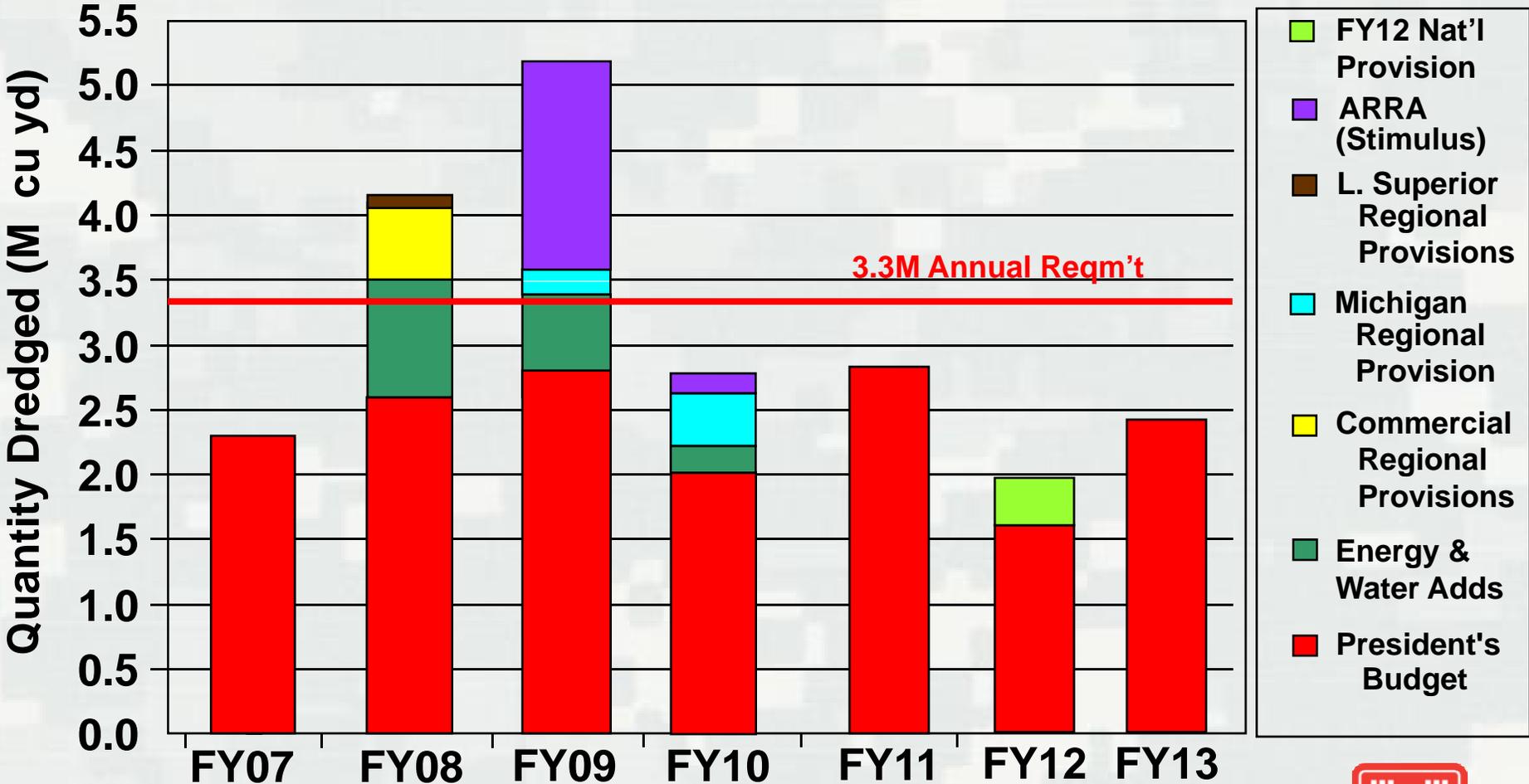
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## Backlog Growth Under Constrained Dredging Funding 2012-2017



# Dredging Funding Trends 2007 - 2013



# Sample GL SAND Results

## Economic Impact on Interconnected Ports

### Economic Impact of 6-Foot Shoal in Ashtabula Harbor

PORT	Economic Impact to Interdependent Port
ST LAWRENCE RIV ABOVE INTER BDRY-PORT CARTIER	\$6,334,464
ST CATHARINES ONTARIO	\$51,911
HAMILTON ONTARIO	\$136,439
CLARKSON ONTARIO	\$152,472
FAIRPORT HARBOR OHIO	\$722
NANTICOKE ONTARIO	\$760,653
WINDSOR ONTARIO	\$9,095
COURTRIGHT ONTARIO	\$1,482,917
ALPENA MICHIGAN	\$15,639
CALCITE MICHIGAN	\$459,073
MUSKEGON HARBOR MICHIGAN	\$79
GRAND HAVEN HARBOR MICHIGAN	\$6,165
GREEN BAY WISCONSIN	\$303
ESCANABA MICHIGAN	\$65,539
PORT INLAND MICHIGAN	\$450,579
MARQUETTE HARBOR MICHIGAN	\$309,579
PRESQUE ISLE HARBOR MICHIGAN	\$180,437
SUPERIOR WIS	\$1,350,904
SILVER BAY MINN	\$8,147,984
<b>ASHTABULA HARBOR OHIO</b>	<b>\$19,914,954</b>



# Sample GL SAND Results

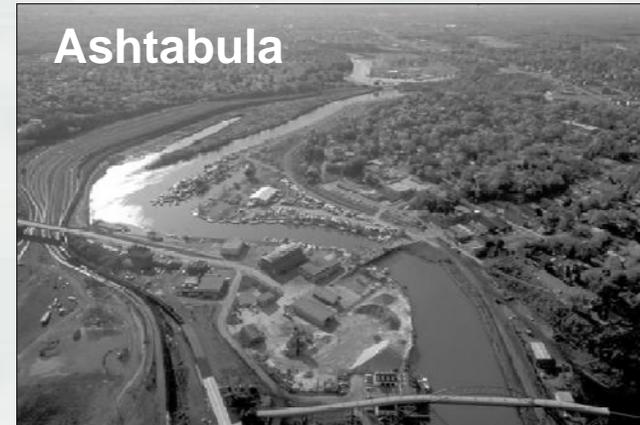
	St. Joseph Harbor	Waukegan Harbor	Holland Harbor	Great Lakes System Modeled
<b>Tons Modeled</b>	326,297	452,443	421,555	132,455,531
<b>Number of Interconnected Harbors</b>	7	8	6	-
<b>Jobs</b>	63	92	77	26,036
<b>Revenue</b>	\$7,320,507	\$9,799,559	\$11,267,114	\$5,325,226,611
<b>Salary</b>	\$2,865,558	\$4,228,311	\$3,507,993	\$1,192,769,570
<b>Emissions Reduction Annually (lbs of PM-10)</b>	1,843,565	2,712,832	31,449,114	5,075,324,081
<b>Fatal rail accident cost avoided</b>	\$23,745	\$50,556	\$14,449	\$27,662,254
<b>Non-fatal rail accident cost avoided</b>	\$19,990	\$42,561	\$12,164	\$23,287,655
<b>Physical damages from rail accident cost avoided</b>	\$3,820	\$8,132	\$2,324	\$4,449,649
<b>Total Rail accident cost avoided</b>	\$47,555	\$101,249	\$28,937	\$55,399,558
<b>Fatal Truck accident cost avoided</b>	\$118,840	\$33,635	\$678,659	\$28,451,156
<b>Non-fatal Truck accident cost avoided</b>	\$555,833	\$157,315	\$3,174,193	\$133,070,380
<b>Physical damages from Truck accident cost avoided</b>	\$23,291	\$6,592	\$133,008	\$5,576,048
<b>Total Truck accident cost avoided</b>	\$697,964	\$197,542	\$3,985,860	\$167,097,584





# Great Lakes Dredged Material Management

- Federal navigation channels are located in 28 of 31 Areas of Concern (AOCs)
- “Restrictions on Dredging” - one of 13 beneficial use impairments listed in WQA
- USACE has removed over 100 million cubic yards of contaminated sediments
- CDFs are now more than 80% full



## Partnerships

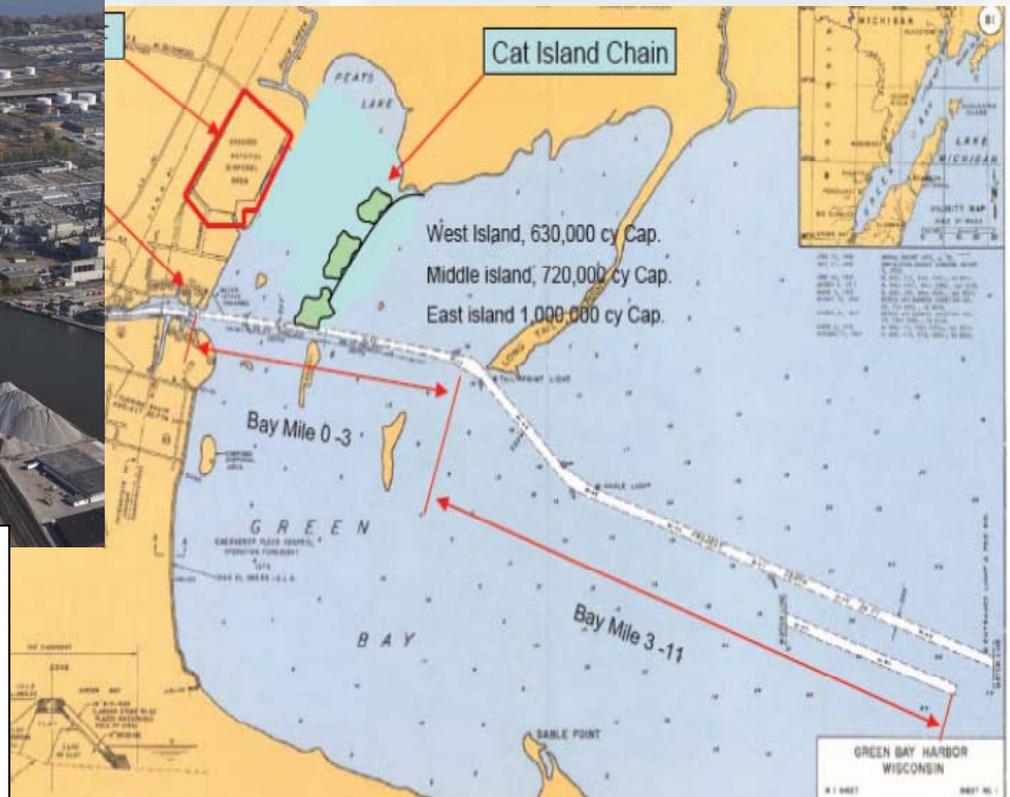
- Collaboration with EPA Legacy Act cleanup at Ashtabula, OH
- Milwaukee CDF used for Legacy Act cleanup of Kinnickinnic River; new CDF at no cost to Corps
- Buffalo River CDF repair facilitated strategic navigation dredging with GLRI and Legacy Act funds
- Working with state of MI on using Pte. Mouillee as potential placement site for GLRI dredging

# Green Bay – Cat Islands



Provide for 2.35M cy of disposal capacity  
Provide significant reduction in M/D costs  
Restores over 1,400 acres of habitat

Total Project Cost = \$30.6M  
FY11 E&W = \$0  
FY12 Approp = \$0  
FY13 Pres Bud= \$7M  
GLRI Funding = \$12M



# Indiana Harbor Confined Disposal Facility

\$180.M Project : FY 11 - \$8.0M (CG)

South End Features  
\$2.8M  
Contractor: IES  
Completion in Sep 2011

Complete Dikes III  
\$7.9M  
Contractor: Rausch  
Completion in Sep 2011

Groundwater drawdown & Interim  
Treatment Plant  
\$5.0M  
Contractor: Clean Harbors  
Completion in Dec 2011

## **COMPLETED CONSTRUCTION**

**Obstruction Removal**  
\$ 2.0M - FY06

**Slurry Wall**  
\$10.6M - FY07

**Dikes I**  
\$ 5.6M - FY07

**South Cutoff Wall**  
\$17.3M - FY10

**Groundwater Gradient  
Control System**  
\$21.0M - FY 11

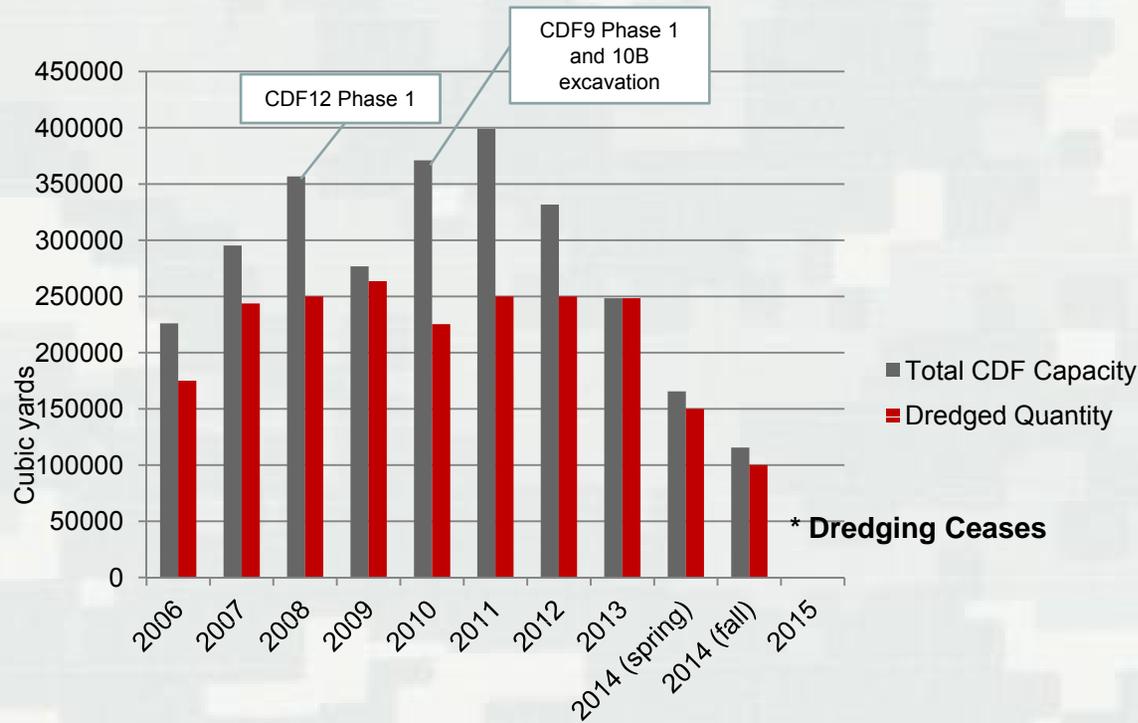
**Dikes II**  
\$ 5.5M - FY11

**Facility Operations/ Dredging Contract**  
Award in September 2011 - \$3.9M (O&M)  
Contractor: TBD  
Initiate dredging in Spring, 2012



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# Cleveland Harbor Dredged Material Management

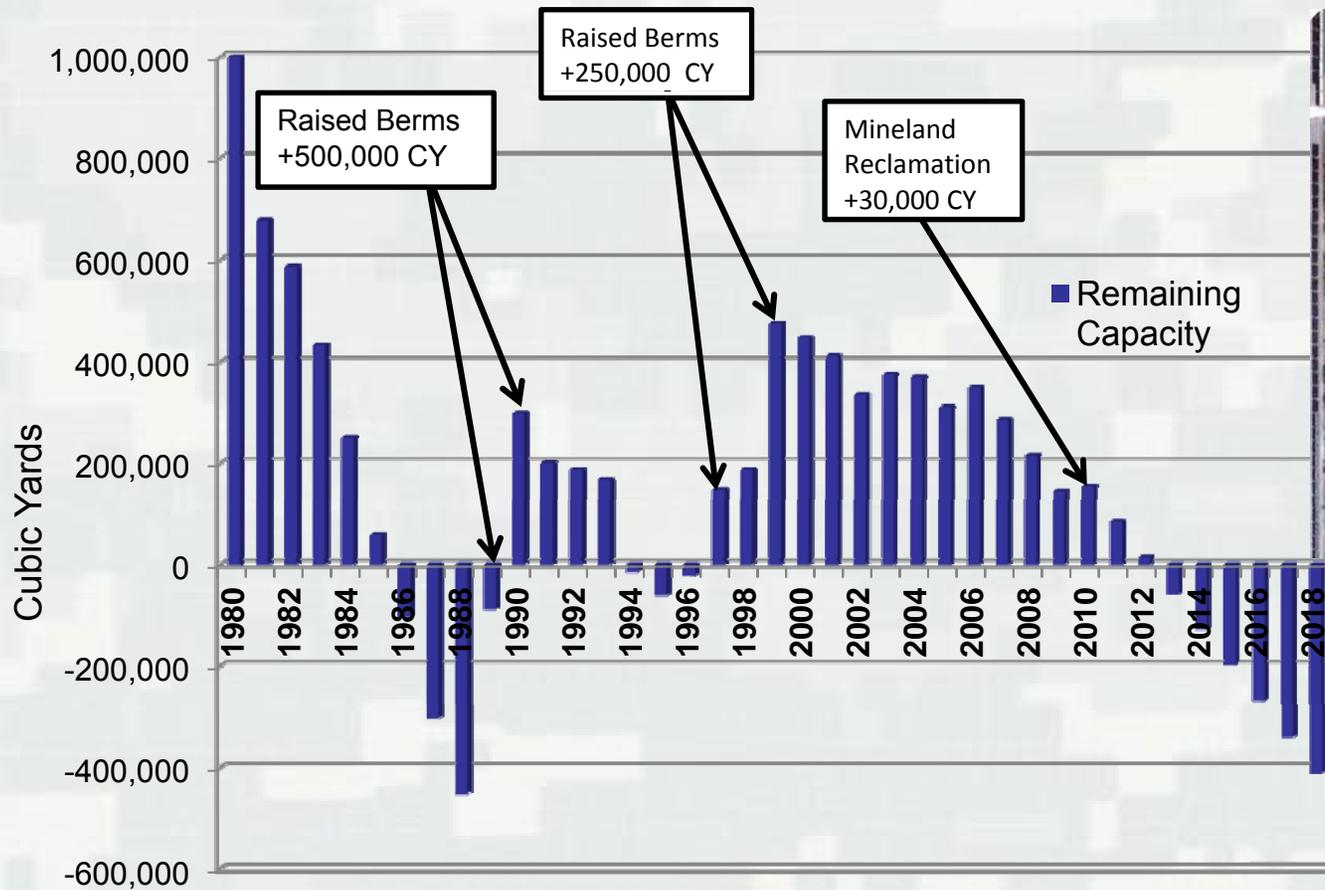


- **Out of capacity in FY15 without long-term management alternatives**
- **Potential short term fill management activities: harvesting and re-use for beneficial uses, mechanical offloading**
- **Added efforts by dredgers due to decreased allowance for dredge water may slow dredging operations and increase federal costs**
- **Dredged Material Management funding: FY12 = \$5.0M; FY13 President's Budget = \$4.8M**



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# Duluth Harbor CDF Capacity



- 21<sup>st</sup> Avenue Site- 75 acres, 800k CY capacity, \$1.5M
- Pursuit of Open Water Placement - testing ongoing
- Mineland Reclamation - pilot study, 30,000 CY
- Exterior Berm Raising – performed in 1990s - increased capacity by 750k CY
- Fill Management - Interior berm raising, pond excavation, construction of MSE Wall/ Intermediate Offloading Platform ongoing



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# Soo Locks Reliability



# The Soo Locks

## A Lynch Pin of the Great Lakes Navigation System

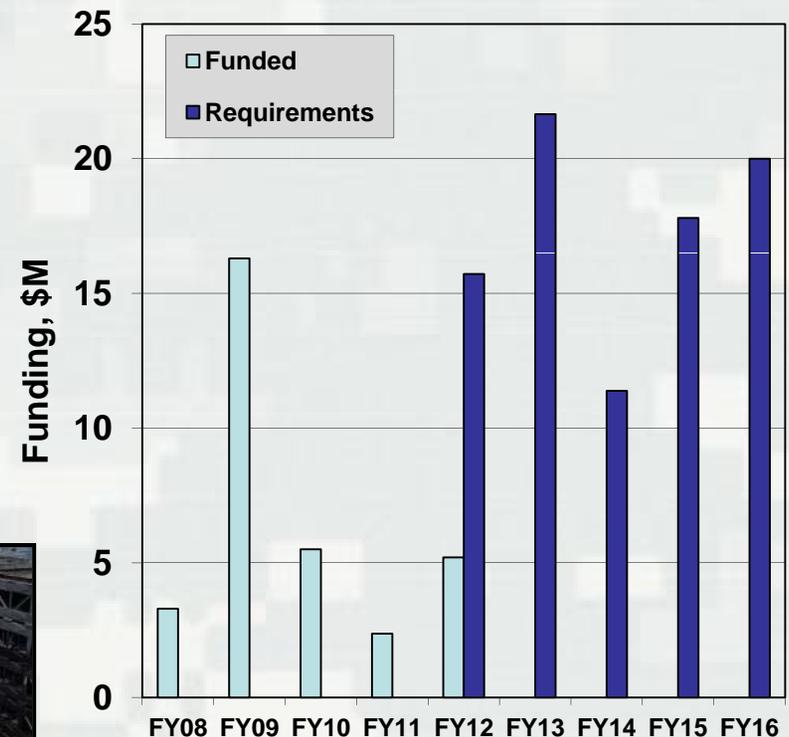
- 70% of the commercial commodities transiting the Soo Locks are limited by size to the Poe Lock
  - Security concerns - foreign crews in vessels are capable of seriously damaging or destroying locks
  - There is currently no redundancy for the Poe Lock
  
- The economic impact of a 30-day unscheduled 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. Add redundancy by constructing a new replacement lock with the same dimensions as the Poe Lock



# Soo Locks Asset Renewal Long-Term Plan

Asset Renewal Plan will maximize reliability and reduce risk through 2035

- \$32.8M funded to date through FY12
  - New hydraulics, stop logs, utilities
  - Crib Dam construction
  - Compressed Air System design
  - Mac Lock modernization design
- Remaining funding required \$87 million over 5 years
  - Compressed air system
  - Rock Cut stabilization



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# New Replacement Lock



- Inconsistent with Administration policy due to BCR of 0.73
- WRDA 2007: Construction at 100% federal expense
- Other Considerations: Security, rail/infrastructure capacity, impacts of extended closure



# Soo Locks Construction

**Full Funded Total Project Cost Estimate: \$580.3 M**

**Current BCR: .73**

**Funds Expended Through FY10: \$29.5 M**

**Completed Construction Contracts :**

- **Coffer Dam: \$3.2 M**
- **Down Stream Approach Channel Excavation: \$7.1 M**

**FY13 Budget and Potential Construction Information:**

- **FY13 President's Budget = \$0**
- **FY13 Capability = \$125,000,000**
  - Increment 1 - \$12 M Continue Design & Up Stream Approach Wall at RR Bridge
  - Increment 2 - \$28 M Down Stream Approach Walls
  - Increment 3 - \$41 M Up Stream Channel Excavation
  - Increment 4 - \$44 M Up Stream Approach Walls



**Way Ahead, as funding allows**

- **Complete Design**
- **Any funds received will be used for two purposes**
  - **Move forward with new lock design and construction**
  - **Provide long term stabilization of construction sites if full funding will not be received**

80 Million tons of cargo transits the locks annually

30 day unscheduled outage = \$160M

Without the Poe Lock, America's Steel Industry would be severed from its major source of iron ore

Over 90% of the U.S. Iron Ore passes through the locks

~8,000 vessels traverse the locks annually

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# Great Lakes Navigation Structures

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- 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



# Regional Risk Communication Meetings



# Coastal Structure Communication Objective

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Program Objective: Communicate the risk of breakwater and structure conditions to local stakeholders and navigation system users

Process:

1. **Conduct Condition Assessments**
  - Commercial Harbors- Use detailed Breakwater Assessment Team (BAT) Evaluation
  - Recreational Harbors- Rely on expert elicitation
2. **Conduct Harbor Infrastructure Inventory on all structures**
3. **Prepare summary document** that conveys the current condition of the harbor infrastructure as well as the risk involved in the event of failure
4. **Share with stakeholders** in regional meetings



# Grand Haven Harbor: C: Medium Risk of Failure



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## Grand Haven Harbor:

Overall rating of 'C',  
rating of 'D' where  
remaining failed earth  
anchors are located  
along boardwalk

### Infrastructure:

1. Grand Haven State Park
2. Stearns Park: United States Coast Guard-Grand Haven Station
3. Lakefront/Channel front Homes
4. Captain's Cove Condominiums



# Grand Haven Harbor:

## Potential Impact Areas

Buffer Feet	Land Value	Improv. Value	Total Assessed Value
1,000	\$56M	\$10M	\$66M
1,500	\$63M	\$74M	\$137M
2,000	\$80M	\$105M	\$185M



# Communication

- Great Lakes Brochure
- Web Site:  
[www.lre.usace.army.mil/greatlakes/navigation](http://www.lre.usace.army.mil/greatlakes/navigation)
  - ▶ Fact Sheets
  - ▶ Presentations
- Mailing Lists – send information to  
glnavigation @usace.army.mil



# Identifying Needs of Harbor Fact Sheets

- Identifying the Economic and Social Impacts Related to Maintaining the Authorized Project
- Identifying Other Critical Factors (Subsistence Harbor, Infrastructure Protected by Harbor)
- We will continue to refine the information with your help!



## Saginaw River, MI

### River Features

- Saginaw River is formed by the union of the Tittabawassee and Shiawassee Rivers, is 22 miles long, and flows northerly into the south end of Saginaw Bay in Lake Huron. The cities of Saginaw and Bay City are on the river.
- Authorization: River & Harbor Acts of 25 Jun 1910, 3 Jul 1930, 26 Aug 1937, 20 Jun 1938, 3 Sep 1954, 23 Oct 1962, 27 Oct 1965
- Deep draft commercial harbor
- Project depths varying from 27 feet below LWD in the Saginaw Bay entrance channel to 22 to 26 feet in the Saginaw River channel.
- 3.7M tons of material shipped or received in 2008
- Total of 26 miles of Federal channels and 5 turning basins
- Saginaw Bay confined disposal facility is located about one mile northeast of the mouth of the river in Saginaw Bay and has sufficient capacity for the next 25 years.
- Major stakeholders include U.S. Coast Guard, Lake Carriers' Association, ADM, Bay Aggregates, Bit-Mat Products of Michigan, BMT Terminals, Burroughs Materials Corp., Conagra, Consumers Energy, C. Reiss Coal, Dow Chemical, Essroc Italcementi Group, General Motors, International Materials, Lafarge North America, Lee Wood Terminal, Morton Salt, Mosaie, Northern Star Minerals, Peavey Grain, Potash Corp Saskatchewan, Saginaw Bay Fertilizer, Saginaw Asphalt Paving Co., Saginaw Rock Products, Saginaw River Alliance, Sargent Docks & Terminal Company, SIFTO North American Salt, Triple Clean Liquifuels, Wirt Stone Docks.



### Project Requirements

- Entrance channel in Saginaw Bay requires annual maintenance dredging of approximately 180,000 cubic yards. The upper river channel requires maintenance dredging of 50,000 to 100,000 cubic yards on a 2 to 3 year cycle.
- Maintenance dredging was conducted in 2011; dredging was funded for 2012 by an allocation from the National Provision in the FY12 Consolidated Appropriation Bill; dredging will also be required in 2013.
- There is a requirement for maintenance dredging in FY13. Without annual dredging transportation costs would increase by \$6.5 million. Significant light loading and increased groundings could be expected.
- ARRA funds were used to complete fill management of the Saginaw Bay CDF and dredging of the upper Saginaw River. The Bay CDF is nearing capacity and requires a Dredged Material Management Plan to be completed to identify a 20 year solution to dredged material disposal.
- Material dredged from the upper river is placed in the Dredged Material Disposal Facility that was constructed in 2008 and will provide capacity for the material dredged from the upper Saginaw River channel.

February 2012

**Consequences of Not Maintaining the Project**

- Bulk commodities that pass through the Saginaw River generate \$143M annually in direct revenue while supporting over 1,100 jobs and generating \$51M per year in personal income.
- Light loading; loss of between 1 and 2 feet of channel depth results in increased transportation costs of between \$1.7M and \$3.9M annually.

**Transportation Importance**

- Major receiving port on the Great Lakes
- All Mid-Michigan and thumb of Michigan fertilizer shipped through Saginaw River.
- Commodities include coal, limestone, petroleum products, gypsum, salt, fertilizers - potash, urea, DAP, Ag lime; food and grains, and cement.

**U.S. Army Corps of Engineers Fiscal Year (FY) 2011, 2012 and 2013  
Saginaw River, MI - Project Requirements and President's Budget (\$1,000)**

Work Package	FY11 Requirement	FY11 Work Plan	FY12 Requirement	FY12 Appropriation	FY13 Requirement	FY13 President's Budget
Project Condition Surveys	340	336	350	343	350	350
Maintenance Dredging - Primary Work Package	2,100	2,075	2,205	2,079*	3,290	3,290
Maintenance Dredging - Backlog Work Package	3,170		3,170		2,000	
CDF EBI Management	750	741	1,000		750	
DMMP Development			200	196	188	188
Upper Saginaw CDF Ops					263	263
<b>TOTALS</b>	<b>6,360</b>	<b>3,152</b>	<b>6,925</b>	<b>2,618</b>	<b>6,841</b>	<b>4,091</b>

\*Provided by National Provision in the FY12 Consolidated Appropriation Bill

**Congressional Interests**

- Representative Dale E. Kildee D-MI-5
- Senator Carl Levin D-MI
- Senator Debbie Stabenow D-MI



# Key Great Lakes Contacts

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[www.lre.usace.army.mil/greatlakes/navigation](http://www.lre.usace.army.mil/greatlakes/navigation)



# Questions?

