

Great Lakes Infrastructure

~ Managing the Challenges ~

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US Army Corps of Engineers
BUILDING STRONG®



Ongoing Critical Issues

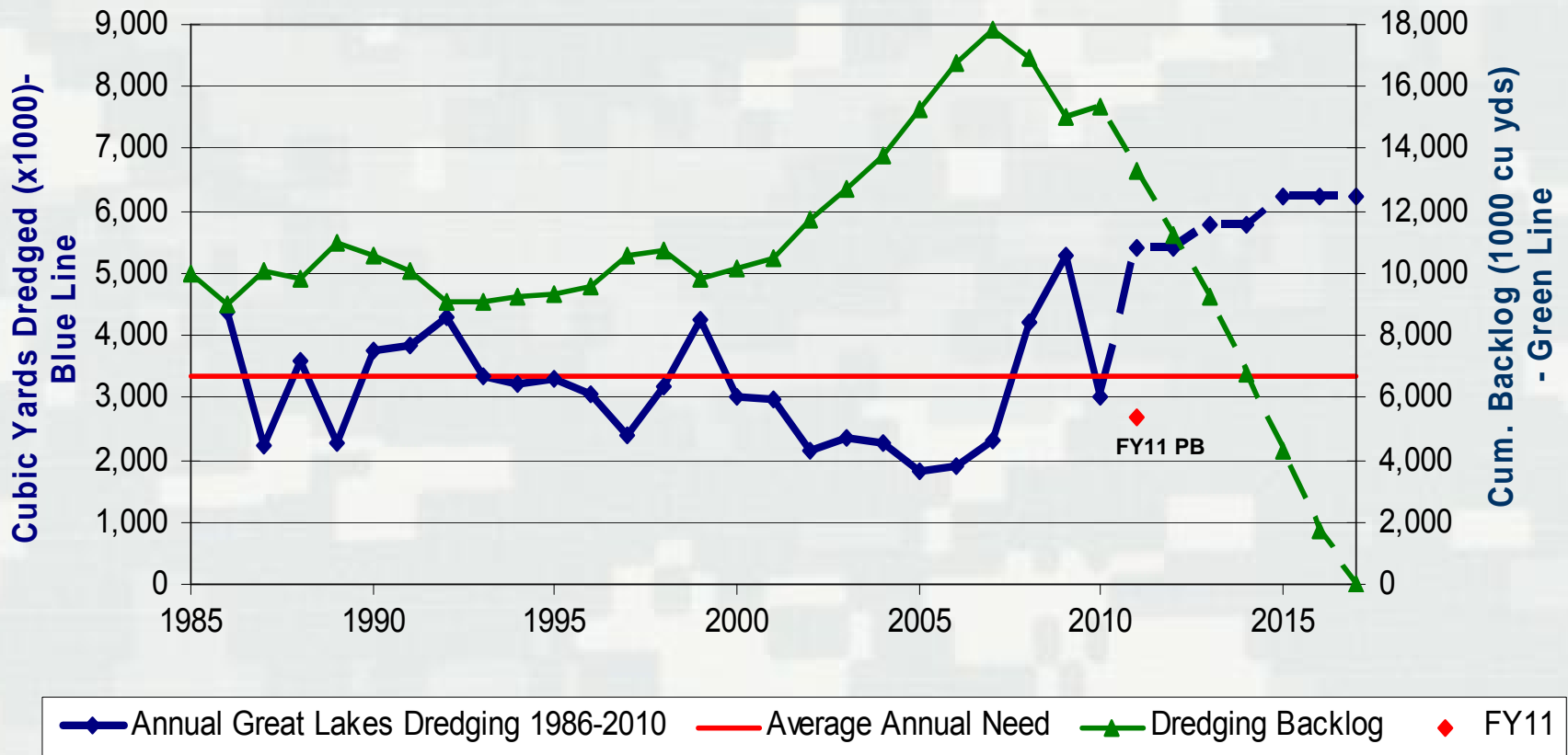
- Reducing Dredging Backlog
- Dredged Material Management Strategic Plan
- Soo Locks Reliability
- Great Lakes Restoration Initiative
- Aquatic Invasive Species Dispersal Barrier



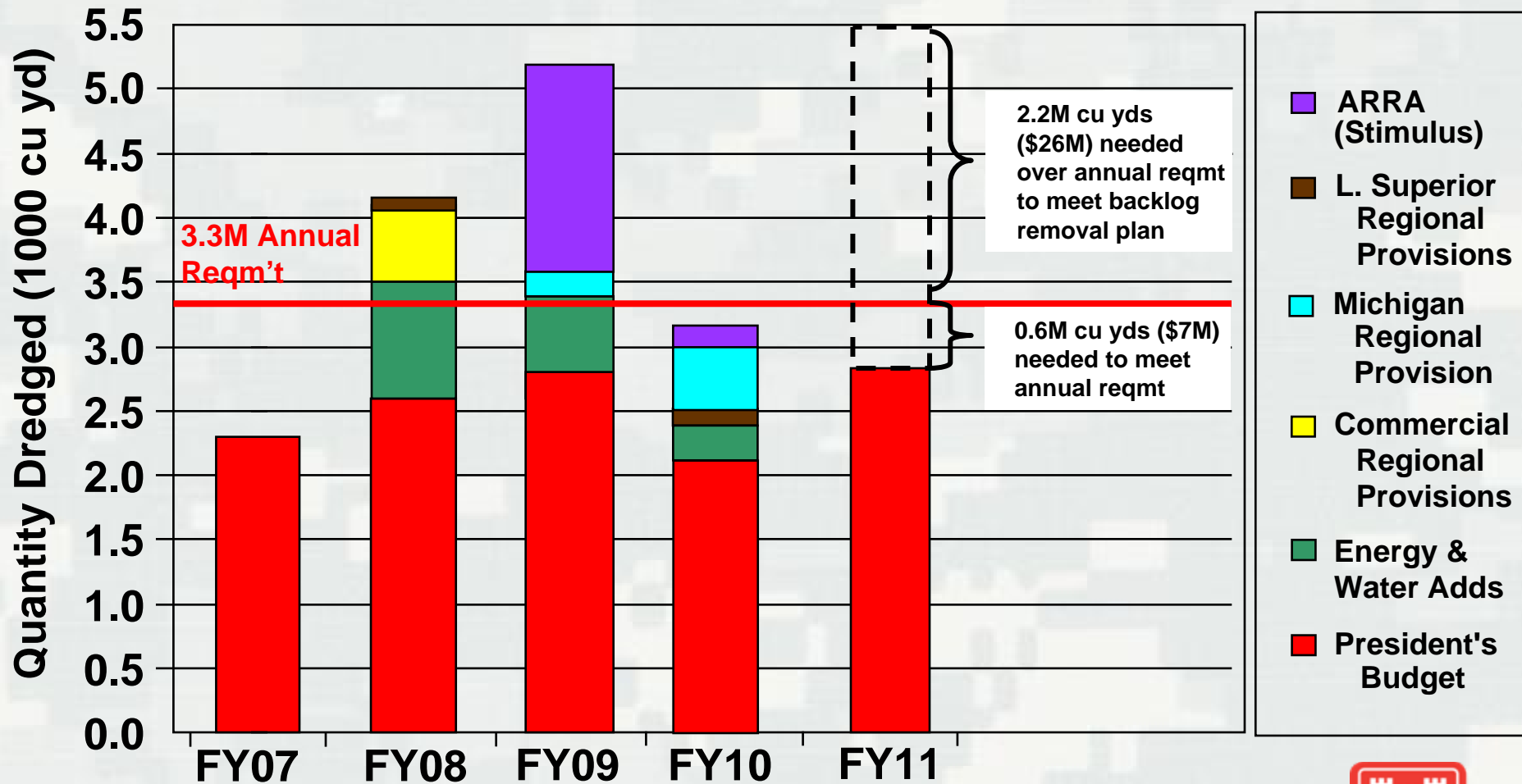
Reducing Dredging Backlog



Path Forward to Reduce Backlog 2010-2017



Dredging Funding Trends 2007 - 2011



Strategic Dredging Initiatives

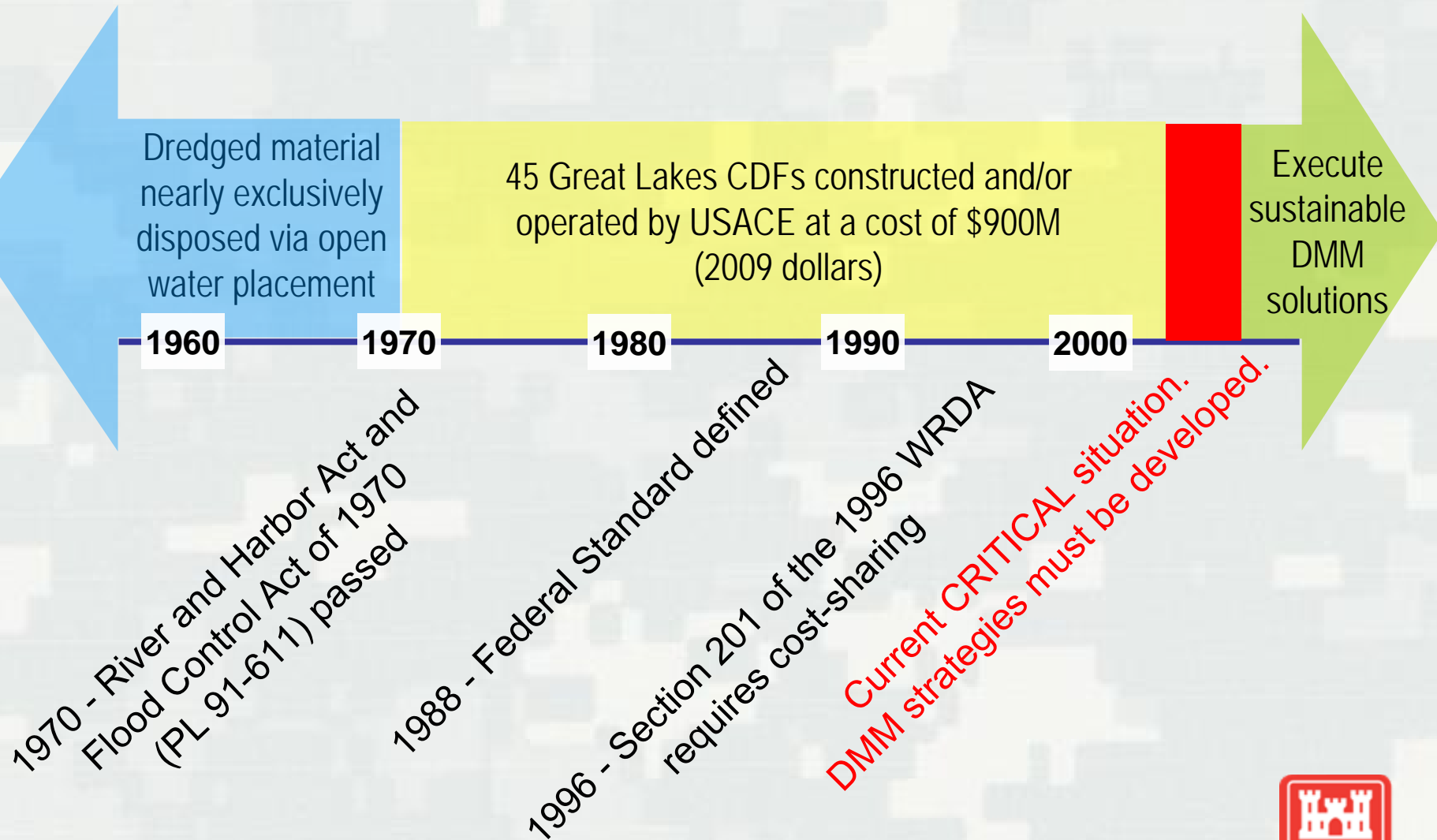
- Executed \$63M in dredging in 2009; removed nearly 2M cubic yards of backlog
- Employing innovative acquisition strategies; increasing the number of GL contractors
- Increasing capacity: GL Contractor fleet added hydraulic dredging capacity in 2009
- Working to improve efficiency: improved dredging efficiency in 2009 by 5%



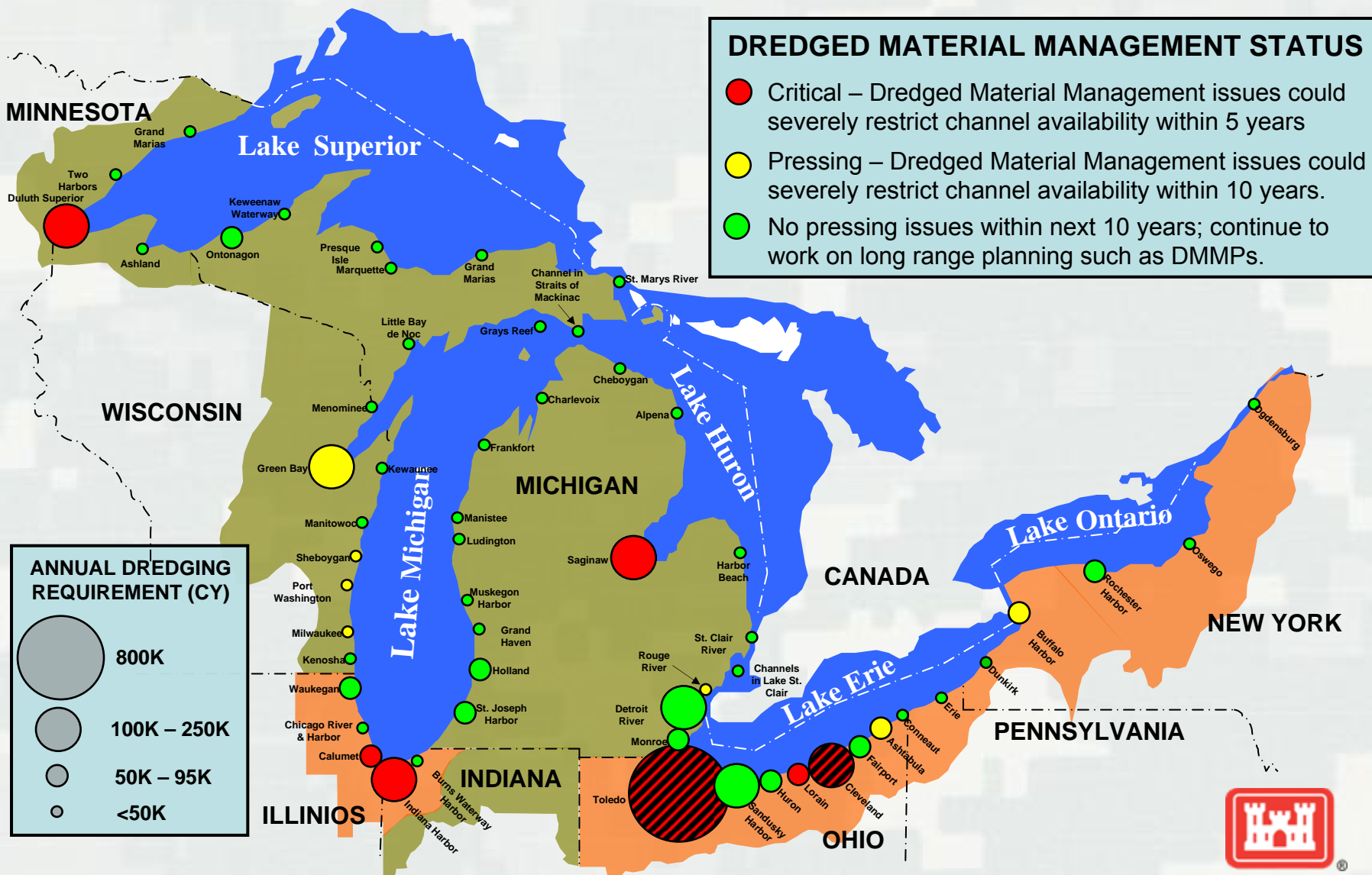
Dredged Material Management Strategic Plan



DMM Historical Perspective



Current Dredged Material Management Conditions



DMM Long-Term Strategy

- Strategic Plan
 1. Extend CDF Life through Fill Management
 2. Aggressively pursue opportunities for beneficial use and reuse of dredged material to create CDF capacity.
 3. Reduce Amount of Materials Entering Federally Maintained Navigation Channels
 4. Engage State Agencies in Solutions
 5. Foster Partnership with USEPA to Leverage Funding for Projects Supporting Environmental Goals and Navigation Benefits

Relying solely on new CDF construction is uncertain; we must maximize the use of the 5 strategies above.

- Harbors that require immediate DMM-related solutions:
 - ▶ Cleveland, Lorain, Calumet, Indiana, Toledo, Duluth-Superior, Saginaw Bay



Coordination with Other Agencies is Critical

- Collaborate with USDA-NRCS, state and local agencies to leverage the Corps' current programs such as Great Lakes Tributary Modeling to ultimately reduce the amount of material entering watersheds that contribute to sedimentation in federally maintained navigation channels.
- Engage states, USEPA, and USFWS to participate in studies to improve the scientific basis for establishing environmental dredging windows and open lake placement decisions; develop specific strategies for each state.
- Partner with USEPA to aggressively leverage authorities and funding for projects that benefit navigation and the environment - Great Lakes Legacy Act & Great Lakes Restoration Initiative.



Soo Locks Reliability



The Soo Locks

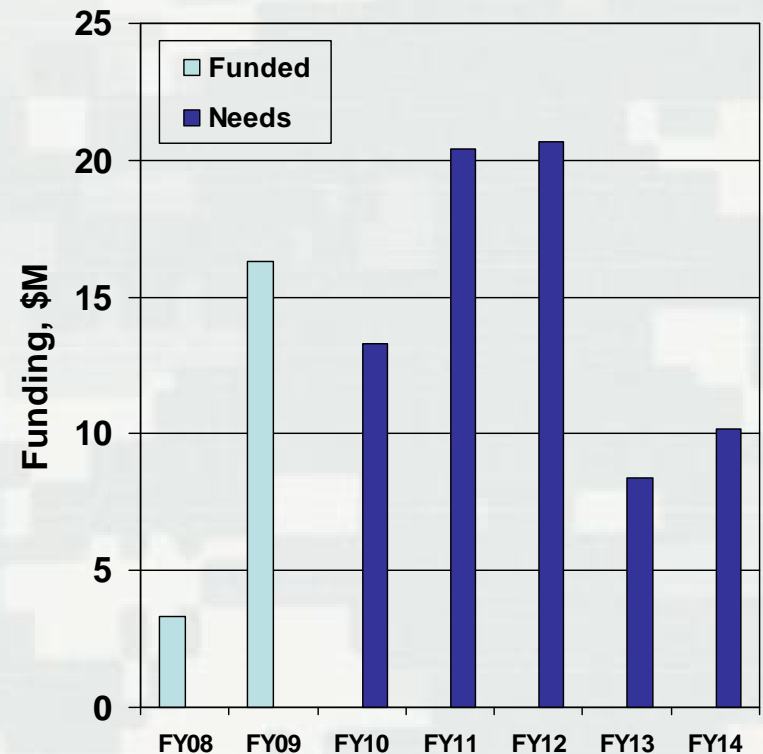
A Lynch Pin of the Great Lakes Navigation System

- 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
- Full funding requires \$93 million over 6 years
 - \$19.6 M funded to date
 - ✓ new hydraulics, stop logs, utilities
 - \$73M in needs from FY10-FY14
- Major remaining needs:
 - New compressed air system
 - Heavy lift equipment procurement
 - Rock Cut stabilization
 - Bollard reinforcement



Great Lakes Restoration Initiative



Great Lakes Restoration Initiative

Overview

- Administration Budget Initiative for restoration of Great Lakes ecosystem
- \$475M in FY 2010 (\$411M new funding)
- Led by EPA and coordinated through GL Interagency Task Force
- Budgeted through EPA Appropriations



- Five-Year Action Plan (FY10 - FY14)
- Identifies five Focus Areas for restoration
- Objectives, short- and long-term goals for each Focus Area
- \$46.3M for USACE projects in FY10



Great Lakes Restoration Initiative

Navigation Connections

- Strategic Navigation Dredging (SND)
 - GLRI funds will be used to dredge contaminated sediments from Federal navigation channels to complement clean-up with Legacy Act
 - Buffalo River – \$7M in FY 2010 for removal of up to 660,000 cubic yards
- Dredged Material Disposal Facility Construction
 - GLRI funds can be used for development of DMDFs that also provide habitat benefits
 - Green Bay – DMDF will help restore 1,000 acres of coastal wetlands – Cat Island Restoration



Great Lakes Restoration Initiative

Navigation Connections

- Beneficial Use of Dredged Material
 - GLRI funds will be used to plan, design and construct beneficial use projects
 - Wynn Road and Maumee Bay – projects for dredged material from Toledo Harbor
- Tributary Models
 - GLRI will supplement Corps' base funding for models that support soil conservation and nonpoint source pollution prevention activities by state and local agencies



Aquatic Invasive Species Dispersal Barrier

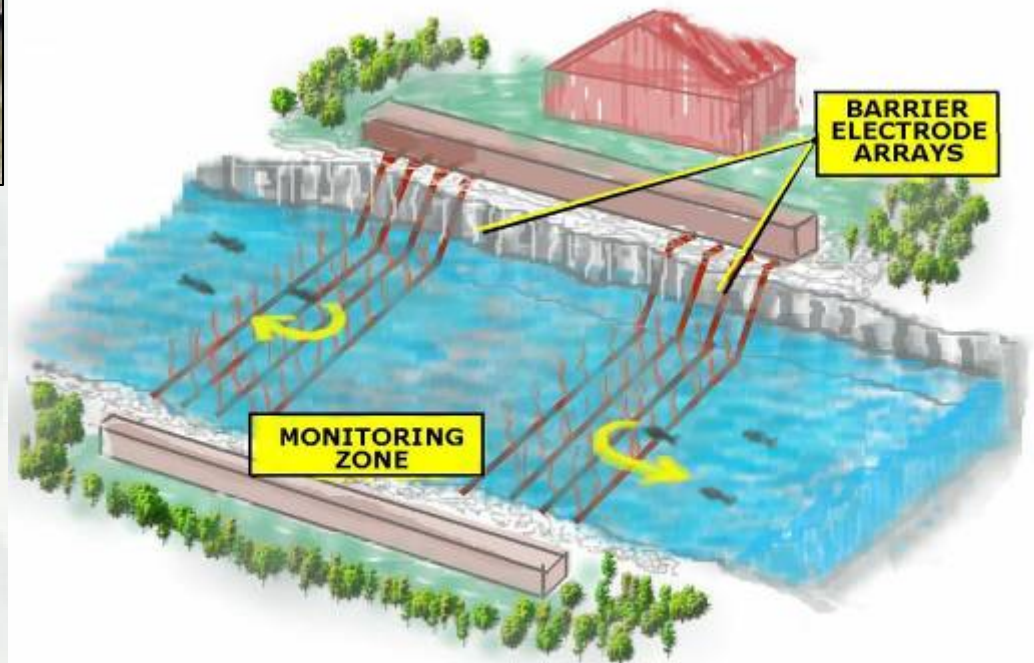
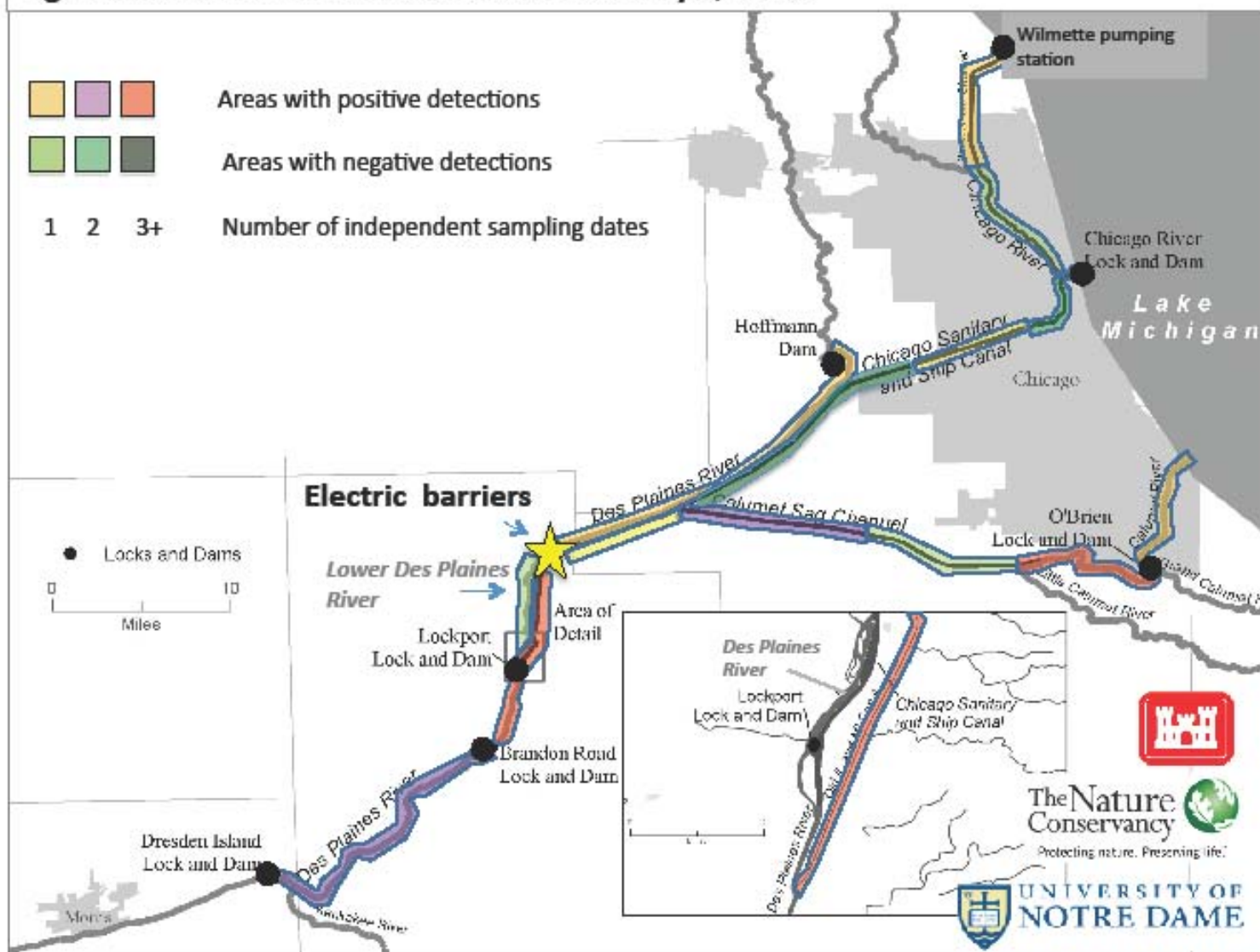
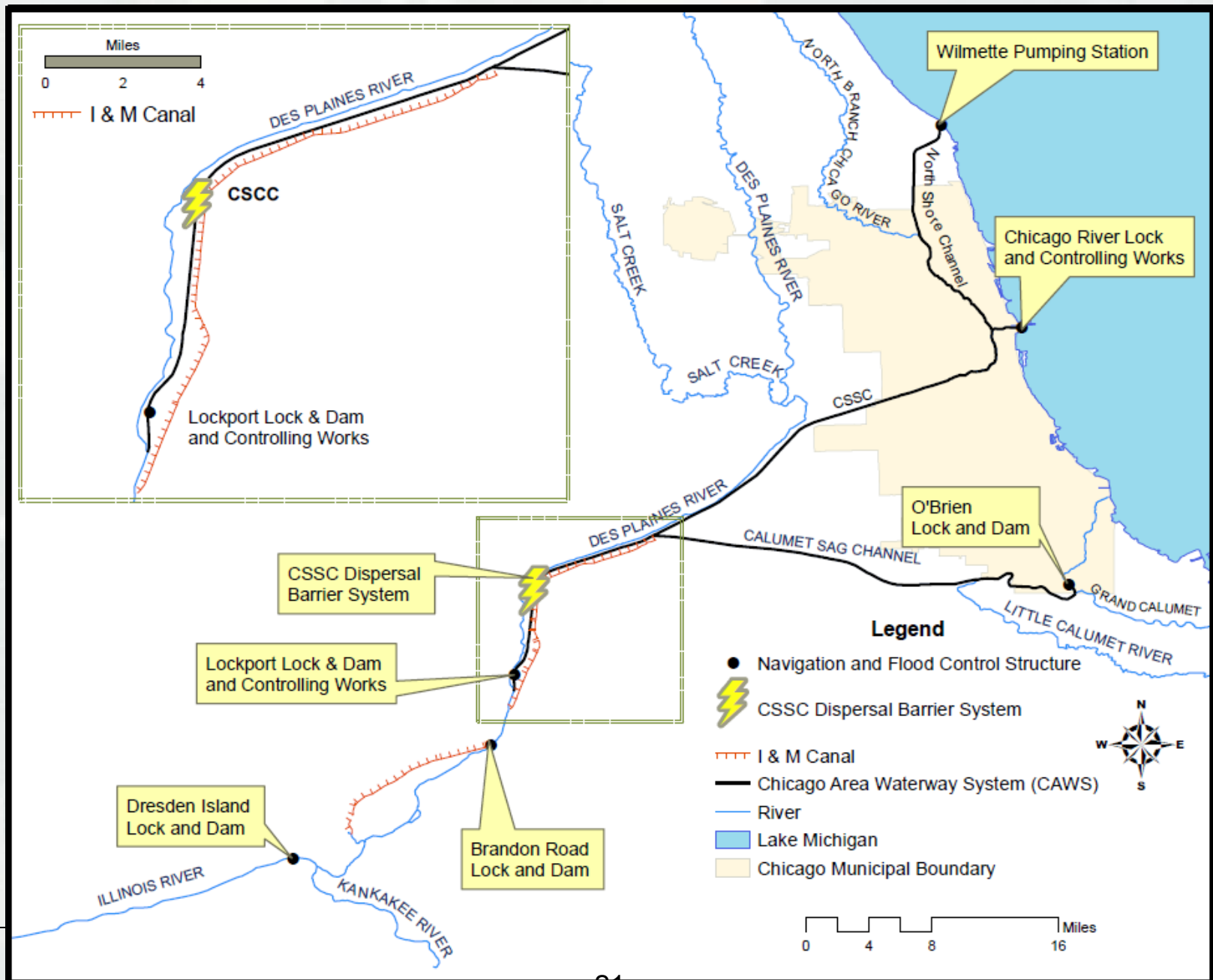


Fig. 1 Environmental DNA results as of February 5, 2010.



Chicago Area Waterway System



Dispersal Barriers Overview



Barrier I (Demonstration):

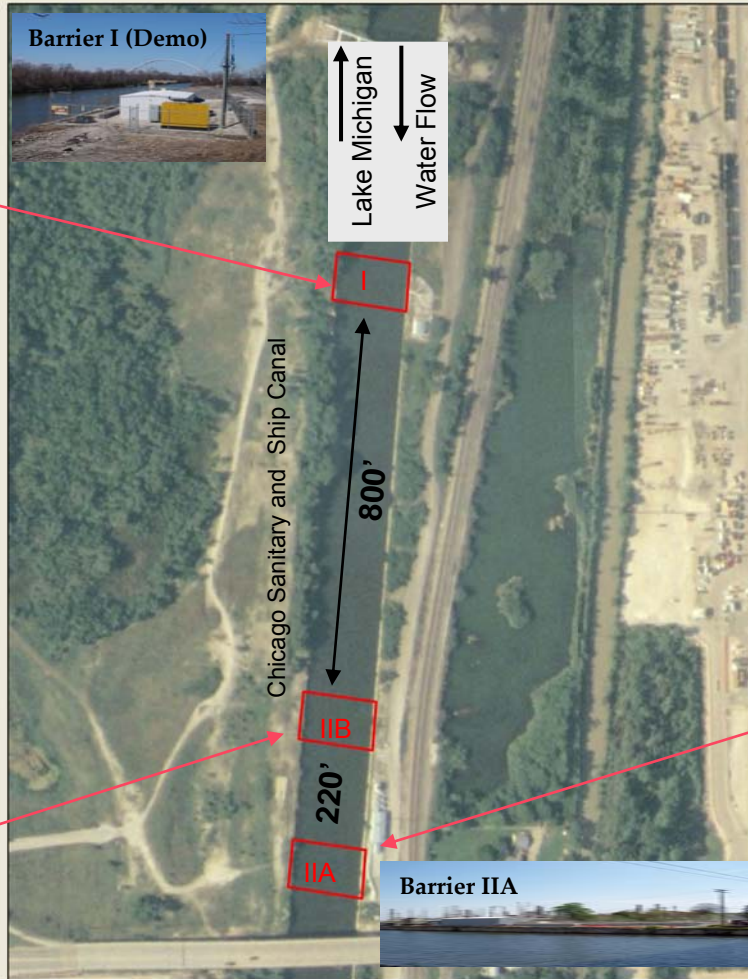
- In continuous operation since 2002 @ 1 Volt/in, 5 hz, 4 ms
- Rehabilitated in Oct 2008

Barrier I (Permanent):

- Upgrade to a permanent barrier authorized; plan activation by 2013 if funded

Barrier IIB:

- Site prep completed
- Building construction contract NTP issued 3 Dec
- Electronics design ongoing
- **Construction to be completed 30 Sep 10**



Other Ongoing Efforts:

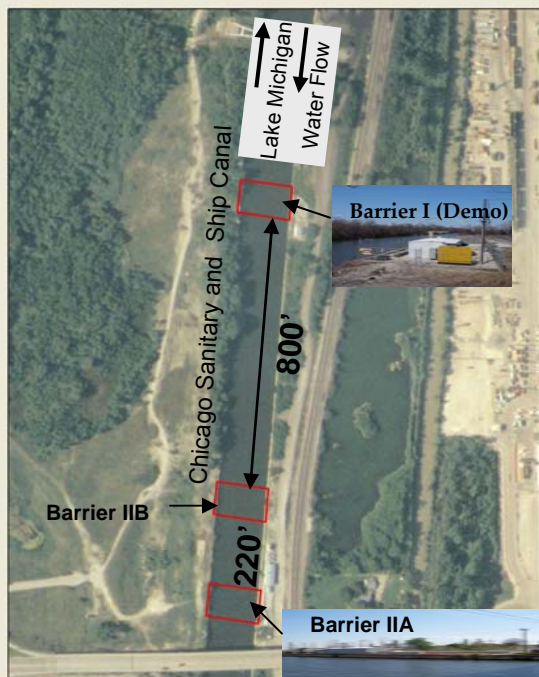
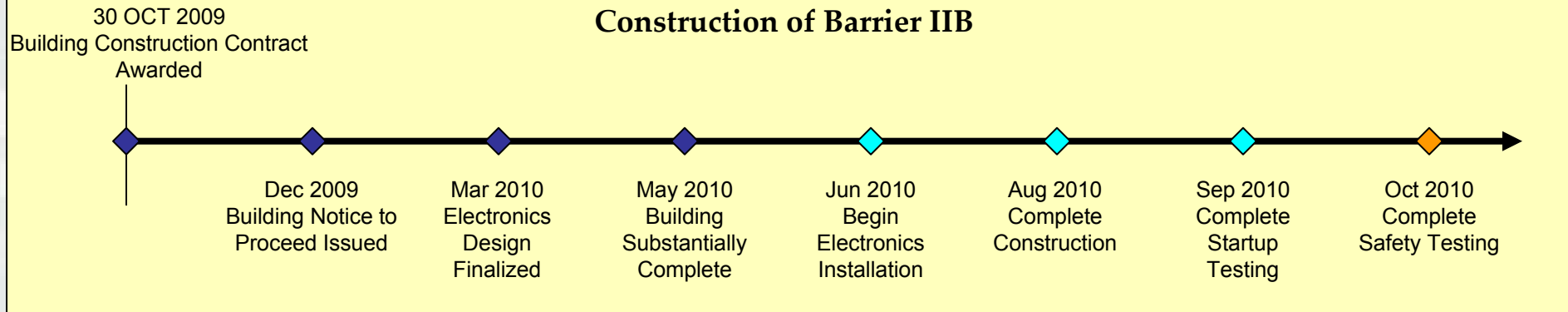
- Asian Carp Monitoring
- Research on Optimum Operating Parameters
- Study of Solutions to Potential Barrier Bypasses

Barrier IIA:

- Activated @ 1 Volt/in, 5 hz, 4 ms in APR 09.
- Increased to 2 Volt/in, 15 hz, 6.5 ms in AUG 09
- Maintenance shutdown completed 3 – 4 Dec w/rotenone support by State

Construction of Barrier IIB & Permanent Barrier I

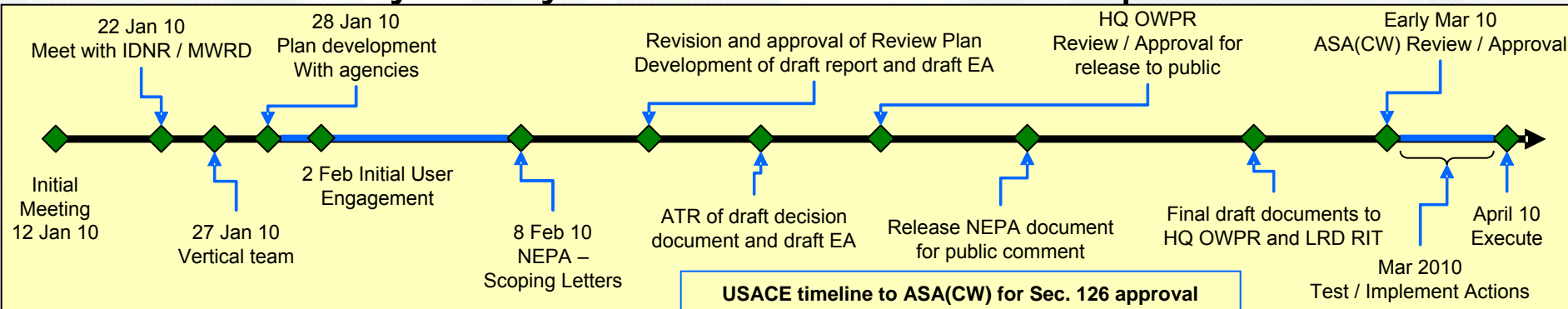
Construction of Barrier IIB



- IIB Capabilities: Range of Operating Parameters Same As IIA
- Improvements for Barrier IIB Vs. Barrier IIA
 - ▶ Closed-Loop Cooling System
 - ▶ All System Components Enclosed in Sealed Building
- Upgrade of Barrier I to Permanent
 - ▶ Similar to IIB
 - ▶ Initiate Once Barrier II is Fully Operational



Efficacy Study Interim III – Modified Operations



Modify Waterway Operations (MWRD)

- Lower water levels in advance of storms
- Retrofit sluice gates with screens
- Use pumps instead of opening gates at Wilmette Pumping Station
- Investigate possibility of modifying water quality to distress / kill AC

Establish Control (Kill) Zones (IDNR/FWS)

- Identify areas & establish plans for “spot treatment” using piscicide
- Identify areas and establish plans for intensive fishing operations (nets / commercial / shock)

Guide AC into Control Zones (IDNR/FWS)

- Herd fish into designated control zones – directional boat mounted; electro-fish; nets
- Stationary directional barriers – Chicago and O’Brien Locks – deny access through locks

Modify Structural Operations (USACE)

- Close both sets of gates between lockages
- Intermittent lock operations
- Screens for flooding?
- Screens during treatments or commercial fishing

Uncontrolled Pathways (USACE/IDNR/FWS)

- Intense monitoring/population control actions in Little Cal
- Directional / interim barriers – Little Cal / Grand Cal

Impact Uncertainties

Flooding:

- Flood Damage Reduction Structures
- TARP Impacts
- Property Loss / Damage (\$B)
- Loss of Life

Public Health and Safety/EM:

- USCG/DHS/Chicago Fire and Police

Commerce / Economics:

- Transportation System Upset
- Critical Infrastructure
- Revenue Impacts
- Job Impacts

Water Quality:

- TARP Impacts

Recreation / Tourism:

- Navy Pier
- Great Lakes Shoreline
- Great Lakes Fishing

Great Lakes Ecosystem:

- Asian Carp (AC) Adaptability
- AC Impacts to Shoreline and Tributaries
- AC Impacts to Great Lakes Fisheries (\$B)



Moving Forward

- We are working on many key Great Lakes navigation related issues:
 - ▶ Continuing to work toward gaining efficiencies and improving cost-effectiveness of Great Lakes dredging
 - ▶ Aggressively working multiple paths to solve the Dredged Material Management crisis – including maximizing the beneficial reuse of dredged material
 - ▶ Continuing to assess and prioritize risks and refine needs to ensure reliability at the Soo Locks
 - ▶ Working collaboratively with EPA on important GLRI projects that will benefit Great Lakes navigation
 - ▶ Tackling the Asian Carp Barrier issues on multiple fronts – a dynamic situation



Questions

