

# GREAT LAKES NAVIGATION UPDATE

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October 5, 2021

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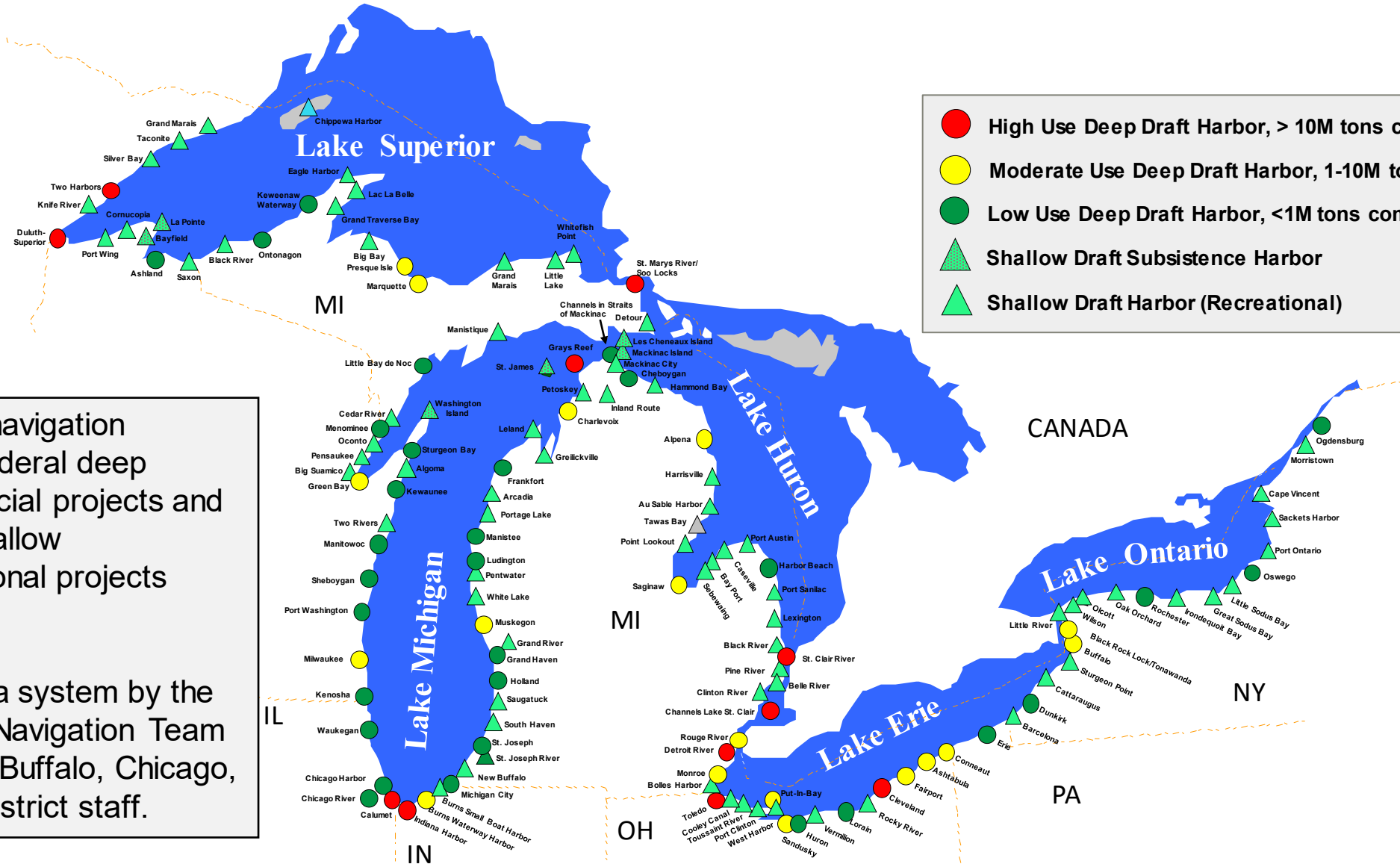


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# GREAT LAKES FEDERAL HARBOR TYPES



A non-linear navigation system; 60 federal deep draft/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.



- Non-linear interdependent system
- Commercial ports dependent on each other
- 95% of traffic is internal to the Great Lakes
- System saves **\$3.9 Billion per year** over next mode of transportation
- Ports/harbors located at manufacturing sites/centers
- Ports compete with other modes of transportation rather than each other



# HARBOR MAINTENANCE TRUST FUND BACKGROUND

- Prior to 1986, Great Lakes O&M was conducted at full federal expense
- WRDA 1986 established the Harbor Maintenance Trust Fund: a fee collected from coastal maritime users (owners of cargo) to fund Army Corps operation and maintenance of federal navigation projects
  - 1986: Tax imposed of 0.04% of cargo value
  - 1990: Tax changed to 0.125% of cargo value
    - In 1998, Supreme Court removed export tax, now the tax is paid only on domestic cargo and imports.
  - The fee is typically passed on to U.S. tax payers through the cost of goods and services.

HMTF funds O&M costs for all coastal navigation (locks, dredging, dredged material management, nav structure repair, including all recreational projects) and a few inland systems.\

 WRDA 14 set a path to full use of the HMTF by 2025 and established goals for GL Nav O&M; investments in GL Nav O&M began increasing.



# WRDA 2020 – SIGNIFICANT HMTF CHANGES

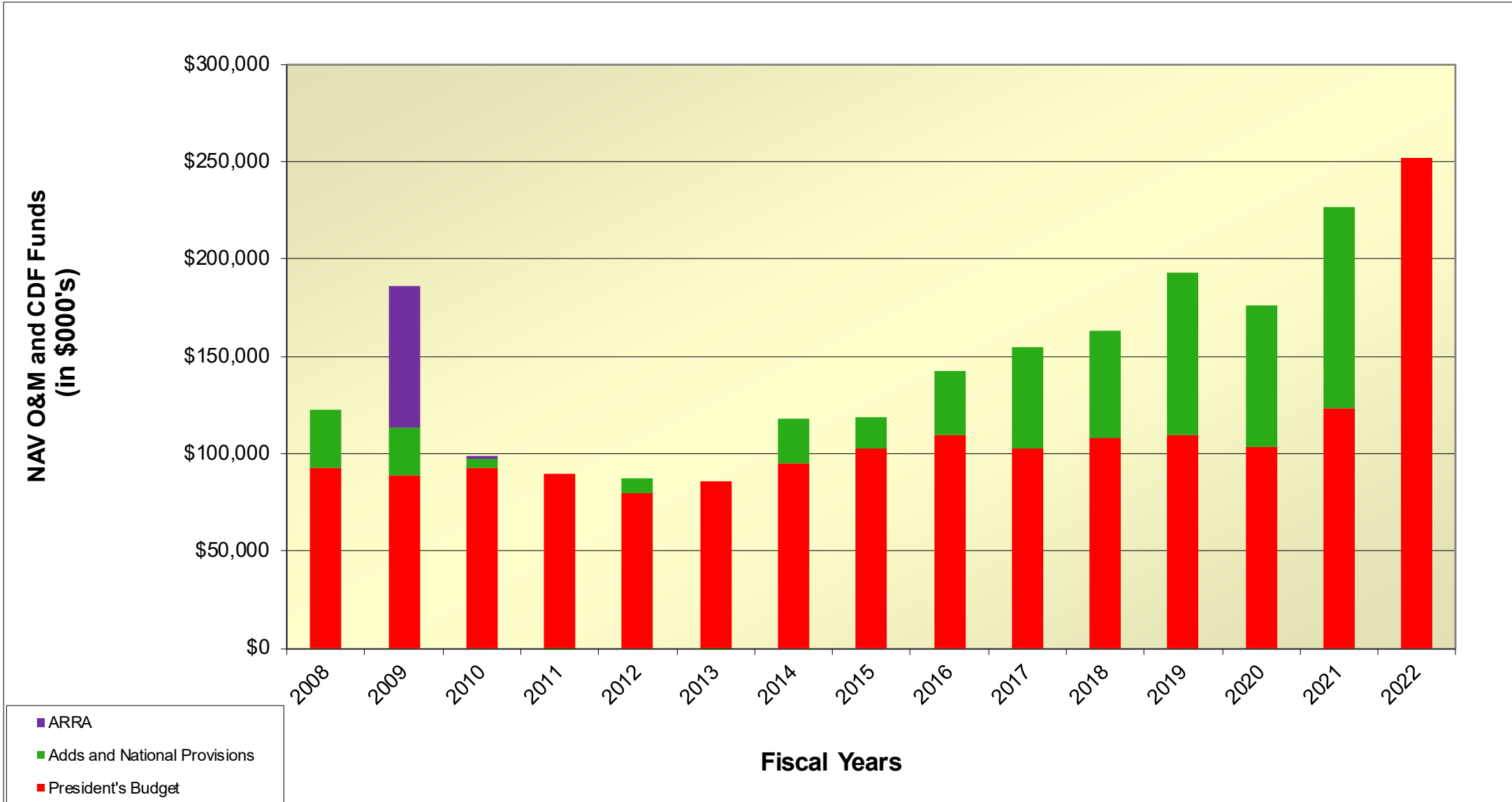
Significant changes in Water Resources Development Act (WRDA) 2020 related to Harbor Maintenance Trust Fund (HMTF)

- HMTF “off budget” – CARES Act March 2020
- No less than 13% of annual expenditures from HMTF to GL
- Not less than 15% for emerging harbors (<1M tons)
- For the first time, direction to spend the HMTF “surplus”
- Directs appropriation from HMTF = HMTF deposits two year prior plus:
  - \$500M for fiscal year 2021
  - \$600M for fiscal year 2022
  - \$700M for fiscal year 2023
  - 
  - 
  - Continuing up to 2030 to spend down the \$10B surplus





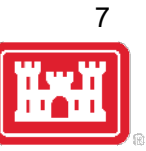
# GREAT LAKES NAVIGATION FUNDING HISTORY





# FY21 GREAT LAKES NAVIGATION PRESIDENT'S BUDGET

## PRESIDENT'S BUDGET + WORKPLAN



Great Lakes Navigation Operations & Maintenance  
\$107.6M + **\$103.2M = \$210.9M**

### Key O&M Items

\$48.6M in Dredging (22 projects; 3.7M cy) (\$37.6M + **\$11.1M**)

\$10.4M in Dredged Material Management (\$5.9M + **\$4.5M**)

**\$32.0M in Soo Locks Maintenance**

**\$20.2M in Chicago Lock Maintenance**

\$4.5M in Black Rock Lock Maintenance

**\$34.8M in Navigation Structure Maintenance/Repair**

### Construction General

\$123.2M + **\$46.5M = \$169.8M** New Soo Lock Construction

\$16M Calumet CDF Construction



# FY22 GREAT LAKES NAVIGATION PRESIDENT'S BUDGET

Great Lakes Navigation Operations & Maintenance - \$224.5M

## Key O&M Items

\$49.8M in Dredging (27 projects; 3.15M cy)

\$10.6M in Dredged Material Management

\$24.8M in Soo Locks Maintenance

\$5.95M in Chicago Lock Maintenance

\$8.5M in Black Rock Lock Maintenance

\$57.6M in Navigation Structure Maintenance/Repair (incl 7 \$25K safety maint)

\$3.5M in Section 111 Beach Nourishment

## Construction General

\$480M New Soo Lock Construction

\$18.4M Indiana Harbor CDF Construction

\$9.1M Calumet CDF Construction

Awaiting FY 22  
Workplan





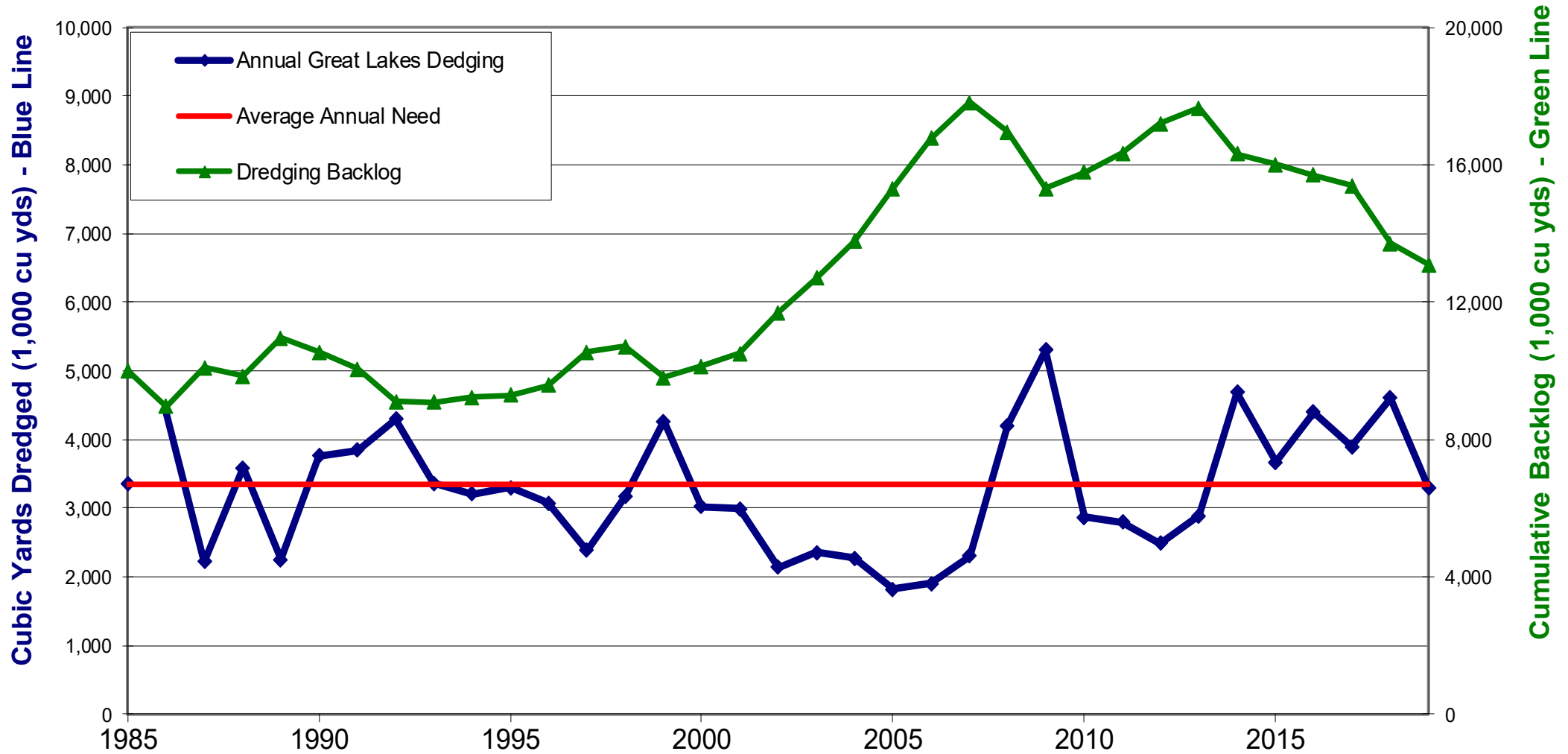
# Major System Requirements

- Dredging
- Dredged Material Management
- Navigation Structures
- Locks Reliability



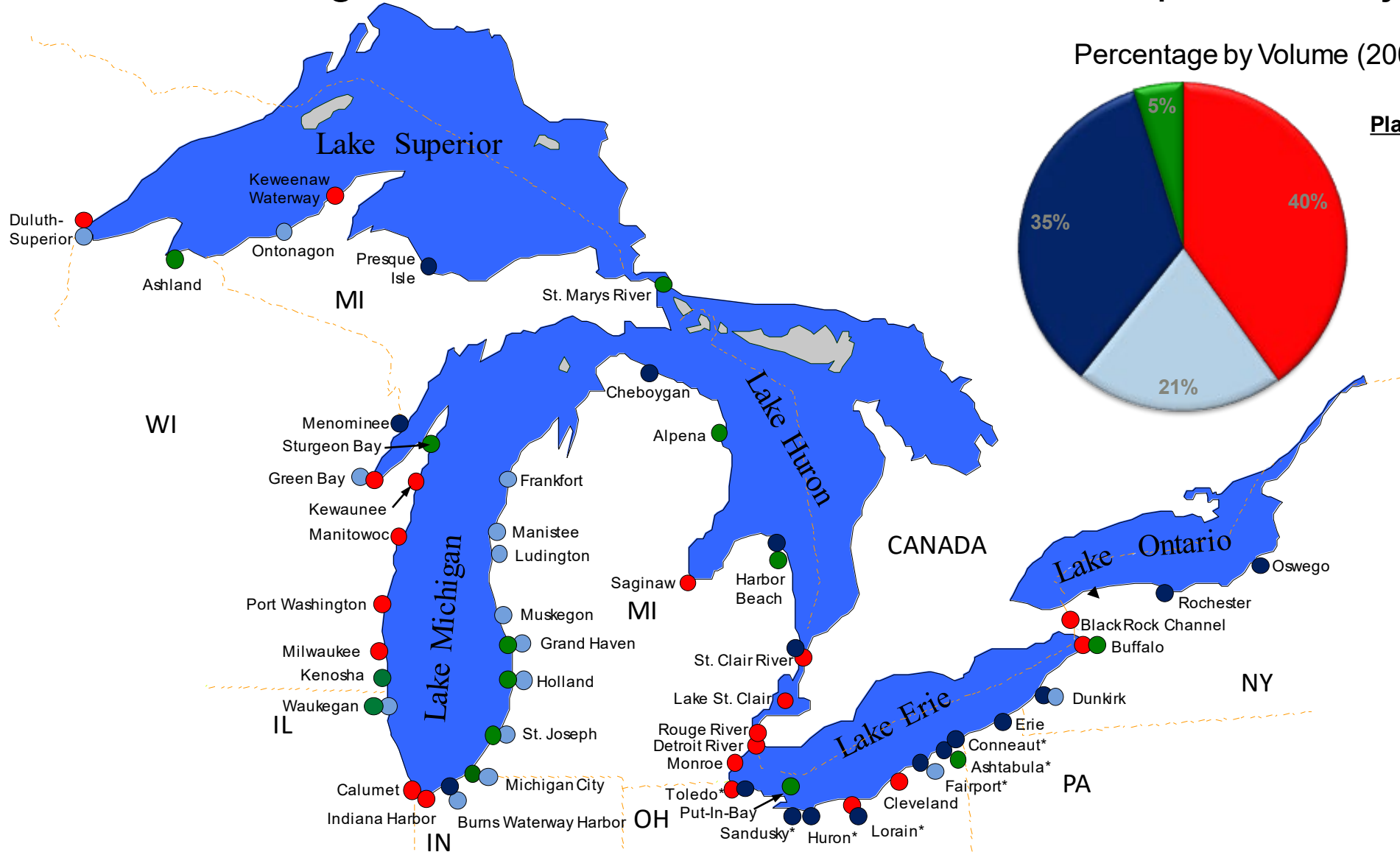


# Great Lakes Dredging Backlog 1985-2020





# Current Dredged Material Placement Methods – Deep Draft Projects

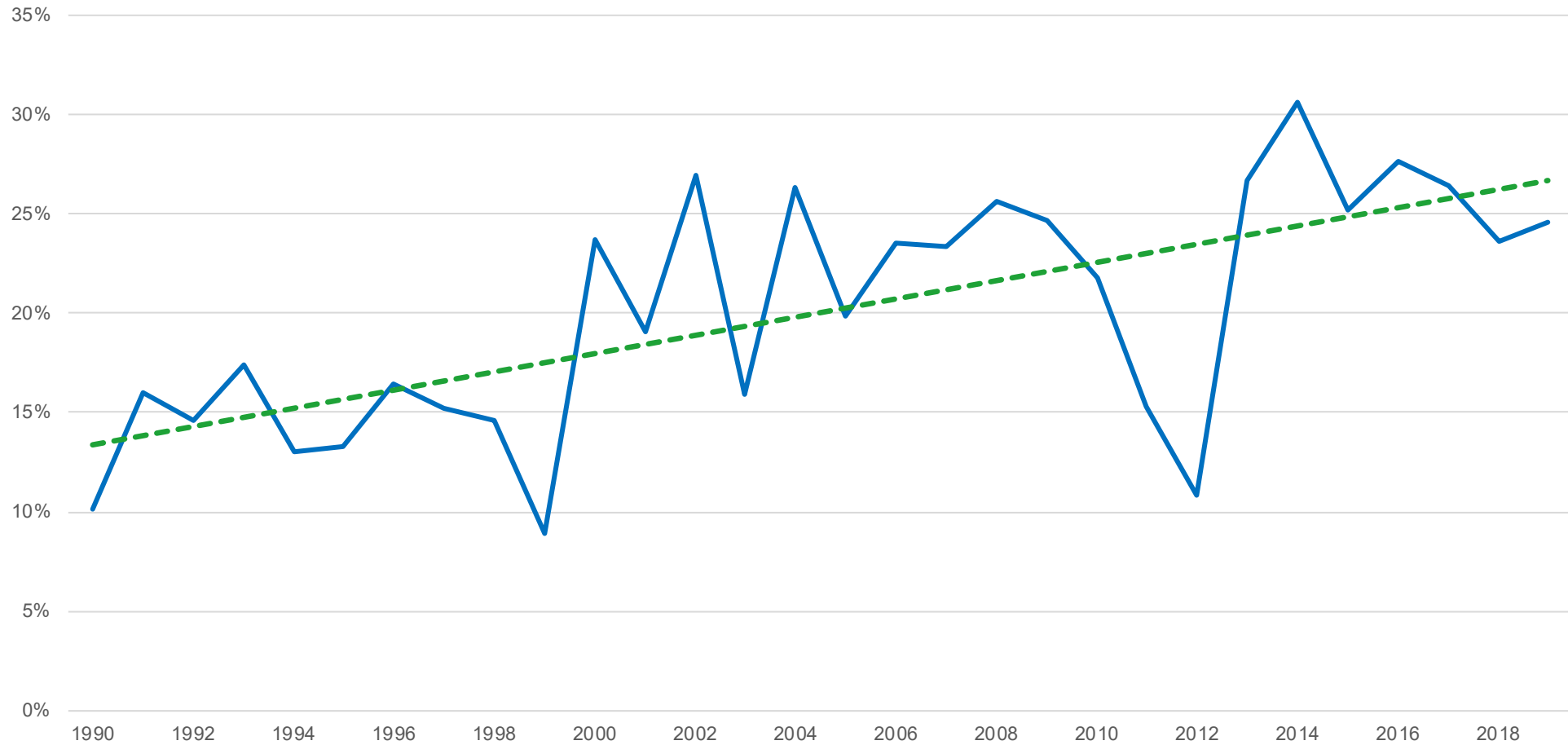




# BENEFICIAL USE OF DREDGED MATERIAL



% of Dredged Material from GL Harbors Beneficially Used \*



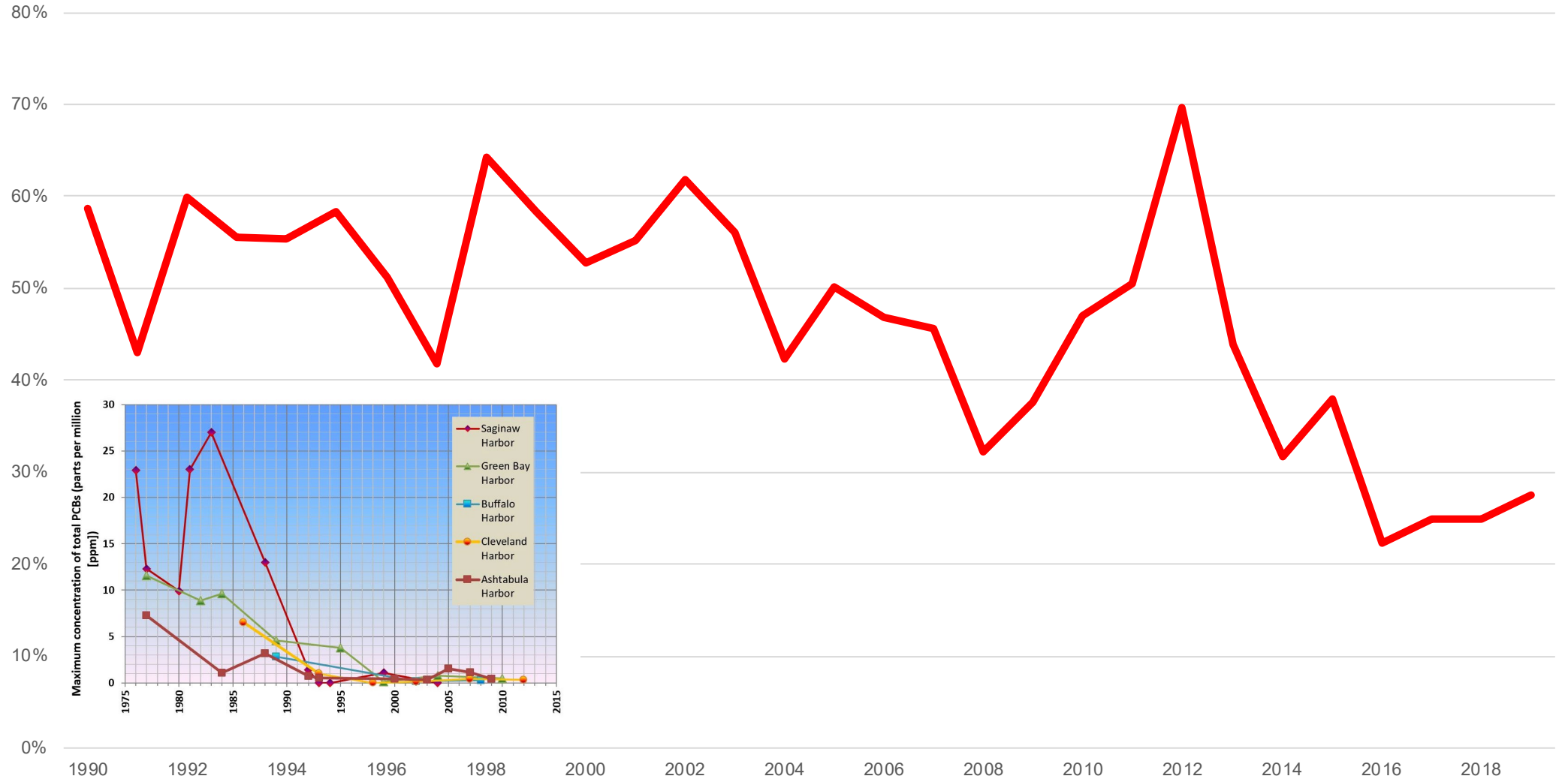
\* Beneficial use assumed to include all Nearshore and Upland Placement



# PERCENT OF DREDGED MATERIAL TO CDF



% of Dredged material from GL Harbors placed in CDFs





# DREDGED MATERIAL MANAGEMENT CHALLENGES/OPPORTUNITIES



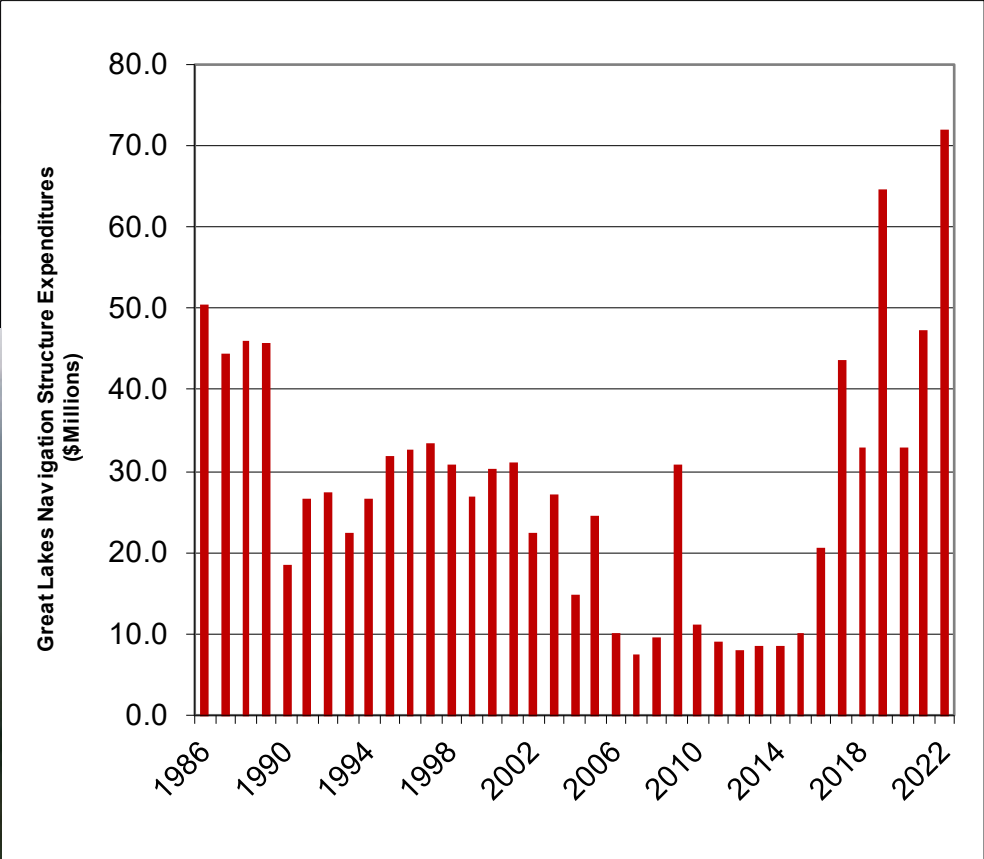
- Declining availability of confined disposal facility (CDF) space
- Prohibitively expensive cost for new CDF construction
- But... Good News – improving quality of dredged sediment
- Traditional perception of dredged material as a waste; reality-material is a great resource!
- Finding beneficial uses for fine material (silt/clay)
- Policy Limitations (PGL 47) on authority for use of O&M funds – WRDA implications?



# GREAT LAKES NAVIGATION STRUCTURES

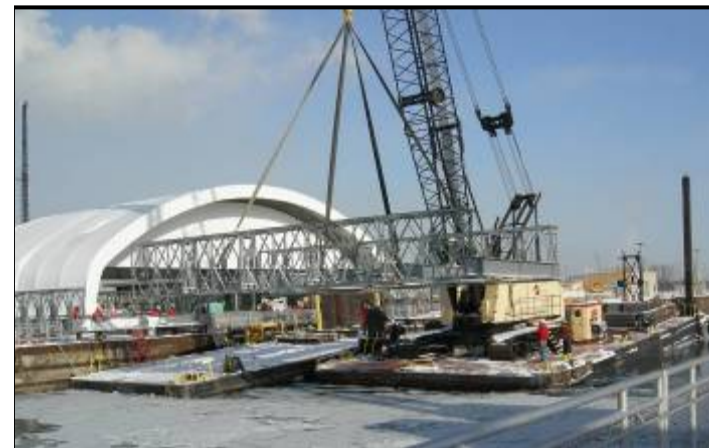
- 104+ miles of navigation structures on the Great Lakes
- Structures include piers, jetties, revetments, and breakwaters
- Most were built between 1860 and 1940
- Jetties and piers were constructed perpendicular to shore to keep the channel open for navigation
- Off-shore breakwaters were constructed to allow safe navigation entry to harbors and channels

- 60% of GL coastal structures were built before WWI
- Over 90% of all coastal structures exceed 60 years of age
- Over 30% of structures have timber crib core sections; past low water levels have accelerated deterioration of the wood
- Over 40% of structure segments are rated C - F; backlog funding need is estimated at \$320M





# SOO LOCK RELIABILITY







# SOO LOCKS – RELIABILITY AND RESILIENCE



➤ 89% 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
- **Only lock in the Corps with no alternate mode of transportation around lock**



Dive Team – dewatering



Winter work on Poe Gate



Winter maintenance on anchorages

Two major efforts are underway to improve reliability of the Soo Locks:

1. Maintain existing infrastructure through O&M and Major Rehab (CG)
2. Construct new lock with the same dimensions as the Poe Lock



# SOO LOCKS ASSET RENEWAL PLAN (O&M)



\$162M funded to date through FY21:

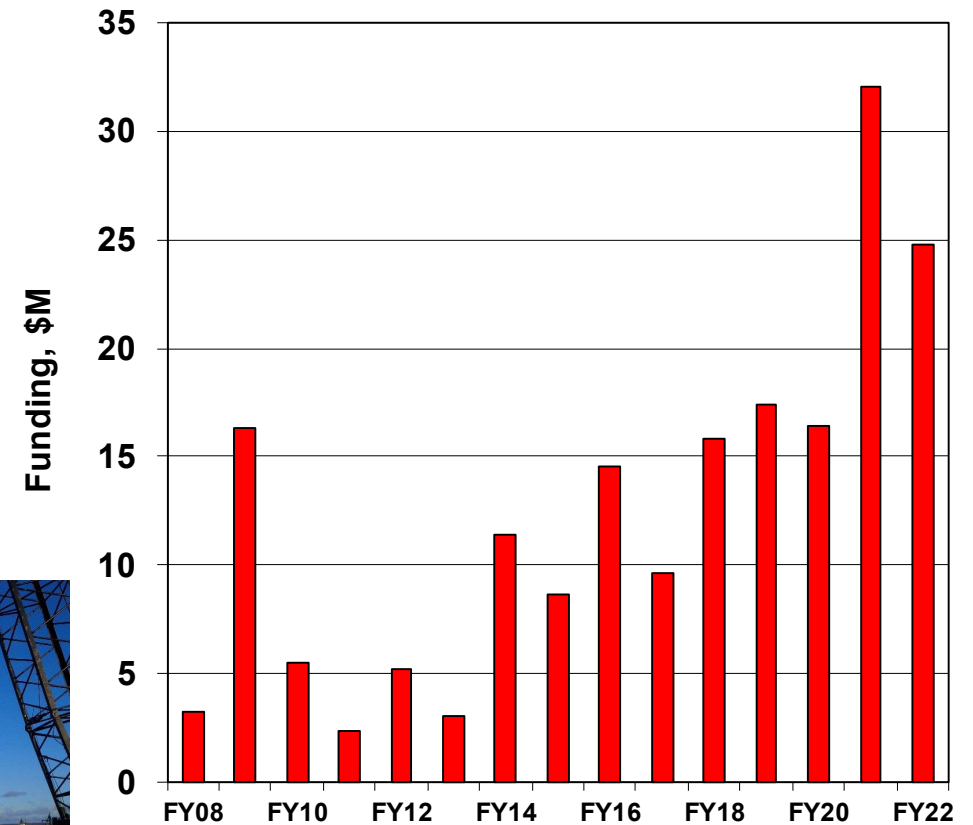
Key projects completed to date:

- Poe and MacArthur Lock Embedded Anchorages
- Poe Hydraulics Replacement
- New Poe Stoplogs
- Poe Miter and Quoin Block Replacement
- Critical Poe Gate 1 Repairs
- West Center Pier Repair
- New Compressed Air System

Remaining key priorities:

- Poe Lock Gate 1 Replacement
- Poe Lock Ship Arrestor
- Electrical Duct Bank and Feeder Replacement
- Poe Lock Filling and Emptying Valves

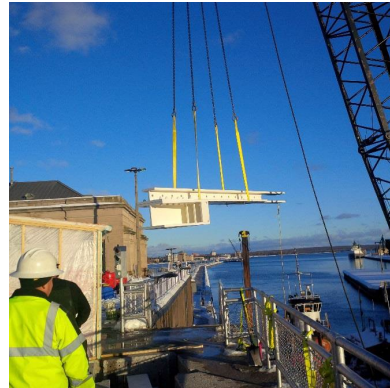
Asset Renewal Plan will maximize reliability and reduce risk



Deicing gate to allow maintenance to be performed during winter work



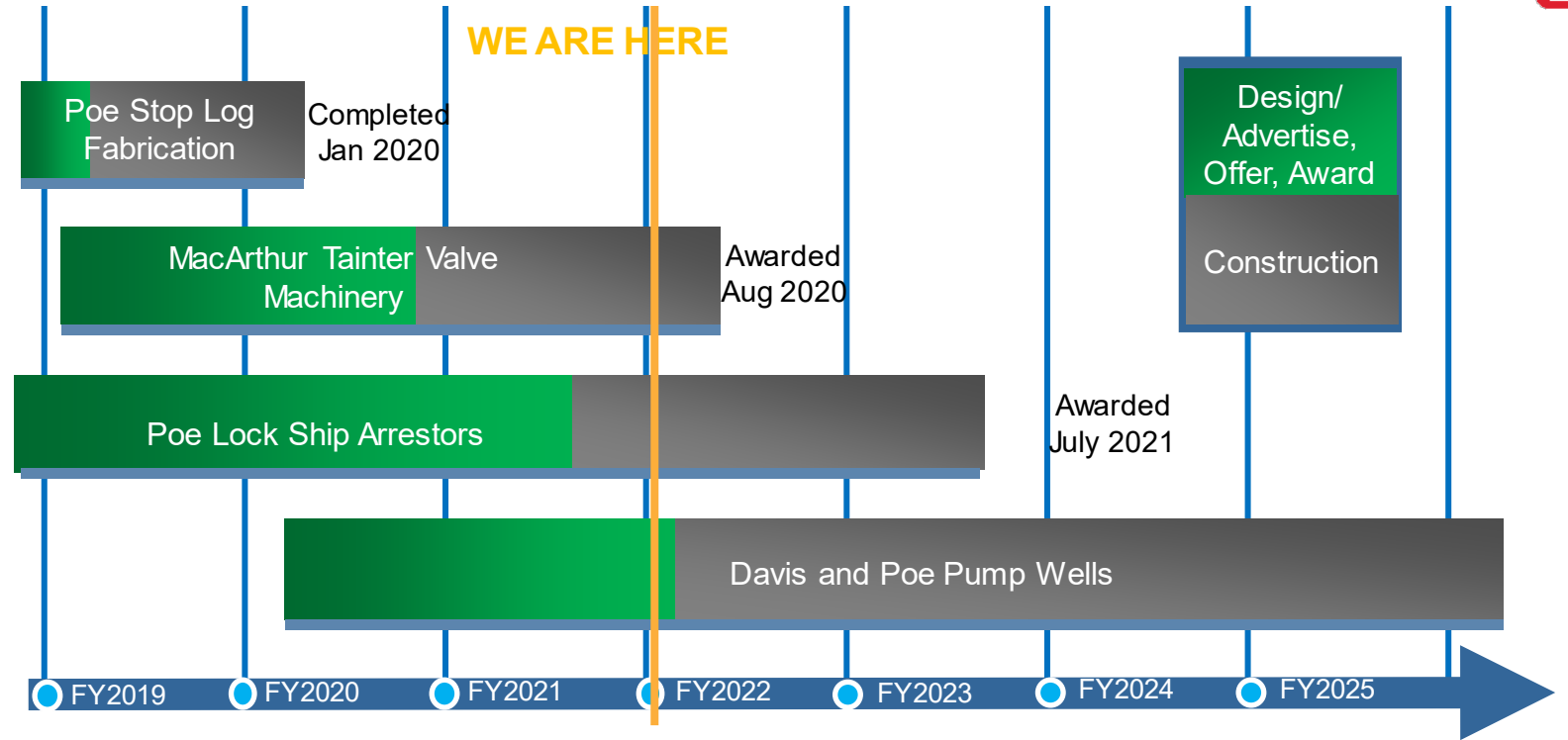
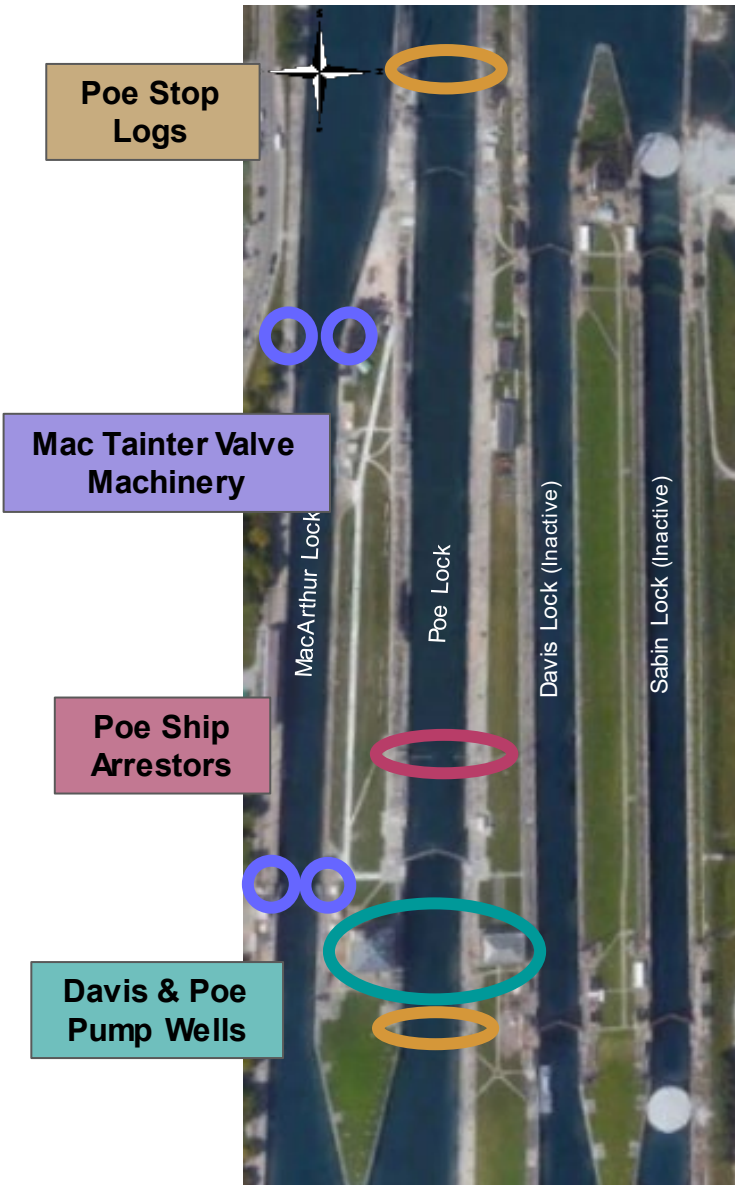
Replacing anchorage links during winter work – Poe Lock



Placing new embedded anchorage – Poe Lock



# SOO LOCKS MAJOR REHAB (CG FUNDED)



## Davis and Poe Pumpwells (\$37.3M FY21 Capability)

- The pumpwell system will serve all locks (including new lock); system >100 yrs old
- Delayed funding for repair increases O&M every year with additional interim risk reduction measures required and increasing probability of failure; greatly increases operational risk to navigation. Locks must be dewatered in 10 hours due to extreme cold temps in January.
- Original 1914 manifold is most critical component; has lost half its wall thickness
- New Pump Well will be contracted with the New Lock to reduce risk associated with 2 contractors working in close proximity at the same time.



# NEW LOCK AT THE SOO – ARTISTIC RENDERING



Current Lock Configuration

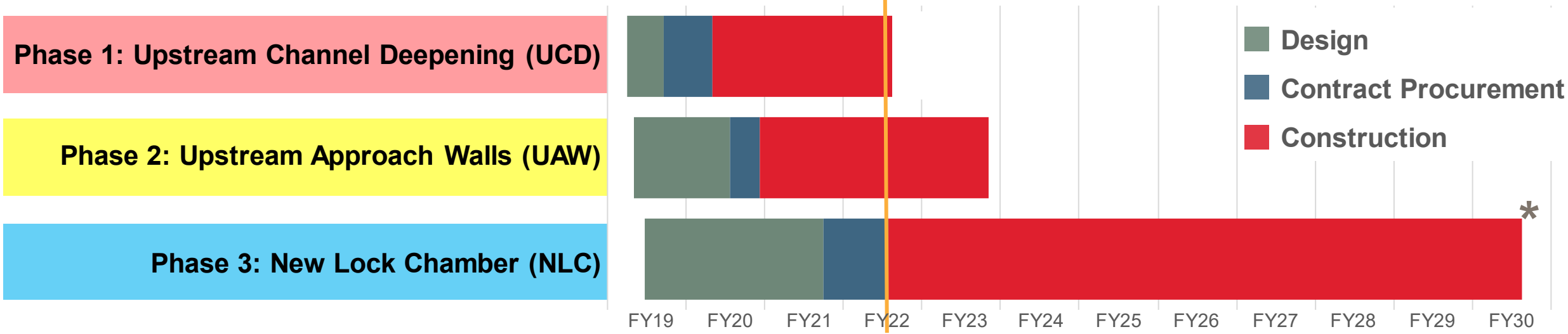


New Lock Artist's rendering

Artistic rendering of the New Lock at the Soo Locks in Sault Ste. Marie, Michigan.

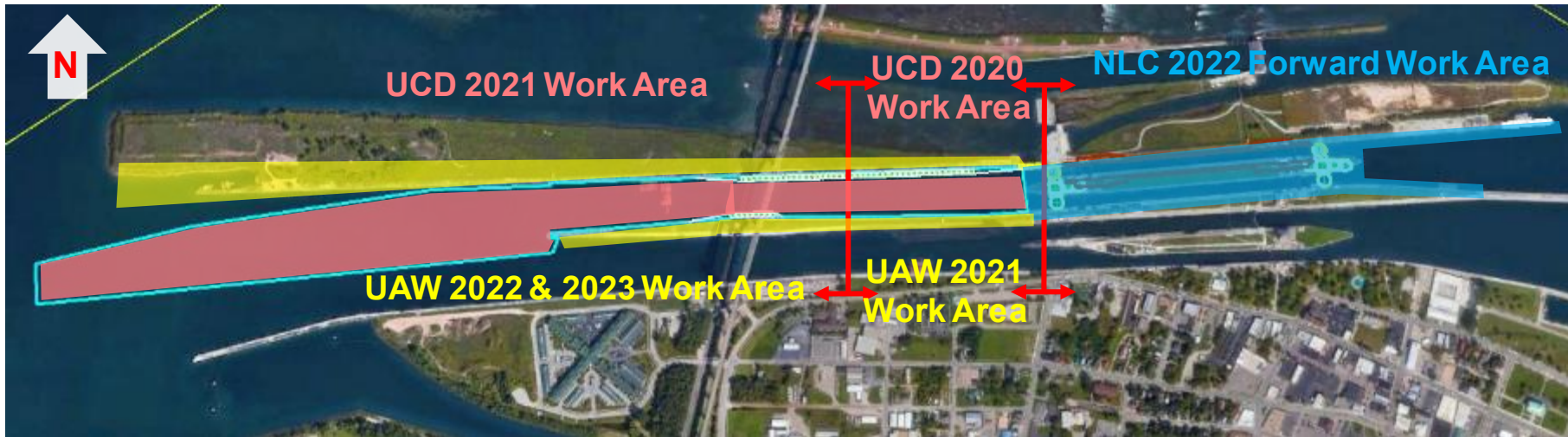


# NEW LOCK AT THE SOO - STATUS



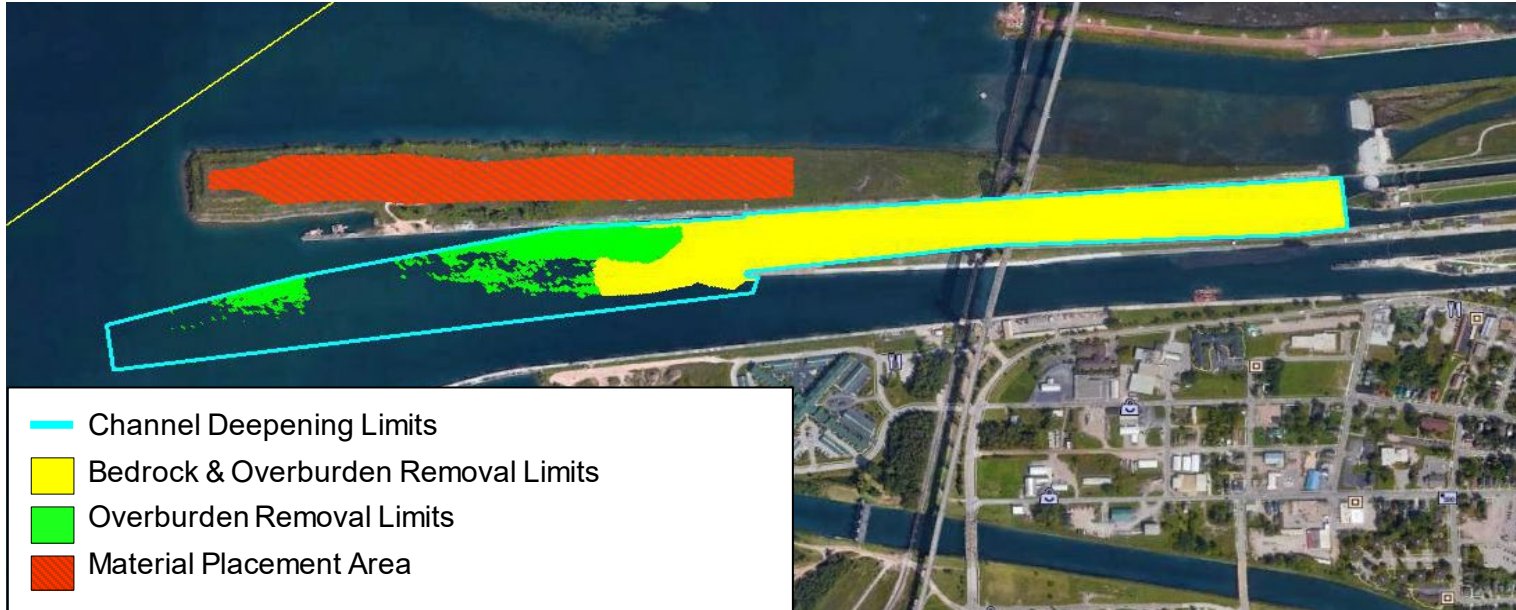
**WE ARE HERE**

\* Early completion could be realized with efficient funding, and favorable weather conditions





# PHASE 1: UPSTREAM CHANNEL DEEPENING



**Scope:** Remove 300,000 CY of Jacobsville sandstone and overburden (loose sediment) to deepen the Upstream Approach Channel to depth of 30 feet

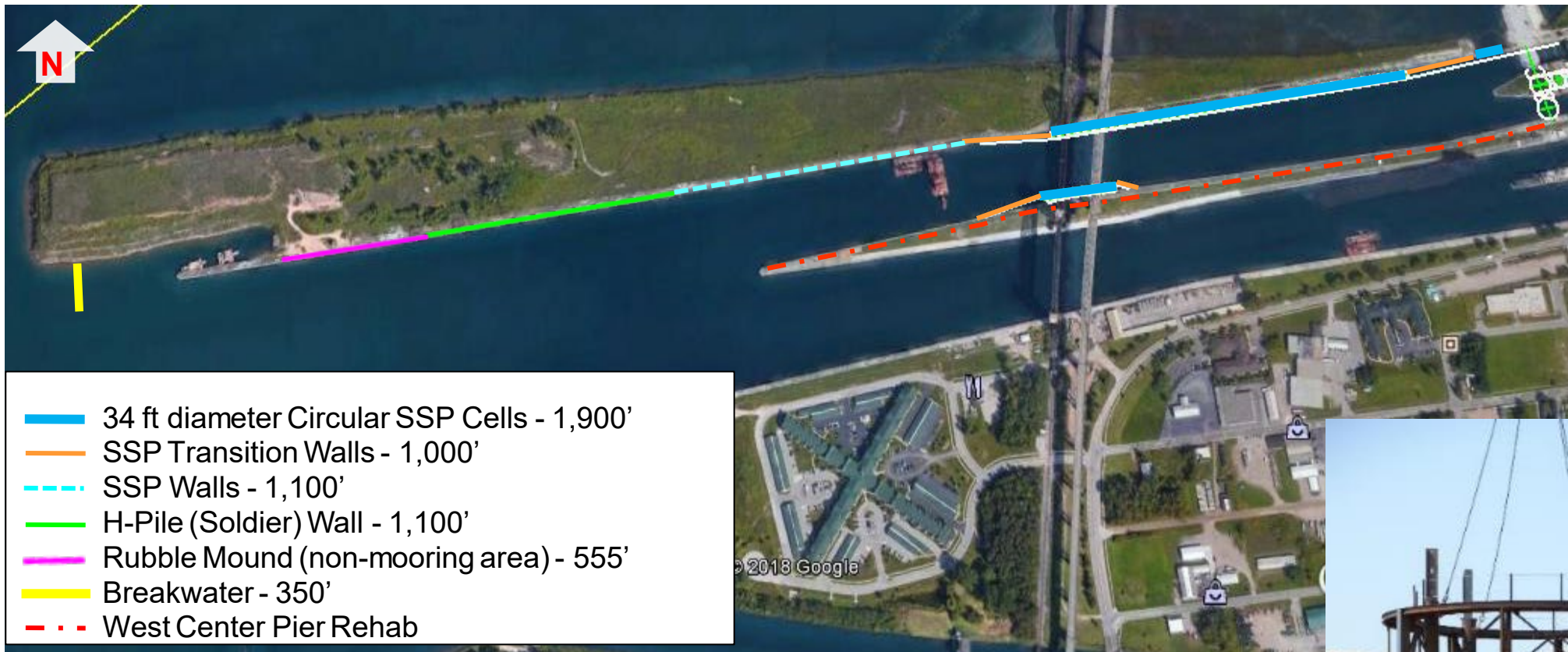
**Construction Status:**

- \$52.6M Contract awarded in January 2020 to Trade West Construction Co. of Nevada.
- Contractor has completed roughly 85% of the required contract work.  
The contractor is on track to substantially complete work by end of Fall 2021.

**Estimated Performance Period:** 20 Months



# PHASE 2: UPSTREAM APPROACH WALLS



**Scope:** Rehabilitate approach walls upstream of New Soo Lock including reconstruction of walls, concrete caps, mooring bollards, electrical, and lighting.

**Project Status:**

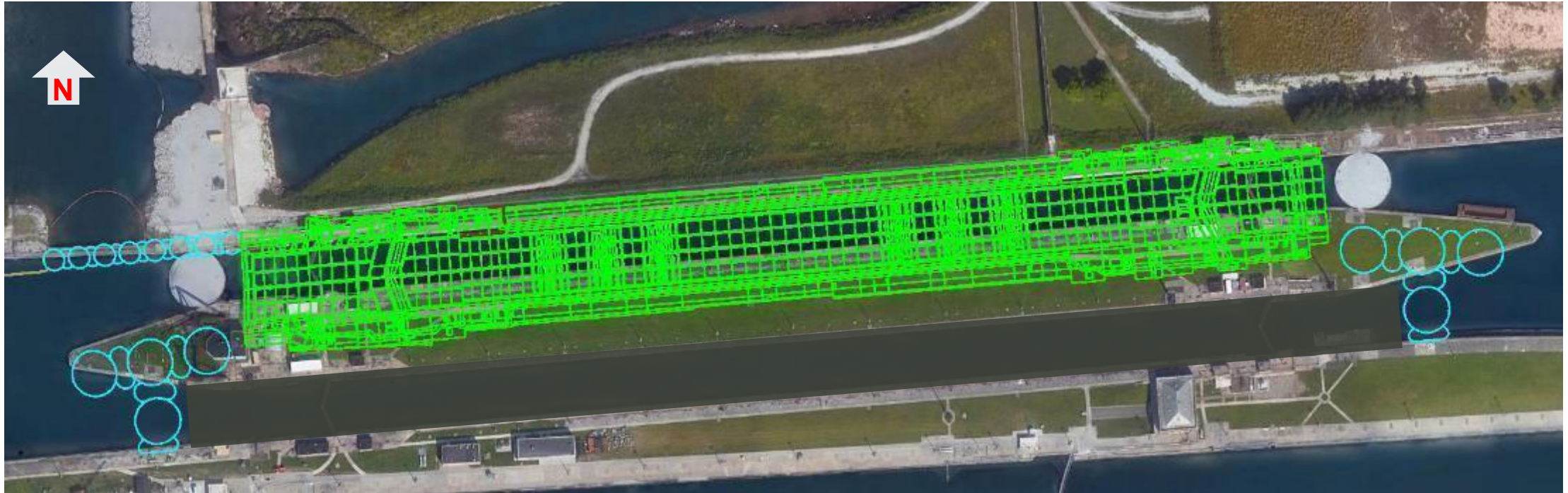
- \$111.3M Contract awarded to Kokosing Alberici in September 2020
- Contractor arrived on site in April 2021 and is scheduled to complete work in Fall 2023

**Estimated Performance Period:** 36 Months





# PHASE 3: NEW LOCK CHAMBER



**Scope:** Construct new 1,200' long by 110' wide by 32' deep chamber and rehabilitate downstream approach walls

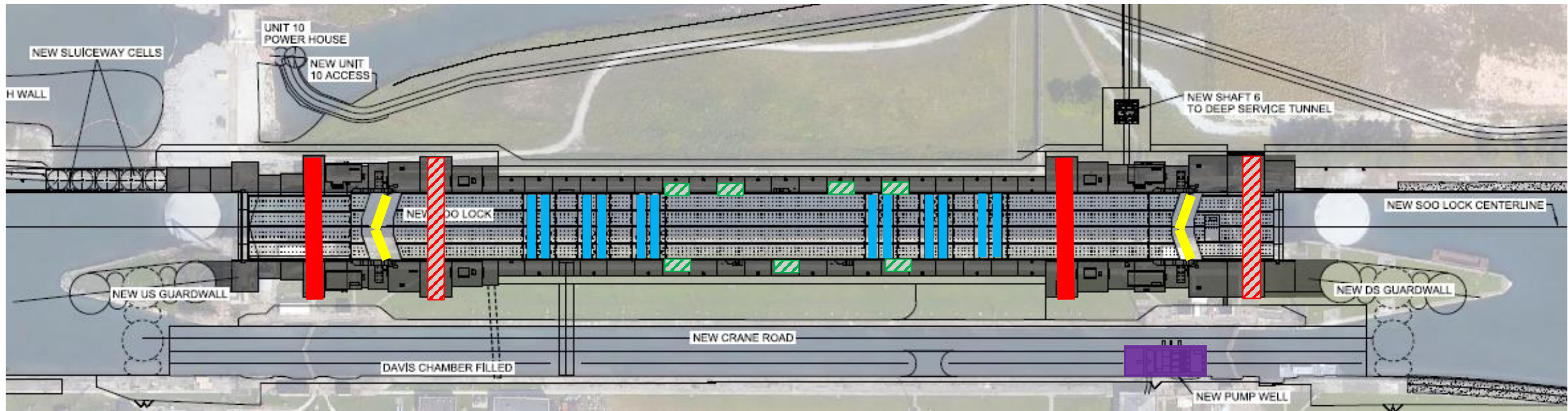
**Project Status:**

- 100% Design to be complete in August 2021
- Contract award expected in Winter 2022

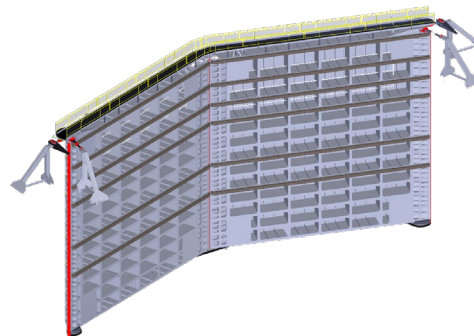
**Estimated Performance Period:** 5-8 Years



# NEW LOCK CHAMBER KEY FEATURES



- Miter Gates
- Filling and Emptying System
- Upstream Ship Arrestors
- Downstream Ship Arrestors
- Hands Free Mooring
- New Pump Well



Miter Gates



Ship Arrestor



Hands Free Mooring Unit



# FUTURE SOO LOCKS: ~2027-2030



Artistic Rendering of the New Lock of the Soo Locks in Sault Ste. Marie, Michigan.



# GREAT LAKES NAVIGATION SYSTEM

The GL system's savings over the next  
least costly mode of transportation

➔ **\$3.9 Billion/year**

- More competitive American steel
- Essential to sustaining U.S. auto industry
- Lower cost energy
- Lower cost concrete (construction)
- More competitive grain for export
- Less fuel consumption and greenhouse gas emissions
- Less congested highways/rails





# Questions?

