Infrastructure & Maintenance in Great Lakes Working Waterfronts:

Broken Funding Mechanisms & Community Impacts

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MICHIGAN STATE UNIVERSITY

NOAA

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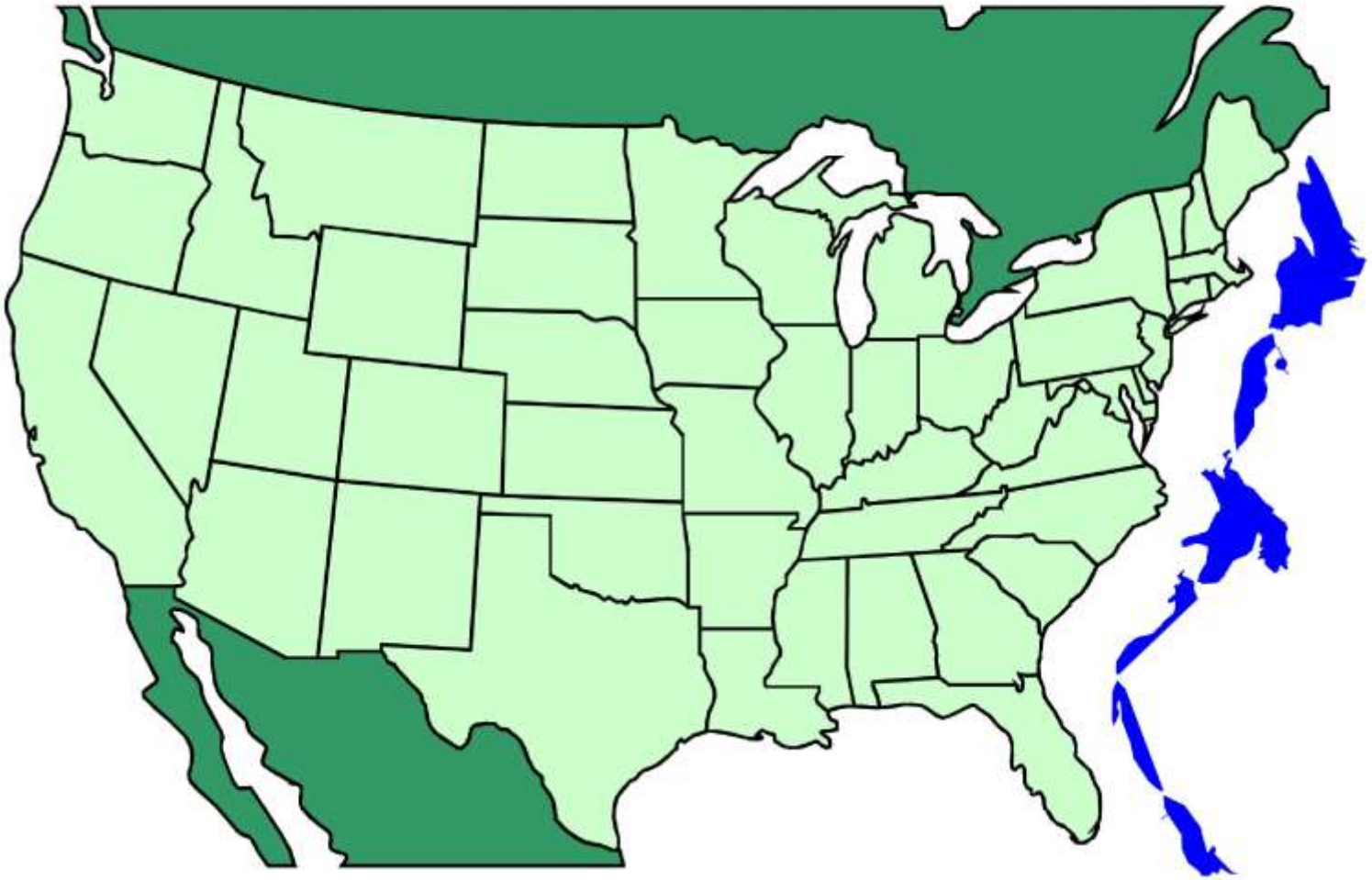
Presentation Overview

- Great Lakes – our context / introduction to topic
- Issues with keeping Great Lakes Working Waterfronts functioning & open from the water side
  - Broken federal funding $$ mechanisms are causing non-access to harbors, impacting coastal community ability to have a functioning working waterfront
    - *Working waterfronts* are affected by forces which communities cannot control or anticipate.
- Next Steps / Conclusion

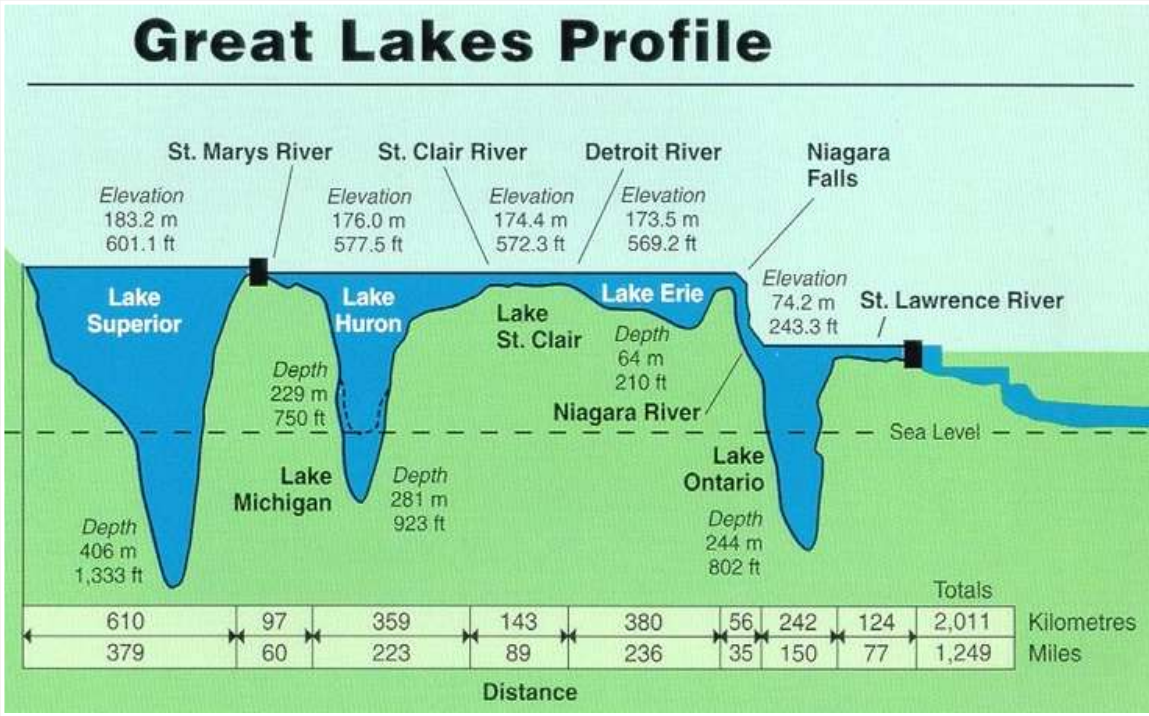

Provided by the SeaWiFS Project, NASA/Goddard Space Flight Center, and ORBIMAGE

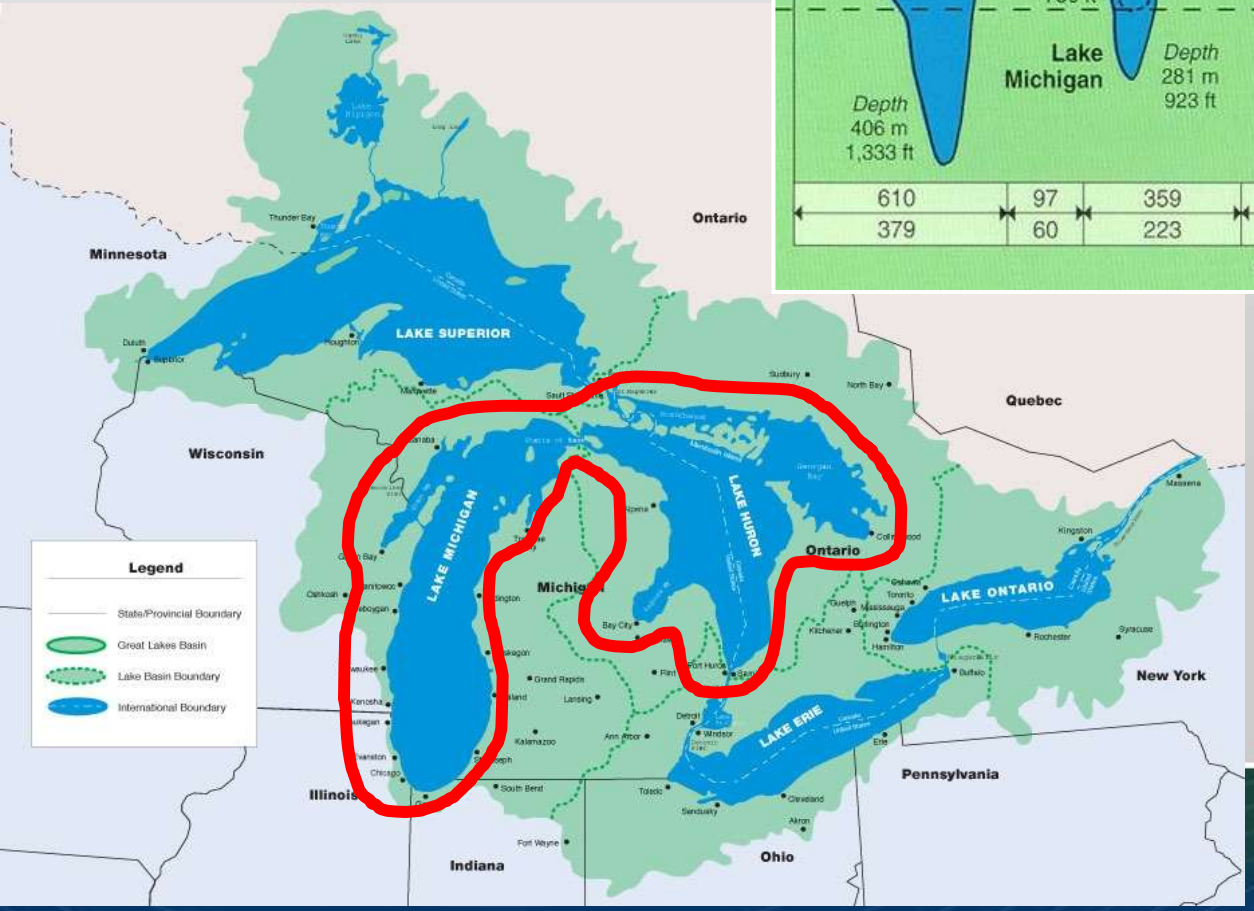

The Great Lakes compared to:
Chesapeake Bay
Albemarle-Pamlico Sound
Puget Sound
Everglades Restoration Area
Everglades Restoration Area, FL
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
Puget Sound, WA
Chesapeake Bay, MD, VA
LAKE ONTARIO
LAKE ERIE
Albemarle-Pamlico Sound, NC

Great Lakes Coastlines



Great Lakes Basin





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Name	Country	Surface area		Volume	
		(km^2)	(mi^2)	(km^3)	(mi^3)
Caspian Sea	Multiple	371,000	143,000	78,200	18,800
Michigan–Huron	U.S. and Canada	117,702	45,445	8,458	2,029
Superior	U.S. and Canada	82,414	31,820	12,100	2,900
Victoria	Multiple	69,485	26,828	2,750	660
Tanganyika	Multiple	32,893	12,700	18,900	4,500
Baikal	Russia	31,500	12,200	23,600	5,700
Great Bear Lake	Canada	31,080	12,000	2,236	536
Malawi	Multiple	30,044	11,600	8,400	2,000
Great Slave Lake	Canada	28,930	11,170	2,090	500
Erie	U.S. and Canada	25,719	9,930	489	117
Winnipeg	Canada	23,553	9,094	283	68
Ontario	U.S. and Canada	19,477	7,520	1,639	393

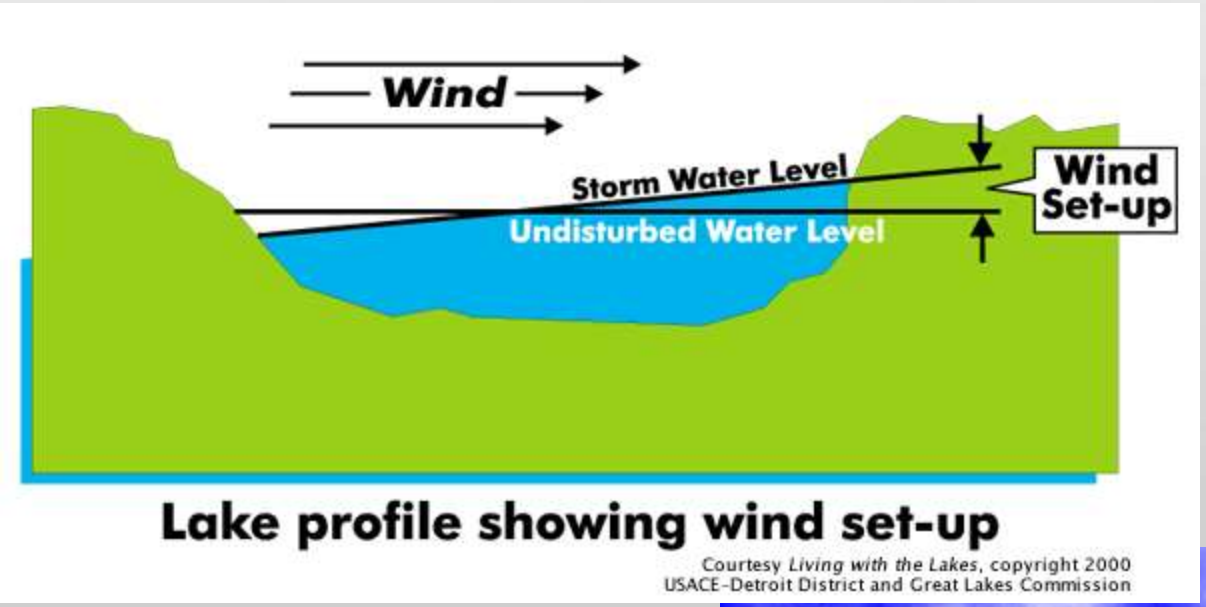
Table: Water volume and surface areas of the earth's twelve highest surface area continental water bodies.

GLERL Great Lakes Environmental Research Laboratory

NOAA

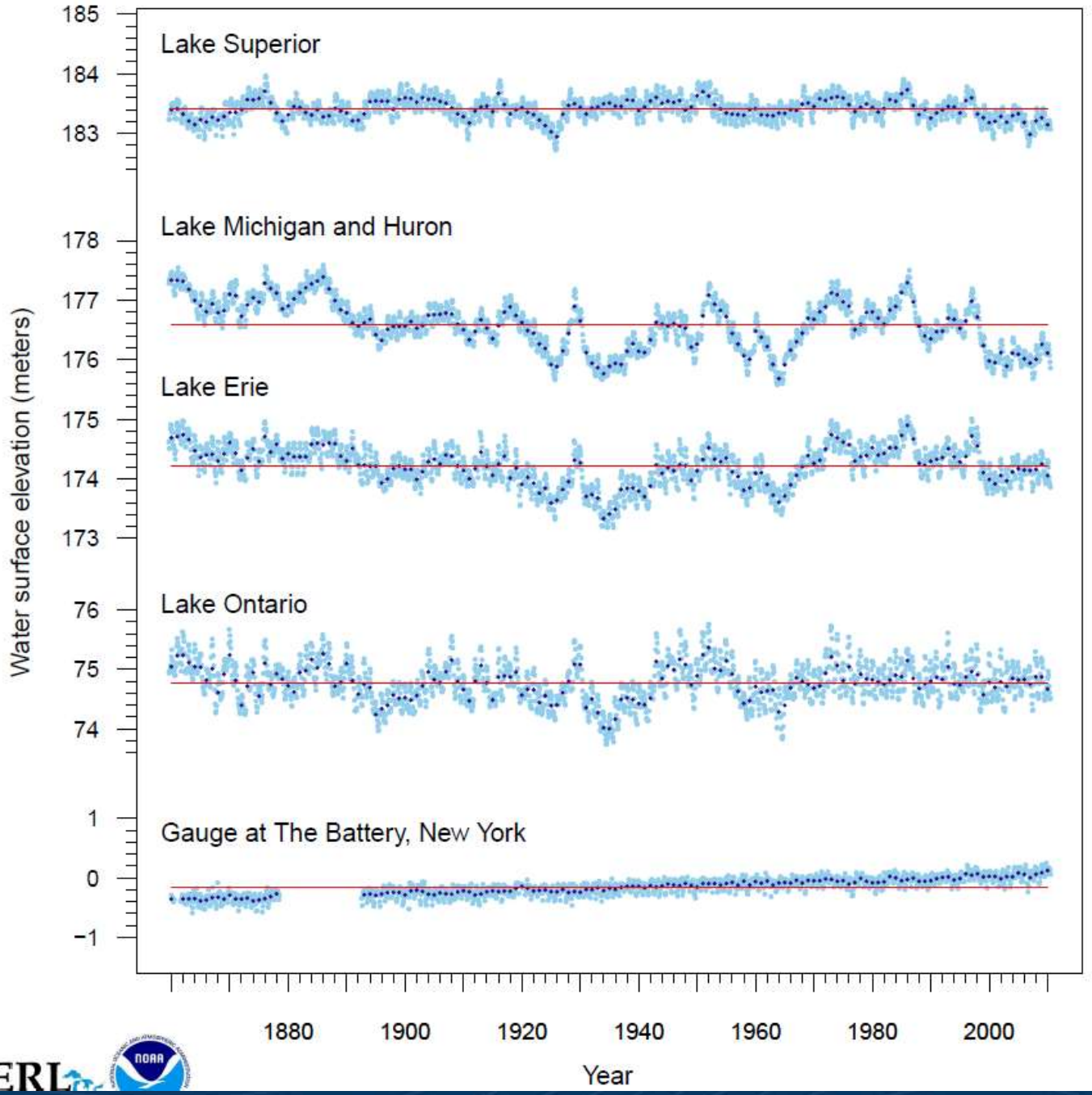
Courtesy of Drew Gronewold, GLERL

SHORT TERM FLUCUATIONS

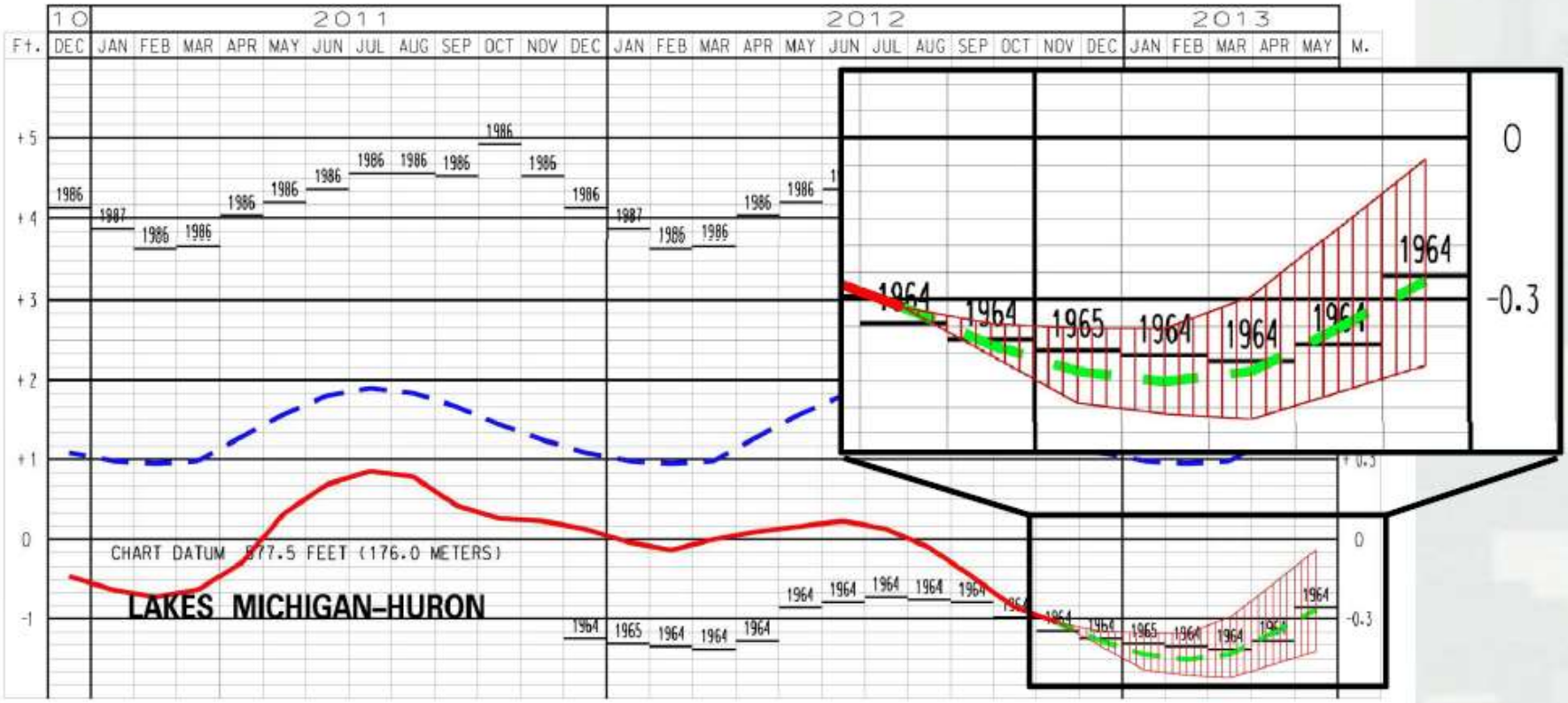


Lake profile showing wind set-up

STORM SURGE


Lake Superior
Lake Michigan and Huron
Lake Erie
Lake Ontario
Gauge at The Battery, New York
Water surface elevation (meters)
185
184
183
178
177
176
175
174
173
76
75
74
1
0
−1
1880
1900
1920
1940
1960
1980
2000
Year

LAKES MICHIGAN–HURON WATER LEVELS – DECEMBER 2012



LEGEND

LAKE LEVELS

RECORDED

PROJECTED

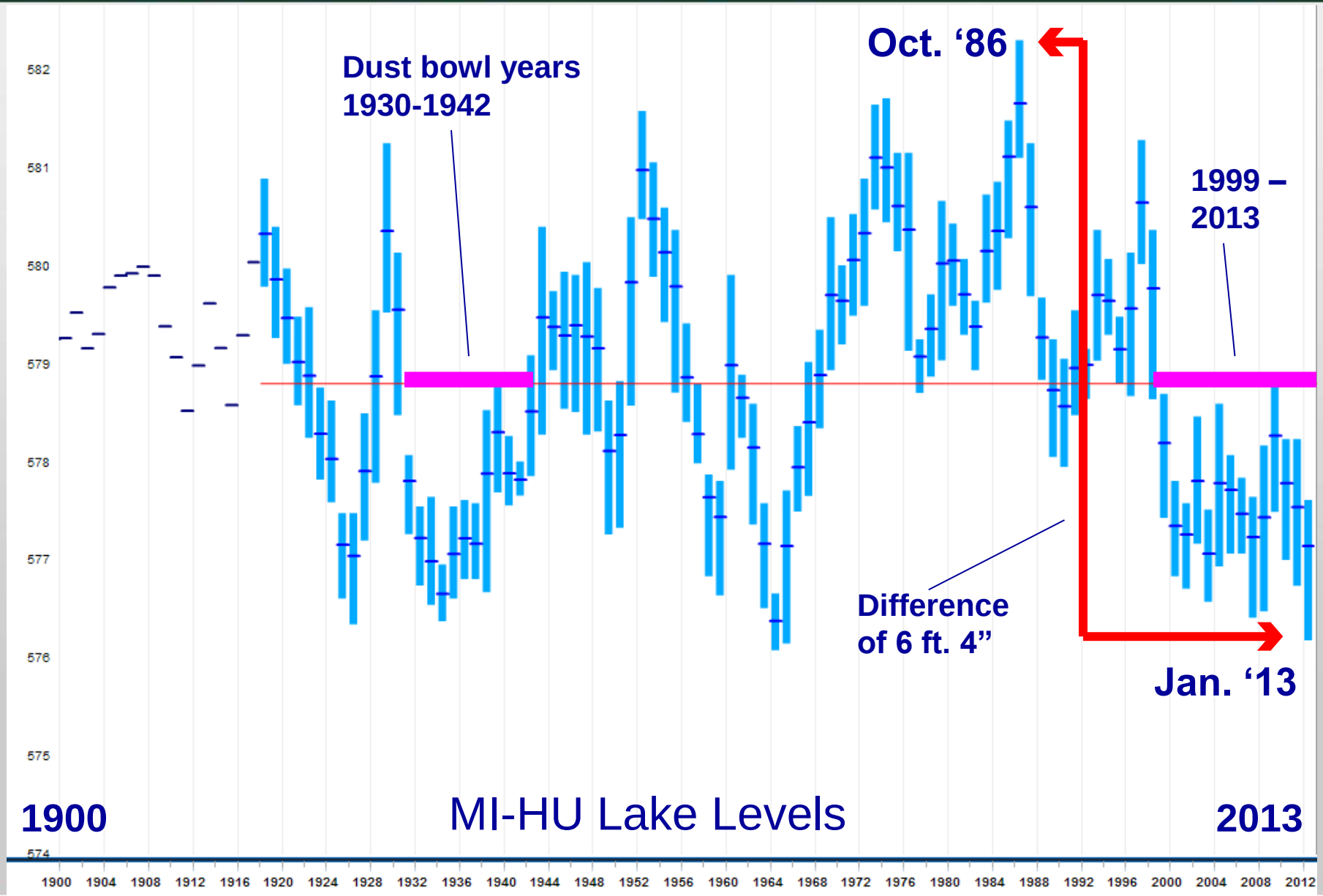
AVERAGE **

MAXIMUM **

MINIMUM **

MAXIMUM **	1985	1985	1973	1973
MINIMUM **	1936	1934	1926	1934

** Average, Maximum and Minimum for period 1918-2011



MI-HU Lake Levels

Issues with keeping working waterfronts open from the water side

- Pre-World War I coastal protection infrastructure (deteriorating)
- Broken funding mechanisms
- Longshore currents drive "rivers of sand"
- All Time Record Low Great Lakes Levels (MI-HU) in Jan. 2013
- Emergency Funding from State of Michigan spring, 2013

Leland, MI

Photo Source: http://greatlakes.usace.army.mil/

April 5, 2012

Great Lakes Commission
des Grands Lacs

NEWS RELEASE

For Immediate Release
March 6, 2013

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Low water levels and deteriorating Great Lakes infrastructure top priorities of Great Lakes Commission

Washington, D.C. – 100-year-old water resources infrastructure, built before World War I, is trying to serve 20th century needs in the Great Lakes region. Delegates to the Great Lakes Commission's Semiannual Meeting, which concluded today in Washington, D.C, will now be descending on Capitol Hill to impress upon lawmakers the importance of investments in infrastructure, ecosystem protection and restoration.

The January 2013 monthly mean for lakes Michigan and Huron was the lowest that has ever been recorded, dating back to the early 1900s. Michigan-Huron levels rose slightly in February 2013 but, according to Keith Kompoltowicz, hydrology chief for the U.S. Army Corps of Engineers-Detroit District, long-range forecasts illustrate that the lakes will remain near or below their long-term averages over the next six months.

Coastal Structures

Great Lakes Navigation

- 104+ miles of navigational structures on the Great Lakes
- Most built between 1860 and 1940
- Timber crib construction (typical)
- Low Lake water levels since the 1990's have accelerated deterioration

Structure Function/Consequences

Contain and reduce shoaling in navigation channel

Protect navigation channel and shoreline infrastructure

Control wave climate within navigation channel and harbor

Navigation structures are regularly subjected to extreme winds, waves and ice forces

St. Joseph Harbor, MI

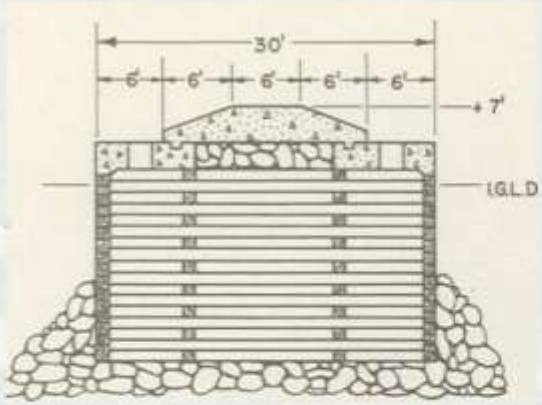
Cleveland Harbor, OH

Typical Coastal Structures

Steel Sheet Pile Structures

Rubble Mound/Laid-Up Stone Structures

Other Components: safety (railings, walking surface, etc.)



Typical Wood Crib/ Concrete Cap Structures Cross-section

Some Great Lakes Navigation Structure Conditions are Failing

Port Washington Harbor, WI

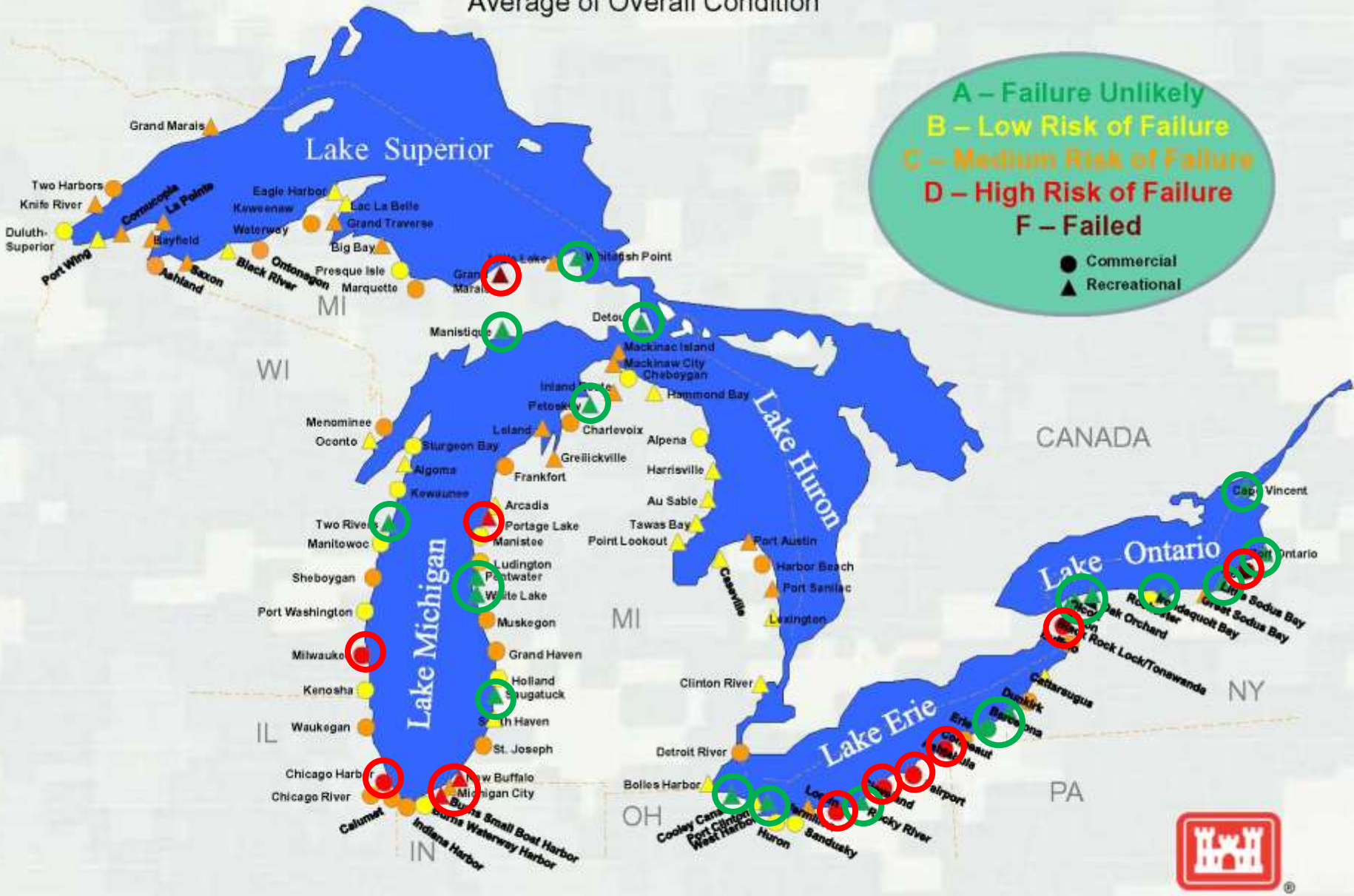
Michigan City, IN
East Pier Failure

High Level Display of Potential Impact Areas

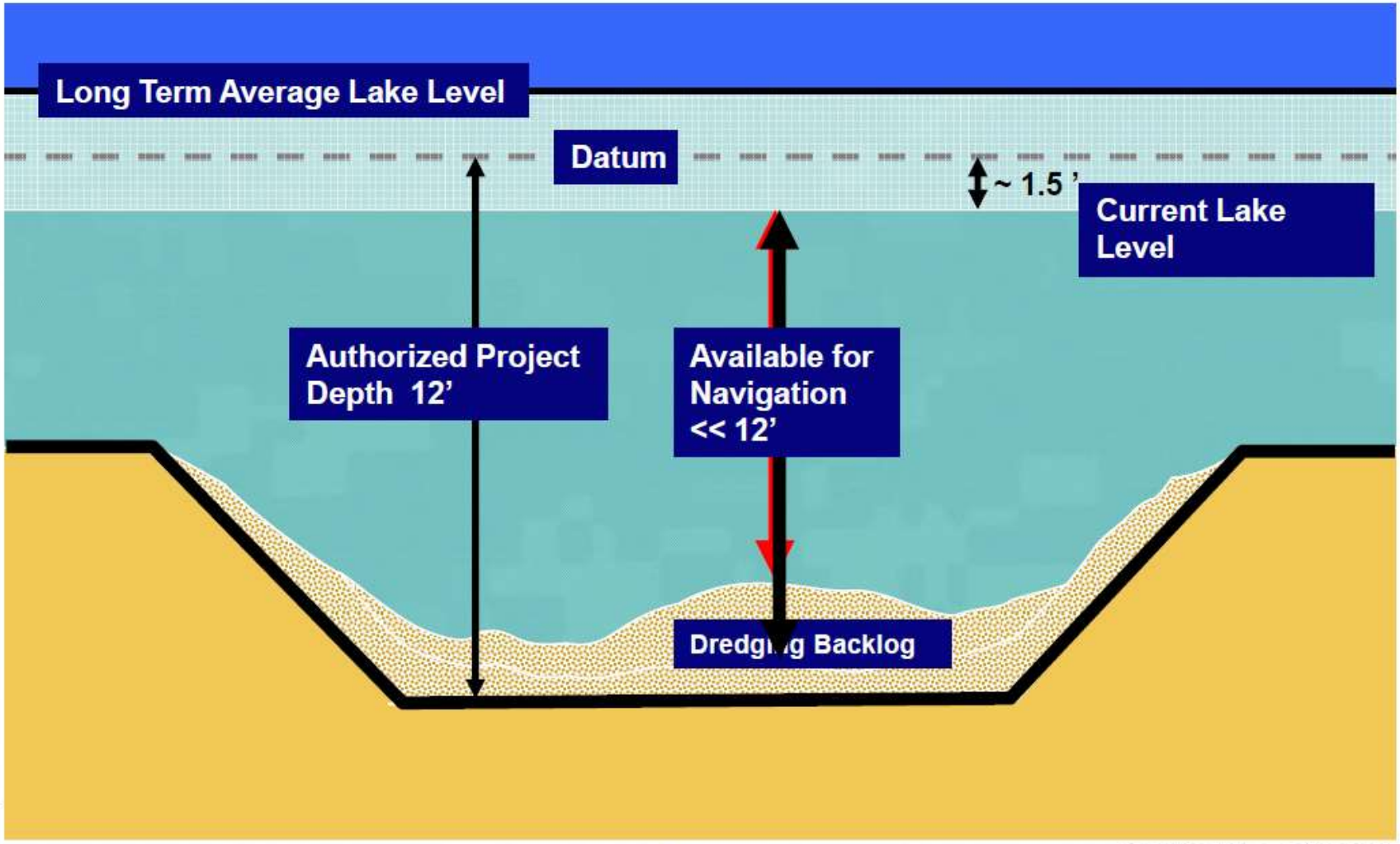
- Three potential impact areas were defined at 500 ft intervals
- Shows potential value of land and infrastructure within each “potential impact area” based on tax assessment data

Harbor Structure Condition Assessments

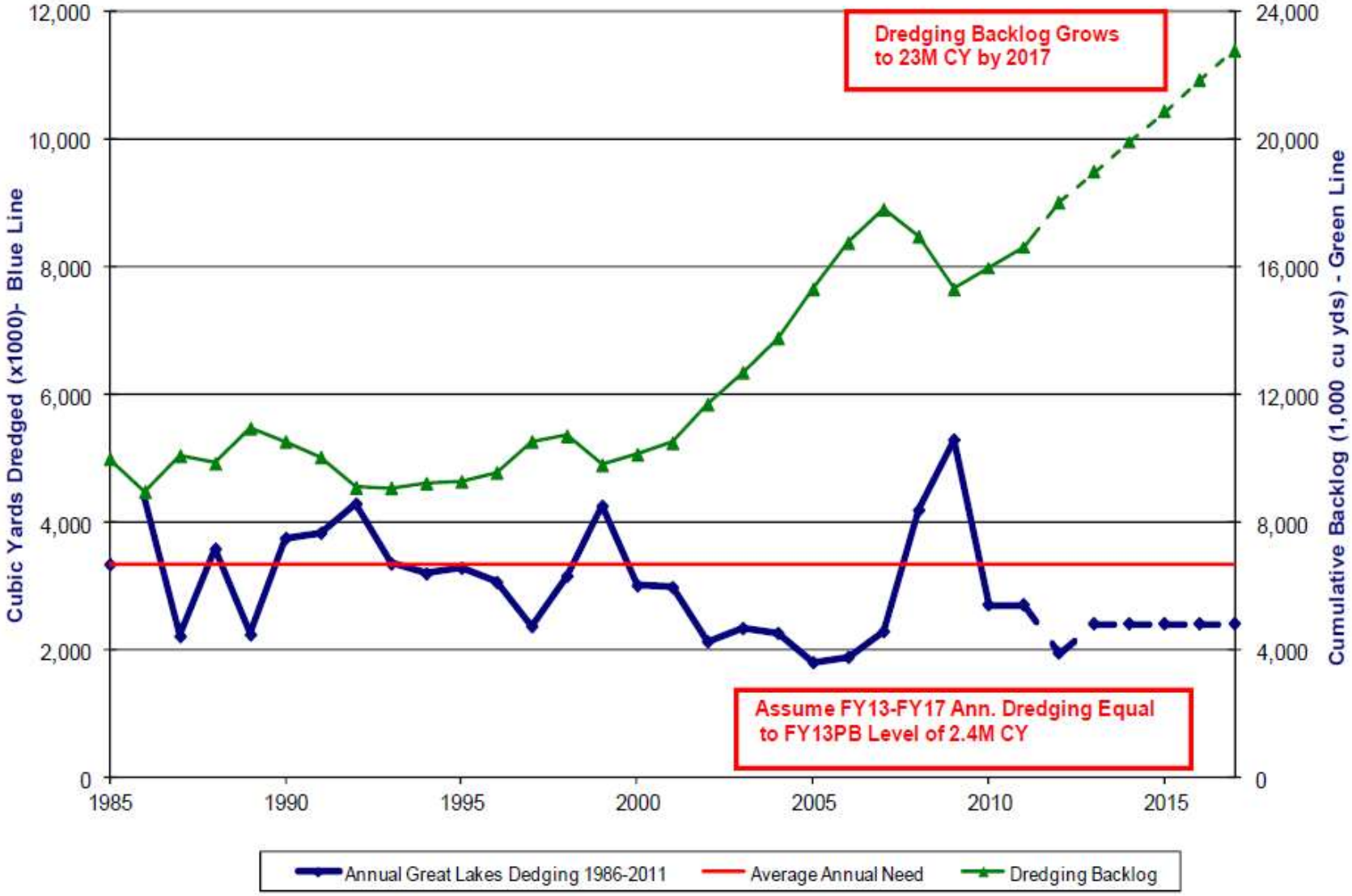
Average of Overall Condition



Condition: Water Level Below Datum w/Dredging Backlog



Backlog Growth Under Constrained Dredging Funding 2012-2017



For Immediate Release
January 25, 2013

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GOVERNORS APPLAUD INTRODUCTION OF LEGISLATION TO FIX HARBORS

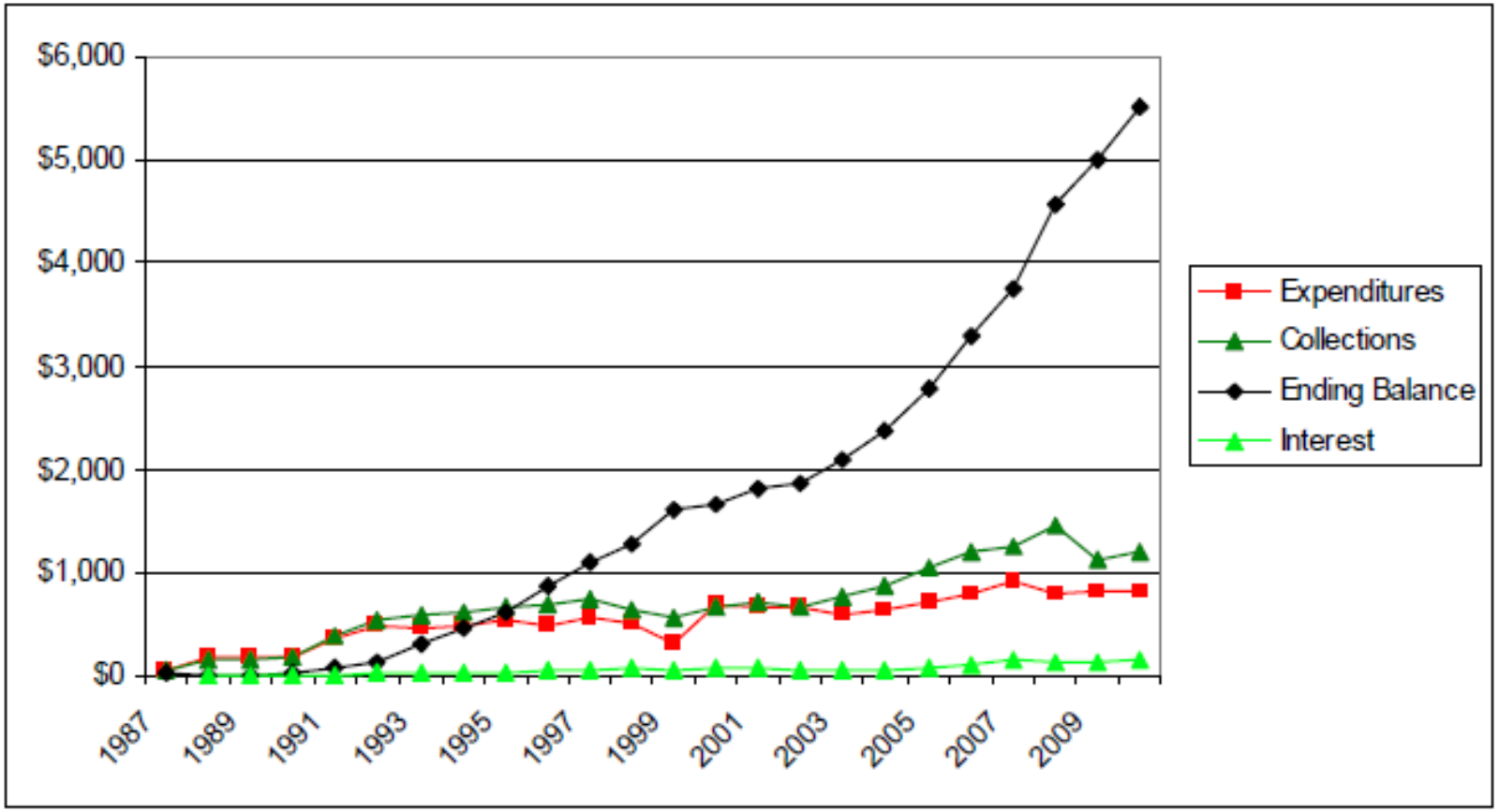
Chicago, IL – The Great Lakes Governors today applauded recently introduced legislation in Congress that would permanently fix the nation's dysfunctional funding program to maintain ports and harbors. Specifically, the Governors pledged their support for the Realize America's Maritime Promise (RAMP) Act, H.R. 335, and commended the sponsors for their leadership in introducing this bill. Once enacted, this legislation will immediately help to put Americans to work on improving ports and harbors, while representing a long-term investment to enhance both the nation's and the region's global economic competitiveness.

Governor Rick Snyder of Michigan, Co-Chair of the Council of Great Lakes Governors, said, "I applaud the Congressmen for working to enact what is really a simple solution to a major problem—actually spending funds already collected for the purpose of harbor maintenance on harbor maintenance. This solution is critical for our region's ports and harbors, and for the national economy."

Harbor Maintenance Trust Fund (HMTF)

Figure 1. HMTF Balance

($ in millions)



Source: USACE annual reports to Congress on the HMTF, Federal Budget Appendix, FY2008-FY2011.

Note: Figures not adjusted for inflation.

Congressional Research Service, 2011

State of Michigan Emergency Dredging $$ 2013

- $9.5M from state Waterways Commission (all other projects on hold) and special $11.5M appropriation general fund = **$21M total**
- Local community match requirements suspended (from 50% to 0%)
- Goal: Protect Harbors of Refuge, Preserve Access to Recreational Harbors & Boating Access Sites
- Proposed temporary state-level emergency permitting changes
- Also proposed FY2014-15 state budget of $9.4M from transportation investment package (ongoing)

October, 2012 ~ Hurricane Sandy, Port Sanilac, MI

Courtesy Justin Selden

National Working Waterfronts & Waterways Symposium
March 25-28, 2013

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