Coastal Communities

Opportunities, Complexities & Challenges

Grand Vision Growth & Investment
December 10, 2012

Mark Breederland
Michigan Sea Grant Extension

Liz Durfee
NOAA Coastal Management Fellow

Agenda

- Coastal Communities + waterfront challenges
  - Federally Authorized Harbors + Consequences of not Maintaining Harbors
  - Climate and Coastal Impacts + Secondary Effects
  - Lake Levels, Coastal Impacts + Management Implications
  - Lake Levels + Coastal Impacts

- Working Waterfronts, Challenges, Tools, National initiative + BMPs from Michigan
  - Smart Growth

- Summary

Coastal Communities + Waterfronts

- Create a sense of place
- Provide jobs
- Key to tourism
- Contribute to local and regional economy
- Have cultural + historic value
- Provide public access to public trust waters

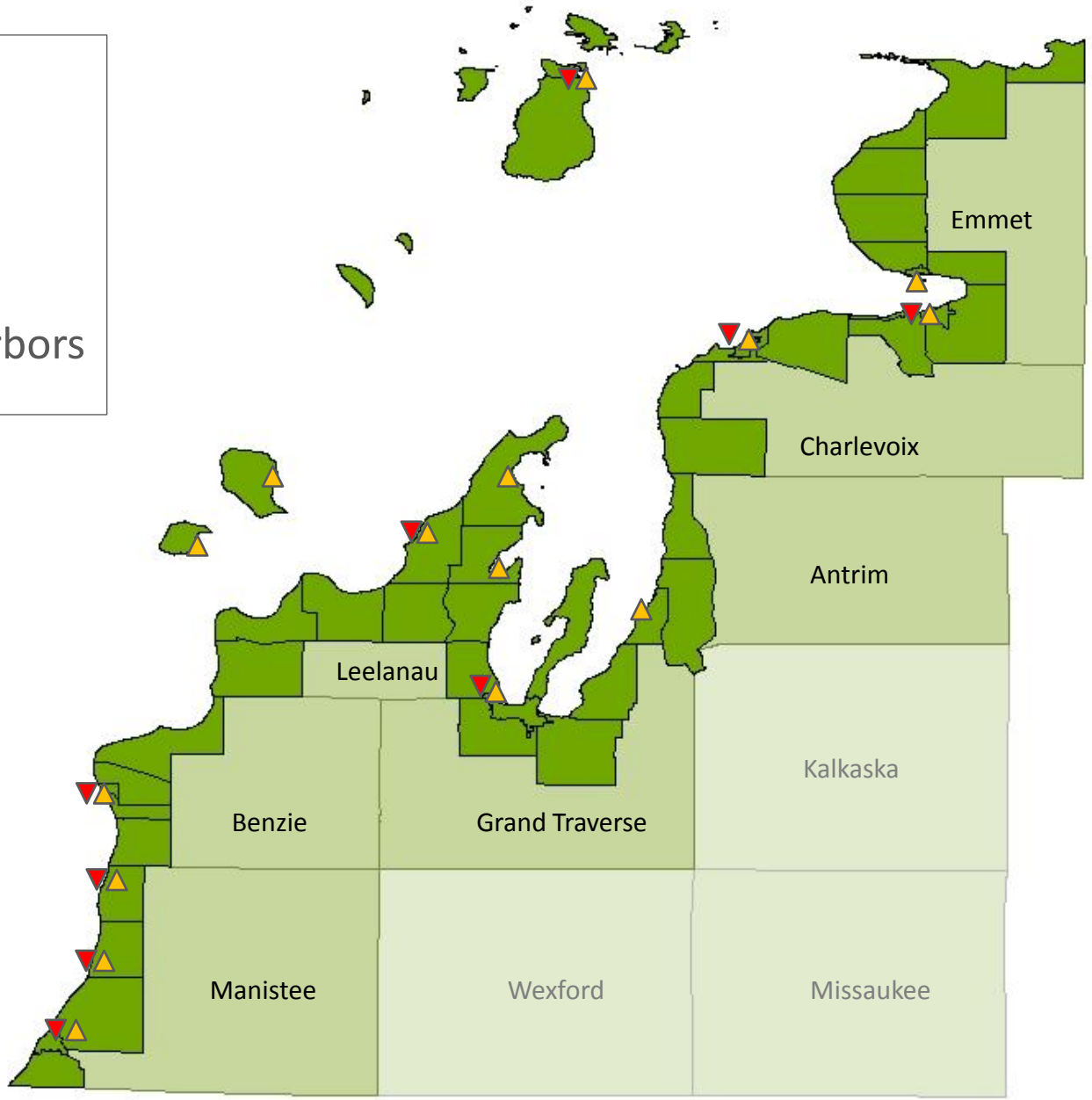
Challenges to a Sustainable Waterfront

- Maintaining harbors and infrastructure
- Future climate impacts
- Low lake levels
- Balancing competing land uses, taxable and non-taxable land
- Maintaining the viability of water dependent uses
- Adapting to changes in population
- Brownfields / contamination from former waterfront uses
- Lack of waterfront planning
- Lack of connection between downtown + the waterfront
- Loss of a major business or industry
- Decline in shipping, cruise ships, fisheries



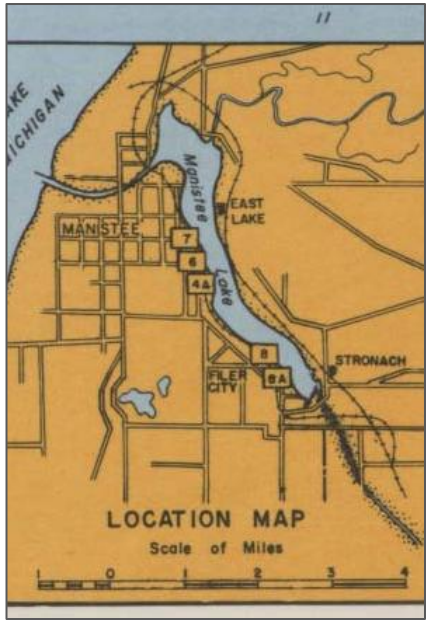
Northwest MI Coastal Communities

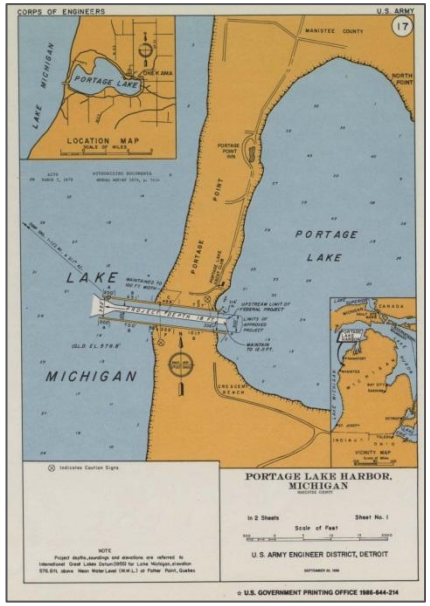
- 10 counties
- 7 coastal counties
- 51 coastal communities
- 15 Ports
- 9 federally authorized harbors



Federally Authorized Harbor Maintenance

- Rivers and Harbors Act – late 1800s / 1913 etc.
- Maintained by U.S. Army Corps of Engineers
- Consist of channels for navigation and structures like breakwaters and piers (built 1860-1940 often on timber cribs – deteriorating with low levels)
- Require dredging on varying cycles
- Federal funding for maintenance prioritized based on the benefits of the harbor related to commercial navigation, recreational harbors are low priority
- Recreation has become the major industry at many Great Lakes harbors, less than half over federally authorized harbors on the Great Lakes support commercial navigation
- Harbor Maintenance Trust Fund, tax revenue from shipping, not fed back into harbor maintenance
- Aging infrastructure: 80% of Great Lakes harbors are older than the typical 50-year design life





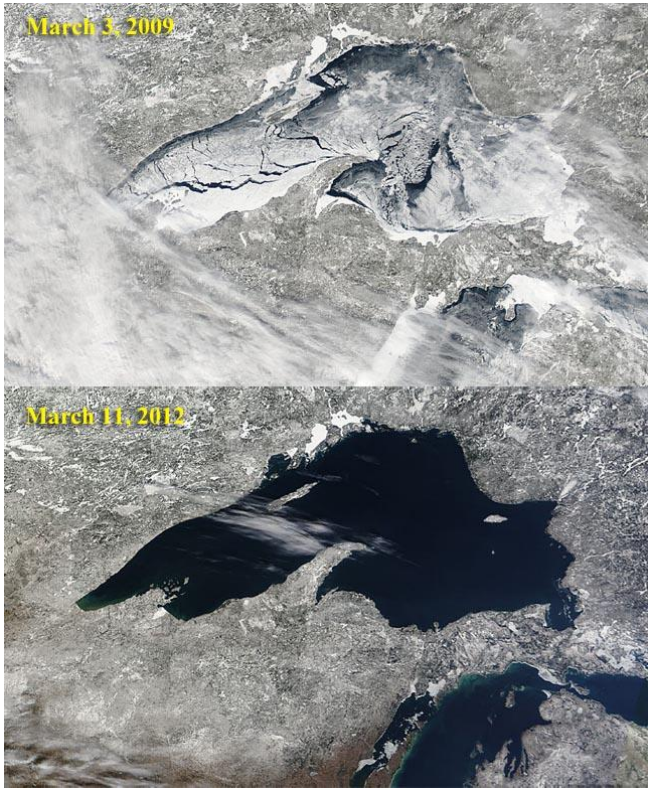
Consequences of Not Maintaining NW MI Harbors

Charlevoix · Manistee · Frankfort · Leland · Petoskey · Grellickville · Portage Lake · St. James · Arcadia

- Loss of local and regional jobs
- Safety issues associated with loss of harbor of refuge
- Potential loss of consideration of port as a potential site for future industrial facilities
- Light loading and increased costs of shipping
- Loss of recreational slips
- Loss of recreational and charter fishing
- Loss of ability to use port for shipping bulk commodities

Climate + Coastal Impacts

- Water level + temperature
- Ice cover
- Precipitation
- Increase in storm frequency and intensity
- Erosion and threats to beach nourishment



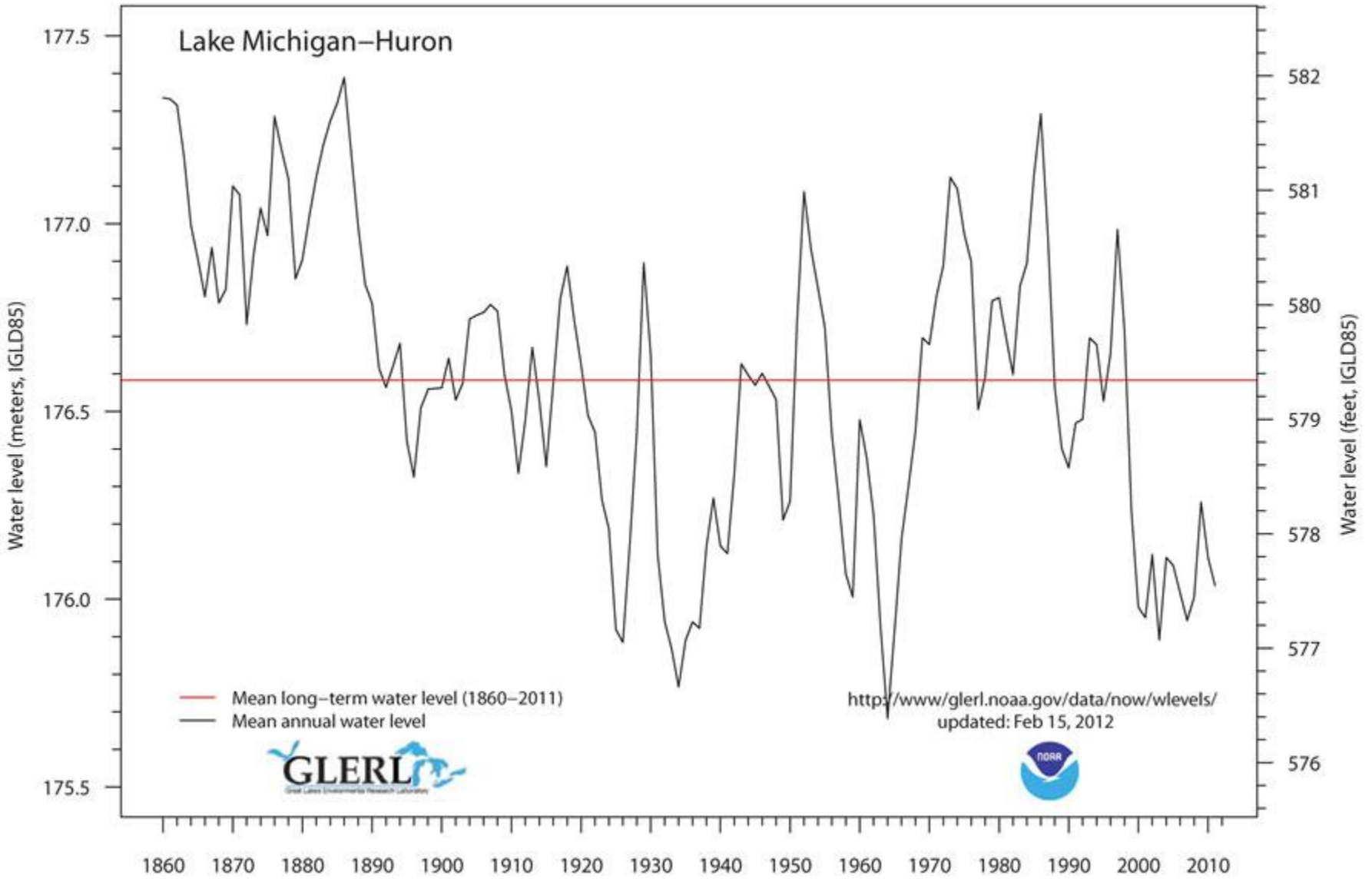
Lake Superior Ice Cover

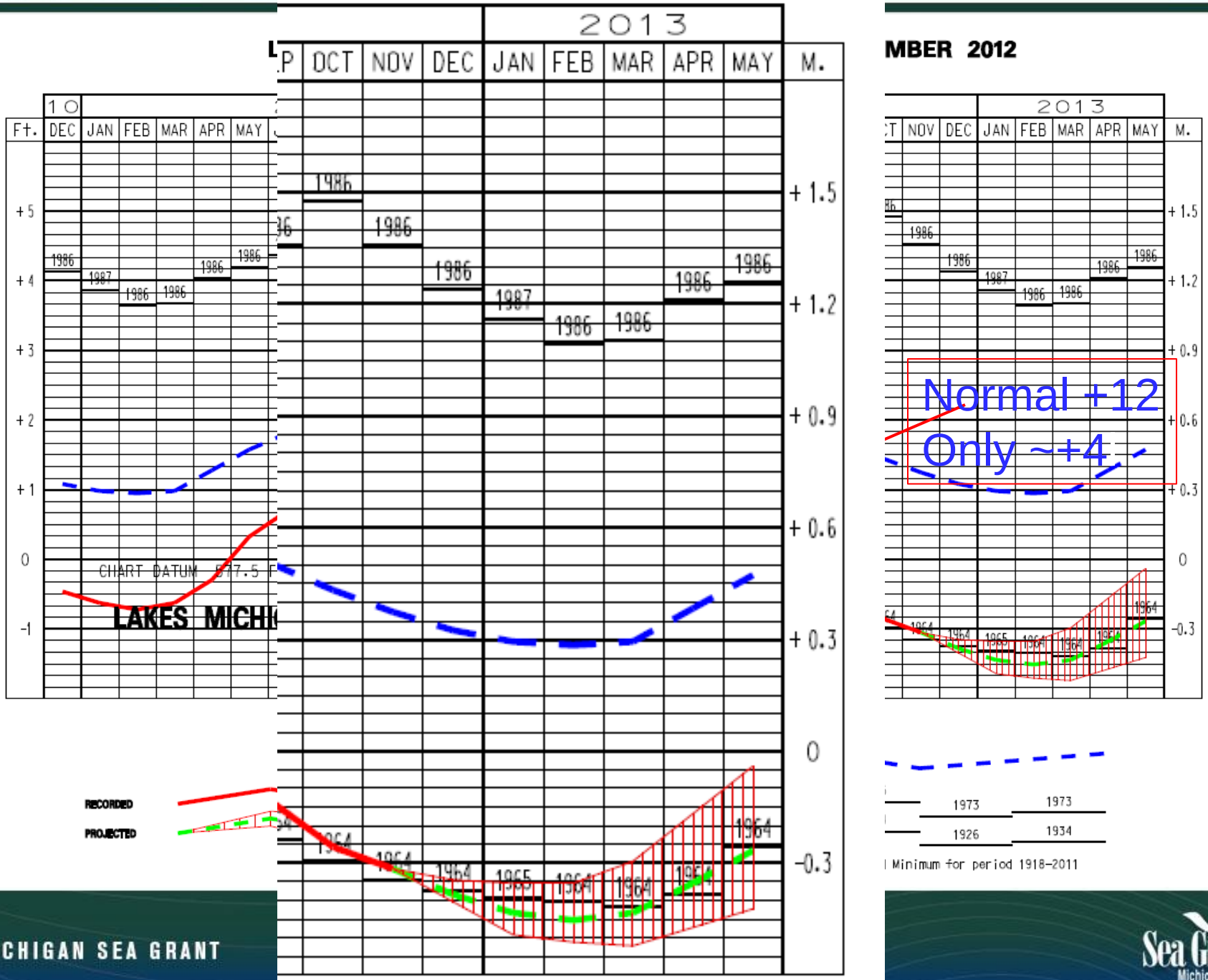
Port Huron,
Hurricane Sandy


12 04 2012


12 04 2012


12 04 2012

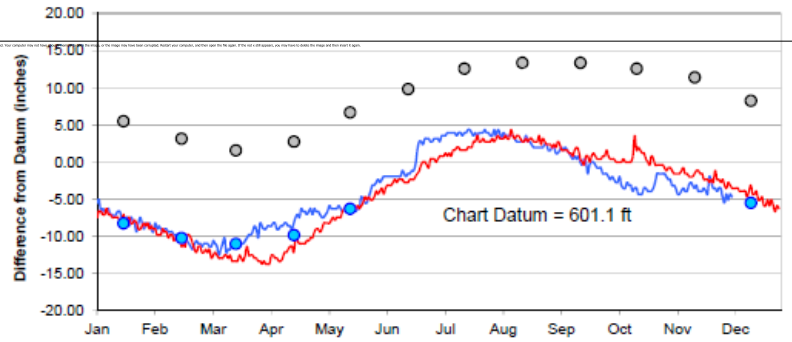

Lake Michigan–Huron
177.5
177.0
176.5
176.0
175.5
Water level (meters, IGLD85)
582
581
580
579
578
577
576
Water level (feet, IGLD85)
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Mean long–term water level (1860–2011)
Mean annual water level
GLERL
https://www/glerl.noaa.gov/data/now/wlevels/
updated: Feb 15, 2012
NOAA


2013
DEC
JAN
FEB
MAR
APR
MAY
M.
+ 1.5
+ 1.2
+ 0.9
+ 0.6
+ 0.3
0
-0.3
1986
1987
1964
Normal +12
Only ~+4
RECORDED
PROJECTED
1973
1926
1934
Minimum for period 1918-2011

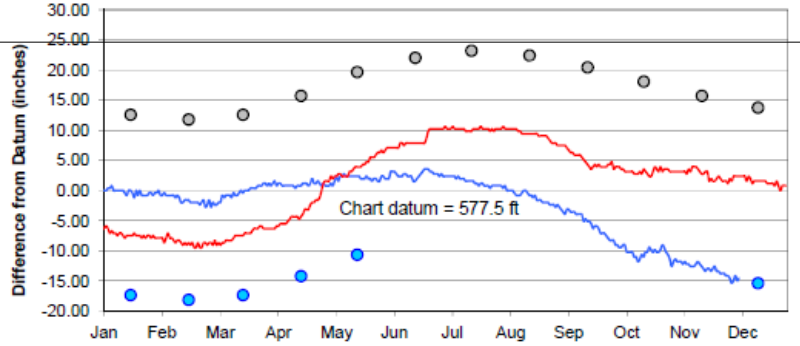
% of Average Precipitation

- Superior
  - Aug. 2012 = 56%
  - Sept. 2012 = 46%
  - Oct. 2012 = 128%
  - Nov. 2012 = 67%
- Michigan-Huron
  - Aug. 2012 = 93%
  - Sept. 2012 = 74%
  - Oct. 2012 = 148%
  - Nov. 2012 = 32%

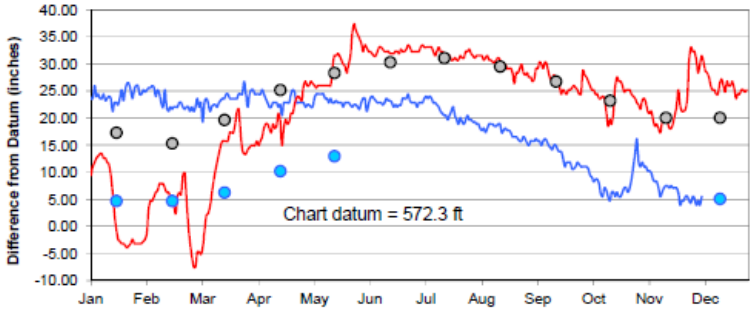
Lake Superior



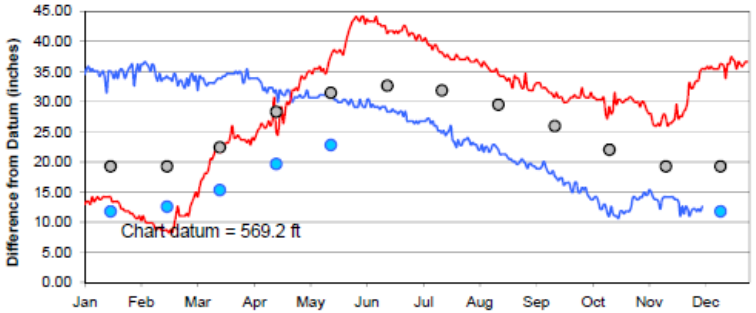
Lake Michigan-Huron



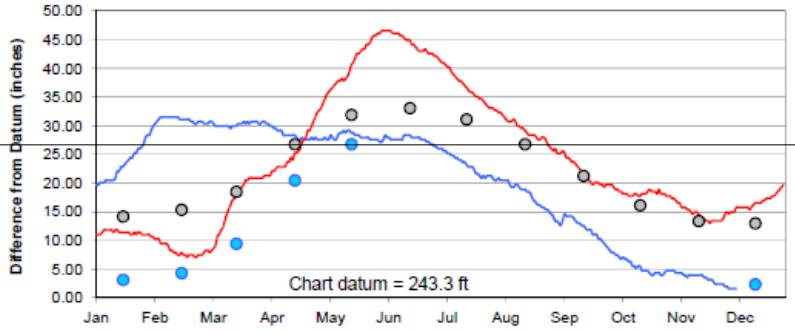
Lake St. Clair

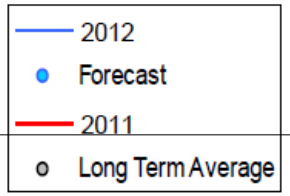


Lake Erie



Lake Ontario





U.S. Army Corps of Engineers
Detroit District
http://www.lre.usace.army.mil

12-6-12

Secondary Effects of Climate Change

- Drainage of entire system/watershed, increased load and potential blockage in culverts and pipes

- Frequent storm events could impact port operations, commodity handling, energy and maintenance costs, vessel maneuverability, loading, ice-in and ice-out times, and create navigation and safety issues

- Potential increase in microbial induced corrosion, algal blooms, habitat change, species migration, distribution of aquatic invasive species associated with warmer water

- Increased deterioration of exposed wood infrastructure in harbors

Lake Levels + Coastal Impacts

Potential impacts of low lake levels include:

- Reduced access to marinas, harbors and shipping channels
- Stranded docks and boat ramps
- Exposure of boats to navigation hazards like shoals
- Changes to pumping efficiency of water intake pipes
- Increased coastal vegetation, including invasive species, along exposed bottomlands
- Reduced cargo capacity
- Reduced vessel speed and maneuverability

Potential impacts of high lake levels include:

- Potential impacts of high lake levels:
- Shoreline erosion
- Flooded docks, boat ramps, marinas, houses and other coastal infrastructure
- Flooding on shorelines and along rivers that empty into the Great Lakes

Lake Levels + Management Implications

- Future water levels will vary, shoreline infrastructure and communities need to be resilient to both high and low water levels
- Commercial and maritime harbor structures typically use more robust design standards than private water dependent businesses and community access structures, non-commercial structures will be impacted by smaller ranges of climatic change
- High water mark, regulations for building docks, etc

Examples of management strategies:

- Floating docks
- Softshore engineering
- Shoreline setbacks that incorporate potential lake-level rise
- Drought contingency plans
- Strategies for navigation + dredging under low water conditions

National Working Waterfront Network

- A nationwide network- comprised of multiple sectors, orgs, agencies and Sea Grant programs- with a mission to increase the capacity of coastal communities and stakeholders to make informed decisions, balance diverse uses, ensure access, and plan for the future of their working waterfronts and waterways.
- A website will serve as a one stop shop for WWF issues + info (and will feature a case study on Fishtown in Leland, MI)
- Website will go live March 2013 at the National Working Waterfront + Waterways Symposium

http://depts.washington.edu/uwconf/workingwaterfronts/index.html

Protecting Working Waterfronts

Tools + Resources to Protect Water Dependent Uses + Public Access

Inventory

Coastal Site Access
Community Assets
Build Out Analysis
Economic Assessment
Needs Assessment

Policy + Regulation

Visual Access
Design Standards
Historic Preservation
CZMP
Public Trust Doctrine

Planning

Harbor Mgmt Plan
Waterfront Smart Growth
Waterfront Master Plan

Zoning

Form-Based Code
Overlay Zoning
Shoreland Zoning
Water Dependent Use Zoning

Stakeholder Engagement

Coalition
Conflict Resolution
Visioning Exercise
Branding
Stakeholder Analysis

Authority

Port Authority
Harbor Authority

Tax

Incentives
Current Use Taxation
Exemption/Abatement

Land Acquisition + Rights

Easement
Land Bank
Transfer/Purchase of Development Rights

Examples from Michigan

- Collaboration in the Tri-Community area of Saugatuck, Douglas, and Saugatuck Township, preparation of harbor studies and harbor master plans, establishment of a harbor authority that enables a TIF district to generate revenue to maintain the harbor

- Permitting water dependent uses in most zoning districts, enhancing the connection between downtown and the waterfront and ensuring the waterfront viewshed is maintained in Charlevoix

- Regional port collaborate in Northeast Michigan to plan for the future of 3 ports, identify opportunities to attract new businesses

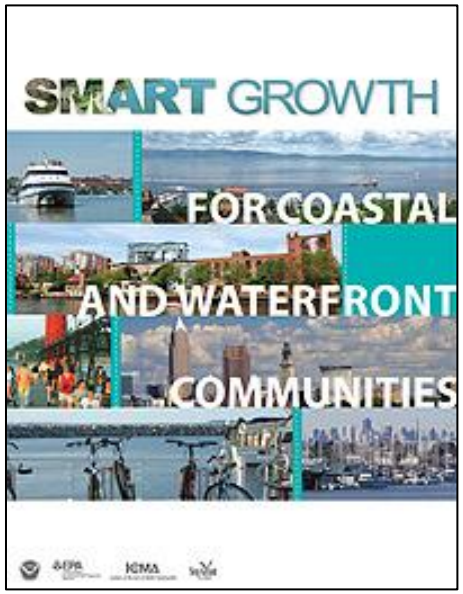
- Establishing specific working waterfront zoning districts, Smart Growth planning, transitioning from an industrial to a well connected, walkable downtown recreational waterfront in Marquette

- Private acquisition and donation of prime, formerly industrial waterfront land and creation of public open space dedicated to waterfront uses in Port Huron

- Establishment of a nonprofit to acquire historic, culturally and economically significant Fishtown, historic structures inventory and master plan, and creation of new zoning

Tool: Smart Growth + Waterfront Smart Growth Workshop

1. Mix land uses, including water-dependent uses
2. Take advantage of compact community design that enhances, preserves, and provides access to waterfront resources
3. Provide a range of housing opportunities and choices to meet the needs of both seasonal and permanent residents
4. Create walkable communities with physical and visual access to and along the waterfront for public use
5. Foster distinctive, attractive communities with a strong sense of place that capitalizes on the waterfront's heritage
6. Preserve open space, farmland, natural beauty, and the critical environmental areas that characterize and support coastal and waterfront communities
7. Strengthen and direct development toward existing communities and encourage waterfront revitalization
8. Provide a variety of land- and water-based transportation options
9. Make development decisions predictable, fair, and cost effective through consistent policies and coordinated permitting processes
10. Encourage community and stakeholder collaboration in development decisions, ensuring that public interests in and rights of access to the waterfront and coastal waters are upheld



SMART GROWTH
READINESS ASSESSMENT

Summary

Challenges

- Maintaining coastal infrastructure and draft
- Balancing waterfront land use
- Adapting to uncertain changing climate and water levels

Planning Needs

- Plan for high highs and low lows
- Flexible systems
- Identify alternative sources for funding harbor maintenance
- Evaluate existing planning for + measures to protect working waterfronts

Examples of Resources

- Smart Growth Workshop
- National Working Waterfront Network website
- Climate IA data
- NOAA data: Digital Coastal Economic data (ENOW), water level and climate forecasting data

Questions?