

Changing Lake Levels:

Opportunities & Threats,
Coping, Mitigating & Planning

for

Cultural Resources & Tourism

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Changing Lake Levels:

Opportunities & Threats, Coping, Mitigating & Planning



Changing Lake Levels

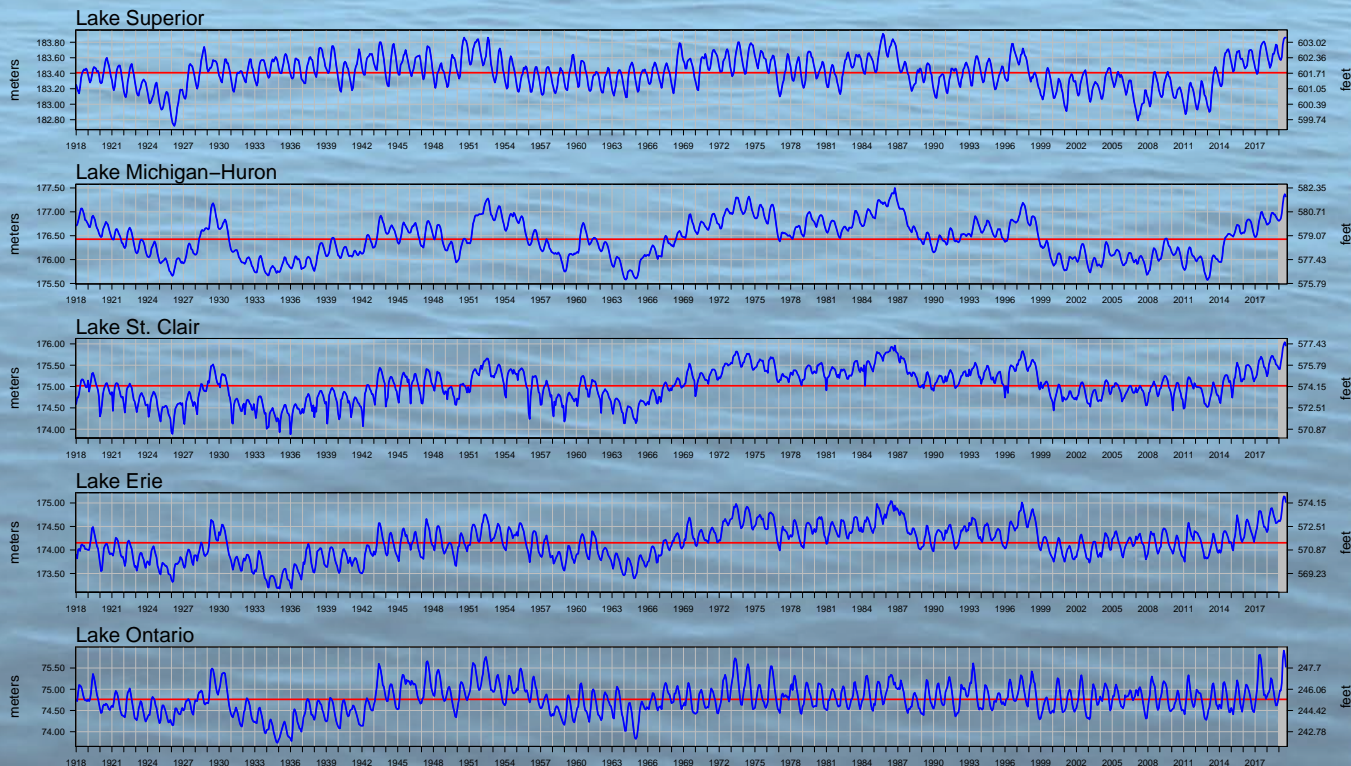


Changing Lake Levels



Great Lakes Water Levels (1918–2019)

— Monthly Mean Level — Long Term Average Annual



The monthly average levels are based on a network of water level gages located around the lakes. Elevations are referenced to the International Great Lakes Datum (1985).

Water levels have been coordinated through 2018. Values highlighted in gray are provisional.

Cultural Resources, Cottages, Tourism



- ✳ Lakefront property owners
- ✳ Lighthouse managers
- ✳ Underwater cultural resources
- ✳ Tourism communities/sites
- ✳ Charter/recreational fishing

**Threats & Opportunities
Short- & Long-term Responses**

✱ Lakefront Property Owners



Ann Chastain photos



THREATS

- Property erosion/loss
- Destruction of docks & other structures
- Water incursions into septic tanks and leach fields

HERE: Loss of 10-15' in past year
AROUND POINT: Loss of up to 30'

✳ Lakefront Property Owners

CONTRIBUTORS

- High water levels
- Storms & waves
- Seiches
- Barometric pressure changes



Ann Chastain photos



✳ Lakefront Property Owners

RESPONSES *(short term)*

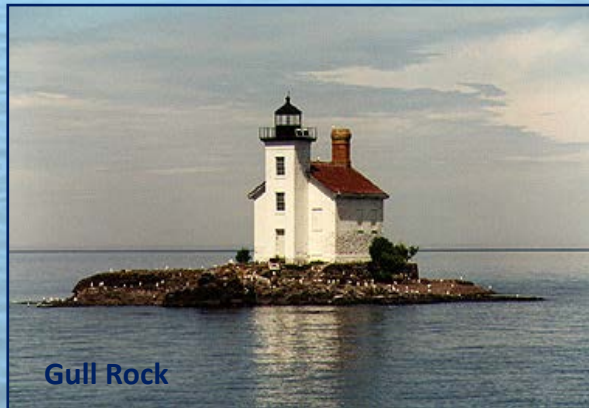
- Move structures back
(policy: no permanent structures)
- Re-think septic field location
- Install rip-rap
- Remove docks



Ann Chastain photos



✱ Lighthouse Managers



⚓ Lighthouse Managers

St. Clair Flats Canal Range Light Station



THREATS

Similar to those of coastal landowners

I have been inundated with high water on **Harsens Island at the St. Clair Flats Canal Range Light Station**. I had to wear boots to walk through the yard. I had minnows swimming in the garage. I have water under the houses and going over top of the sea walls. On part of the property with new sea wall we welded I beams on top to knock down the boat wave traffic, 2 to 4 foot waves rolling through the front yard. Destroyed my docks. I have mold inside and base boards popping with moisture wicking up and floors swelling. Basically I almost have to start over on restoration there. It's been a disaster for me, lots of others on Harsens Island as well. I have not been able to use the houses, septic tanks flooded with water.

Jeff Shook, MI Lighthouse Conservancy, 9/23/19

✦ Lighthouse Managers

St. Clair Flats Range Light Station



PHOTOS: Jeff Shook, Michigan Lighthouse Conservancy



✦ Lighthouse Managers

St. Clair Flats Range Light Station



PHOTOS: Jeff Shook, Michigan Lighthouse Conservancy

✳ Lighthouse Managers

Whitefish Point



Photos:
Bruce Lynn, Great Lakes Shipwreck Historical Society



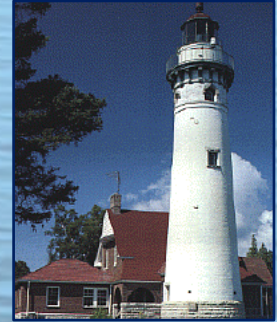
THREATS

- Loss of protective dunes
- Loss of safe beach access from deck
- Visitor social trails through former dunes

✳ Lighthouse Managers



Not just flooding and erosion:
other water changes, invasive
species, lake access issues
(requires harbor dredging)



Seul Choix Pointe Lighthouse Public Access: zebra mussels

✳ Underwater Cultural Resources



✱ Underwater Cultural Resources



PHOTOS: MI State Underwater Archaeologist at Thunder Bay National Marine Sanctuary



THREATS

- Underwater cultural resources exposed to damage from wave action, sand scouring, human damage, zebra/quagga mussels
- Dive mooring buoys submerged

OPPORTUNITIES

- Lay person “discoveries”
- Increased interest in UW cultural resources
- Opportunities for public education

RESPONSES *(short term)*

- Request photos, measurements, GPS, observations
- Field truth when possible
- Lengthen mooring buoy tackle

✦ Tourism Communities & Sites

Harbor Springs, Beach Drive



PHOTOS: Steve Zucker/Petoskey News-Review

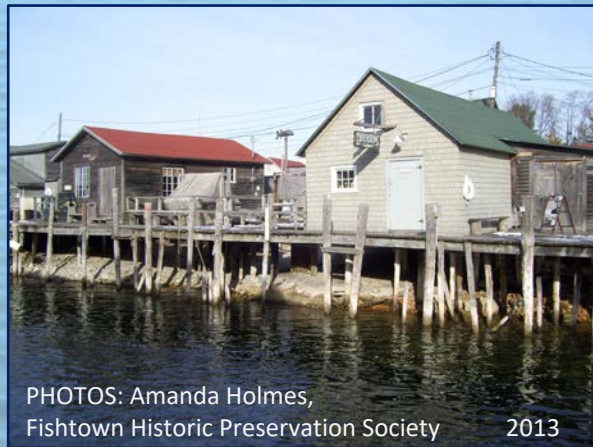


THREATS

- Washed out & covered roads
- Damage to docks, moorings, hoists
- Damage to near-shore businesses
- Loss of beaches
- Reduced tourist visitation (and associated economic activity)

✦ Tourism Communities & Sites

Fishtown, near Leland

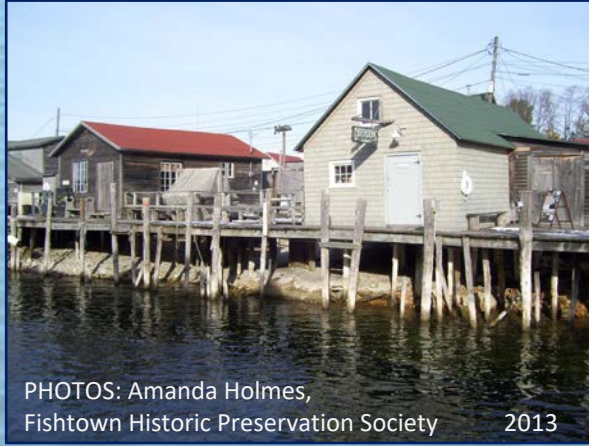


THREATS

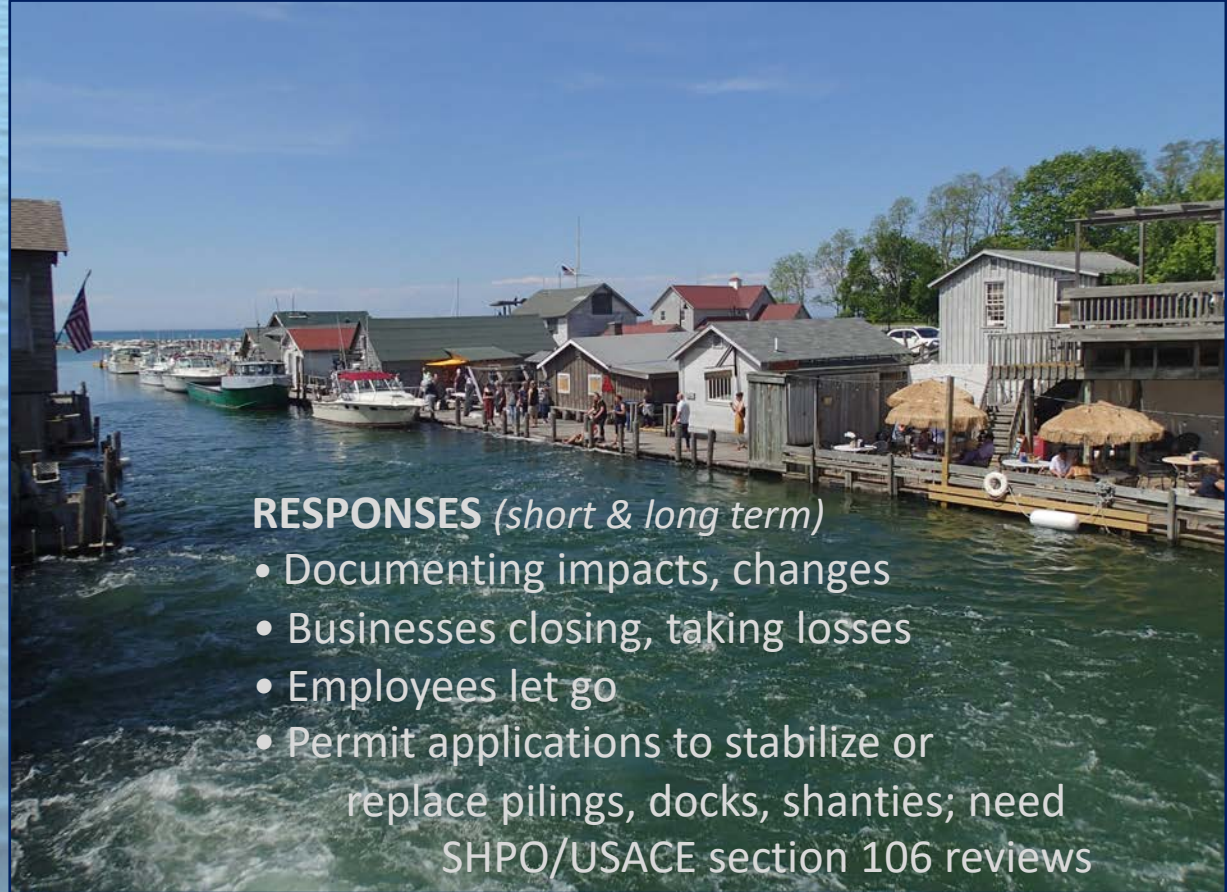
- Pilings destabilized
- Docks flooded, damaged
- Businesses inundated (damage to/ loss of products in shanties)
- Reduced tourist visitation (and associated economic activity)

✱ Tourism Communities & Sites

Fishtown, near Leland



PHOTOS: Amanda Holmes,
Fishtown Historic Preservation Society 2013



RESPONSES *(short & long term)*

- Documenting impacts, changes
- Businesses closing, taking losses
- Employees let go
- Permit applications to stabilize or replace pilings, docks, shanties; need SHPO/USACE section 106 reviews

✳ Charter & Recreational Fishing



PHOTOS: Mike Thomas, MI DNR
Fisheries Division, Retired



THREATS

- Flooded accesses and docks
- Marinas flooded
- Former shore/wade fishing spots inundated
- Fish move (*based on habitat, currents, H₂O depth, temperatures*)

OPPORTUNITIES

- New spawning areas (wetlands)
- New places to fish
- Potential for new, changed charter businesses
- Increased catch rates (in some locations)

✳ Charter & Recreational Fishing



RESPONSES *(positive)*

- Change fishing tackle, sites, time of day, and fishing tackle to take advantage of changes
- Positive impact on charter business & recreational fishing

RESPONSES *(negative)*

- Can't find fish in same places
- Negative impact on charter business

Changing Lake Levels:

**Opportunities & Threats,
Coping, Mitigating, Planning**

- Lake Levels Change Constantly**
- Threats & Opportunities**
- Responses: Short- & Long-term**

Resources



MSU Extension
Michigan Sea Grant

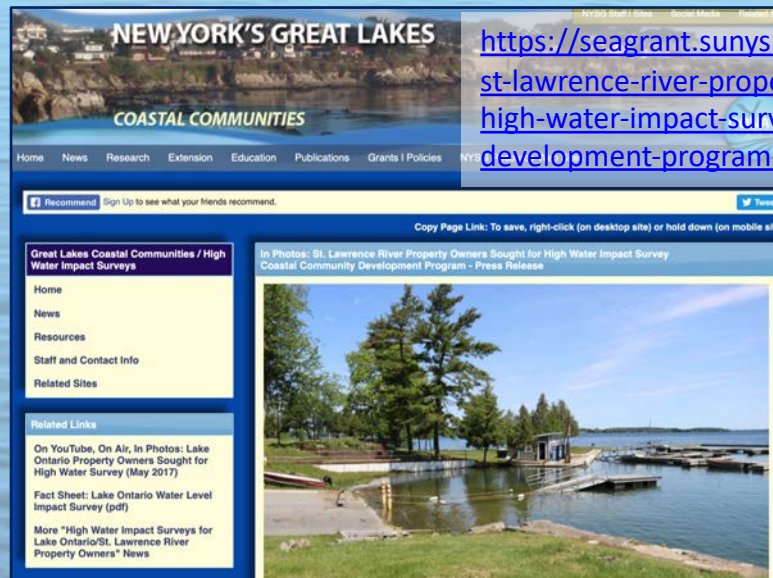
<https://www.canr.msu.edu/news/summer-2019-high-great-lakes-levels-likely-for-lakes-michigan-huron-msg19-breederland19>

Summer 2019: High Great Lakes levels likely for lakes Michigan, Huron

Infrastructure damage and beach erosion highly possible for coastal communities.

May 15, 2019 - Author: [Mark Breederland](#), Michigan Sea Grant, [Michigan State University Extension](#)

Michigan is well known as [the Great Lakes state](#). Four of the five Great Lakes touch our shores and we're blessed as well with the spectacular Lake St. Clair squeezed in-between Lake Huron and Lake Erie. Most rivers and streams in the state flow into the Great Lakes, and half of Michigan's 83 counties are Great Lakes coastal counties. The coasts are dynamic places to live and work.



<https://seagrant.sunysb.edu/articles/t/in-photos-st-lawrence-river-property-owners-sought-for-high-water-impact-survey-coastal-community-development-program-press-release>

Helpful tools

Here are some helpful tools and information:

- [Michigan Sea Grant: Lake Levels](#)
- [NOAA: Lake Level Viewer](#)
- [Great Lakes Shoreviewer: A coastal risk and climate adaptation tool](#)
- [The Great Lakes Dashboard](#)
- [U.S. Army Corps of Engineers: Great Lakes Information](#)

[Michigan Sea Grant](#) helps to foster economic growth and protect Michigan's coastal, Great Lakes resources through education, research and outreach. A collaborative effort of the [University of Michigan](#) and [Michigan State University](#) and its [MSU Extension](#), Michigan Sea Grant is part of the [NOAA-National Sea Grant](#) network of 33 university-based programs.

This article was prepared by Extension educator Mark Breederland under award

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