• NOAA Shoreline Website: https://shoreline.noaa.gov/index.html
• NOAA-NGS Continually Updated Shoreline Products (CUSP): https://www.ngs.noaa.gov/CUSP/
Coastal Program Overview

• Protect, preserve, restore, and enhance coastal resources and communities
• Established 1978
• state-federal partnership with the National Oceanic and Atmospheric Administration
Our ties to NOAA
Challenge #1 - A Vast & Diverse Coast

387 Coastal municipalities to work with...

...along more than 3,200 miles of coast!
The Michigan Coastal Management Team!

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www.michigan.gov/coastalmanagement
Twitter.com/MichiganOGL
Coastal Management Focus Areas

- Coastal Community Planning & Zoning
- Coastal Public Access
- Coastal Habitat
- Coastal Water Quality
- Coastal Hazards
How we Work

• Provide technical expertise
• Competitive grant funding
  • Supports community coastal projects in five key focus areas
  • Grant Opportunity released each October
• Program enhancement initiatives
  • Currently focused on coastal community resilience
A Sample of Michigan CZM Projects that Include GIS Components

Getting to Know our Coast
Great Lakes Shoreviewer

- Project completed 2015
- Covers 1,000 miles of Michigan’s coast
- Collected:
  - Ortho-imagery (4-band, 1-foot res.)
  - Low-altitude, high-resolution coastal oblique images
- [www.greatlakesshoreviewer.org](http://www.greatlakesshoreviewer.org)
“80-Year View” of Coastal Change

• To be completed by December 31st
• Digitizing bluff and shoreline position
  • 1938
  • 1980
  • 2016
• To inform local planning/zoning officials and property owners
• Lake Michigan Coast

~4.5 ft/yr bluff recession
VALUING MICHIGAN’S COASTAL DUNES: GIS Information and Economic Data to Support Management Partnerships
Previously Mapped Critical Dunes

74,308 acres of Critical Dunes
Definition: Coastal sand dunes are physically identifiable features comprised of wind-blown sand

- Digital Elevation Model of coastal counties
  - Digitize dunes based on morphology
- NRCS soil survey
  - SSURGO soils data to help inform decisions and check
- Critical Dunes map
  - Used to help inform decisions
- Other data sources as applicable
  - Help inform decisions
High-Res Mapping Results
New Comprehensive Coastal Dune Mapping

Legend
- High Resolution Map Units
- Low Resolution Map Units

\(~ 163,000 \text{ acres of dunes}~\)
Improving Beach Safety from Rip Currents and Other Dangerous Nearshore Currents (DNC)

Additional information: www.dangerouscurrents.org
GPS positions & Photographs for:

• Beach flags
• Beach safety signs
• Rescue equipment
• Extent of buoyed swim areas
"ASSAULT ON THE BEACHES": ADVANCING FORE-CASTING THROUGH PERISHABLE DATA RECOVERY

Sonar

Bathyboat

Autonomous Underwater Vehicle
Beach forecast and Rip current incidents:
https://www.weather.gov/greatlakes/beachhazards
NOAA Office for Coastal Management Products
Utilizing Geospatial Data and Tools for Analysis and Visualization in the Great Lakes
Digital Coast

- [https://coast.noaa.gov/digitalcoast/](https://coast.noaa.gov/digitalcoast/)
- Excellent source for coastal data & more
- Landcover
- Topo-bathy LiDAR
- Stories from the coast
- ...and more
Digital Coast Updates

• Coastal Change Analysis Program (C-CAP)
  • 2016 Updated MI, MN, and WI 30 meter products available.
  • High res work on Lake Superior NERR, IL, IN, OH, PA, and NY underway.

• Lake Level Viewer (LLV)
  • New extended coverage now available.
  • New data and services available directly through Digital Coast and Data Access Viewer (DAV).

• Other Updates
  • 2107 datasets, 78 tools, 194 training resources, 145 stories.
Coastal Change Analysis Program (C-CAP)
What is the Coastal Change Analysis Program (C-CAP)?

- Coastal Land Cover & Change data
- NOAA maps 25% of the contiguous U.S.
- Coastal expression of the NLCD (National Land Cover Database): **NLCD is 95% C-CAP in coastal areas**
- Added focus on wetlands detail
- Updated every 5 years
- High resolution available*
# C-CAP in the Great Lakes Region

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HRD = High Resolution Development Underway
C-CAP in the Great Lakes Region

1975

2010
Lake Level Viewer (LLV)
What is the Lake Level Viewer?

• First official release in November 2014
• Funded by the Great Lakes Restoration Initiative
• Fills a critical information data gap:
  1. 40% of Coastal Storms Program survey respondents said current data on future lake level changes are inadequate
  2. Only 26% said existing tools to work with or visualize these data are adequate

Source: 2013 Shoreline Change Workshop: Perspectives on the Great Lakes Survey
What is the Lake Level Viewer?

The Impacts of Changing Water Levels
What is the Lake Level Viewer?

## Water Levels

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<tr>
<th>Lake</th>
<th>Low Water Datum (ft)</th>
<th>Min Elevation (ft)</th>
<th>Year</th>
<th>Max Elevation (ft)</th>
<th>Year</th>
<th>Long Term Average (ft)</th>
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<td>Superior</td>
<td>601.1</td>
<td>599.5</td>
<td>1926</td>
<td>603.4</td>
<td>1986</td>
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<td>Michigan-Huron</td>
<td>577.5</td>
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<td>St. Clair</td>
<td>572.3</td>
<td>570.5</td>
<td>1934</td>
<td>577.3</td>
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<td>573.8</td>
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<td>Erie</td>
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<td>568.2</td>
<td>1934</td>
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<td>241.9</td>
<td>1935</td>
<td>248.6</td>
<td>1952</td>
<td>245.0</td>
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6.4 feet range in Min – Max water levels!!!
What is the Lake Level Viewer?

Use this data...
What is the Lake Level Viewer?

...to visualize the impacts
US Interagency Elevation Inventory
NOAA Office for Coastal Management Digital Coast
cost.noaa.gov/digitalcoast

Coastal Change Analysis Program
cost.noaa.gov/ccapftp/  (Data)
cost.noaa.gov/ccapatlas/  (Land Cover Atlas)

Lake Level Viewer
cost.noaa.gov/llv

US Interagency Elevation Inventory
cost.noaa.gov/inventory/
Thank You!

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Michigan Coastal Management Program
Office of the Great Lakes
Department of Natural Resources