Lake Level Viewer: Tool Overview and Guidance

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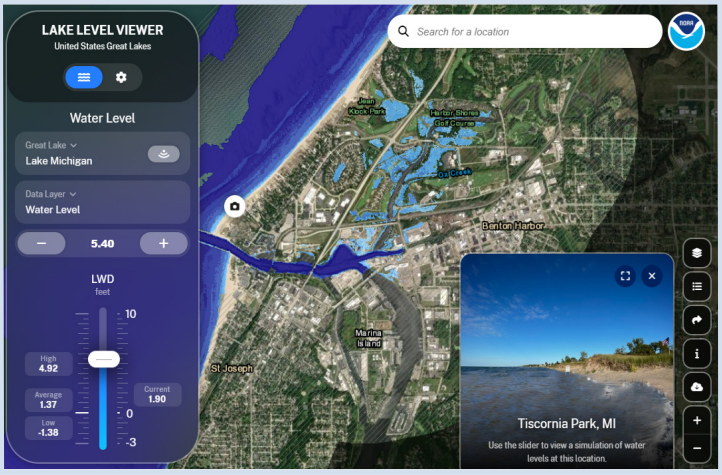
GLISA developed this tool guidance based on their experience as a potential user. It is intended to help other users in the Great Lakes region better understand the tool and its potential applications. For an in-depth walkthrough of how to use the tool, please see this tutorial video.

Overview

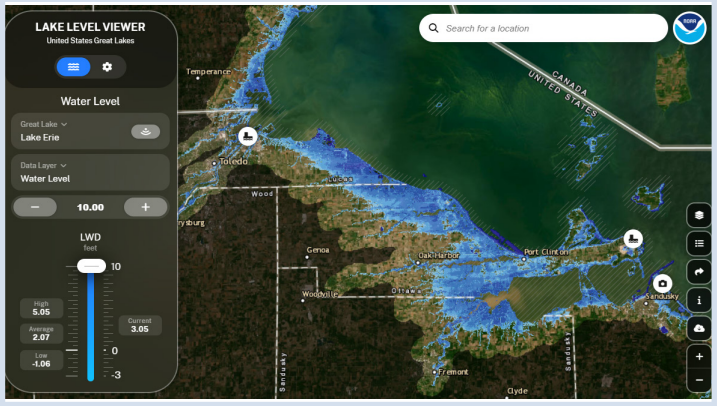
Water levels on the Great Lakes fluctuate across different time scales and affect numerous human and environmental sectors in the region. The Lake Level Viewer displays variations in the Great Lakes water levels through interactive maps to help users visualize the effects of lake level fluctuations on shorelines and coastal areas.

Outputs

- Users may choose one of the Great Lakes and zoom in on the map to find specific locations.
- A slider bar feature allows users to raise or lower water levels to see how they might impact water depths and shoreline positions.
- Users may view water level, land cover, or social vulnerability index data on the map.
- Clicking on station icons displays a time series graph of historical lake level observations for that location.
- Clicking on camera icons displays a shoreline photo from that location with an overlayed simulation of water level changes that can be adjusted with the slider bar feature.
- Users can download the data to view outside of the tool or on a finer scale.



Simulated map and photo of Lake Michigan under high water level conditions from the Lake Level Viewer. Credit: NOAA.



Simulated map of Lake Erie under high water level conditions from the Lake Level Viewer. Credit: NOAA.

Applications and Use

- **Intended audience:** The tool was created to help communities make planning decisions about infrastructure and zoning restrictions. It may be relevant for planners seeking a high-level visualization of shorelines under different lake level conditions to identify and understand potential vulnerabilities in their community, as well as areas for improvement to increase resilience.
- **Background needed:** The tool is easy to navigate to visualize shoreline impacts of varying water levels.
- **Example of potential uses:** A community may use the tool's maps and graphs to understand how lake level fluctuations will impact their shoreline infrastructure and to plan for beach nourishment projects in the future. See tutorial video for example demonstration.

Potential Limitations and Considerations

- Water levels are shown as they would appear in calm conditions and do not account for wave action during storms and wind, erosion, subsidence, or future construction.
- The tool's maps may not accurately capture detailed hydrologic/hydraulic features such as canals or ditches and may result in a lack of represented possible flood areas.
- The search bar does not always function properly when looking to zoom to a specific location and may require manually scrolling to it on the map.

Data Sources

Data type	Source
Historical water level	NOAA Water Level Stations
Land cover	NOAA Digital Coast's Coastal Change Analysis Program
Social Vulnerability	CDC/ATSDR Social Vulnerability Index
Lake Level Reference Data	Great Lakes Sea Grant Network
Great Lakes Shoreline	U.S. Army Corps of Engineers' National Coastal Mapping Program

More Information on the Tool

The Lake Level Viewer is managed and hosted by the National Oceanic and Atmospheric Administration (NOAA)'s Office for Coastal Management. The tool was first developed in 2014, and most recently updated in May, 2024. The tool and its products are all publicly available. For questions or comments on the Lake Level Viewer, please contact: coastal.info@noaa.gov.

This guidance document and accompanying tutorial video were developed by GLISA, NOAA's Great Lakes Climate Adaptation Partnerships (CAP, formerly RISA) team, under a project funded by Michigan Sea Grant to help make climate, weather, and coastal resilience tools more accessible to end users in the Great Lakes region. They were created for educational purposes only and are in no way affiliated with the Lake Level Viewer or its developers.