
Lake Ontario

Shoreline Resident Information Folder

Residing along the shore has wonderful benefits, such as proximity to recreational activities and tranquil views of the water from your own backyard. Shoreline ownership comes with benefits, challenges, and responsibilities. Tools, such as this folder and its contents, can help with management of your property. There are many options for working with nature and your communities' shoreline ecosystem to keep your property healthy and resilient.



Figure: New York's Great Lakes Basin (or watershed) is shown in green. New York has 473 miles of Great Lakes shoreline along Lake Erie and Lake Ontario. CREDIT: NEW YORK SEA GRANT

Lake Erie

- Surface area: 9,910 sq. miles
- Maximum depth: 210 feet
- Retention time: 2.7 years
- Outlet: Niagara River and Welland Canal
- Population: 10.8 million U.S.

Lake Ontario

- Surface area: 7,340 sq. miles
- Maximum depth: 802 feet
- Retention time: 6 years
- Outlet: St. Lawrence River to the Atlantic Ocean
- Population: 2.8 million U.S.

Understanding the Shoreline

The Great Lakes shorelines are in a constant state of change. You can see this dynamic shift in the break down of bluff faces, recession of property frontage, the buildup of dunes and spits, or the creation of sandbars within the water.

Shoreline Changes:

Wind, waves, and lake levels all contribute to these changes, including **accretion** – the build-up of the shoreline beaches and dunes, and **erosion** – the process of breaking down these features by physical forces, such as wave action. The natural process of erosion supplies the lakes with additional sediments. These are transported along the shoreline, generally from west to east, and provide material for re-building shorelines elsewhere.

Working with the shoreline rather than against it, provides for a more resilient approach to managing shoreline erosion. In summer and during lower lake levels, shoreline changes tend to be muted, while much of the significant changes to formation happens from autumn to spring. Seasonal increases in lake levels and intense wind and wave climates create an environment of change. These move sand, gravel, and cobble from the shoreline and places them back into the **littoral** zone (nearshore area where sediments dominantly move) for redistribution along the shoreline. In winters when there are expansive shore-fastened ice, this erosion may be lessened. However, ice gouging of the shoreline may also occur during break-up in spring and winter thaws.

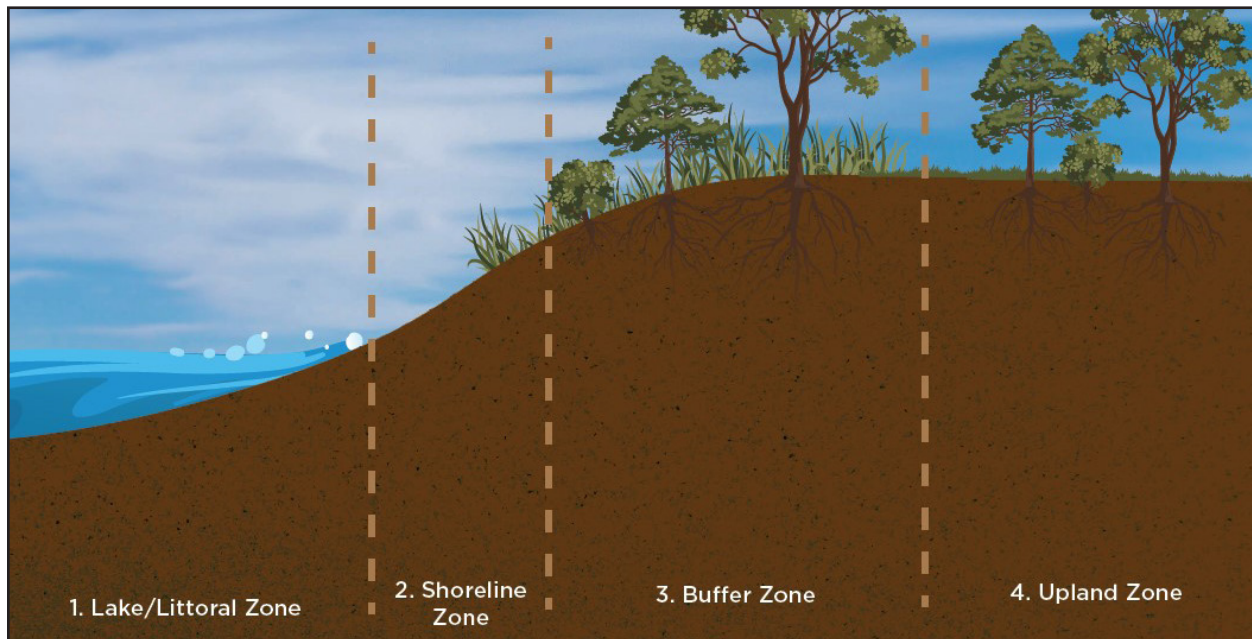


Figure: Shoreline zones in a lake ecosystem.

CREDIT: R. WIDRIG, NYSG

Water Levels

Water levels in the Great Lakes fluctuate primarily due to natural changes in hydrology. Factors such as precipitation, runoff, and evaporation from the lake surface ultimately cause water levels to vary. Flooding along the shoreline can be induced by high static water levels and storm-related activities, such as storm surge, wave runup, or a combination of the two.

Water Level Resources:

HISTORIC WATER LEVELS

NOAA Great Lakes Environmental Research Laboratory Water Level Dashboard

- Provides historic water levels from 1918-present.

CURRENT AND FORECASTED WATER LEVELS

US Army Corps of Engineers Weekly Water Level Forecasts

- Provides the current and forecasted water levels for each of the Great Lakes on a weekly basis.

Lake Ontario Flood Forecast Mapper

- Displays flood-risk based on “month-ahead” water level forecasts of the New York shoreline.

INTERACTIVE MAPPING TOOLS

NOAA Lake Level Viewer

- Displays variations in lake levels ranging for six feet above and below the long-term average. This helps users visualize the impacts of lake-level fluctuations on shorelines and coastal areas.

Lake Ontario Inundation WebMap

- This map tool overlays inundation at different lake levels to bring awareness to infrastructure and services that may be at risk. Currently wave runup data are not readily available. As a result, the generated maps assume only flat water associated with lake levels, not stormwater drainage issues.

ADDITIONAL RESOURCES

National Weather Service Great Lakes Portal

- Provides current and forecasted wave height, wind speed, and wind gust information for the Great Lakes.

International Joint Commission

- The IJC is an organization created by the United States and Canada whose role is to approve projects that affect water levels and recommend solutions that take into account a wide range of water use needs.

To access the online resources provided above, scan this QR code using the following instructions:

1. Open the camera app on your mobile device and aim camera at the QR code.
2. A link will appear at the top of your screen, click on it.
3. This link will bring you to a webpage that contains all of the links for these resources.



New York Sea Grant Resources

New York Sea Grant (NYSG) has many resources available to grow your Great Lakes knowledge!

For digital versions of this folder
and its contents:



<http://www.nyseagrant.org/LOLandownerFolders>

For more information about
the Great Lakes:



<https://seagrant.sunysb.edu/articles/t/new-york-s-great-lakes-learn-more-about-new-york-s-great-lakes>

For updates on NYSG activities and resources, follow the NYSG Great Lakes Region's
social media accounts:

Facebook



<https://www.facebook.com/greatlakes.nysg>

Instagram



<https://www.instagram.com/greatlakes.nysg>

New York Sea Grant is part of a nationwide network of 34 university-based programs working with coastal communities through the National Oceanic Atmospheric Administration (NOAA). Sea Grant research and outreach programs promote better understanding, conservation, and use of America's coastal resources. Sea Grant is funded in New York through SUNY and Cornell University and federally through NOAA.

New York's Sea Grant Extension Program provides Equal Program and Equal Employment Opportunities in association with Cornell Cooperative Extension, U.S. Department of Agriculture and U.S. Department of Commerce and cooperating County Cooperative Extension Associations.



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