

Coastal Erosion Hazards Across the Great Lakes



Coastal erosion is a natural process that shapes and maintains the coastline and beaches along the Great Lakes. Extreme winds, waves, rainfall, surface runoff, and a decrease in winter ice cover accelerate erosion rates, creating hazardous areas that threaten homes, businesses, infrastructure, recreational areas, and public safety.

Coastal Conservation Authorities are local watershed experts who identify and monitor areas prone to coastal erosion across the Great Lakes region, regulating development and supporting erosion prevention measures to keep people and development away from erosion-prone areas.



Cohesive Bluffs composed of clay and silt particles, remain strong in dry conditions but become loose and unstable during heavy rain or snow and ice melt. Without vegetation on the bluff, water flows quickly, accelerating erosion.



Banks along the coast can erode quickly from strong and frequent waves. The geological composition of the bank influences the rate of erosion; for example, banks made up of sandy soils are more prone to erosion than those composed of solid bedrock.



Dynamic Beaches are continuously changed by wind and water erosion, threatening any built infrastructure in the area. The width of the beach changes with water levels and wave conditions. High water levels move sand, eroding dunes, whereas periods of low lake levels allow dunes to reform but expose the lakebed to wind erosion.



Gullies are formed from runoff during rainfall, snow, or ice melt. Water travels down the slope and creates rills that can develop into large gullies. Depending on the soil type, gullies can extend landward at a fairly rapid rate.

Seasonal Impacts



Winter

Consistent ice cover on the Great Lakes during the winter months shields the coast from harsh storms by reducing wave energy. In mild winters, the absence of ice leaves the coast vulnerable to damage from ice storms and increased erosion.



Ice Intrusion



Spring

Frequent heavy rain, along with melting snow and ice, sends water rushing down slopes. This runoff washes away sediment and vegetation, weakening slopes and increasing the risk of failure.



Slope Failure



Periods of Low or High Lake Levels

Periods of low water levels increase the risk of wind erosion on exposed lake beds. Periods of high water levels increase the frequency of flood events.



Lakebed Erosion

Recognizing the early signs of erosion can help protect your property and your safety. Look out for:

1. Bare slopes without vegetation
2. Bent or leaning trees
3. Tension cracks in the soil
4. Loss of sediment at the base of the bluff or bank
- Over-steepened banks



Visit www.conservationontario.ca to find your local Conservation Authority and learn more about erosion hazards in your community.