The coast is where land and water meet – a dynamic place of movement, interaction and change.

The largest coastal wetlands along this section of shoreline occur at the mouth of the Grand River. Coastal marshes often develop at rivermouths, which empty sandy sediments into the lake.

Our tallest bluffs are found at Mohawk Bay, where a high ridge of land known as a moraine, left behind during the last glaciation, is eroded to expose dramatic bluffs up to 25 metres tall.

Mohawk Island is the only island along this section of shoreline. It is a critical shorebird breeding area.

Bank Swallows have dug over 130,000 burrows into Lake Erie's bluffs, forming one of the largest known concentrations of nesting colonies.

Sugarloaf Hill is our tallest sand dune, reaching 42 m above the mean lake level.

Caspian Terns once nested on the breakwall at the entrance of the Welland Canal. Gulls have now taken over this nesting habitat.

Nickel Beach supports the longest stretch of dynamic dunes, over 1 km in length.

Here Fowler's Toads cling to their diminishing habitat at the northern extreme of their global range. They require breeding pools on bedrock headlands and active sand dunes for shelter and hibernation.

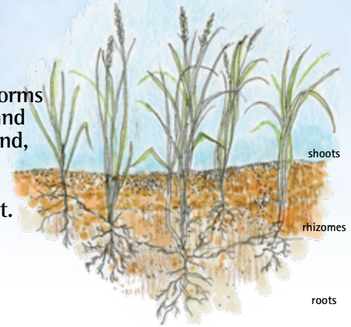
Piping Plovers, an endangered bird species, once nested at Pleasant Beach. They were last seen with young in the 1930s.

Point Abino is a tombolo, a neck of land formed when currents deposit sand and connect a reef or former island to the mainland. Here tower sand dunes formed thousands of years ago, when lake levels were much higher.

Headlands, such as Windmill Point, expose bedrock formed millions of years ago under a vast tropical sea, during the Devonian Period. Fossils of sea creatures observed here are a legacy of this deep past.

Quiet bays in the lee or shadow of bedrock headlands often support coastal marshes. In these bays, currents eddy and slow, depositing sands and sediments which accumulate and promote marshy vegetation.

The action of wind over large bodies of water forms waves and currents. Waves crash against the land and wash it away; currents slow and deposit sand, building up the land. This creates a dynamic equilibrium, part of the coastal process that shapes and reshapes where land and water meet.

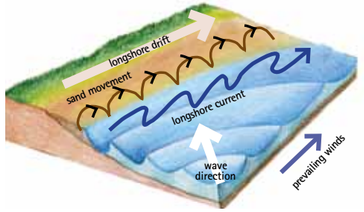


WHAT MAKES A DUNE
1. WIND, WAVES AND CURRENT 2. SAND 3. BEACHGRASS

Sand washes ashore. Wind blows it across the beach and onto the dunes, where beachgrass and other specialized plants slow the sand-laden winds, causing the sand to drop. The roots and rhizomes of these plants capture the sand and hold it in place, allowing the dune to grow. Extremes of temperature, moisture and wind and a lack of nutrients permit relatively few plant species to thrive on a dune.

WIND, WAVES AND THE LONGSHORE CURRENT

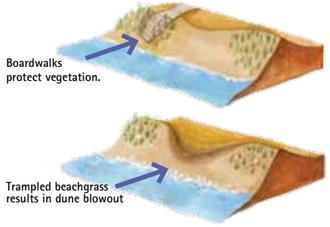
Waves are caused by wind. The prevailing southwesterly winds provide the energy to power waves. The wave crests are perpendicular to the wind direction.



The wind direction and wave action create the longshore current. On Lake Erie, the longshore current moves from southwest to northeast. Points of land called headlands form bays that slow the current and cause it to eddy. The longshore current, essentially a watery conveyor belt of suspended sand, deposits that sediment which then gets washed ashore.

DUNE BLOWOUT

When trampled beachgrass dies and the exposed sand begins to blow away, the result is called a blowout.



DYNAMIC DUNES

Sand dunes are a highly dynamic ecosystem. They are reservoirs of sand, formed by wind, waves, currents and specialized plants. They are the first line of defence against waves, storms and shoreline erosion. When high water levels or storms erode the beach, the dunes act as a reserve, replenishing the beach with sand. When water levels are low, the exposed beach sand dries and is blown inland to build up the dune.

EROSION

Erosion is a natural and constant process along a coast. It occurs when moving water removes tiny pieces of land and carries them away. Wave action is the main agent of erosion. Wind is the energy that powers this process. Without erosion, the lake would have no sediment to deposit. Shorewalls lock up sediment and deflect all of the wave energy downwards, causing serious erosion damage.

Protect YOUR Coast

Without beachgrass, there are no dunes!

Beachgrass is a coastal plant that grows along the Atlantic Ocean and the Great Lakes coast. Its sturdy leaves build and protect sand dunes by capturing windblown sand and preventing the sand from blowing away. When beachgrass is trampled, it dies. Sand begins to blow away.

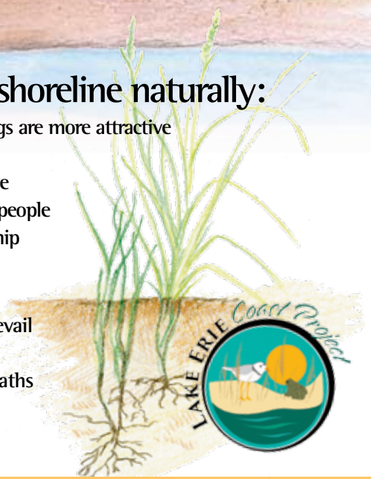
Once the sand is gone, it cannot return.

Why you should protect your shoreline naturally:

- increase property values – natural settings are more attractive
- reduce erosion and property damage
- increase resilience against climate change
- healthy habitats for plants, wildlife and people
- community building and wise stewardship

What you can do:

- allow dynamic coastal processes to prevail
- plant locally harvested beachgrass
- use boardwalks and create S-shaped paths
- do not rake the beach
- do not harden your shoreline



What type of shoreline do you have?

PELHAM
WELLAND
NIAGARA FALLS
Niagara River
WAINFLEET
PORT COLBORNE
FORT ERIE
Grand River Marshes
Port Maitland
Rock Point
Mohawk Bay
Mohawk Point
Moulton Bay
Lowbanks Point
Willow Bay
Long Beach
Grabell Point
Belleview Beach
Morgan's Point
Sunset Bay
Rathfon Point
Reeb's Bay
Sugar Loaf Point
Eagle Marsh
Gravelly Bay/Port Colborne Marina
Nickel Beach
Cassaday Reef
Lorraine Bay
Pinecrest Point
Cedar Bay
Near Point
Silver Bay
Wyldewood Beach
Shisler Point
Pleasant Beach
Point Abino
Abino Bay
Crystal Beach
Prospect Point
Thunder Bay
Six Mile Creek
Windmill Point
Bertie Bay
Buffalo Road Point
Crescent Beach
Kraft Road Point
Waverly Beach
Erie Beach
Old Fort Erie
LAKE ERIE

Sand Beach/Sand Dune | Cobble Beach | Clay Bluff | Limestone Pavement Headlands | Coastal Wetlands

SAND BEACH
This shoreline type typically forms in crescent shaped bays situated between rocky headlands or bedrock points, creating broad sand beaches often backed by sand dunes. These are also known as bayhead beaches.

BEST EXAMPLES
Crystal Beach, Nickel Beach and Long Beach

SAND DUNE
Sand dunes are among the most fragile ecosystems in North America, yet they offer the best protection against storms and surging waves. Occasionally reaching 42 metres in height, Lake Erie's sand dunes support a number of globally significant plant communities and animals.

BEST EXAMPLES
Point Abino, Pleasant Beach and Nickel Beach

COBBLE BEACH
Cobble beaches typically occur along high energy shorelines. The cobblestones, or pebbles, much larger than grains of sand, help provide the shoreline with a protective armour against the pounding wave energy, erosion and ice scour. Cobble beach is often referred to as shingle beach.

BEST EXAMPLES
Mohawk Bay and Rock Point

CLAY BLUFF
Clay bluffs form where waves erode the shoreline, causing a steep slope or near vertical exposure of soil and sediments. Bluffs are easily eroded. This erosion is a natural process and the source of sediment that is carried away by the longshore current and deposited elsewhere. These are also known as glacial till bluffs.

BEST EXAMPLES
Mohawk Bay

LIMESTONE PAVEMENT
This shoreline type is found where waves wash away the shoreline and expose the underlying limestone bedrock. The flat layers of sedimentary rock resemble pavement. Specialized plants, growing in cracks and fissures in the bedrock, are influenced by storms, fluctuating water levels and ice scour.

BEST EXAMPLES
Windmill Point and Point Abino

COASTAL WETLANDS
Coastal wetlands are located in close proximity to the Great Lakes coastline and are directly connected by surface water to the lakes' fluctuating water levels. These wetlands are continually expanding and contracting, influenced by short term seasonal fluctuations and multi-year changes of lake levels.

BEST EXAMPLES
Abino Bay, Eagle Marsh and the mouth of the Grand River

What you can do:

Allow dynamic coastal process to prevail. Do not harden your shoreline.

Plant locally harvested native beachgrass that has been properly sourced.

Use boardwalks or designated S-shaped access paths. Avoid trampling native vegetation.

Leave natural debris such as driftwood on the beach. Do not rake the beach with heavy machines or tractors.

Leave natural vegetation such as native reeds and rushes. These plants filter and absorb runoff and pollution.

Did you know?

The Great Lakes Basin encompasses more than 16,000 kilometres of shoreline and is home to the largest system of freshwater dunes in the world, but less then 1% of Ontario's land base is covered by sand dunes.

Beachgrass builds and stabilizes sand dunes. Its roots and rhizomes can extend out 3 metres per season and grow as deep as 3 metres. Once sand is blown inland and taken out of the coastal system it cannot be replaced.

Beachgrass is one of the toughest coastal plants, but it cannot withstand foot or vehicular traffic. As few as fifty passes of foot traffic can kill beachgrass.

The strand line is formed where debris is washed ashore. It lies between the low beach, continually washed by waves, and the high-water mark, above which normal waves do not reach. Shorebirds and other wildlife feed on bits of plants, seeds and insects that collect here.

The Great Lakes Basin has lost more than 50% of its wetlands, and some areas within it as much as 95%. Fish species depend on coastal wetlands for spawning and they are important nesting and feeding areas for migratory waterfowl.

Fowler's Toad - a species at risk. Photo by A. Garofalo

For more information/assistance contact
The Bert Miller Nature Club of Fort Erie

the Coastal Centre
Visit the Coastal Centre
www.lakehuron.ca

Bert Miller Nature Club
Sharing our love of nature
www.bertmillernatureclub.org

Ontario

Illustrations, layout and design - joan@joancrawford.ca