

Shifting Sands: A Journey Towards Coastal Resilience



Using nature-based solutions to restore Fort Erie's Bay Beach



**Niagara
Coastal**



Niagara Coastal

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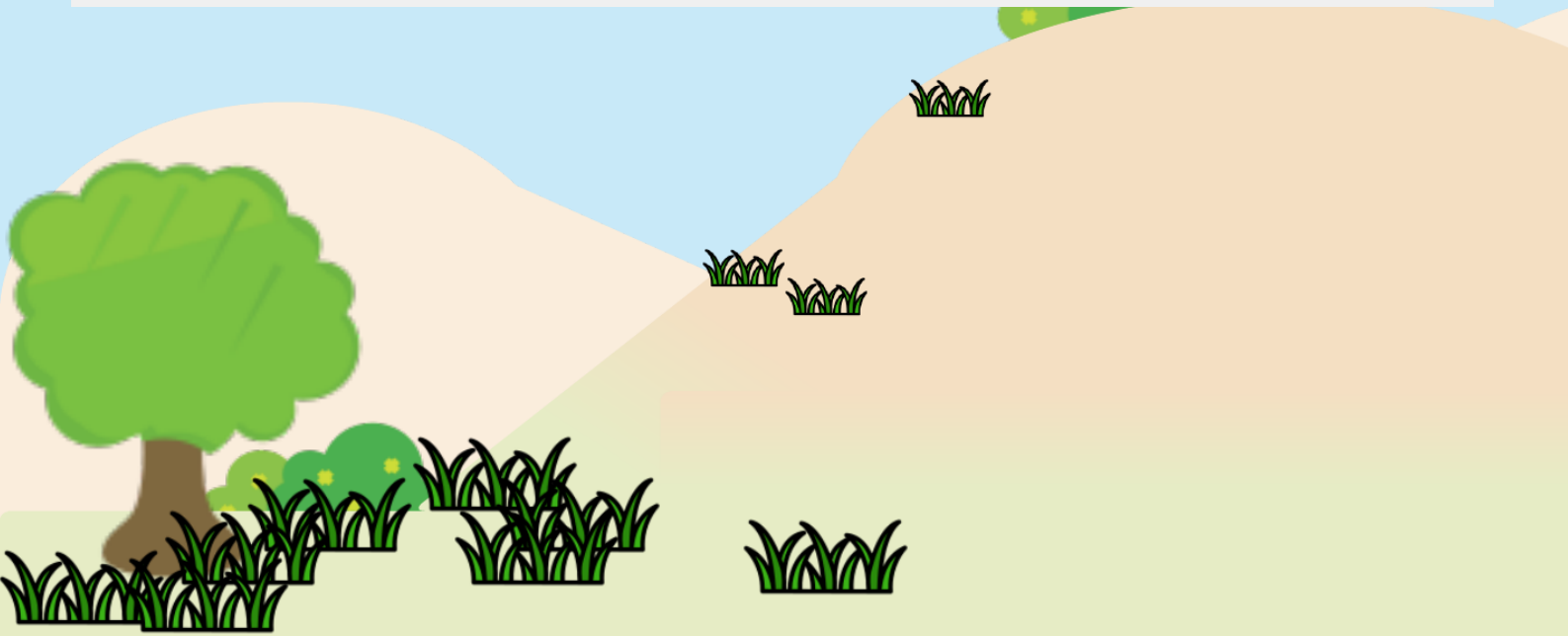


BEFORE Image captured April 16, 2021



AFTER Image captured June 12, 2023

Great Lakes coastal sand dunes are a globally unique ecosystem capable of supporting a diverse range of plants and animals. Formed by trapped windblown sand, dunes act as a sand “bank” that can replenish nearby beaches once shoreline erosion occurs.



Historically, Bay Beach in Fort Erie was home to an extensive dune ecosystem. Unfortunately, high water levels, more frequent and intense storm events, and decreasing lake ice cover are resulting in a loss of habitat and biodiversity.

To mitigate ongoing flooding and erosion, much of the Great Lakes shoreline has been hardened with stones, and other human-engineered structures. While providing a “quick fix”, this has disrupted natural coastal processes.

Nature-based solutions, which focus on working with nature, are a proven alternative strategy to address these complex challenges.



Natural shorelines provide immense value through:

- filtering stormwater runoff;
- accumulating and stabilizing sediments;
- providing habitat for wildlife; and
- protecting against flooding and erosion.

To reverse the habitat loss, Niagara College students began work to restore the dune with support from Niagara Coastal and the Town of Fort Erie.



Restoration efforts began in 2010, and for nearly a decade the restored dune flourished, providing benefits to wildlife and to society.



On April 16, 2021, students planted 500 plugs of Great Lakes Champlain beach grass after a storm in 2019 completely destroyed the dune.



April 16, 2021

The planted area was then enclosed with sand fencing.

The sand fence helps to restore dunes by keeping people and vehicles away from these sensitive areas. It acts as a wind barrier, slowing the speed of the wind and causing sand to be deposited inside the fence, regenerating the dune over time.



With the area closed off to pedestrian disturbance, other native coastal plants were able to establish. In the image insert below, the planted beach grass can be seen along with a variety of Bugseed; a provincially rare coastal plant.



August 10, 2021

Beach Grass Fast Facts

A specialized plant
found on coastal dunes

Roots extend over 2m
deep

A photograph of a beach scene. In the foreground, a young plant with several long, thin, green blades grows out of the light-colored sand. Behind it, a wooden fence made of vertical posts and horizontal rails stretches across the middle ground. The background shows a clear blue sky and some distant trees. The overall scene is bright and sunny.

**Able to trap sand and
prevent beach erosion**

**New shoots grow from
the rhizomes**

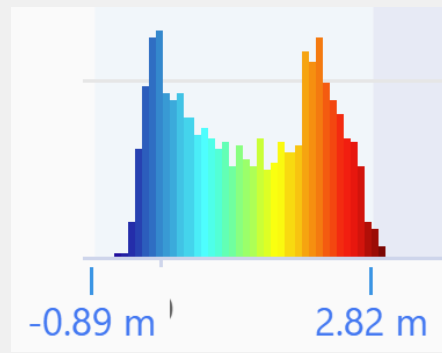


Over the course of the summer and fall, windblown sand was continually deposited within the enclosed area.

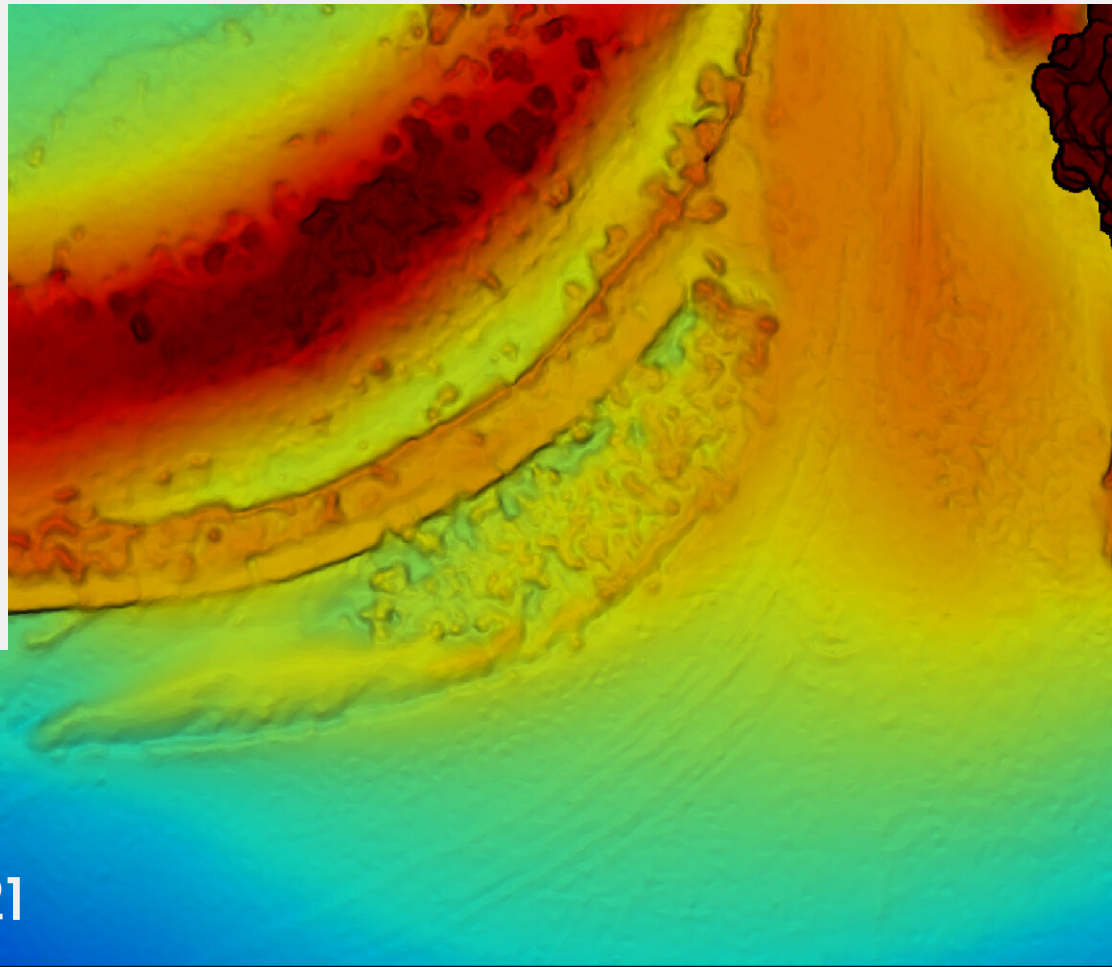
A coastal sand dune began to form.

Digital Elevation Models for Bay Beach

Legend

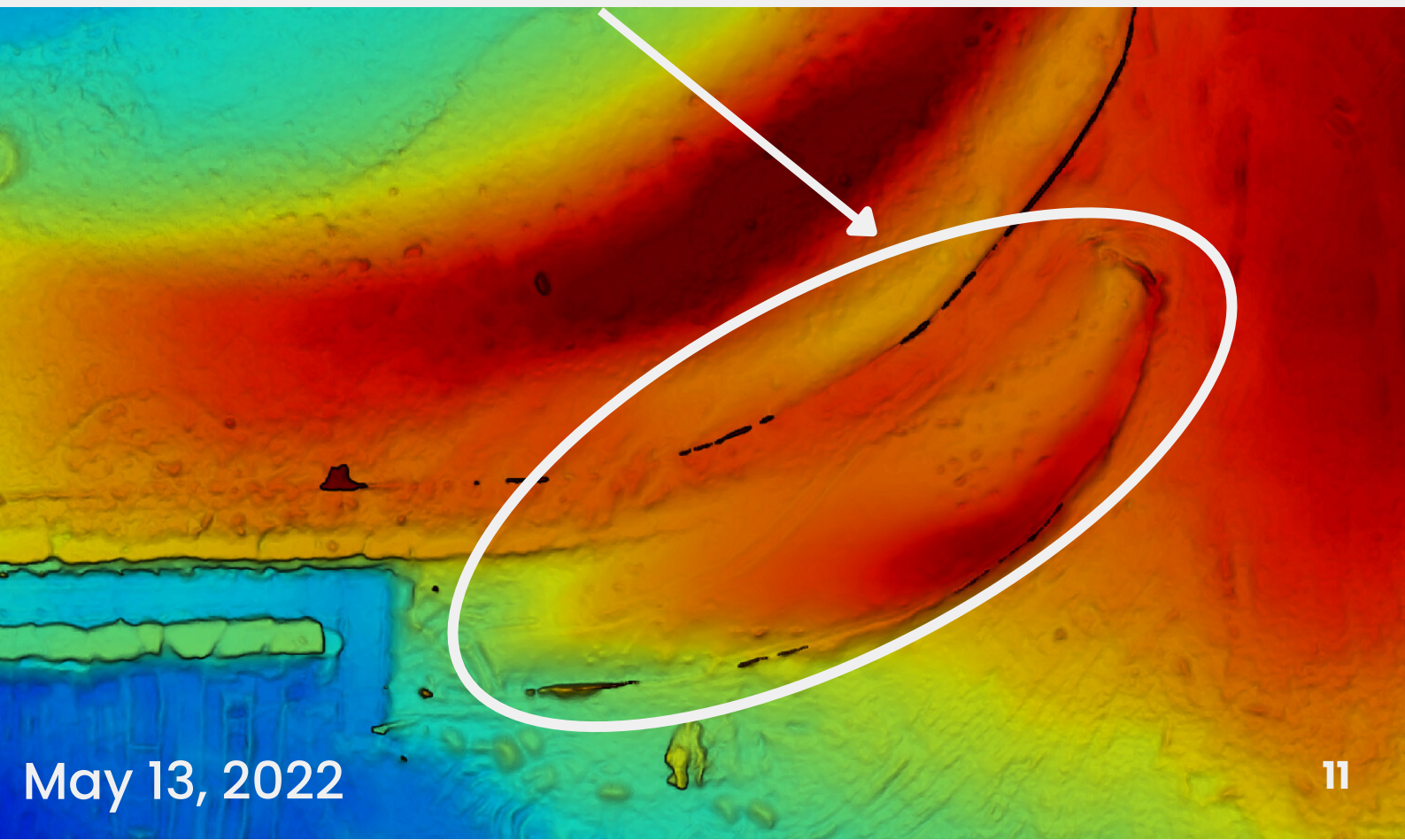


Note - elevations are relative to each other, not in MASL.



October 27, 2021

The restored area accumulated a significant amount of sand in 6 months.



May 13, 2022

By Spring of 2022, the shoots of the planted beach grass began emerging from the sand and have spread to new areas.

Other native coastal species emerged, like the American Sea Rocket shown below!



With the successful accumulation of sand and established plants, the fencing was no longer necessary to trap windblown sand.

The sand fencing was removed, and a more aesthetic rope and cedar post fence was installed in its place to continue limiting disturbance to the sensitive area by beach visitors.





On December 23, 2022, a generational winter storm, dubbed “Winter Storm Elliott,” hit Southern Ontario with brute force. The storm lasted for days and most heavily impacted southern coastal areas of the Niagara Region leaving homes encased in ice.

The sand dune functioned precisely as nature intended, dissipating the storm energy and protecting inland areas from the waves. Neighbouring areas without this protection were not so lucky.



Just a few months after the storm, the dune had fully bounced back and even looked better than before. You wouldn't have guessed it was damaged at all."



January 6, 2023



July 31, 2023

You can help ensure the success of this restoration project by monitoring its progress over time!

Become an active participant in the protection of our shorelines. The photos you submit can be used to guide coastal management decisions and advocate for policy changes!

Visit Bay Beach and scan the VAST QR code to get started.



October 29, 2022 by Tessa Anderson



Thank you to all of the volunteers who have assisted with the restoration of Bay Beach. Your efforts have helped to restore this shoreline to a healthy, resilient coastal ecosystem!

To be notified of future opportunities to volunteer with coastal restoration, sign up through our Get Involved page.

www.niagaracoastal.ca/get-involved



Acknowledgements

This restoration would not have been possible without the support of the following individuals and organizations. Thank you!

Albert Garofalo

Environment and Climate Change Canada

Niagara College Canada

Niagara Peninsula Conservation Authority

The Town of Fort Erie



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Beachgrass and Winged Pigweed, Image Credit: Kiersten McCutcheon