



Hello

March

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## Oak Wilt Workshop

Brought to you by Friends of Pinery Park

Join Friends of the Pinery Park for an informative and free event on the looming threat of oak wilt.

This event aims to raise awareness about the destructive nature of oak wilt and educate attendees on preventive measures and management strategies. Experts in the field will share valuable insights, practical tips, and the latest research findings to empower residents in protecting their beloved oak trees.

Whether you're a homeowner, arborist, or simply passionate about preserving our local ecosystem, this event promises to be a crucial resource in the fight against oak wilt. Don't miss this opportunity to come together and safeguard our cherished oak trees for future generations.

**Date:** Saturday March 2nd, 2024

**Time:** 1:00PM - 3:00PM

**Location:** Pinery Provincial Park (virtual option available)

Questions? Contact Friends of Pinery Park [HERE](#)

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## Our Conservation Programs Need You!

As a small charity, we rely on donations to help fund our conservation programs. Donate now to help us continue our important work to protect Lake Huron.

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## Investigating Bluff Retreat on Lake Huron

By Ben Woodward

Bluff Retreat is a significant concern in many parts of the Great Lakes. When and where it occurs, bluff retreat damages property and infrastructure, and recent research suggests that bluff retreat adds nitrogen and phosphorus to our lakes that contributes to harmful algal blooms. However, not all bluffs within the Great Lakes are created equal, with some experiencing little to no retreat during lake level highs, while others are retreating rapidly.

In 2023, I completed an undergraduate thesis examining bluff retreat along the Lake Huron shoreline between Grand Bend and Goderich. This thesis was completed at the University of Waterloo under the supervision of Dr. Quinn Lewis, with significant guidance also provided by Dr. John Johnston and Dr. Martin



Ross. The objectives of this thesis were to describe and quantify historical bluff retreat and identify potential causes in the most rapidly eroding areas of this section of coast. This work was made possible with the generous support of the Lake Huron Coastal Centre's Geoff Peach Scholarship, an award given out to university graduate students each year who have a focus on conservation and environmental research along Lake Huron.

My thesis used a variety of historical records to describe and quantify historical bluff retreat along the southeastern coast of Lake Huron. Historical air photos from the University of Waterloo's Geospatial Centre and Huron County's GIS team were used for the period from 1955 to present. For the period before 1955, historical photographs, postcards, and survey-based maps of the area were used. These were mostly obtained from the Bayfield Historical Society and can be accessed through the [Bayfield Historical Web Map](#).

# Historical Bluff Retreat in Bayfield: 1955 - 2022

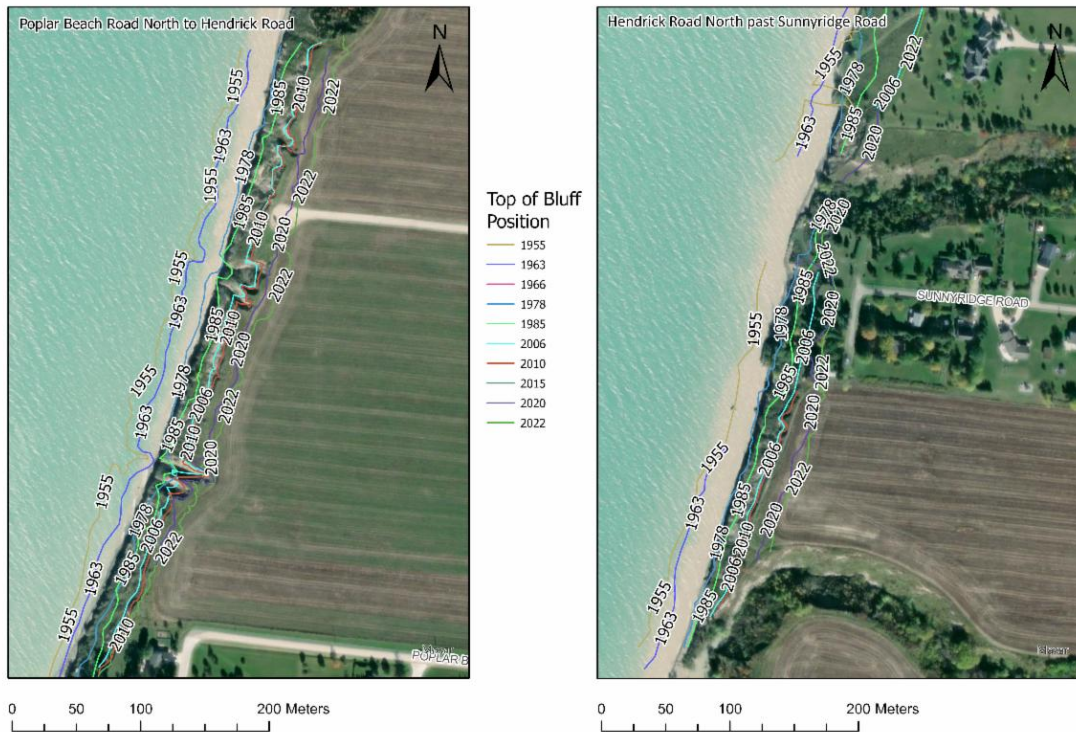


Historical Bluff Retreat Map of Bayfield, ON from 1955-2022.

Analysis of historical air photos showed that the areas with the most historical retreat since 1955 are Poplar Beach (1.2 meters per year), the area immediately south of Bayfield Harbour (0.6 meters per year), and Melena Beach (0.48 meters per year). Many other areas of the coast experienced little to no retreat during this period. Analysis of historical photographs near Pioneer Park and historical lake level data suggests that retreat occurs during periods of *rapidly rising* lake levels, even if lake levels are not yet at historic highs. One such period occurred in the mid 1960s, when lake levels were rebounding from historic lows.



## Historical Bluff Retreat From Poplar Beach Road North to Sunnyridge Road: 1955 - 2022



Historical Bluff Retreat Map of Poplar Beach Road North to Sunnyridge Road from 1955-2022.

In addition to consulting the historical record, Dr. Lewis and I conducted field investigations of several sites along the coast. Previous work along the coastal bluffs of the Great Lakes has identified several factors that may lead to greater bluff retreat at specific locations. These include:

**Bluff material:** Most of the bluffs between Grand Bend and Goderich are composed of silty clay till. This till was compacted under the weight of the Laurentide ice sheet during the last glaciation, making it stiff and resistant to retreat. This is one of the reasons why southeastern Lake Huron's coastal bluffs erode more slowly than the sandier, less compacted ones found along the north shore of Lake Erie.

**Wave energy, bathymetry, and substrate:** Some parts of the lakebed near the shoreline have rocky bottoms due to an underlying stony till layer, which may dissipate wave energy.

**Beach width, sediment supply, and shore structures:** Wider beaches dissipate some or all the wave energy that would otherwise reach the bluff toe, protecting it from retreat. Beach width depends on sediment supply. Along some areas of the shoreline, sediment supply is restricted by human-built structures that jut out from the shoreline, such as piers and groynes.



Bluff South of Bayfield Harbour during a period of rising lake levels in the late 1920's - Courtesy of the Bayfield Historical Society.

Field investigations, interviews with landowners, and additional analysis of historical records unveiled a fourth cause: **agricultural drainage directly onto the bluff face**. This is especially prominent at Poplar Beach, where several tile drains emit runoff directly onto the bluff face. This additional water moistens and weakens the bluff material, making it more vulnerable to slides and slumps.

In summary, this study supports the findings of previous research suggesting that bluff retreat is most severe in areas with low sediment supply (and thus low beach width) and during periods of rapidly rising (but not necessarily high) lake levels. Further, rates of bluff retreat can be worsened by human activities that weaken the bluff, such as drainage of residential or agricultural runoff directly onto the bluff face. However, questions remain regarding sediment transport pathways and the impact that the shape and composition of the lakebed has on rates of bluff retreat. These are questions I hope to answer during my master's research, which I am excited to be starting this fall under the guidance Dr. Chris Houser at the University of Waterloo.

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## Want to Learn More?

If you're interested in learning more on this topic, Ben will be presenting at the Bayfield Historical Society's Annual General Meeting on April 15th at 11:00am located at the Bayfield Lions Club Building (6 Municipal Road, Bayfield, ON). No ticket or RSVP is required. All is welcome.

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*The Lake Huron Coastal Centre is a registered charity founded in 1998 with the goals of protecting and restoring Lake Huron's coastal environment. We are the voice for Lake Huron.*

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