

Geotrails along the Bruce Trail:

a fun way to learn about the
fascinating geological and
environmental history of the Niagara
Escarpment

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APGO EDUCATION FOUNDATION
In partnership with

McMaster University, School of Earth, Environment & Society
and
Bruce Trail Conservancy

Acknowledgements

- Geotrails would not be possible without the assistance of:



What are Geotrails?

GEOTRAILS are **on-line guides** providing information about the **Geological** and **Environmental History** of the Niagara Escarpment along the famous Bruce Trail (<https://geoscienceinfo.com/vft/geotrails.html>)

Our Geotrails take visitors on a **hike** on the Bruce Trail or **virtually** at home to learn about the geology and natural environment through:

- High resolution **360° photos & drone videos** of important sites and features
- **Slide bars** to learn about what rock formations are and how to recognize them
- **3D LiDAR Models** to see exactly where to view key geological features

GeoscienceINFO
GEOTRAILS

Niagara Region Geotrails

Choose a Geotrail, go for a hike, and learn about the geology and natural environment



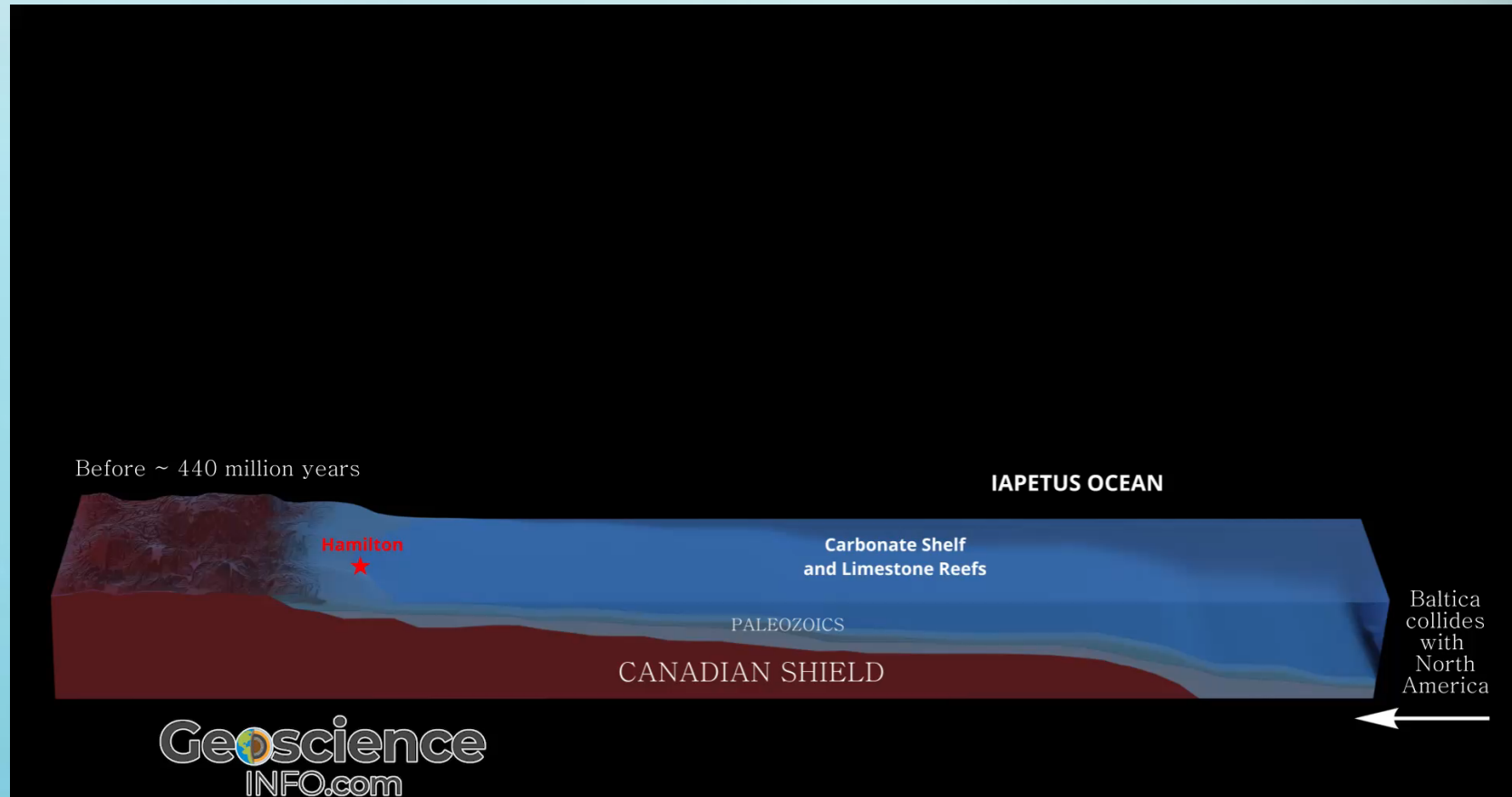
Why the Niagara Escarpment?

- Major **GEOGRAPHIC** and **TOPGRAPHIC** feature in Ontario but most people know little about its fascinating geological history or environmental importance
- It is important recreationally (**BRUCE TRAIL**) and economically (tourism, wineries, aggregates) and culturally (Hamilton - part of city infrastructure)
- **LIMITED** geological or environmental information is available to the public



Fascinating geological history

- Rocks exposed along the Niagara Escarpment accumulated as sediments in **shallow seas** that covered much of the North American continent (Laurentia) during the **Paleozoic (~450 – 420 Ma)**



Dolostones & shales

- Warm shallow seas allowed the accumulation of carbonate sediments – now preserved as **limestones and dolostones** (e.g. Flowerpots of Tobermory)
- Sediment eroded from the Taconic mountains was deposited as **sandstone and shale** (e.g. Queenston Shale)
- Resistant dolostones, easily eroded shales, give shape to the escarpment



<https://bigtimetravels.com/flowerpot-island-ontario-day-trip/>



<https://cvc.ca/discover-our-parks/the-cheltenham-badlands/>

Escarpment contains a rich fossil record



brachiopods



corals



eurypterids



trilobites



cephalopods

Why the Bruce Trail?

- Runs continuously along the **Niagara Escarpment** from Queenston in the south to Tobermory in the north
- **Canada's longest marked footpath**, hiked by many
- BTC, stewards of the trail, has **over 12,000 members**
- **Proximity to GTA** – of interest and accessible to public



Geotrails

- We have published **6 Geotrails** so far:
 - accessed on GeoscienceINFO.com
 - 3 in Hamilton region:
 - Chedoke Radial Trail, Sulphur Springs & Tiffany Falls
 - 3 towards Niagara:
 - Ball's Falls, Cave Springs, & Niagara Gorge



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Ball's Falls Geotrail



Cave Springs Geotrail



Chedoke Radial Geotrail



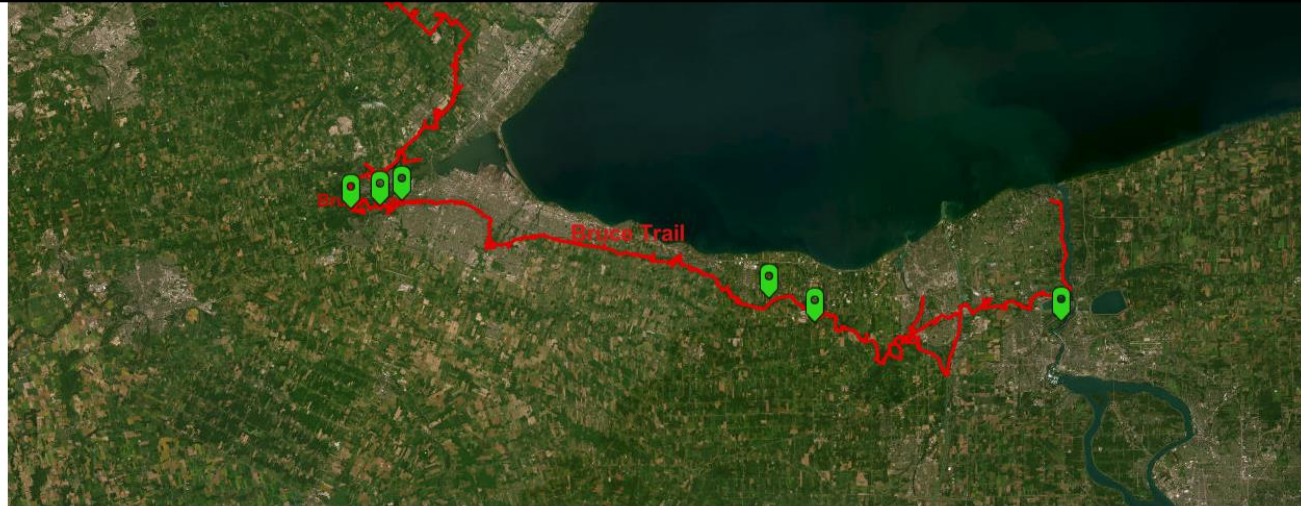
Niagara Gorge Geotrail



Sulphur Springs Geotrail



Tiffany Falls Geotrail

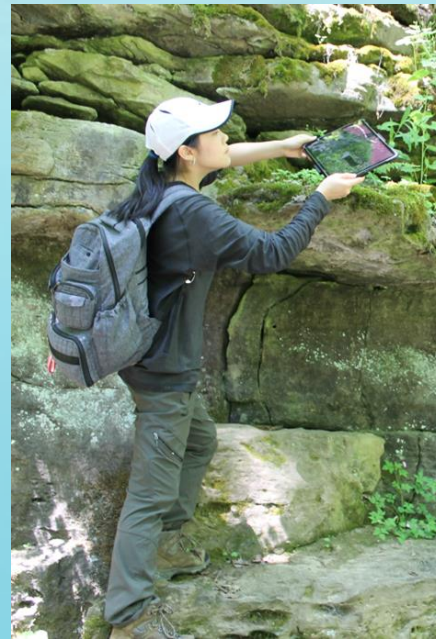


Earthstar Geographics

0 km

How are Geotrails constructed?

- Select portions of the Bruce Trail with **particularly interesting geological features**
- **Field team of undergraduate students** lead by a post-doctoral fellow surveys trail and collects information and images of key features
 - 360°, 3D scans, videos, drone images



How are Geotrails constructed?

- Review/synthesis of published literature and field data to create text
- Assemble trail using ESRI's ArcGIS Story Maps platform.
- Story Map format has a media option to accompany a section of text. Media can be: photo, 360° photo, video clip, 3D LiDAR model.

The screenshot displays the ArcGIS Story Maps editor interface. At the top, there are navigation buttons: a back arrow, a 'Published' status indicator, a 'Saved' indicator, and buttons for 'Design', 'Preview', and 'Publish'. A user profile icon is visible in the top right corner. The main content area is titled 'Stop #8: Royal Ontario Museum'. It features a text block on the left and a media block on the right. The text block is circled in red and contains the following text: 'The Royal Ontario Museum (ROM) is Canada's largest museum of art, culture, and nature from around the world¹. The museum features 40 gallery and exhibition spaces that showcase a diverse collection of 13 million objects and specimens¹. Its exhibits attract more than one million visitors every year, making the museum'. The media block is circled in blue and shows a photograph of the Royal Ontario Museum building. Below the main content area is a 'Sidecar' panel with a 'Drag slides to reorder' instruction. It contains six slide thumbnails, with the first slide showing the same photograph of the ROM building. A '+' button is visible in the bottom right corner of the sidecar panel.

Published Saved Design Preview Publish

Stop #8: Royal Ontario Museum

Text

The Royal Ontario Museum (ROM) is Canada's largest museum of art, culture, and nature from around the world¹. The museum features 40 gallery and exhibition spaces that showcase a diverse collection of 13 million objects and specimens¹. Its exhibits attract more than one million visitors every year, making the museum

Media

Sidecar Drag slides to reorder

1 2 3 4 5 6

Ball's Falls Geotrail

- Ball's Falls lies on the **Bruce Trail** and is also identified as a 'geosite' for the **Niagara Peninsula Aspiring Global Geopark**
- <https://experience.arcgis.com/experience/c39fea16e5994697844239ba5a2f2e84/>



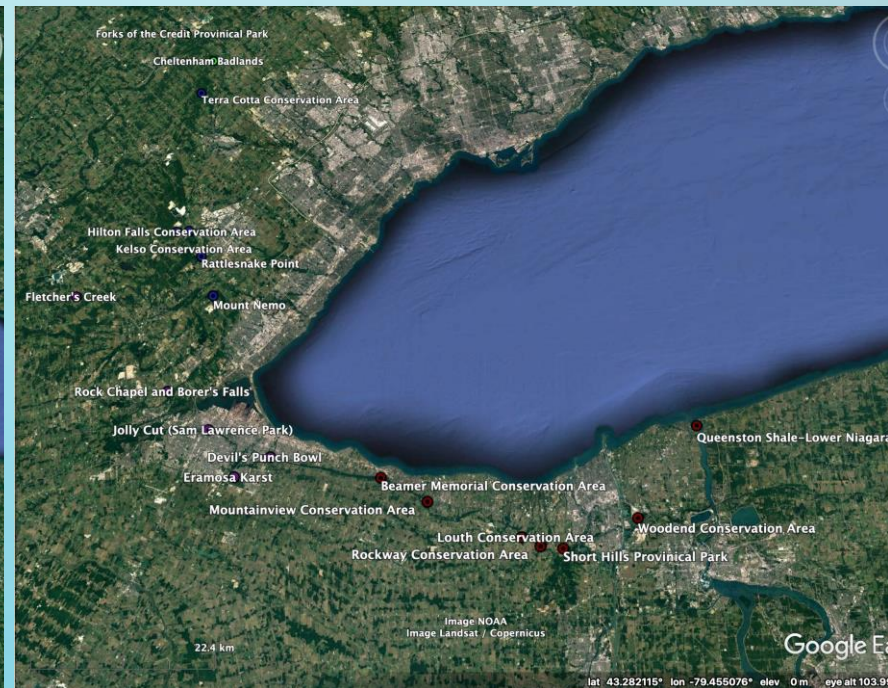
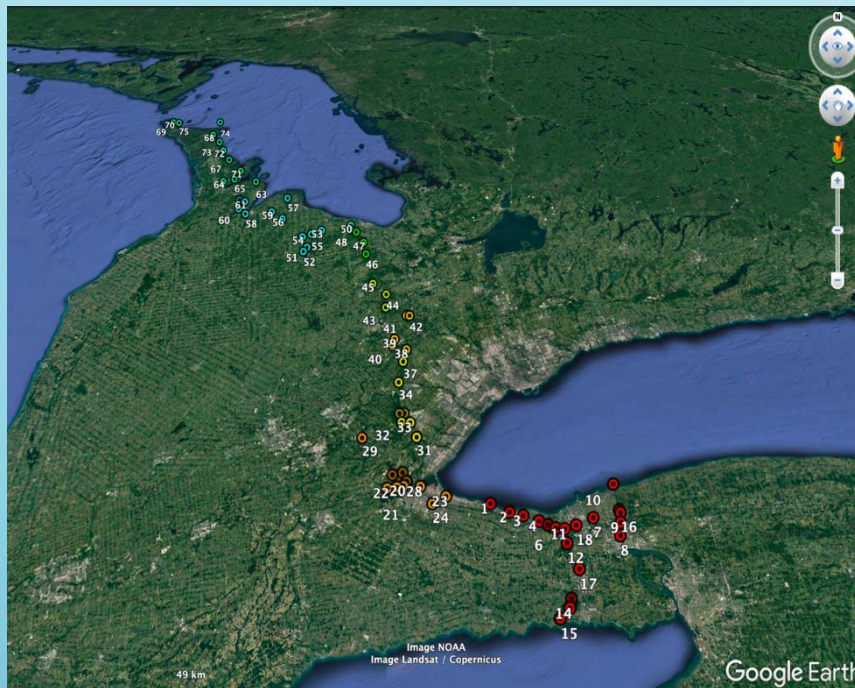
Tiffany Falls Geotrail

- This geotrail focuses on the fluvial and ecological processes active in the **Tiffany Falls Conservation Area** in Hamilton
- <https://experience.arcgis.com/experience/c0b10d68480444ebacde08432b5076b8/>



What's Next?

- Over the next **three years** we plan to complete at least **10 Geotrails** in each major section of the Bruce Trail from Niagara to Tobermory (*subject to funding*)
- Work will be done by **2 field crews** of geological students overseen by a post-doc & supervised by **faculty** at McMaster



How can BTC members help?

- Please send us suggestions for **additional geotrail segments** on the Bruce Trail
- Let us know of any **interesting/unusual geological features** you see along the trails
- Send us any comments/suggestions you have about enhancement of the geotrails to manager@geoscienceinfo.com





THANK YOU

Questions?