

Explore the Geology of Ottawa-Gatineau

Saturday, October 14th 2017

10 a.m. to 3 p.m.

By Beth McLarty Halfkenny

Did you know? In the last 2 billion years, the National Capital Region has been home to a huge mountain chain, a tropical beach, a habitat for large whales, and buried under 2km of ice. Where do the rocks in your backyard fit in?

Explore Geoheritage Day is an annual event held at localities of particular geological interest throughout Ottawa and Gatineau. Volunteers from the Department of Earth Sciences at Carleton University and the Ottawa-Gatineau Geoheritage Project will be on hand to explain what there is to see and how each site fits into the local geological history. This is a perfect event to spark your child's interest in science, technology, engineering and math (STEM), for high school students trying to decide on a university major and for adults with a recreational interest in science.

The sites that we host vary from year to year. Typically, these sites are included for their exceptional geology:

Champlain Bridge Stromatolites

Gatineau



Along the Ottawa River underneath the Champlain Bridge in Gatineau is a pavement of circular mounded structures called stromatolites. These are common fossils in our community. They help us to imagine what this area would have looked like 450 million years ago.

These mounds were once living things – not your average rock! Stromatolites are created by cyanobacteria, one of the first unicellular life forms and the first known organisms to carry out photosynthesis. The bacteria produce a mucus that traps sand, calcium carbonate and other minerals. These materials combine to form a crusty layer on top of the bacteria. The bacteria continue to grow vertically beyond the sand where they can reach sunlight. The process repeats to form layer after layer. The cyanobacteria feed on carbon dioxide, sunlight and water, and in turn give off oxygen.

Today, there are few living stromatolites. Where they do occur, they form in extreme environments - often tropical, shallow and very salty sea water. Finding them in rocks in our area is an indication that Ottawa-Gatineau was once located near the equator at the edge of an ocean. What has happened since to change our environment?

Hog's Back Falls

Old Ottawa South



Hog's Back Falls is like an open book when it comes to geology. It's an excellent example of so many different geological concepts, all in one place, with a cross section to view what is going on beneath the surface. The rocks tell a story about what was happening in that spot as each layer was deposited on top of one another. They record when the water level changed. They record the different types of sediment being brought into the area and how these conditions changed over time. It's all there in the bedrock, unobstructed by vegetation. It really is a big slice of time.

There are many faults in the Ottawa area, places where the Earth's crust has broken and been displaced. Faults result when the stress on the rock becomes so great that it reacts by breaking and one side moves relative to the other, up and down or past each other. Few faults are visible, however, where we can see them, so Hog's Back is very special. This location provides an excellent learning opportunity, with the fault totally exposed at surface level.

Pinhey Sand Dunes

Nepean



The Pinhey Sand Dunes are located just off of Woodroffe Avenue – but you would never know it. It's not the sort of thing you would expect to find in the middle of a forest. The dunes consist of approximately 2 acres of pristine white sand. This unique ecosystem is home to plants and animals typically exclusive to desert environments. Orchids flourish here. It's home to an insect called the Antlion, which uses conical holes in the sand to trap ants for food.

This area was once a shoreline of the Champlain Sea, a temporary extension of the Atlantic Ocean at the end of the last ice age. Since then, the dunes have been shrinking. If the local vegetation keeps encroaching, they will eventually disappear and the species who inhabit it will become extinct locally. That's why a local organization called Biodiversity Conservancy International is working to restore the area. The Pinhey Sand Dunes are a locally unique and interesting spot that they are working to protect and use for education purposes.

Cardinal Creek Karst Orleans



Did you know that there is a cave system in Orleans? The Cardinal Creek Karst was recently designated an Earth Sciences Area of Natural Scientific Interest by the province. This locality is not usually open to the public. Don't miss this opportunity to explore some remarkable geology in your community.

A Karst is a geological term for an underground cave system resulting from soluble rocks, typically limestone or dolomite. They can hold large amounts of groundwater, much of which is converted to drinking water all over the world. Up to half of global oil reserves are contained in these formations.

The Cardinal Creek Karst is not the only cave in the National Capital Region. The Lusk Cave is located inside Gatineau Park and the Bonnechere Caves are in Eganville. The Karst is the only one, however, that is believed to predate the last ice age.

A cave is a difficult thing to date. How do you determine when it formed? Some parts of the Cardinal Creek Karst are full of sediment, which is unusual in this area. That can mean one of two things - either it's the oldest local cave system, or it's the only one with evidence that it's that old. What's your opinion? Come out and learn how to read the stories the rocks can tell.

This year's sites will be finalized on our website the week leading up to the event. Please go to earthsci.carleton.ca for detailed information. We look forward to meeting you!