Reversing Falls Rapids

Information Sheet

Location: REVERSING FALLS RAPIDS
Conservation designations: Stonehammer UNESCO Global Geopark
Grid reference: GPS: 45.2642664, -66.0880366
Address: 100 Fallsview Ave, Saint John, NB E2K 0G8
Parking available: Yes
Personnel to be contacted prior to visit: City office responsible for washrooms to check if they will be open. Skywalk Saint John: 200 Bridge Road, Saint John, NB (506) 642-4400
Saint John Adventures Inc: 100 Fallsview Ave, Saint John, NB (506) 634-9477

Useful equipment:
- Camera
- Binoculars

Relevance national curriculum:
Grade 7 Unit 2 Earth's Crust.
Grade 8 Unit 1 Water Systems on Earth.
Grade 9 Social Studies 9.2.1 & 9.2.4.
Physical Geography 110: Geological emphasis Unit 5G:
Canadian Geography 120: The Physical Basis of Canadian Geography.

Rock types and geological processes observed: Wilson cycle, plate tectonics closing Iapetus Ocean. Caledonia Fault visible contact, Brookville (Precambrian marble) and Caledonia (Cambrian sandstone and shale) Terranes and Ice Age erosion.
Geological structures: Fault, gorge, fossils
Earth processes: eg. Landslides, volcanoes, mudflow seabed sediment, continental drift, continental crust fragmentation, graphite mining, glaciation and erosion
Geological periods present: Precambrian, Cambrian, Ordovician, Quaternary

Site specific hazards and risks:
- Traffic
- Seasonal maintenance, ice possible
- Open water, strong currents

Mitigation measures:
- Park in designated areas
- Do not collect rocks or fossils
- Do not feed or disturb wildlife habitat
- Do not litter
- Find out whether the tide is going in or out and the next high or low tide occurs

Did you know: The Reversing Falls are famous for the tidal phenomenon that forces the Saint John River to flow backwards as the Bay of Fundy reaches high tide. The difference in tide can be 8 metres! A narrow gorge where the river flows out to the sea and an drowned waterfall make for powerful rapids and whirlpools at low tide, which are brought to a standstill by the rising tide. High tide sees rapids flow in the reverse direction as the tide water forces its way upstream, before another slack tide brings a period of calm and then low tide frees the river's flow to the sea again approximately 12hrs 25 mins later as the cycle continues.

Topics to cover before visit: Plate tectonics, Ice Age, Fundy tides, industrial history, erosion, Wilson Cycle and Wolastoqiyik culture

Keywords: Continental collide, plate tectonics, Ganderia, Avalonia, Gondwana, Laurentia, Rheic Ocean, Iapetus Ocean, Wilson Cycle, terrane, contact, Pangaea, Cambrian, glaciation, moraines, Koluskap, Fundy tides, graphite mining, seals, cormorants, pulp mill, log drive

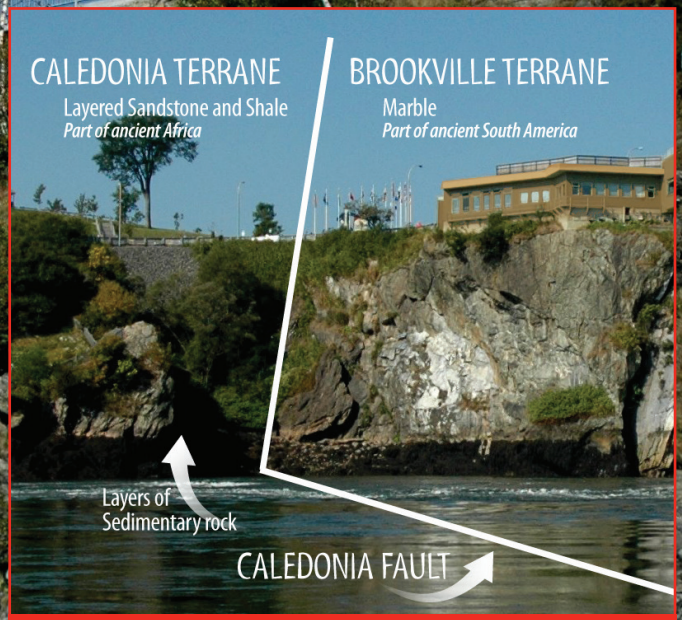
Format developed by the Western Education and Library Board's Magilligan Field Centre

Colliding Continents

Two continental fragments collided here during the closing of the Lapetus Ocean. Right is marble of the Precambrian Brookville Formation associated with Amazonia (proto South American continent) and left is sandstone and shale from the Cambrian Caledonia Formation associated with Gondwana (proto African continent)

Trilobite

Trilobite fossils are found throughout the Cambrian sandstone and shale in Saint John. Many important specimens, including type fossils of certain species, are found in the NB Museum collection. The rocks this fossil came from have been studied extensively to develop a time frome for Cambrian rocks worldwide.



Caledonia Fault Line

The Caledonia faultline runs through the Stonehammer Geopark area.

Geological history*:

The geological story here is a story of plate tectonics and the collision of ancient continents. Here you can see the contact of two ancient continental fragments that began their story far, far away. Looking across the river, north of the bridges, the light gray marble rocks are Precambrian age, 750 million to a billion years old, part of Ganderia, a fragment of crust once attached to South America. To the south are darker Cambrian shale and sandstone rocks 541 to 485 million years old, part of Avalonia, a fragment of crust once attached to Africa. Each rock type was formed, million of years and many kilometres apart, from shallow ocean sediments on the margins of the ancient continents.

Geologists call these fragments of crust, terranes, pieces of the earth's crust that have broken off one continental plate and attached to the crust on another continental plate. In this case, South America and Africa's continental plates had pieces break off that attached to North America's, and right here you can see them extremely well.

The Wilson Cycle, or the cycle of opening and closing of ocean basins, is an integral element of the Drifting Apart story as it explains how oceans such as the ancient Iapetus Ocean open and closed over many millions of years. Ocean closure was enabled by subduction of the ocean floor underneath a continental plate, which created a lot of volcanic activity. The volcanic rock in surrounding geosites in Stonehammer provide evidence of this activity, as do the convoluted deformation of the earth's crust visible in folding and thrusts in the area. Fossil stromatolites (found near Dominion Park) in the Brookville Terrane are the oldest evidence of life in the Drifting Apart area which covers many thousands of square kilometres.

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