



DRIFTING APART



Conservation designations: *Stonehammer UNESCO Global Geopark (1st 10km); Fundy UNESCO Biosphere Reserve; Trans Canada Trail*

Grid reference: GPS: 45° 23'11" N / 66° 27'55" W

Address: Fundy Trail Pkwy, Salmon River, NB E5R 0B3

Parking available: Yes, seasonal/fees apply, school programming available

Personnel to be contacted prior to visit: 1-866-386-3987 or info@fundtrailparkway.com

Driving Directions:

Route 111 from Saint John or Sussex located 10 km east of the Village of St. Martins

Site specific hazards and risks:

- Steep drops, eroding edges
- Mixed use car, bikes and hiking, be aware of surroundings
- Wear footwear suitable for hiking across sandy, wet and rocky areas
- Temperatures can change within the park
- Fear of crossing the suspension bridge
- Danger of being stranded on beaches due to quick changing tide. Ensure familiar with tide schedule and be aware the tide can come in quickly behind you

Useful Equipment:

- Compass and map or GPS
- Binoculars
- Sketch book
- Sun protection
- Cornstarch, water & container for glacier experiment
- Camera
- Tide table
- Towel
- Wear layers

RELEVANCE PROVINCIAL CURRICULUM

Grade 7 Unit 2 Earth's Crust. *Examine catastrophic events that occur on or near the earth's surface-volcanoes, earthquakes; explain the process of mountain formation and the folding and faulting of earth's surface; develop a chronological model or time scale of major events in earth's history; classify and describe rocks on the basis of their transformation in the rock cycle; explain various ways that rocks can be weathered; describe how plate tectonic theory has evolved in light of new genealogical evidence.*

Grade 8 Unit 1 Water Systems on Earth. *Unit 1 How waves and tides are generated and how they interact with shorelines; processes of erosion and disposition that result from wave action and water flow, processes that lead to development of ocean basins and continental drainage systems.*

Grade 9 Social Studies 9.2.1 *Demonstrate an understanding of the basic features of Canada's landscape and climate: explain the creation and characteristics of mountains and plains; examine a map showing the earth's major plates and their direction of movement; identify zones of compressional and zones of tensional forces; Physical weathering or chemical weathering; use block diagrams (i.e., cross-sections) to describe the landform features resulting from continental glaciation (e.g., medial moraine, terminal moraine, esker, drumlin, and erratics) and alpine glaciation (e.g., medial moraine, terminal moraine, hanging valley, horn); develop a photo-essay to illustrate some of the coastal features formed by wave action (e.g., tombolo, spit, bay beach, stack, sea arch, sea cave); 9.2.4 analyse the effect of geographic features on the development of Canada and of a selected country with similar geographic features.*

Physical Geography 110: *Geological emphasis Unit 5G: From Continental Drift to Plate Tectonics: Field Work and Local Studies*

Canadian Geography 120: *The Physical Basis of Canadian Geography: evolution of the Canadian landscape through geologic time; landform processes.*

Mitigation measures:

- Park in a designated area
- 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 when the next high or low tide occurs

Topics to cover before visit Coastal erosion, ancient erosion: fluvial, alluvial fan, and dune deposits, rock classification, Plate tectonics, Atlantic Ocean formation (breakup of Pangea)

Keywords Coast cliffs, physical erosion, fluvial, alluvial fan, dune deposits, sandstone, conglomerate, Echo Cove formation, Middle Triassic, rift valley, aulacogen, Pangea, flowerpot rock, volcanic, sedimentary, Silver Hill formation, Seelys Beach formation, clay, cobble, grain size, Iapetus Ocean, Atlantic Ocean, Island Arc volcanoes, Seafloor sediments

Rock types and geological processes observed

Sandstone and conglomerate: fluvial, alluvial fan, and dune deposits into a rift valley (aulacogen) associated with the breakup of Pangea and the initial stages of Atlantic Ocean formation; erosion features, coastline. Volcanic and sedimentary rocks from Iapetus Ocean island arc volcanics and sea floor deposits.

Geological structures Flowerpot rocks, cliffs, ocean, river, waterfalls

Earth Processes Continental drift, physical erosion, folding and thrusting, volcanoes, landslides

Geological periods present Precambrian to Cambrian (about 600 to 500 Ma) and Permian to Triassic (about 251 to 199 Ma)

Did you know?

The Fundy Trail gets to the heart of the story of the Opening of the Atlantic Ocean, where the Drifting Apart area got its name. Permian-Triassic rocks record the breakup of Pangea and the opening of Atlantic Ocean. Coastal erosion of the sandstones has produced spectacular sea caves and flowerpot rocks.

ADD further info about the cliffs ripping apart beginning as a rift valley?

Geological history*

The rock outcrops along the Fundy Trail Parkway expose both Precambrian to Cambrian rocks near the bridge at Big Salmon River and Triassic age rocks along the coast to the west. About 400 million years of Earth history can be seen here! The older rocks tell the story of the ancient Iapetus Ocean which existed before the Atlantic Ocean while the younger Triassic indicate the Atlantic Ocean was created by sea-floor spreading. Molten rock from the Earth's interior rises to the surface to create new crust. As it rises and cools the new crust expands along volcanic mountain chains on the seafloor. Old crust returns to the Earth's interior along deep ocean trenches. Seafloor volcanic mountain chains mark the middle of an expanding ocean basin. The rising molten material creates a 'bubble' in the crust that eventually breaks (to create volcanoes).

They eventually join to form a long break in the crust where a new ocean is born. One crack fails to join another. The 'failed rift' is called an aulacogen. The Bay of Fundy is a 'failed rift' created when the Atlantic Ocean was born. Instead of becoming part of a new ocean, it became a 'rift valley' that filled with sediment. Water action erodes rocks breaking down the layers and the resultant mud and sand are washed out into the Bay of Fundy by the St John River.



Flower Pot Rock, part of the Triassic coastline stretching from St. Martin's to Big Salmon River further along the Fundy Trail, is a testament to the power of the tides and coastal erosion.



Triassic sedimentary rock along the Fundy Trail consists of bedding of various size and colour of clasts. This fragment of sandstone shows finer clast and is intermingled with conglomerate.



Long Beach extends 500m into the Bay of Fundy at low tide so you can truly walk on the ocean floor. The 2.5km beach is sandy and the shoreline is rimmed with an array of rocks of a range of sizes from tiny particles in clay to