

Research Card: Animated Earth



Potential Culprits

Water and Ice: All forms of water, including glaciers, the ocean, and precipitation like rain, can cause geological change through erosion and deposition. They can even be powerful enough to carve out large pieces of land.

Tectonic Plates: Tectonic plates lie on top of the fluid mantle, causing geological change through the moving the continents (continental drift). This movement can lead to earthquakes, volcanoes, and landforms like mountains or rift valleys.

Air: The atmosphere around us can cause geological change through wind erosion, deposition, and the generation of waves.

Living Things: Things that are alive can cause geological change by producing chemicals that can cause erosion and weathering, or through changing the climate. Things that were once alive make organic matter that can create some geological formations.

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Driving Question

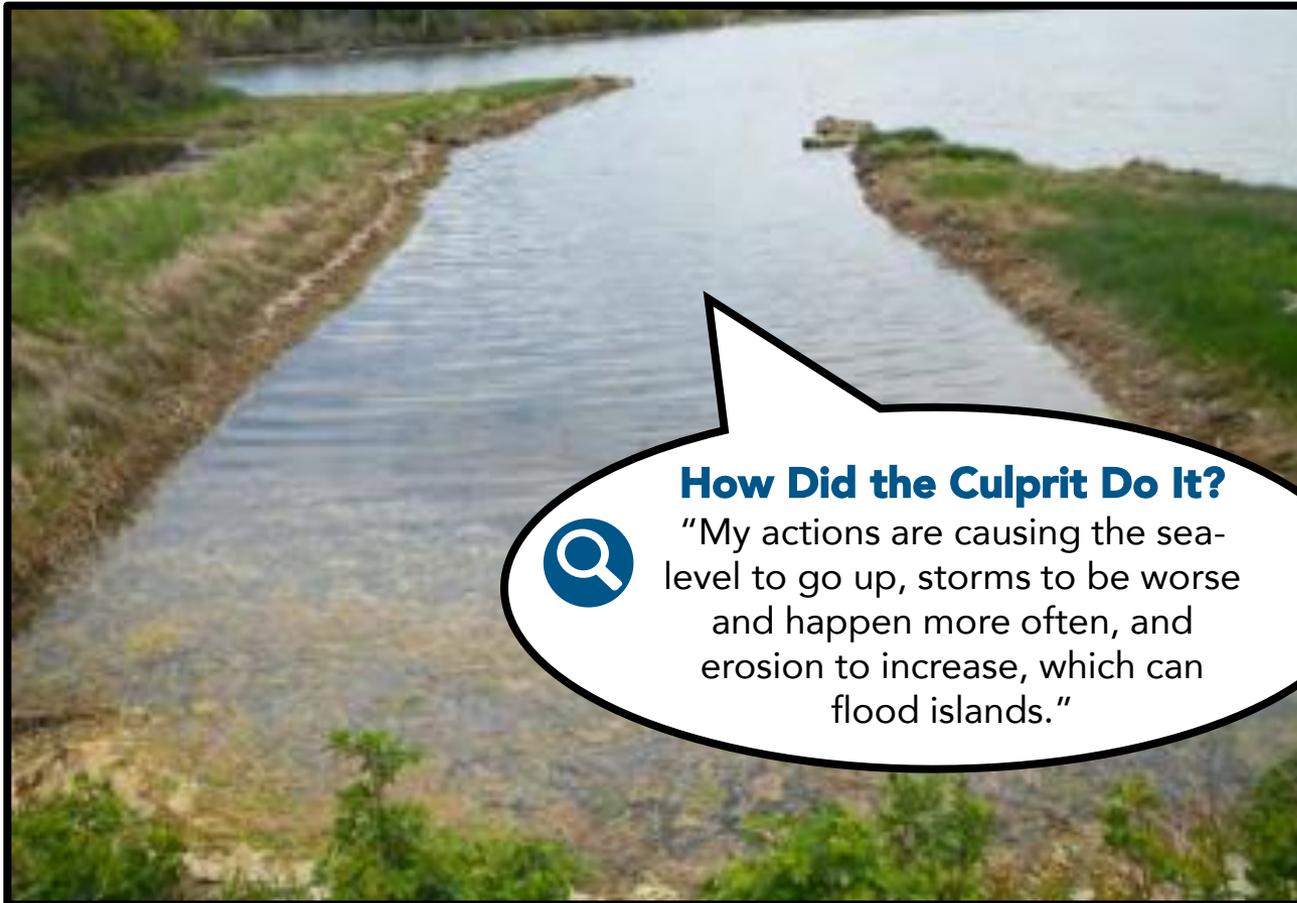
How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? An Island
(an area of land surrounded entirely by water)

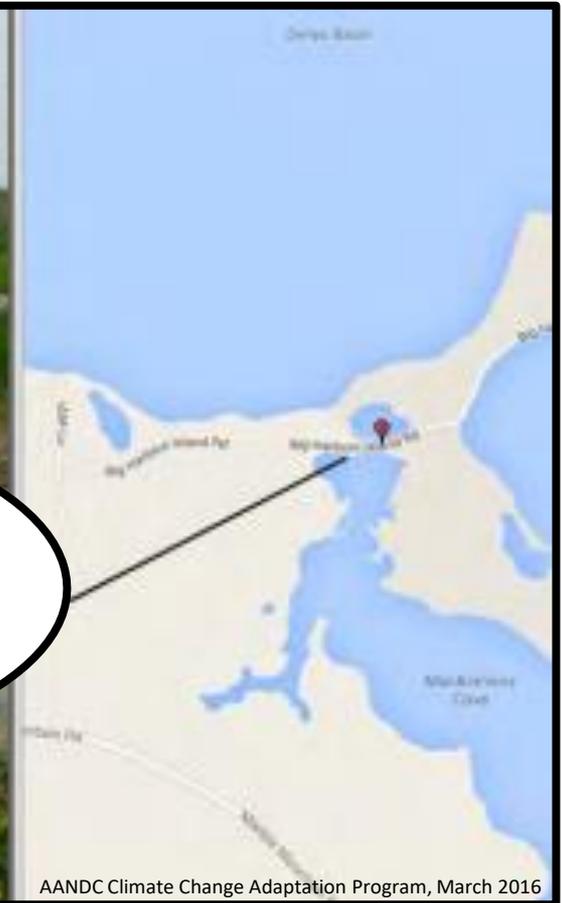


Where in Nova Scotia Can You See an Island? Siskuikek, At the muddy place (Big Harbour Island, Melikewe'j First Nation, Cape Breton)



How Did the Culprit Do It?

"My actions are causing the sea-level to go up, storms to be worse and happen more often, and erosion to increase, which can flood islands."



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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Make? A Sinkhole
(a hole in the ground with no natural drainage)



Where in Nova Scotia Can You See a Sinkhole?
Kwesomalegek, The Hardwood Place (Cumberland County)



How Did the Culprit Do It?



"My actions, like the building of roads and underground pipes, are making the ground less stable and increasing the risk of sinkholes."

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Make? A Mine (a hole in the ground made so things like metals can be removed)



Where in Nova Scotia Can You See a Mine?

Sedabooktook, *Harbour running far back* (Crow's Nest gold mine, Guysborough county)



How Did the Culprit Do It?



"I removed massive amounts of rock and soil to get to the precious items within the Earth, fast-tracking the natural erosion process."

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change?

Agricultural Land (land that can support the growing of food)



Where in Nova Scotia Can You See Agricultural Land?

Kespukwitk, *End of Flow* (Annapolis Valley)

How Did the Culprit Do It?



"I use fertilizers to force the soil to produce lots of the same type of food, which stresses the land and makes the soil easy to erode (take away)."



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Driving Question

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What Landform Did the Culprit Help Make? A Land Bridge (a partially underwater strip of land that connects two areas of land)



Where in Nova Scotia Can You See a Land Bridge? Canso Causeway, connecting Matuesuatp, *Porcupine Head (Cape Porcupine)* and Apatamkiaq, *At the place of the turning sand (Port Hastings)*



How Did the Culprit Do It?



“By depositing millions of tonnes of rock, I connected Cape Breton to the mainland and separated the northern and southern Atlantic Ocean.”

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? A Shale Formation (an area covered by a type of smooth rock that breaks easily into layers)



Where in Nova Scotia Can You See a Shale Formation? *Knektkuk River extending far away (Kennetcook, East Hants County)*



How Did the Culprit Do It?



"Below the ground there is shale (rock that breaks easily) that I cracked with high-pressure water, to release the natural gas below."

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? Many Rock Types



Where in Nova Scotia Can You See Many Rock Types? Kjipanu'pek, *Great bay opening out to the sea* (Areas along St. Margaret's Bay)



How Did the Culprit Do It?



"As I sit on rocks, I release chemicals that breaks them down (erode); I can also get into holes in the rock, making the cracks bigger."

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? Many Rock Types



Where in Nova Scotia Can You See Many Rock Types? Kejimikujik, *Tired Muscles/Little Fairies* (Kejimikujik National Park)

How Did the Culprit Do It?



"As my roots grow, I puts stress and pressure on rocks, causing the rocks to crack."



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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Make? The Horton Group (a large area of layered rock across much Nova Scotia)



Where in Nova Scotia Can You See The Horton Group?
So'qmkiknuk At the place where the pole is used to push instead of paddling (Shelburne, Shelburne County)

How Did the Culprit Do It?



"When I died, I layered on top of other organic matter, which created the conditions needed to produce coal."



Anthony Devlin for PA Wire, 2017.

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Make? An Agricultural Dyke (a bank used to hold back water)



Where in Nova Scotia Can You See an Agricultural Dyke? Apji'jkmujue'katik, *Place of the Ducks* (Wellington Dyke, Kings County)



How Did the Culprit Do It?



"I formed this barrier between the Canard River and the fertile land so it could be used to grow food."

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Driving Question

How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? Quartzite Ridges (hard and dense metamorphic rock)



Where in Nova Scotia Can You See Quartzite Ridges? Kwipék* (Bedford Barrens, Halifax County) **Mi'kmaw meaning uncertain*



How Did the Culprit Do It?

"I made markings like the one on the quartzite ridges of the Bedford Barrens. These cultural symbols are now difficult to see due to erosion."



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Definition Page

Basin: A bowl-like indent in the Earth's surface. Some basins are filled with water.

Bedrock: Solid rock beneath surface materials like soil and gravel.

Chemical Weathering: The process of breaking down rocks by changing their chemical structure.

Coal: A hard rock containing a lot of carbon that can be burned as a solid fossil fuel.

Deposition: The process that adds soils, rock, or other sediments to a landform.

Fissure: A narrow crack or opening.

Fjord: A deep, narrow body of water that stretches inland.

Glacial Rebound: The rise of land masses that were under pressure from the huge weight of ice sheets during the last ice age.

Granite: Hard igneous rock containing quartz and other minerals. It is one of the oldest rocks on Earth.

Groundwater: Water beneath the Earth's surface contained in soil, cracks in rocks, and underground reserves.

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Definition Page

Gypsum: A mineral that produces large beds of soft rock that is soluble in water.

Mechanical Weathering: The process of breaking larger rocks into smaller ones.

Organic Matter: Decomposed or decomposing matter that was once alive, containing high amounts of carbon.

Peat Bog: A wetland where high amounts of organic matter are repeatedly deposited.

Sea-Level Rise: The average long-term global rise of the ocean's surface measured from the centre of the earth. In the past century, climate change has drastically increased the rate of sea-level rise around the world.

Tilling: Preparing the land for crops by turning up the earth.

Water Soluble: Able to be dissolved by water.

Windsor Group: A group of rocks covering large areas of Hants County and Kings County that consist of soft, water-soluble calcium and salt-rich rocks like gypsum, limestone, and siltstone.

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The Rock Cycle

Metamorphic Rock

Rock that has been transformed from its original form through intense heat or pressure

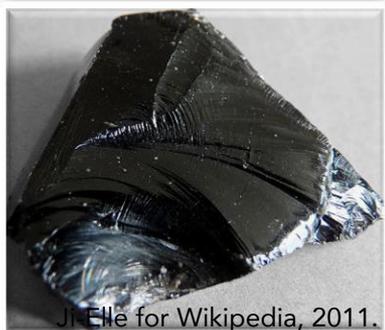


OnlineScienceMall, 2019.

Melting and Cooling
Heat and Pressure

Igneous Rock

Volcanic rock, formed from the cooling of magma or lava



Jr Elle for Wikipedia, 2011.

Weathering and Erosion
Weathering, Erosion, and Pressure

Sedimentary Rock

Rock formed from other rocks by the deposition of small particles



Minimegeology.com, 2019.

Weathering and Erosion
Heat and Pressure

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Our Most Likely Culprit Is...
