

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 Make? A Drumlin (a long oval-shaped hill)



**Where in Nova Scotia Can You See a Drumlin?
Kuowaq'e'jk, *Big Pine Hill* (Citadel Hill, Halifax)**



How Did the Culprit Do It?



"As I left Nova Scotia, I scraped the land and deposited (left behind) large amounts of dirt in the shape of this oval hill."

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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 Erratic (a rock that does not match the rocks of the area)



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



How Did the Culprit Do It?



"As I moved across Nova Scotia, I carried these large granite boulders from a nearby mountain and deposited (left them) in random places."

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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 Lake Basin (a dent in the land where the water of a lake can collect)

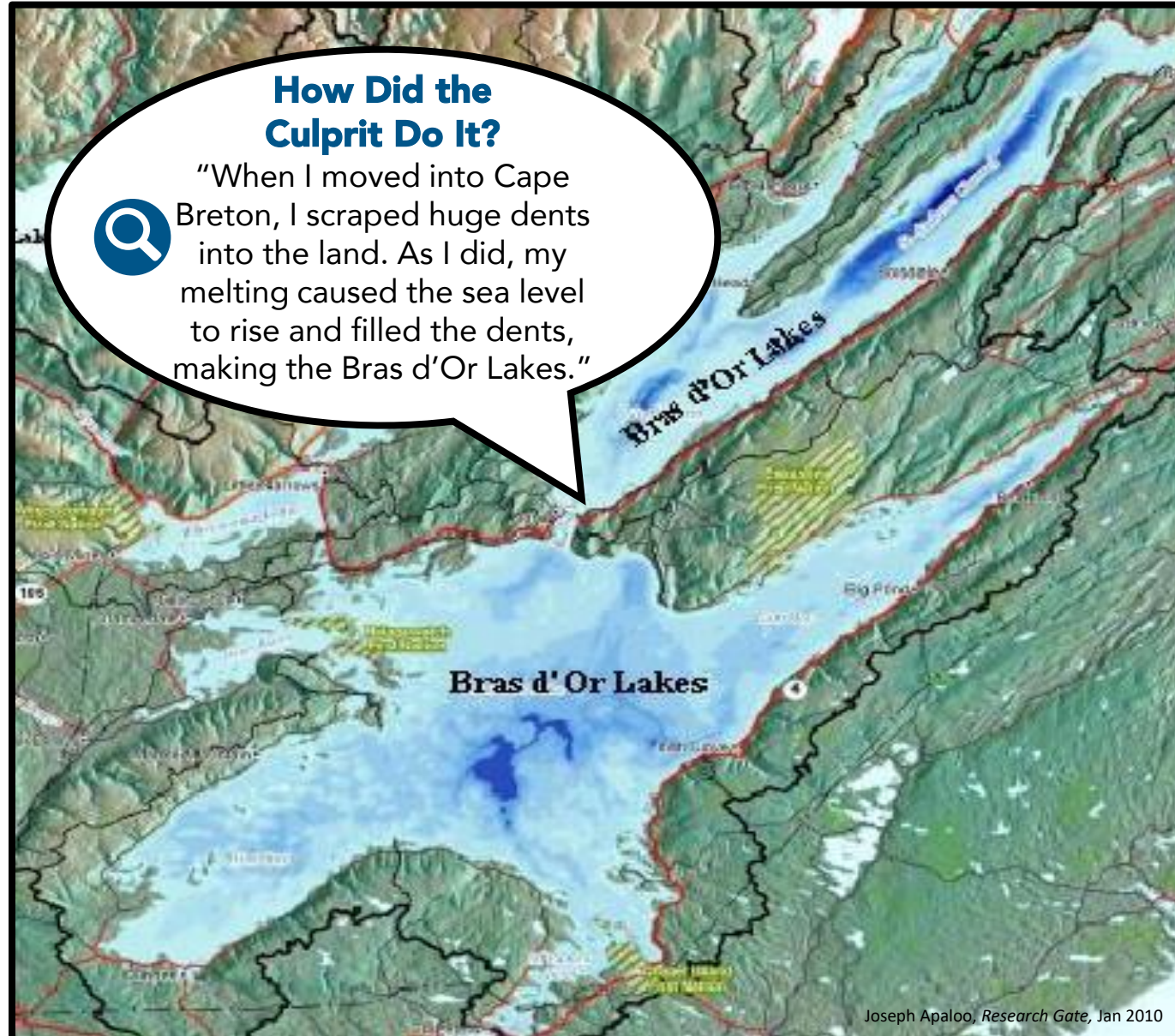


Where in Nova Scotia Can You See a Lake Basin? Pitu'pok/Pitu'paq, *Long dish of saltwater/To which all things flow* (Bras d'Or Lakes, Cape Breton)

How Did the Culprit Do It?



"When I moved into Cape Breton, I scraped huge dents into the land. As I did, my melting caused the sea level to rise and filled the dents, making the Bras d'Or Lakes."



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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 Roche Moutonnée (a hill with a smooth gentle slope side and a steep, rough cliff side)

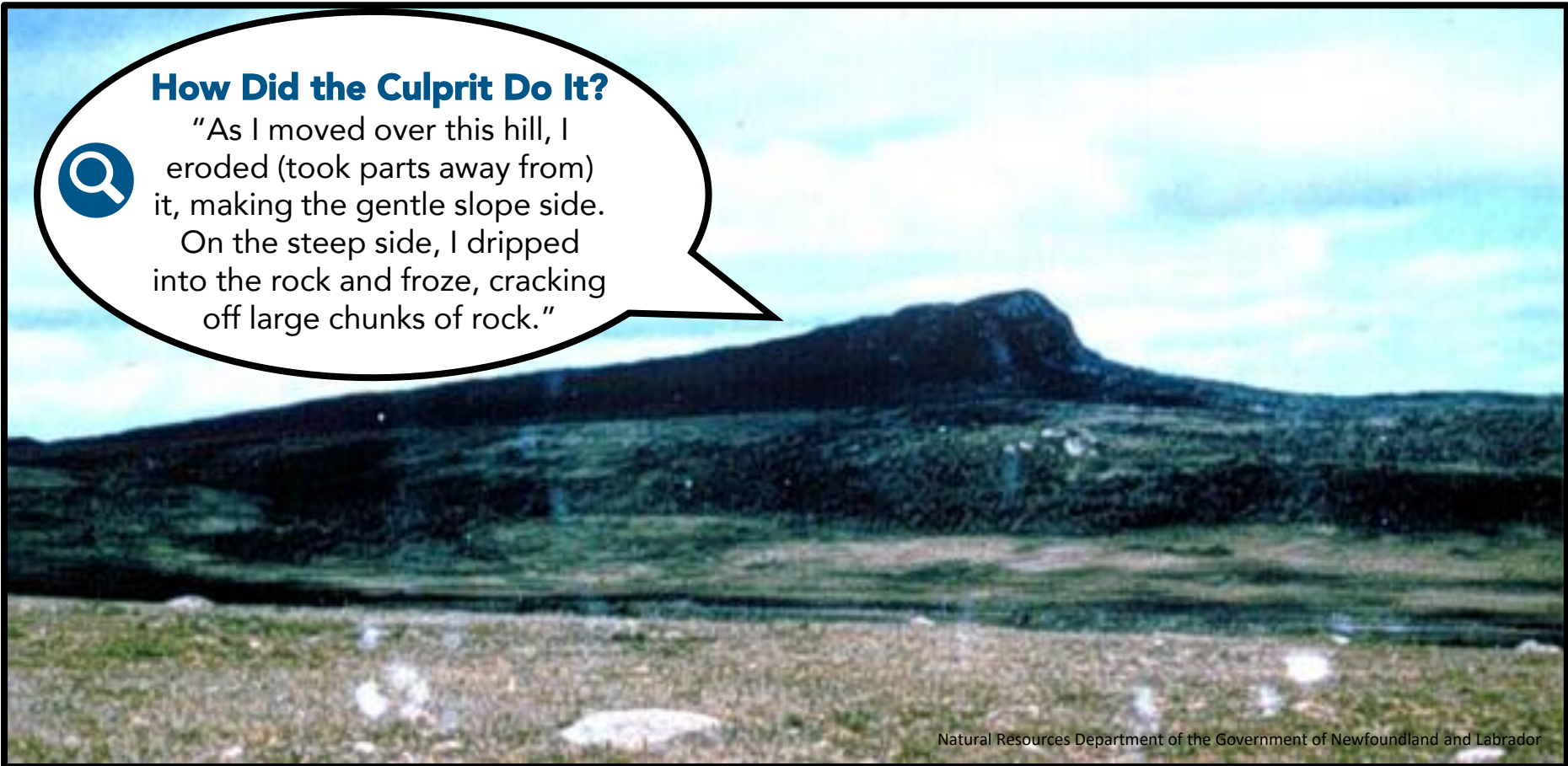


Where in Nova Scotia Can We See a Roche Moutonnée? Nukumkikewe'jk, *At the soft place* (Taylor Head Provincial Park)

How Did the Culprit Do It?



"As I moved over this hill, I eroded (took parts away from) it, making the gentle slope side. On the steep side, I dripped into the rock and froze, cracking off large chunks of rock."



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Driving Question

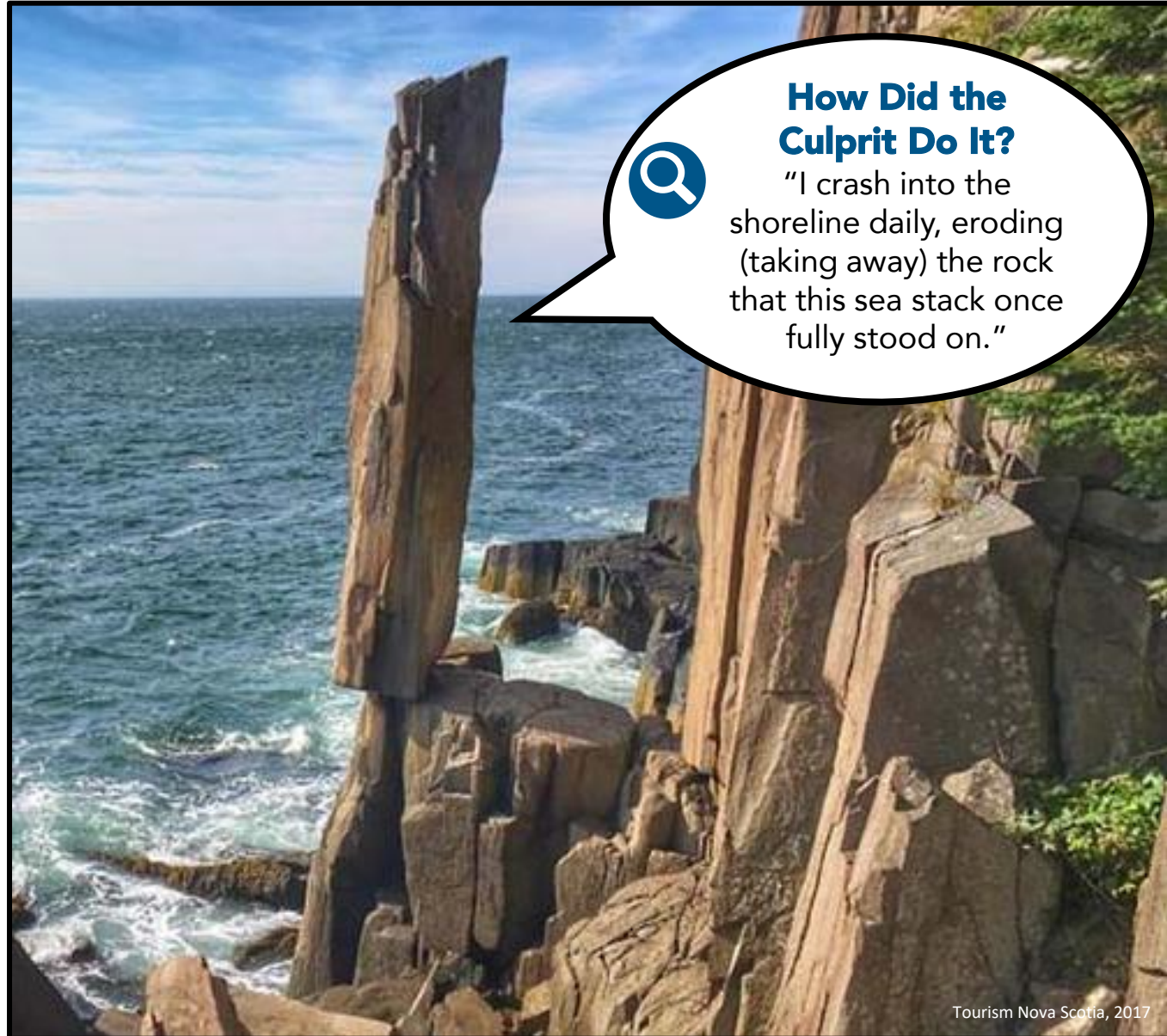
How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Make? A Sea Stack (a column of rock detached from the shoreline)



Where in Nova Scotia Can You See a Sea Stack? We'kwayik/Wsituaq nek, *At the end of land* (Digby Balancing Rock, Digby Neck)



How Did the Culprit Do It?

"I crash into the shoreline daily, eroding (taking away) the rock that this sea stack once fully stood on."

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Driving Question

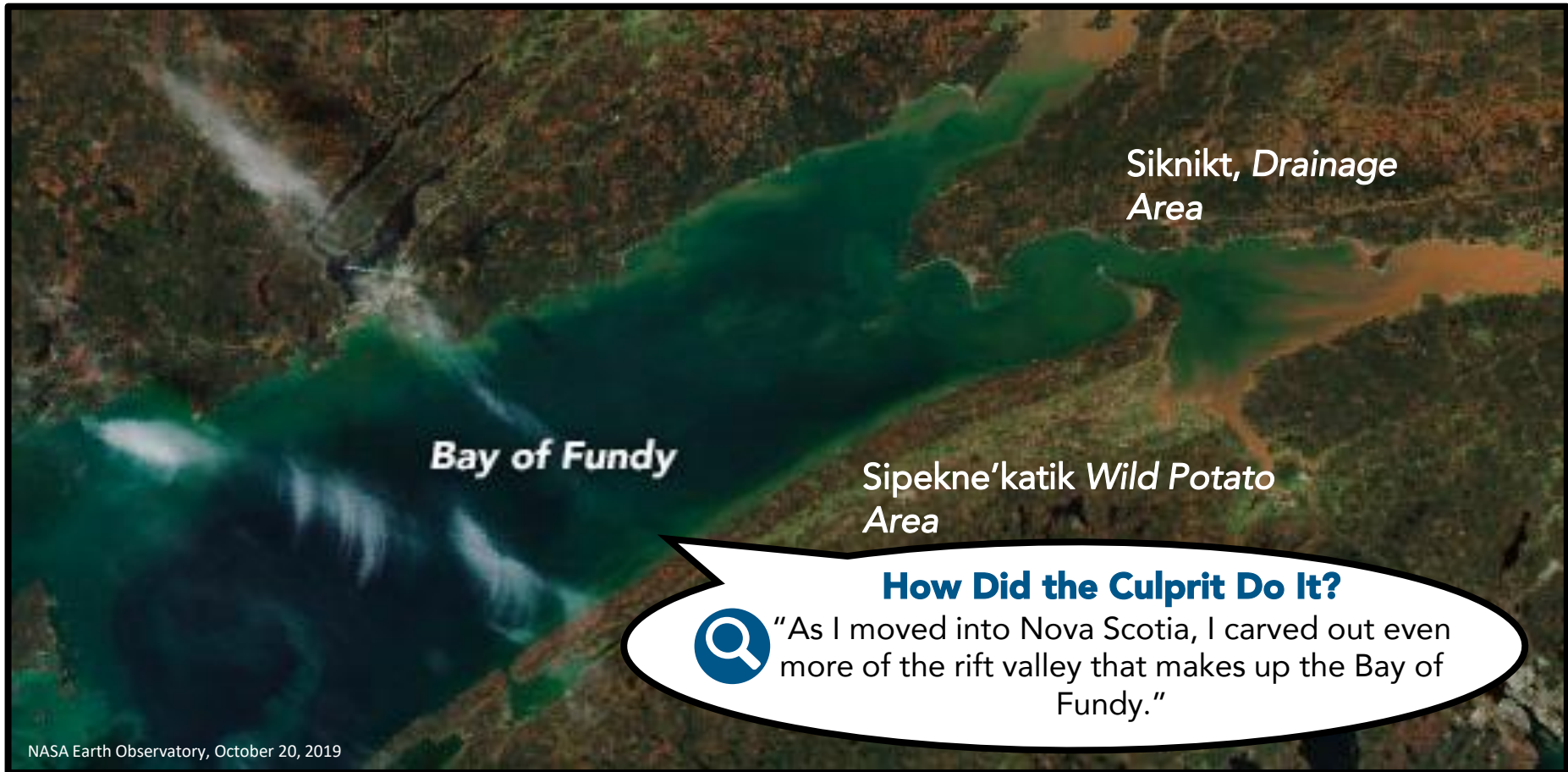
How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? A Rift Valley (a long, deep dent in the land with steep walls)



Where in Nova Scotia Can You See a Rift Valley? The Bay of Fundy, which borders many Mi'kmaq territories such as those below



How Did the Culprit Do It?



"As I moved into Nova Scotia, I carved out even more of the rift valley that makes up the Bay of Fundy."

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Driving Question

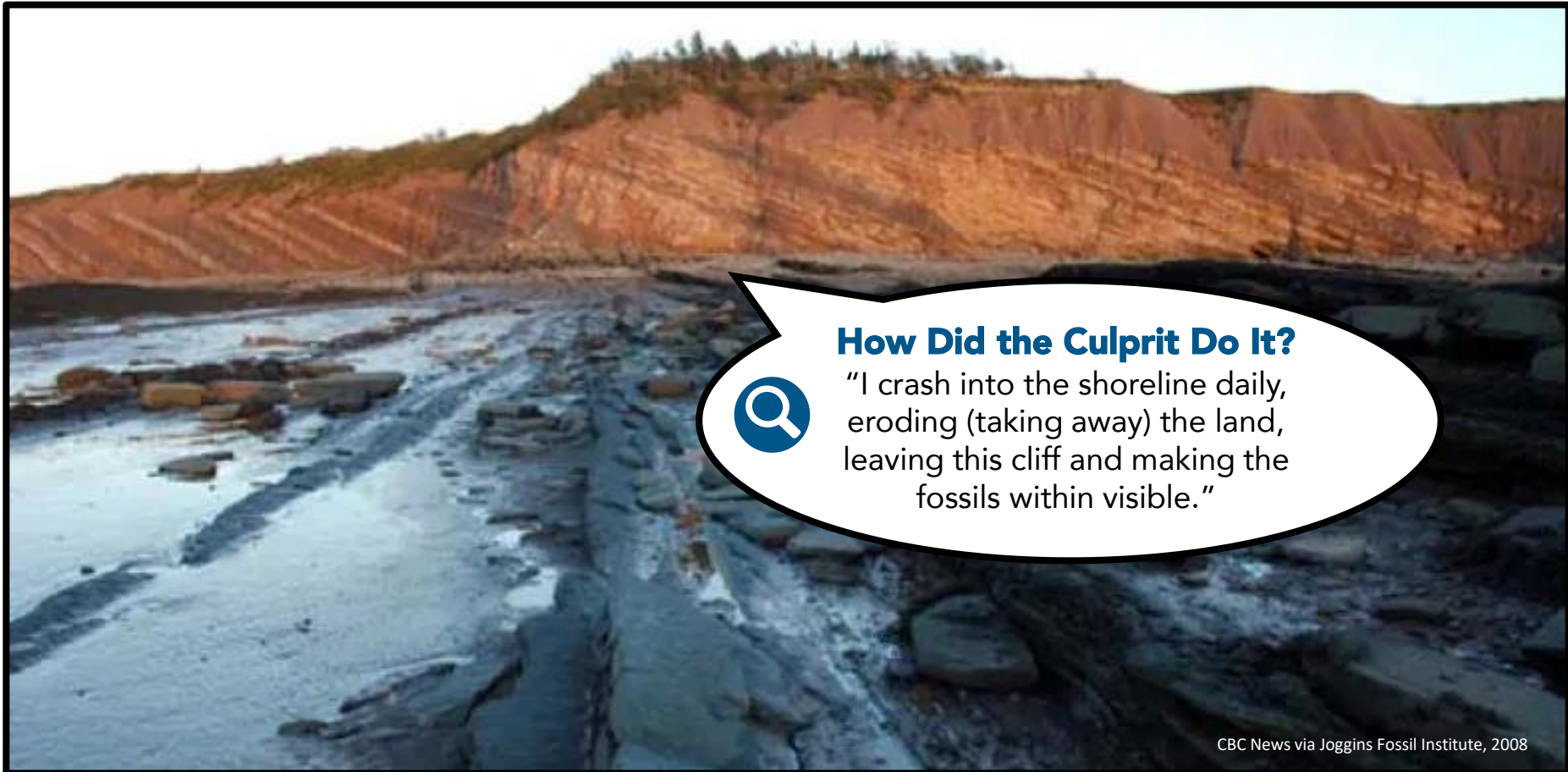
How can you analyse the sources and consequences of geological change on a global and a local scale?



What Landform Did the Culprit Help Change? Fossil Cliffs (a steep rock face with exposed fossils)



Where in Nova Scotia Can You See a Cliff? *Grand Nyjagon or Chegoggin(s), Place of the Fishing Weirs/The Great Encampment (Joggins Fossil Cliffs, Joggins)*



How Did the Culprit Do It?

"I crash into the shoreline daily, eroding (taking away) the land, leaving this cliff and making the fossils within visible."

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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 Slot Canyon (a very tall and narrow rock channel)



Where in Nova Scotia Can You See a Slot Canyon?

Taqamiku'jk, *A little crossing place* (George Fraser Slot Canyon, Parrsboro)



How Did the Culprit Do It?



"I leak into cracks in the rock, making them bigger until they become narrow openings like this one."

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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 Shoreline (the boundary between land and water)



Where in Nova Scotia Can You See a Shoreline? Tia'muisqunji'jk, At the Moose's Nose (Cape John Lowland Cliffs, Pictou County)



How Did the Culprit Do It?

"By crashing into the land daily, I am eroding (taking away) dirt from the land."

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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?
Wapu'ek, *The White Waters*
(Cheverie, Hants County)



How Did the Culprit Do It?

"Below the ground there is soft rock which I can easily erode (take away), causing the top layer to fall through."

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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 Salt Marsh (a flat, coastal wetland ecosystem)



**Where in Nova Scotia Can We See a Salt Marsh?
We'kwawisisk, Water Flow Stops (Bear Cove, Halifax County)**

How Did the Culprit Do It?



"To make the marshes, I deposited (left behind) dirt near the coast and filled that land with salt water."



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Definition Page

Basalt: A volcanic rock formed by the rapid cooling of lava at or near the Earth's surface.

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

Batholith: A large amount of volcanic rock that formed beneath the Earth's surface but was forced out to the crust.

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

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

Limestone: A sedimentary rock with high levels of calcium, formed from parts of fossil animal shells.

Sandstone: A sedimentary rock made from sheets of sand and minerals that water easily passes through.

Sediment: Solid material that is eroded and deposited in a new location.

- **Unsorted:** Sediment of all sizes mixed together; e.g. Glacial Till.
- **Stratified:** Sediment that shows different layers of deposited material.

Striation: One of many parallel lines or scratches on a rock surface.

Wetland: An area of land that is flooded by water either permanently or seasonally.

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The Rock Cycle

Metamorphic Rock

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

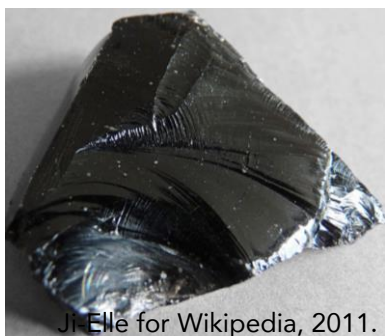


OnlineScienceMall, 2019.

Melting and Cooling
Heat and Pressure

Igneous Rock

Volcanic rock, formed from the cooling of magma or lava



Ji 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...

