

Cape Split (54km)

Parrsboro (41km)

Five Islands (22km)

Economy Point (8km)

## What's Out There?

The whole Bay of Fundy is 400km long and stretches along southwestern Nova Scotia and southern New Brunswick to northern Maine. Burntcoat Head is on Cobequid Bay, one of the two northeastern arms of the Bay of Fundy. Right now, you're looking northwest at Nova Scotia sites: towards the town of Parrsboro, Five Islands Provincial Park, and Economy Point. If it's not sundown just yet, consider coming back when it is. Our sunsets are as exceptional as our tides.

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## How the Bay was Made

Long before the Bay of Fundy was formed, the world's continents were all joined into one supercontinent called Pangaea ("One Earth.") When Pangaea began to split apart, some 230 million years ago, a very large, deep rift valley was formed where the Bay of Fundy is now. Braided rivers flowing through the rift valley carried pebbly sand and hot dry winds blew fine sand into dunes, which now form the red sandstone that we see here today at Burntcoat Head and elsewhere around the Bay of Fundy shoreline.

Vast outpourings of lava from the earth's mantle emerged through the rift and, once cooled, produced dark basalt. This hard rock forms the headlands of Cape Split and Cape Chignecto. The same rock formed the western edges of France and Spain, West Africa and eastern North and South America.

Up to 9000 years ago, you could easily keep your socks dry walking from Parrsboro to Wolfville. The rift valley hadn't yet filled with water. As glaciers of the last Ice Age melted, rising sea levels began to creep through the gap between Parrsboro and Cape Split, about 5000 years ago, and tides were felt for the first time in the upper Bay of Fundy.



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SUN

# The Science of Tides

*Why do the ocean tides move up and down each day?*

Ocean tides are affected by the gravity of the moon and its position relative to the earth. As the earth rotates, the moon's place in the sky changes, too. For example, when the moon is overhead or at the far side of the earth, we have high tides. But when the moon is a quarter away in either direction, the tide is low. The moon passes over a different quarter of the earth every 6 hours and 13 minutes, and the ocean level rises and falls following that moon.

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## A Different Kind of Water Tower

Roughly every 6 hours and 13 minutes, 100 cubic kilometers of water enter or leave the Bay of Fundy. That's more water than the combined daily flow of the world's freshwater rivers. Imagine a cube of that size: 100km wide by 100km high by 100km deep.

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## Spring and Neap Tides

The sun's gravity also affects the ocean. Twice a month, during the full moon and the new moon, the earth, moon and sun are all in a line. The combined gravity of the sun and moon makes the ocean tides rise even higher than normal. This is known as a "spring tide." When the moon is at first or third quarter the sun's gravity partially cancels out the moon's gravity and we have "neap tides." The tidal range is at its minimum then.

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## Measuring a Record

Long ago, the tidal range was measured simply by marking the pile of a pier when the water was at different levels. Of course, it's not just a vertical distance: as the tide goes out, the bay recedes to the lowest point of land, sometimes hundreds of metres away from shore.

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Today, we have electronic methods of measuring water. In 1998, hydrographers confirmed the 1975 record by placing water level recorders on the bottom of the Bay of Fundy off Burntcoat Head. The device measured the pressure of the column of water above, and combined with measurements of salinity and temperature, measured water levels to give a precise tidal range to within centimetres – a 16.3 metre range, the highest ever recorded in the world.

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