

7.6

Erosion

The movement of weathered rock materials from one place to another is called **erosion**. Erosion may occur rapidly, such as when a landslide races down a mountain. It may also occur slowly, over hundreds or thousands of years. Erosion can be the movement of grains of sand or the movement of gigantic boulders. Erosion can drop materials at any distance from their source—from a few centimetres to hundreds of kilometres away. When eroded rock materials stop moving, they settle on Earth's surface. The laying down of sediments is called **deposition**. Gravity, wind, water, and ice all help to move weathered rock materials.

Gravity

▶ LEARNING TIP

Scan the subheadings in this section. How many types of erosion do you think you will learn about?

Gravity causes rock falls and avalanches along many of British Columbia's highways. Early in the morning on January 9, 1965, a landslide near Hope, British Columbia, sent millions of tonnes of rock down a mountain into the valley below (**Figure 1**). Four people died, buried under rocks that reached depths of over 60 m. A small earthquake may have loosened the rocks, but the force of gravity caused the rocks to fall.

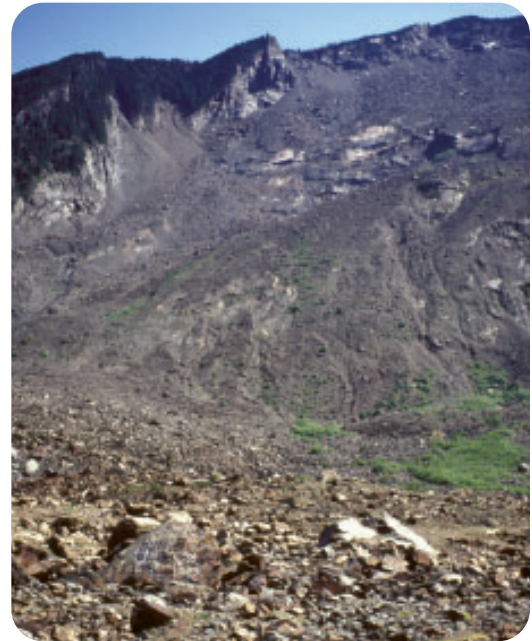


Figure 1

This rock slide, east of Hope, British Columbia, raced down the mountain with deadly force on January 9, 1965.

Wind

Wind can carry dust, sand, and soil for many kilometres. Particles in the air are deposited when the wind speed drops. On some beaches and deserts, the wind picks up dry, loose sand and deposits it in regular piles called dunes.

The devastating dust storms in the Prairies during the severe droughts of the 1930s demonstrated the wind's power (**Figure 2**). Due to the lack of rain, the rich surface soil became very dry. The wind was able to pick up the light, dry soil particles and blow them several kilometres away. In many places, the surface soil was completely blown away. The layers of soil that remained were not rich enough to grow crops, and many farmers were forced to abandon their farms. The effects of dust storms are not just local. Wind can even carry dust across oceans (**Figure 3**).



Figure 2
Dust storms on the Prairies in the 1930s damaged farmland.

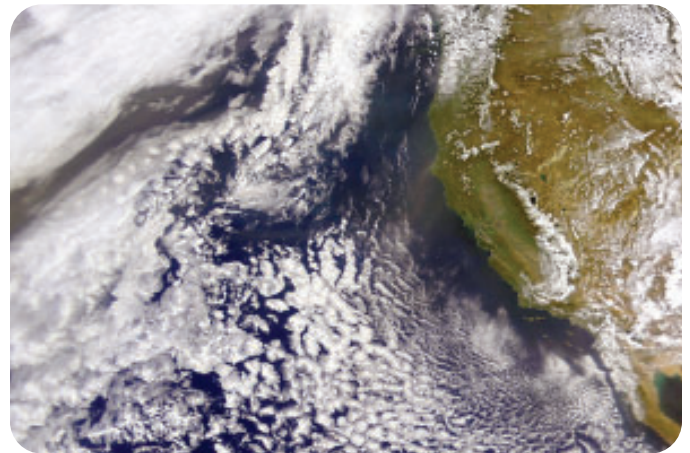


Figure 3
The dark streak in the cloud approaching North America is dust from a dust storm in China six days earlier.

Water

Little by little, a large river like the Fraser River can move billions of tonnes of rock from the land it crosses. As the river does this, it cuts into the land and makes a deeper and deeper valley. A **valley** is any low region of land between hills or mountains. Valleys that are formed by flowing water tend to be V-shaped. On the way to the sea, many rivers cross flat areas, or **plains**, near the coast. Since a river moves slowly on a plain, the heavier sediment is deposited on the riverbed or riverbanks in the plains.

A river also slows down when it runs into a lake or ocean. Much of the sediment that the river was carrying is deposited on the bottom of the lake or ocean. As the sediment builds up, it causes the river to fan out over a broad area, often shaped like a large triangle. This area is called a **delta** (**Figure 4**). At a delta, the river often breaks into a number of smaller channels, separated by islands of sediment.

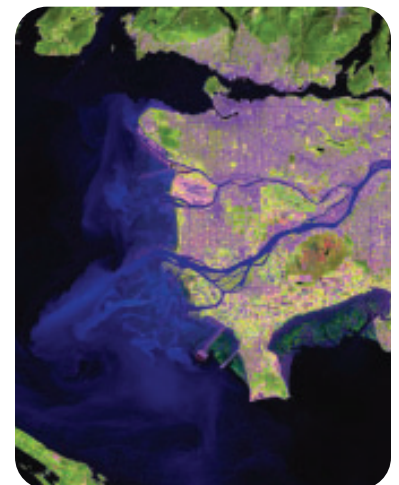


Figure 4
This satellite photograph shows the Fraser River delta in southern British Columbia.



The Fraser Canyon was carved out of the land by the action of flowing water (**Figure 5**). Over the years, the Fraser River cut deeper and deeper into the land until the canyon was formed. The Fraser River continues to carry rocks, gravel, sand, and mud. As time goes by, a large river extends its delta farther and farther out into the ocean. For example, 10 000 years ago, the end of the Fraser River delta was in the New Westminster area, 30 km east of where it is today.



Figure 5

The Fraser Canyon was carved out of the land by the action of flowing water.

Ice

Glaciers form when snow builds up over many years in the valleys and hollows of mountains (**Figure 6**). As the snow builds up, the layers are pressed together. The pressure gradually turns the snow to ice. The weight of the ice mass causes the glacier to move slowly downhill.

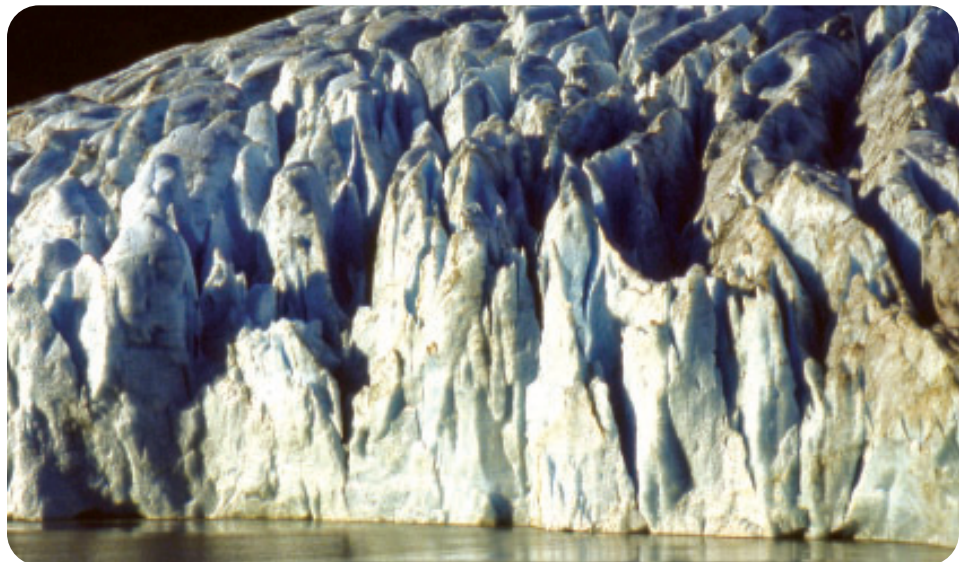


Figure 6

Bear Glacier, near Stewart, British Columbia, is a popular tourist attraction.

Rocks and soil that are frozen in the ice travel with the glacier. These materials can be carried many kilometres before being dropped in a new location when the glacier begins to melt. Glaciers can leave large, individual boulders in areas where they would not normally occur. These out-of-place boulders are called erratics (**Figure 7**).

Evidence indicates that the last ice age ended in most parts of Canada about 10 000 years ago. The effects of this ice age, however, can still be seen in many areas today. As rivers of ice moved down mountainsides, they eroded deep U-shaped valleys with round bottoms and steep sides. Along the coast, many of these valleys became filled with seawater after the glaciers melted. The resulting long, narrow inlets of the sea are called **fiords** (**Figure 8**). Howe Sound and Knight Inlet are two of the many fiords that are found along the coastline of British Columbia.

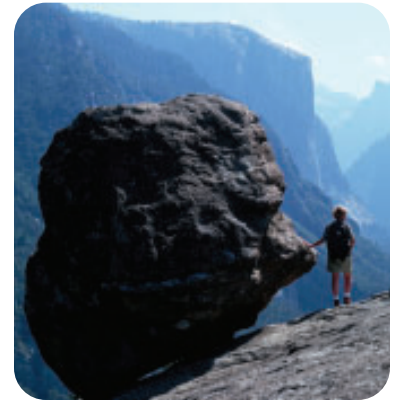


Figure 7
An erratic boulder.



Figure 8
Rivers Inlet is a fiord on the central coast of British Columbia.

CHECK YOUR UNDERSTANDING

1. What is erosion? How is it different from weathering?
2. List four forces that cause erosion, and give an example of each.
3. Give two examples of erosion that can happen quickly. Give two examples of erosion that happens slowly.
4. Deltas are often good areas for farming. Explain why.
5. How do you think Delta, in British Columbia, got its name?