

# How does erosion happen?

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These rock formations, in Bryce Canyon National Park, Utah, are called hoodoos. Although the soft sandstone was carved away by the erosion of wind, water and ice, tall hoodoos stand as the result of sturdy limestone caps protecting the sandstone underneath. Photo by: Luca Galuzzi - [www.galuzzi.it](http://www.galuzzi.it) from Wikipedia.

Erosion causes the earth to be worn away, often by water, wind or ice. A similar process, called weathering, breaks down or dissolves rock. Weathering also weakens rock or turns it into tiny fragments. No rock is hard enough to resist weathering and erosion. Together, they shaped the sharp peaks of the Himalaya mountains in Asia and the spectacular rock towers of Bryce Canyon, in the U.S. state of Utah.

Erosion moves bits of rock or soil from one place to another. Most erosion is caused by water, wind, or ice usually in the form of a glacier. If water is muddy, it is a sign that erosion is taking place. It indicates that bits of rock and soil are floating in the water. This material is called sediment.

When wind or water slows down, or ice melts, sediment is deposited in a new location. As the sediment builds up, it creates fertile land.

## Erosion By Water

Moving water is the major agent of erosion. Rain carries away bits of soil and slowly washes away rock fragments. Rushing streams and rivers wear away their banks, creating larger and larger valleys. Over 5 million years, the Colorado River cut deeper and deeper into the land and eventually formed the Grand Canyon. The Grand Canyon is more than 1 mile deep and as much as 18 miles wide in some places.

Erosion by water changes the shape of coastlines. Waves constantly crash against shores. They pound rocks into pebbles and reduce pebbles to sand. Water sometimes takes sand away from beaches. This moves the coastline farther inland.

The Cape Hatteras Lighthouse was built in 1870, on the Outer Banks, a series of islands off the coast of North Carolina. At the time, the lighthouse was nearly 3,300 feet from the ocean. Over time, however, the ocean eroded most of the beach near the lighthouse. By 1999, people worried it would collapse during a strong storm. The lighthouse was moved 2,900 feet inland.



The battering of ocean waves also erodes seaside cliffs. It sometimes bores holes that form caves.

### **Erosion By Wind**

Wind also erodes land. It carries dust, sand, and volcanic ash from one place to another. Wind can sometimes blow sand to create towering dunes. Some sand dunes in the Badain Jaran area of the Gobi Desert in China reach more than 400 meters (1,300 feet) high.

Wind is responsible for the dramatic arches that give Arches National Park, in Utah, its name. Wind can also erode rock until nothing remains at all.

### **Erosion By Ice**

Ice can erode the land. Glaciers move slowly downhill and across the land. As they move, they pick up everything in their path, from tiny grains of sand to huge boulders.

The rocks carried by a glacier rub against the ground below, eroding both the ground and the rocks. Moving glaciers gouge out basins and form steep-sided mountain valleys.



During several times in Earth's history, vast glaciers covered parts of the Northern Hemisphere. These glacial periods are known as ice ages. Glaciers carved much of the northern North American and European landscape. They scoured the ground to form the bottom of what are now the Finger Lakes in the U.S. state of New York. They also carved fjords, deep inlets along the coast of Scandinavia.

### **Erosion And People**

Erosion is a natural process, but human activity can make it happen more quickly. Trees and plants hold soil in place. When people cut down forests or plow up grasses, the soil washes away or blows away more easily. Landslides become more common. Water also rushes over exposed soil rather than soaking into it, causing flooding.

Erosion control is the process of reducing erosion. Sometimes, engineers simply install structures to physically prevent rocks or soil from being eroded away.

Erosion control can also be done by changing the landscape. Living shorelines, for example, are a form of erosion control for wetland areas. They are constructed by placing native plants, stone, sand, and even living organisms such as oysters along wetland coasts. These plants help anchor the soil to the area, preventing erosion.

Global warming is speeding erosion. The change in climate has been linked to more frequent and more severe storms. Storm surges after hurricanes and typhoons can erode miles of coastline.

The rise in temperature is also quickly melting glaciers. This causes the sea level to rise and erodes beaches more quickly. In the Chesapeake Bay area, it is estimated that a rise in sea level of 3 to 4 inches will cause enough erosion to threaten buildings, sewer systems, roads and tunnels.

## Quiz

- 1 Which sentence from the article introduces the idea that people can play a role in erosion?
- (A) Together, they shaped the sharp peaks of the Himalaya mountains in Asia and the spectacular rock towers of Bryce Canyon, in the U.S. state of Utah.
  - (B) They also carved fjords, deep inlets along the coast of Scandinavia.
  - (C) Erosion is a natural process, but human activity can make it happen more quickly.
  - (D) Sometimes, engineers simply install structures to physically prevent rocks or soil from being eroded away.

- 2 Which sentence from the introduction [paragraphs 1-3] BEST introduces the topic of erosion to the reader?
- (A) Erosion causes the earth to be worn away, often by water, wind or ice.
  - (B) No rock is hard enough to resist weathering and erosion.
  - (C) If water is muddy, it is a sign that erosion is taking place.
  - (D) When wind or water slows down, or ice melts, sediment is deposited in a new location.

- 3 Read the selection from the introduction [paragraphs 1-3].

*If water is muddy, it is a sign that erosion is taking place. It indicates that bits of rock and soil are floating in the water. This material is called sediment.*

Which phrase from the selection helps the reader understand the meaning of "sediment"?

- (A) If water is muddy
  - (B) sign that erosion is taking place
  - (C) bits of rock and soil
  - (D) floating in the water
- 4 Read the following selection from the section "Erosion By Ice." Then, fill in the blank.

*During several times in Earth's history, vast glaciers covered parts of the Northern Hemisphere. These glacial periods are known as ice ages. Glaciers carved much of the northern North American and European landscape.*

The word "vast" in the sentence above tells the reader that \_\_\_\_\_.

- (A) the glaciers were very small
- (B) the glaciers were very large
- (C) glaciers were numerous
- (D) glaciers covered all of the land