

# Erosion—Soil on the Move

from **Celebrating Chemistry**



Chemists Celebrate Earth Day

**W**hen the Earth's surface is worn away by wind or rain, we call the process erosion. Erosion changes the face of the Earth dramatically. Sometimes the change is quick, like a flash flood or landslide, or it can take a long time, for example, as long as it took the Colorado River to carve the Grand Canyon. Water from heavy rains, or melting snow and ice, and wind are the main sources of erosion. Soil erosion cannot be stopped, but it can be controlled and it is important to take steps to keep soil in place.

Why is it important to prevent soil erosion? It takes at least one hundred years to make two and a half centimeters (one inch) of soil. Although soil is constantly being made from parent materials and organic matter found at the surface of the Earth, sometimes soil erosion occurs faster than soil can be made. In general, soil erosion is slow and hard to detect. We know that it is worse if we don't protect the soil. Without protection, several centimeters of soil may be washed or blown away in a single day!

Soil is an important natural resource. We use it to grow plants for food like vegetables and fruit trees. We plant food crops, grasses, and forests in soil because soil has nutrients plants need. It can become hard to grow plants where soil has eroded. Eroded soils can increase the cost of growing crops like grains, vegetables, and fruit. This can cause the price of food and clothing to go up. On poor or eroded soil, we cannot grow as many crops as we can on good, nutrient-rich soil.

All it takes is one little raindrop to start soil erosion. If the raindrop falls on bare soil it may soak into the soil, or it may combine with many falling drops to make a trickle of water which may flow over the ground. And if a lot of rain falls quickly, the water will not have time to soak in, but it will flow downhill. The top layer of soil is quickly washed away by the water when there are no plants growing to help keep it in place.

To prevent erosion, farmers and soil conservationists plant crops to cover and protect the soil. Plants and trees grow roots which hold the soil in place. Leaves and grass may trap soil so it is not blown around by the wind. Plant roots take in water and air. The large pores, or air-filled spaces in soils, let excess water drain away and then air reenters these pores.

Soil stores water for plants and provides a home for bacteria and small animals (e.g. moles, worms, and other living creatures). They help chemically break down minerals and dead plants and animals into nutrients to be absorbed by plant roots. The soil supports trees and plants, and they protect the soil and prevent erosion. Plants and soil work together to help one another!



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