



KNOW SOIL KNOW LIFE



WATER EROSION AND BEST MANAGEMENT PRACTICES

You can see the long-term effects of water erosion in the shape of landscapes in many regions of the United States and around the world. Older, unglaciated landscapes such as those of Missouri and southern Iowa are typically more deeply incised, with more stream channels, rivers, and gently rolling topography, than are the relatively flat plains of the Dakotas and Minnesota. Rivers meander and change course as stream banks erode. Weathering and water erosion create beaches, which continue to change due to tidal erosion. Beaches can also be devastated by erosion from hurricanes and tsunamis.

Rivers, lakes, estuaries, bays, and water bodies receive runoff that carries sediment (displaced soil) from construction sites, agricultural land, and urbanized areas. Such sediments fertilize floodplains and deltas, but they are also a prominent source of water pollution. Eroded topsoil is detached from land and transported to water bodies where it is detrimental. Increased sediment in water degrades water quality and discolors water, making it less attractive for swimming, fishing, and other recreational endeavors. Sediments deposited in lakes and reservoirs decrease depth, thereby decreasing the volume of available water. Sediments fill up river and lake beds where some organisms take refuge and fish lay eggs. The shallow water spreads over a larger surface area, increasing evaporation. In addition, sediment clogs hydroelectric turbines and increases the cost of drinking water purification. For all these reasons, it is important to employ BMPs to decrease water erosion on managed landscapes.

What is Water Erosion?

Water erosion is caused by two detaching forces: raindrop impact and flowing water. Raindrops falling on soil surfaces may destroy soil aggregates, detach particles, and transport particles short distances. Raindrops are small, but move fast and so have a lot of energy when they strike bare soil surfaces. Flowing water transports particles, but

may detach them as well. In flowing water, both the mass of water and its velocity affect the ability of the water to detach and transport particles.

Controlling Water Erosion

Water control methods attempt to decrease the kinetic energy of the water by limiting soil detachment, decreasing transportation, and encouraging deposition.

The most effective way to control erosion is to keep the soil surface covered, either with growing plants or residues from past crops to absorb the impact of raindrops, decreasing the kinetic energy when the raindrops reach the soil. This also slows the rate of water flow across the surface allowing more time for the water to infiltrate the soil, thus decreasing runoff, detachment, and transportation and increasing deposition.

Best Management Practices used to Control Water Erosion:

- reduced tillage, conservation tillage,
- residue management,
- contour plowing, strip cropping,
- cover crops,
- crop rotations,
- diversions,
- terraces,
- grassed waterways,
- water control structures, and
- buffer strips (also called vegetative filter strips).

Best management practices (BMPs) are any of a group of practices that help conserve soil and water resources. BMPs are proven to reduce erosion and pollution and improve water and environmental quality.

Resource: *Know Soil, Know Life*, David L. Lindbo, Deb A. Kozlowski, & Clay Robinson, Editors
Soil Science Society of America, 2012
www.soils4teachers.org