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FACT SHEET

Soil Erosion

What is soil erosion?

Soil erosion is a process that occurs when soil particles move and are deposited across land because of water, wind, ice, or gravity. Water and wind erosion are the most serious types of erosion.

Why is soil erosion harmful?

Too much erosion reduces the ability of soil to grow sufficient crops and trees. Some ancient civilizations, such as Mesopotamia, became extinct largely because too much erosion ruined cropland and people either starved or were forced to move. In addition, erosion leads to soil particles polluting lakes and rivers—a process called sedimentation. Sedimentation is a major threat to water quality in Minnesota.

How significant of a problem is soil erosion in Minnesota?

According to the Natural Resources Conservation Service (1997), the statewide estimated annual sheet and rill erosion rate on cultivated cropland is estimated at 2.1 tons per acre per year. Although 2.1 is well below the generally accepted tolerable rate of five tons per acre per year, the most severe erosion is well above five tons per acre per year and occurs on significant acreages, especially in southeastern and northwestern Minnesota. Forty-five percent of cultivated cropland in Minnesota is eroding above the tolerable level. The 42 percent of the cultivated cropland acres that have the potential for wind erosion above the tolerable level account for 82 percent of the total wind erosion.

Is soil erosion just an agricultural problem?

No. Soil erodes from gullies on construction sites in a city or from highway construction sites if they are not properly managed. These gullies are costly to repair and the sediment from them can damage streams, lakes, ponds, and property.

What can be done to prevent soil erosion?

Many things. Vegetation planted on exposed soils helps prevent both wind and water erosion. Plant residue or mulch can be used to protect soil while vegetation grows. Water erosion can be prevented by using terraces and waterways to help control and direct water. Retaining walls or carefully placed stones and wire mesh—called riprap—along shorelines and steep banks protect the land from water erosion. Wind erosion can be reduced by using rows of trees for windbreaks. On construction sites, erosion and resulting sedimentation can be reduced by a barrier such as a silt fence or by using the practices mentioned above.

What is the Board of Water and Soil Resources doing to prevent soil erosion?

The Board of Water and Soil Resources (BWSR), working through local soil and water conservation districts (SWCDs), has a number of programs that help prevent soil erosion in the state. The Reinvest in Minnesota (RIM) Reserve pays landowners to retire certain lands, including marginal cropland that erodes easily, from agricultural production. The State Cost-Share Program provides grants to



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landowners, through SWCDs, to pay part of the costs of installing practices that reduce erosion and sedimentation and protect water quality.

Why is sedimentation considered a pollutant in lakes?

Soil particles, or sediment, can actually fill a lake if erosion is severe. More often, sediment contains nutrients (like nitrogen and phosphorus) that can cause algae blooms. In addition, sediment can contain pesticides that kill aquatic plants and fish.

What are the characteristics of soil that is good for growing crops?

Soil that is good for growing has the following characteristics: relatively flat slope; well drained; deep, fertile topsoil (more than 12 inches); visible organic matter; and deep subsoil.

How does soil erosion impact agriculture?

The most productive soil, which contains organic matter, is near the land surface. Once this topsoil is removed, only the less productive subsoil remains. Crops do not grow well on subsoil.

Can topsoil be replaced?

Yes, but it's a slow process. Eventually, subsoil becomes more productive topsoil if the right conditions are present. The subsoil must have plenty of rain, be broken up by freezing and thawing, and be exposed to the air and mixed by worms before it becomes topsoil. It can take from 30 to 100 years to form one inch of topsoil.

Are there regulations in place to prevent soil erosion?

Cities often require installation of erosion-control measures when subdivision roads and new homes are being built. Counties, townships, and watershed districts may regulate other land use, such as agriculture, to control erosion.

How can I get more information about soil erosion?

You can start by calling your local SWCD. Minnesota has 91 SWCDs, most of which are formed along county lines. SWCDs often share office space with the local unit of the Natural Resources Conservation Service, another excellent source of information on erosion control. Watershed districts, watershed management organizations, counties, cities, or townships may also be good sources of information at the local level.

Here are some helpful web sites:

Minnesota Board of Water and Soil Resources: www.bwsr.state.mn.us

Minnesota Department of Natural Resources: www.dnr.state.mn.us

Association of Minnesota Counties: www.mncounties.org

Minnesota Association of Soil and Water Conservation Districts: www.maswcd.org

Minnesota Association of Townships: www.mntownships.org

Minnesota Association of Watershed Districts: www.mnwatershed.org

University of Minnesota Extension Service: www.extension.umn.edu

Minnesota Sea Grant: www.seagrant.umn.edu

USDA Farm Service Agency: www.fsa.usda.gov/MN

USDA Natural Resources Conservation Service: www.mn.nrcs.usda.gov

Minnesota Erosion Control Association: www.mnerosion.org