



Michigan Association of Planning
A Chapter of the American Planning Association

Excerpted from the MSPO Community Planning Handbook

Soil Erosion and Sedimentation Control

Description

Soil erosion and sedimentation is a major source of nonpoint pollution to waterways. The term “nonpoint” refers to pollutants that come from diffused areas rather than point, or easily identified sources (e.g., from stormwater runoff vs. the outlet pipe of a wastewater treatment plant or industrial facility).

Stormwater runoff washes soil from unprotected ground and carries it to receiving waters along with any pesticides, fertilizers, lubricants, solvents, or other floatable debris. Stormwater increased channel flow and erodes stream or river channels, which adds to the sediment load. Eventually, eroded soil settles in lakes, rivers and streams in the form of sediment. Sediment damages the ability of the waterway to serve its natural functions. Sedimentation in water bodies can have several adverse effects including:

- Decreasing the watershed’s ability to carry and retain stormwater, clogging drainage systems and increasing chances of flooding and property damage.
- Affecting a watercourse’s navigability.
- Decreasing the amount of oxygen available to organisms as biochemical oxygen demand (BOD) increases (by bacteria in the natural system try to break down organic and chemical nutrients carried in the sediment).
- Reducing the attractiveness of streams, rivers, lakes, and reservoirs, both recreationally and aesthetically.
- Smothering aquatic life by clogging gills of adult fish, covering critical insect habitat, and fish reproduction areas.
- Carrying pollutants into the waterway.

Soil is carried from areas where natural vegetation has been disturbed by agricultural practices and/or development (urbanization). Bare or inadequately protected soil can

be quickly carried away by wind and water erosion. The soil is most often carried to receiving waters via runoff, where it is deposited.

Sedimentation control regulations require developers to take measures to curb erosion from developing sites. Per P.A. 347 of 1972 as amended, requirements include a preliminary earth change plan, an earth change permit, soil and sedimentation control plan, and subsequent inspections by the agent of the local enforcement authority. An enforcement agency may require posting of performance guarantees as a condition of receiving an earth change permit.

Soil erosion and sedimentation controlled through development regulations can include:

- Requirements for a sedimentation basin during construction or for developments with large amounts of impervious surface area.
- Greater use of soil conservation practices on farmlands.
- Stabilization of stream channels to reduce channel erosion.
- Protection or creation of vegetative or buffer strips near areas adjacent to water bodies to reduce wind and water erosion potential.
- Increasing landscaping requirements throughout the watershed.
- Reducing the amount of impervious surfaces.
- More frequent street and sewer cleaning to reduce system back-ups and the amount of nonpoint pollutants entering surface waters.
- Reducing the creation of impervious surfaces, such as downsizing parking lots.

The Soil Erosion and Sedimentation Control Act gives primary responsibility in administering the statute to the counties. In addition, cities, villages, and charter townships may assume administrative responsibilities within their political jurisdictions by enacting a MDNR approved Soil Erosion and Sedimentation Control Ordinance.

Planning Considerations

A watershed is the total land area that drains into a particular water body. Runoff and sediment from this natural geographic area, therefore, becomes a logical planning unit for soil and sedimentation control measures. Since watersheds and associated sedimentation issues do not respect corporate boundaries, intergovernmental efforts will likely yield the most significant impacts.

Analysis of areas within a watershed that are particularly susceptible to erosion includes considering:

- The texture, structure and cohesiveness of a soil (e.g., clays, loams, or sand).
- Terrain of an area, frequency and degrees of slopes (lengths & steepness of slopes).

- Types and amounts of vegetation available or needed to protect soil from rain splash and wind, slow runoff and subsequent erosion.
- Amount and proportion of impervious surface (e.g., pavement and rooftops).

A county soil survey and U.S. Geologic or other topographic maps can help planners and developers identify those steep slope or loose soil areas that are most susceptible to erosion.

Controlling soil erosion and sedimentation may demand a multifaceted approach, including use of several management approaches (see also Stormwater technique for more information).

Advantages

- Can help reduce flooding.
- Saves soil resources.
- Protects surface waters and aquatic life.
- Can help reduce long term costs of corrective measures such as dredging and water habitat rehabilitation.
- Can help prevent sediment-borne pollutants from entering waterways.

Disadvantages

- May increase the private cost of development, but will reduce public costs.
- May increase local staffing costs for permit issuance and inspections.

Limitations

- Only applies to sites greater than one acre or any earth movement within 500 feet of a lake or stream (but not a wetland).
- Many agricultural erosion control measures are voluntary. Maintaining fence rows and other conservation measures may increase the costs of farmer. To qualify for SCS cost shares, farmers may need to comply.