

# What are the problems and solutions associated with stormwater runoff?

## Why should we be concerned about stormwater runoff?

Runoff from rainstorms and snowmelt is the most significant source of water pollution today. Stormwater carries sediment, oil, grease, nitrogen, phosphorus, and other pollutants into storm drains and then, *untreated*, into nearby waterbodies. Because most stormwater drainage systems provide no treatment, preventing contamination of stormwater is crucial to ensure that pollutants are not released into the environment. Municipal drinking water systems may face higher costs if they must treat water contaminated by stormwater runoff. Improperly managed stormwater runoff is also a leading cause of flooding, which can lead to property damage, cause road safety hazards, and clog catch basins and culverts with sediment and debris. Sediment in waterways can impede navigation and require expensive dredging.

## How does runoff degrade rivers, lakes and coastal waters?

Today, natural areas are being replaced by impervious surfaces, like roads, parking lots, and buildings. This transformation can significantly impact waterbodies. Natural areas allow rain and snowmelt to easily infiltrate into the ground. Impervious surfaces, on the other hand, significantly increase the volume and velocity of runoff and the amount of pollutants in stormwater. Fast-flowing water erodes stream banks, enlarges stream channels and releases sediment. Research indicates that stream quality begins to decline when impervious surfaces cover just 10 percent of a watershed.

Sediment fills the spaces between rocks where fish spawn and aquatic organisms live. It scours streambeds and stream banks, causing additional erosion. Excess nutrients in runoff, especially nitrogen and phosphorus, cause waterbody-impairing algal blooms. As algae die and decompose, oxygen levels decrease, harming or killing fish, plants and other aquatic organisms. Sediment and algal blooms can also prevent sunlight from penetrating deeper waters, killing the plants that provide habitat and food for aquatic organisms.

## What can be done to reduce these pollutants from construction activities?

If construction sites are not properly managed, large amounts of soil will be washed away during rainstorms. To protect water quality, runoff and soil erosion should be controlled by using techniques called Best Management Practices (BMPs).

BMPs can reduce construction-related pollution by:

- Minimizing land clearing to preserve natural vegetation and other natural features
- Managing clearing and grading in phases to minimize the amount of bare soil exposed at any given time
- Building and maintaining proper site entrances (to prevent sediment from being tracked onto streets and, ultimately, washed into storm sewers)
- Stabilizing steep slopes
- Installing sediment trapping devices and perimeter controls like silt fences and sediment basins
- Stabilizing areas as soon as possible after land-disturbing activities

Other BMPs involve good housekeeping measures, like picking up site debris, cleaning vehicles in designated washing areas, and educating construction workers about the stormwater program and pollution prevention techniques. Correctly using BMPs during construction improves water quality by greatly reducing the quantity of pollutants exiting the site. Using a single control measure, such as a silt fence, is rarely adequate. To be most effective, BMPs should be used in combination.

**To get more detailed information, visit U.S. Environmental Protection Agency (EPA)'s website ([www.epa.gov/npdes/menuoffbmps](http://www.epa.gov/npdes/menuoffbmps)) on best management practices.**

