

# Introduction to Stormwater Management

This is the first in a collection of documents about Stormwater Management and Best Practices. For more information on this and many other topics, please visit: [spcwater.org](http://spcwater.org).

Stormwater runoff is created when rainwater or snowmelt flows across land without infiltrating into the ground. Infiltration is important because it provides moisture to plants, feeds streams and lakes, filters out pollutants, and recharges aquifers and groundwater. As stormwater runs across surfaces, it picks up pollutants which are then discharged into streams. Most stormwater is not treated before it is discharged, leading to polluted rivers, lakes, and oceans that are used for drinking water, recreation, food sources, and wildlife habitats.

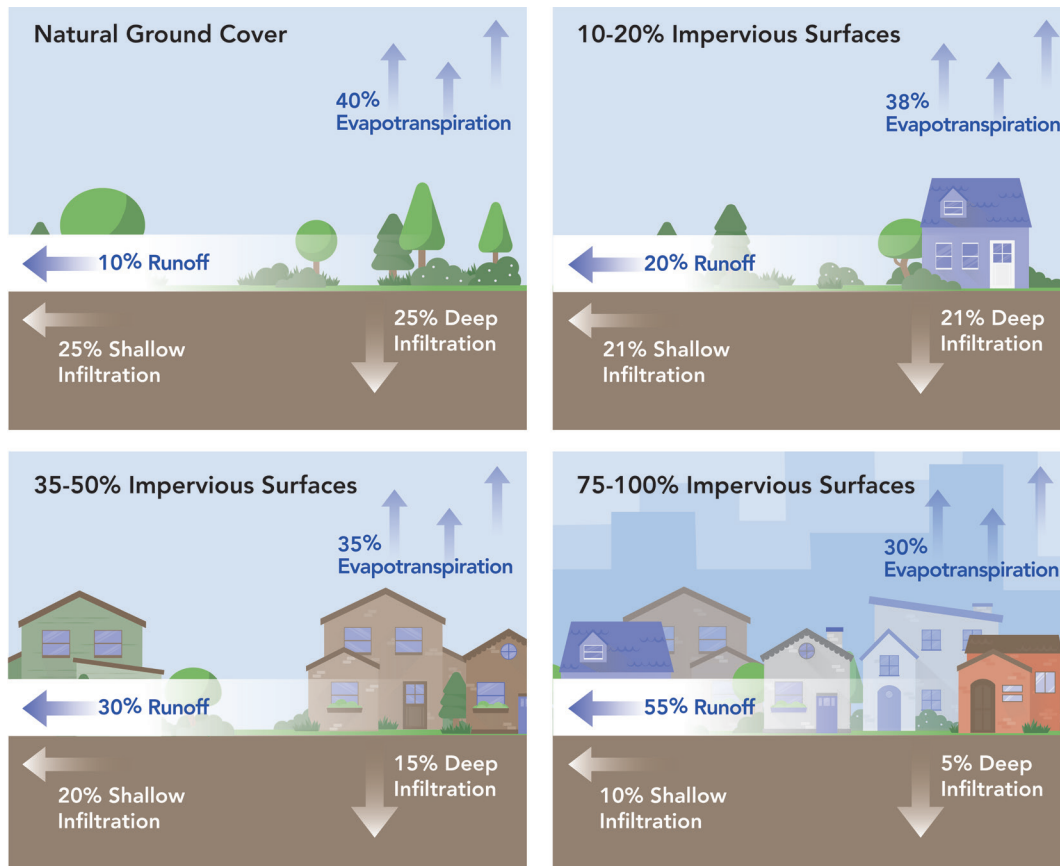
The two biggest concerns with stormwater runoff are polluted water quality and increased water quantity.

## Polluted Water Quality

As stormwater flows across land, it picks up pollutants such as dirt, oil, fertilizer, and bacteria from animal waste. This stormwater often runs right into stormdrains that empty straight into our local waterways without being treated.

## Increased Water Quantity

As illustrated in the diagram below, the amount of stormwater runoff increases as the amount of impervious surfaces increases. Natural ground cover allows for over half of precipitation to infiltrate into the ground, to provide moisture for plants and refill streams (shallow infiltration) and recharge aquifers (deep infiltration).



Data provided by: [nrms.usda.gov](http://nrms.usda.gov) (1998)

## Key Concepts

### Stormwater Runoff

occurs when precipitation, such as rain or snow melt, flows across surfaces.

**Impervious Surfaces** are surfaces that do not absorb water, such as roads, parking lots, rooftops, or compacted land. Water cannot infiltrate through impervious surfaces, resulting in increased stormwater runoff.

### Non-Point Source

**Pollution** is any type of pollution that does not come from one identifiable source. It occurs when stormwater runoff flows across impervious surfaces, picking up natural and human-made pollutants such as sediment, oil, fertilizers, or bacteria from animal waste.



## When it rains, it pours, **But where does it go?**

Stormwater is usually not treated before entering our waterways. Therefore, pollutants that enter storm drains have direct impacts on our waterbodies.

### **Impacts of Stormwater**

Stormwater runoff, when managed improperly, can impact land owners and the environment. Some examples of stormwater-related problems are listed below.

#### **Environmental Consequences**

- Polluted waterways through non-point sources such as oils, pesticides, trash, fertilizers, etc.
- Loss of aquatic habitat and sensitive organisms.
- Lack of groundwater recharge
- Elevated concentrations of nutrients such as phosphorus
- Erosion

#### **Land Owner / Economic Consequences**

- Localized flooding damages
- Land destabilization
- Loss of recreation and tourism income
- Transportation infrastructure and sewer system damage
- Increased cost to treat water used for drinking

### **Stormwater Solutions: Best Management Practices**

Best Management Practices (BMPs) refer to the suite of options available to avoid and/or minimize damages associated with stormwater. BMPs can include the installation of stormwater management controls as well as practices that prevent stormwater pollution. See below for some examples of effective BMPs for common land use types.

#### **Commercial Development BMPs**

- Vegetated swales
- Pervious pavement
- Preservation of existing undeveloped land
- Constructed wetlands
- Capture and reuse of stormwater for irrigation
- Detention basin
- Street sweeping
- Erosion and sediment control during construction

#### **Residential BMPs**

- Rain gardens and rain barrels
- Pervious walkways and patios
- Landscaping with native plants
- Minimization of pesticide and fertilizer use
- Proper disposal of hazardous chemicals, electronics, and pharmaceuticals

#### **Did you know that...**

- Stormwater is the primary cause of water pollution nationally.
- As little as 10% of impervious cover in a watershed can cause degraded stream conditions.
- Drinking water sources can be affected by poorly managed stormwater.

#### **For more information about the impacts of stormwater, visit:**

- [epa.gov](http://epa.gov)
- [dep.pa.gov](http://dep.pa.gov)
- [dcnr.pa.gov](http://dcnr.pa.gov)
- [pacd.org](http://pacd.org)
- [bmpdatabase.org](http://bmpdatabase.org)
- [spcwater.org](http://spcwater.org)



#### **For more information please contact:**

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