# Managing Stormwater at your Home

**Corey Richmond**

**Watershed Specialist**
**Sullivan County**
**Conservation District**

# What is Stormwater?

- It is a result of water being unable to infiltrate the ground.

  Impervious Cover ( houses, roadways, parking areas, etc.)

  Ground Saturation

- Stormwater causes erosion, stream bank instability, and flooding

- Stormwater is a non-point source (NPS) pollution to waterways.

- Stormwater is the #1 way pollutants enter our stream, lakes, rivers, ponds, etc. Effects are felt downstream as far as the Chesapeake Bay.


Chesapeake Bay Watershed
New York
Pennsylvania
Maryland
West Virginia
D.C.
Delaware
Virginia

# Impervious Cover

- Impervious Cover is any material that stops or inhibits rainfall from entering the ground and replenishing groundwater reserves.
- Impervious Cover is a major factor of stormwater and non-point source pollutants.
    - Example: Rainfall flowing across a parking lot can pick-up road salt, oil, gas, anti-freeze that had leaked from automobiles. The rainfall (stormwater) carries these pollutants to a stream, pond, or lake and causes a pollution impact.
- Impervious Cover concerns exist in both the urban (city) and rural settings.
- When the environment is altered, it has to adjust.
- Water takes the path of least resistance, therefore, water will choose to flow over asphalt before it will a grassy area.

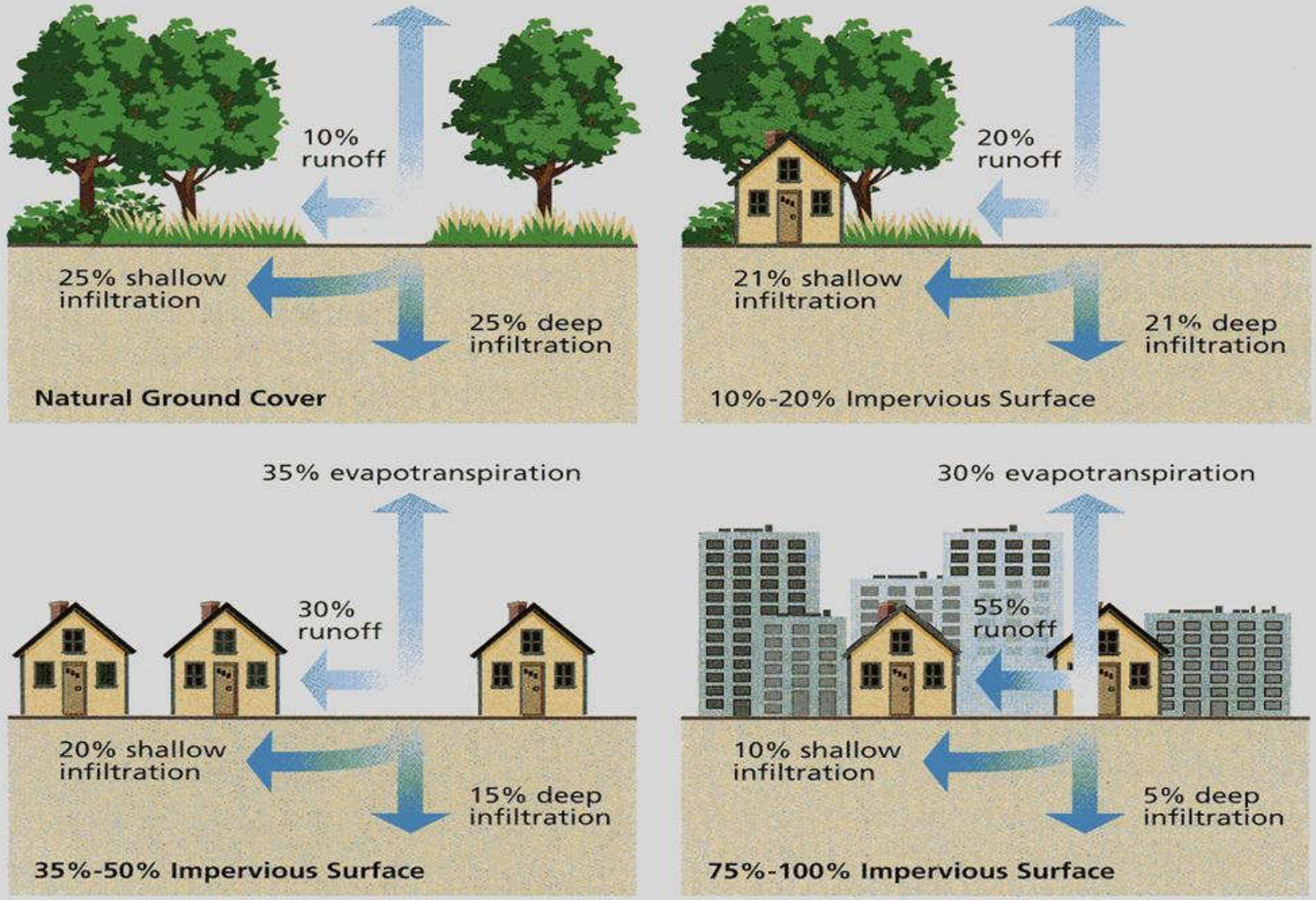



***Figure 3.21: Relationship between impervious cover and surface runoff.*** *Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.*

- One inch of rain yields 0.6 gallons of water per square foot.
- A one inch rain event on a 1,000 square foot home will create 625 gallons of stormwater.
- Add up the square footage of your impervious surfaces around your home and see what amount of stormwater you are creating.
    - Personal property:
        - 1620 sq. ft. of structural impervious surface.
        - 960 sq. ft. of packed gravel driveway
        - 1,548 gallons in a one inch storm event.

Some people believe that Stormwater is only an urban problem.

**See if you agree**

# Impervious Cover

# Stormwater Concerns

- Ground water recharge, infiltration
- What pollutants are being taken to our streams?
  - petroleum products
  - fertilizers
  - pesticides, herbicides
  - and more…
- What impact does the increased runoff have on our streams?
  - stream bank disturbance
  - stream channel changes
  - increased flooding
  - more intense flooding events
  - Elevated water temperatures

# Stormwater Management

- Stormwater Management is not just an urban issue.
- Stormwater Management is typically done through rules and regulations on a municipal, county and state level.
- Stormwater Management planning is expensive and time-consuming.
- Think about the storm events in the past several years
- Think about effects of those storms on streams around you, neighbors and/or friends properties, maybe your property.
- Could decreased amounts of stormwater have helped?
- Can better stormwater management lessen storm event impacts?

## What can I do?
## I'm only one landowner!

# "Backyard Stormwater Management"

# Backyard Management

- Why and how did we get into thinking that the sooner rain water leaves our land the better off we are?
- Who is responsible for teaching us that temporary pooled water in our yards or on our property is a bad thing?
- Our way of thinking about rain events and how we deal with the rainfall needs to change.
- Collecting and keeping water and rainfall is nothing new. Where did we lose the idea?

**We can take steps to improve stormwater management and ensure our own supply of water.**

**By practicing conservation, and encouraging other to do the same, we can make a difference in replenishing ground water and reducing pollution to our waterways.**

# Rain Gardens

- Rain gardens can be very simplistic and in-expensive.
- The idea is to allow runoff a place to percolate into the ground instead of directing the water to a street drain or stream.
- Soil needs to be a drainable soil type. Soils can be amended to fit the needs of a rain garden.
- Rain gardens should not become ponds. The intention is to allow the water to enter the ground.
- Plants for the rain garden need to tolerate wet and dry conditions.
- Rain gardens can fit into many existing landscapes.
- Rain Gardens should be kept a minimum of 10 feet from buildings.

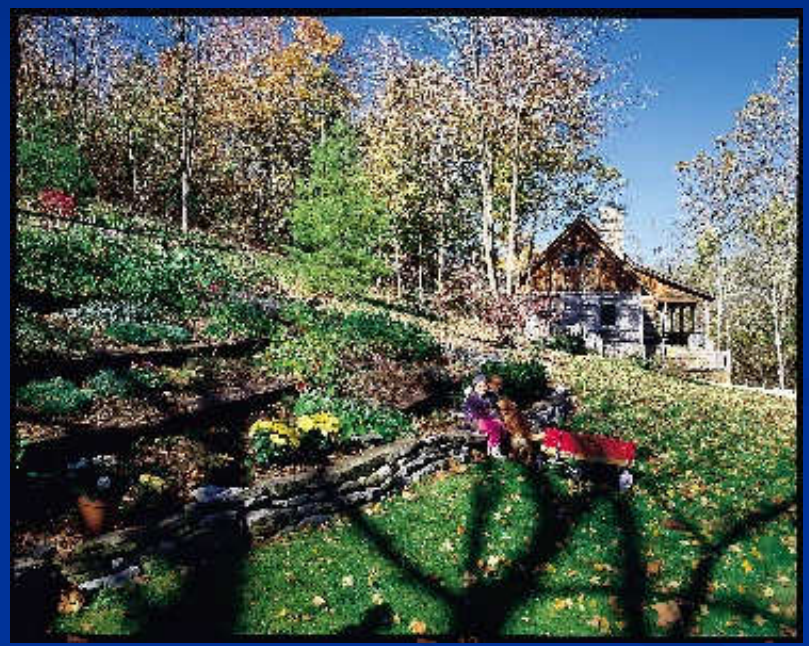
# Backyard Vegetation

- Vegetation has a lot to do with how stormwater is allowed to move across the surface and how it can recharge the groundwater.

- The ideal setting around homes is a setting that resembles a forested woodlot. Trees, shrubs, leaf litter, etc. The forested situation is the best for ground water infiltration and retaining stormwater. Grass lawns are not as effective as many might believe. Lawns tend to have a high soil compaction factor which inhibits water infiltration. Aerating a lawn on a regular basis helps.

# Grade/Slope Concerns

- The grade of your property may be a limiting factor in dealing with stormwater.
- It is important to have a proper grade away from your home. Water access to a foundation can be trouble.
- re-grading or proper outleting of rain water from the home to a rain garden or rain barrel is recommended.
- In steep slope situations, terracing can be a solution. This will allow rain water to stay on your land and replenish the ground water supply.



# Rain Barrels

- A free source of water for needs around the home.
- Can be easily adapted to virtually all situations.
- Affordable and easily maintained.
- Good source of water for gardens, lawns, plants, flowers, washing cars, etc.
- No electricity needs, No use of well water!
- No water conditioners, chlorine, etc. found in public water supplies.
- Barrels serve as a great stormwater control as they provide retention time and prevent runoff pollution potential.

# Rain barrels

- Rain barrels are commercially available and can cost as much as $300-$400.
- Rain barrels can be made very affordably and can be made of many different materials.
- If constructing your own, be aware of what was originally in the container.
- Only food grade barrels should be considered for collecting and using rain.
- Barrels can be assembled in a series to increase capacity.
- All barrels need an overflow devise.
- A rain garden should be considered for collecting overflow.
- Care must be taken to not create a mosquito problem. Sealing or screening openings will prevent mosquitoes from taking up residence.

# Rain Barrel Maintenance

- Maintenance is needed to ensure proper operation.
- Grit from asphalt shingles could cause problems in operation. Periodic cleaning of the barrel will take care of this.
- Barrels need to be drained and capped during the winter months to prevent issues with freezing.
- Overflow from the barrel should be directed to a second barrel or a suitable location where infiltration can occur.
- If mosquito larvae is found in the barrel, a mosquito "dunk" larvacide can be safely used.
- Barrels need to be placed up off the ground to more easily access the spigot and prevent its breakage.

**Rain Barrel water should never be used for drinking, cooking, or bathing.**

# Rain Barrel Construction

- Be sure to thoroughly rinse/clean the barrel prior to collecting rainfall.
- Drill holes
- Install plumbing fixtures for the spigot and overflow.
- downspouts will need to be cut to accommodate the rain barrel. Cut can be made using a hacksaw. You'll want to make a clean cut and save the section for re-installation during the winter months.
- Downspout may have to altered to fit flexible elbow and re-attachment of section for winter use.
    - Alteration can easily be done by cutting a 2 inch slit into the downspout allowing the elbow to slide up the outside of the downspout.
    - Two small screws will allow for attachment and removal of the flexible elbow.
- barrel should placed on an elevated and level area.

**ENJOY YOUR RAIN BARREL!**

# Credits/Acknowledgements


- Vince McCollum, Cumberland County Conservation District.
- Photo credits:
  - USDA- Natural Resources Conservation Service, Back yard Conservation
  - Rain Garden Network www.raingardennetwork.com
  - Rain Barrel Guide www.rainbarrelguide.com
  - Penn State University, College of Ag Sciences

- Financial and other support for this project is provided by the Pennsylvania Association of Conservation Districts, Inc. and the Pennsylvania Department of Environmental Protection's Chesapeake Bay Program.