

Stormwater BMPs for the Homeowner

Susan Greth

Montgomery County Conservation District

Wissahickon Watershed Homeowner's Workshop

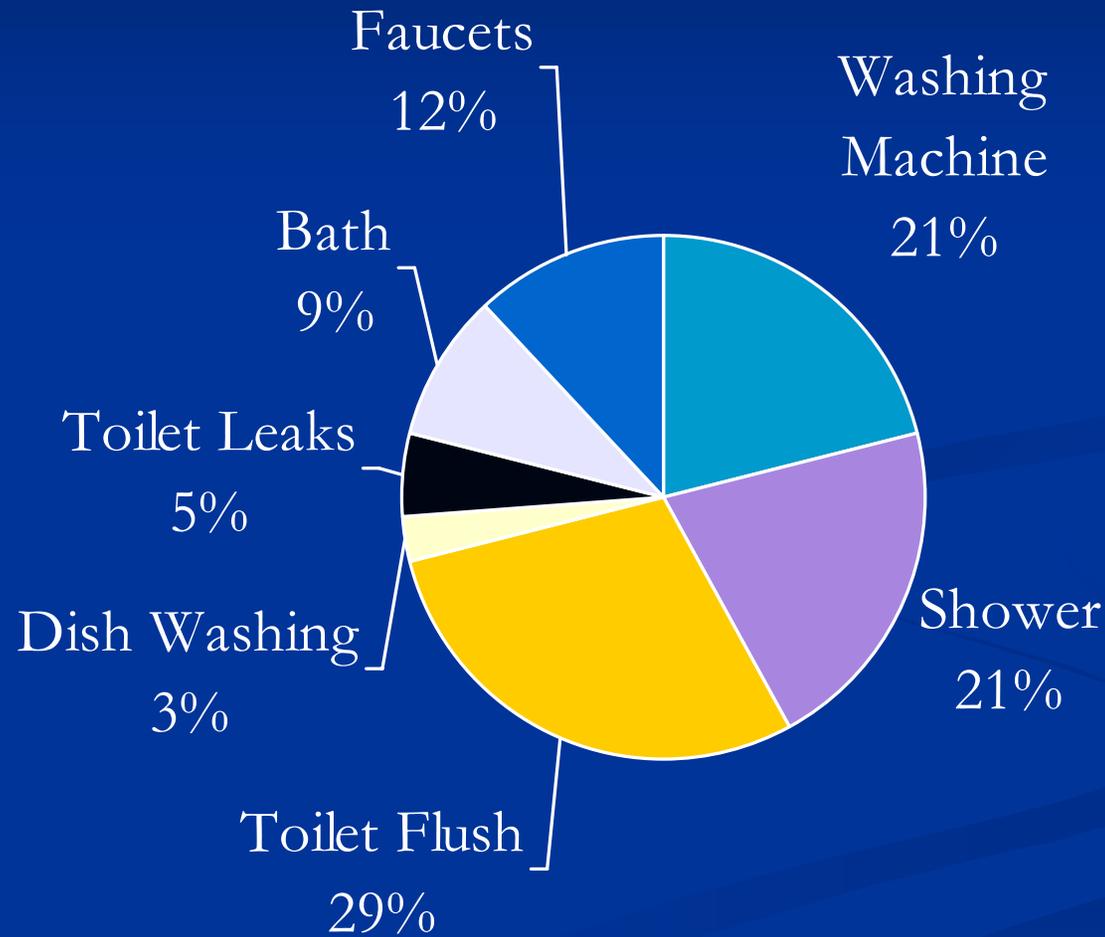
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Why should we conserve and protect water?

Because water is used in all aspects of our daily lives:

- For human consumption: (public water supplies, private well, water, cooking, etc.)
- For Cleaning: (car washing, household tasks, etc.)
- For Lawn and Garden Maintenance

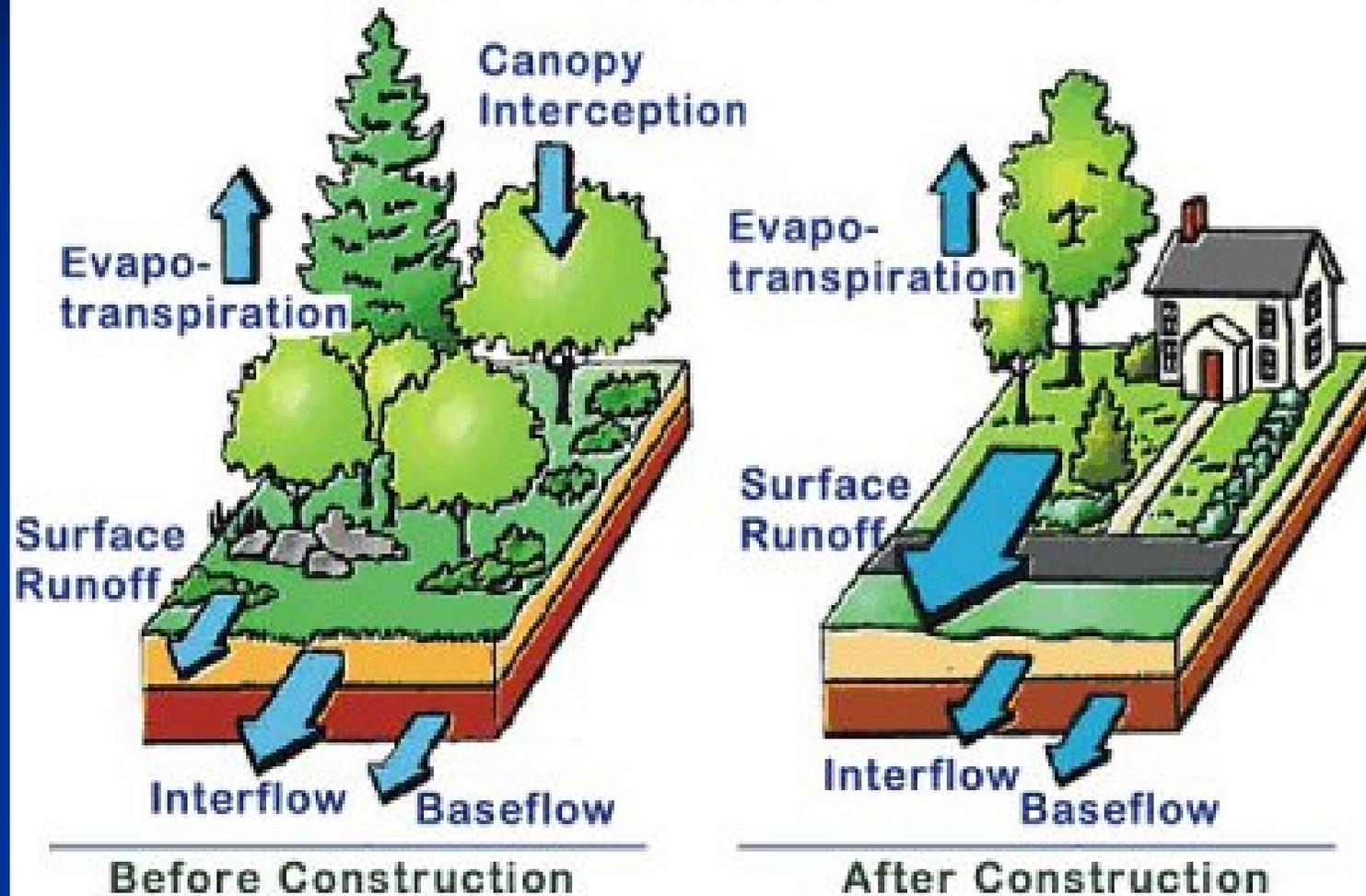
Currently, the per Capita Percent Water Consumption is 168 Gallons per Day according to Purdue University.



Problems arise when we don't manage stormwater:

- Less water is available for human use.
- Decrease in water quality
- Flooding (loss of property and threat to human health and safety)
- Stream Degradation (sedimentation, erosion habitat loss, etc.)

Local Hydrologic Cycle



Low Impact Development

- Minimizing tree clearing and impervious surfaces reduces stormwater run-off.
- Directing run-off to natural areas will encourage groundwater recharge.

What is a BMP?

A BMP or Best Management Practice is defined as any activity, facility, measure, or procedure used to protect, maintain, reclaim or restore the quality of waters and the existing and designated uses of waters of this Commonwealth.



Examples

Structural BMPs

- Rain Barrels
- Rain Gardens
- Infiltration
Trenches/On-lot
Seepage

Non-Structural BMPs

- Riparian Buffers
- Plant trees



Rain Barrels

A rain barrel is a device to collect rainwater from downspouts. Rain barrels can be bought in a store or made at home. They come in all shapes, and sizes....from 55 gallons to 180 gallons.





How much Rainwater?

- 1” of rainfall on a 1000 sq. ft. roof will produce 600 gallons of rainwater.
- In Montgomery County, the annual rainfall has been determined to be 44.35”.
- Annually, a roof this size in Montgomery County will yield 26,610 gallons of run-off.

Benefits

- Reduce stormwater runoff.
- Rain barrels promote local awareness and educate neighbors about stormwater issues.
- Lower water bill by reducing metered water usage. Water can be used for gardening, washing, etc.

Rain Gardens



Photo by Dave Jagodzinski.

Rain Gardens

- A rain garden is an area used to soak up rain water, from the roof, driveway, and lawn.
- They are landscaped areas planted with wild flowers and other native vegetation.
- A rain garden allows for approximately 30% more water to soak into the ground than a conventional lawn.



Mature Rain garden



Visit www.raingardennetwork.com for more pictures of rain gardens.

Rain Garden Construction

- 6" max. ponding depth for soils with infiltration rates of at least 2"/hour.
- 3" to 4" for soils with low infiltration rates.
- A 1" sand bed layer at the bottom of rain garden will increase infiltration rates.
- Standing water should not occur after 24 hours following storm event.

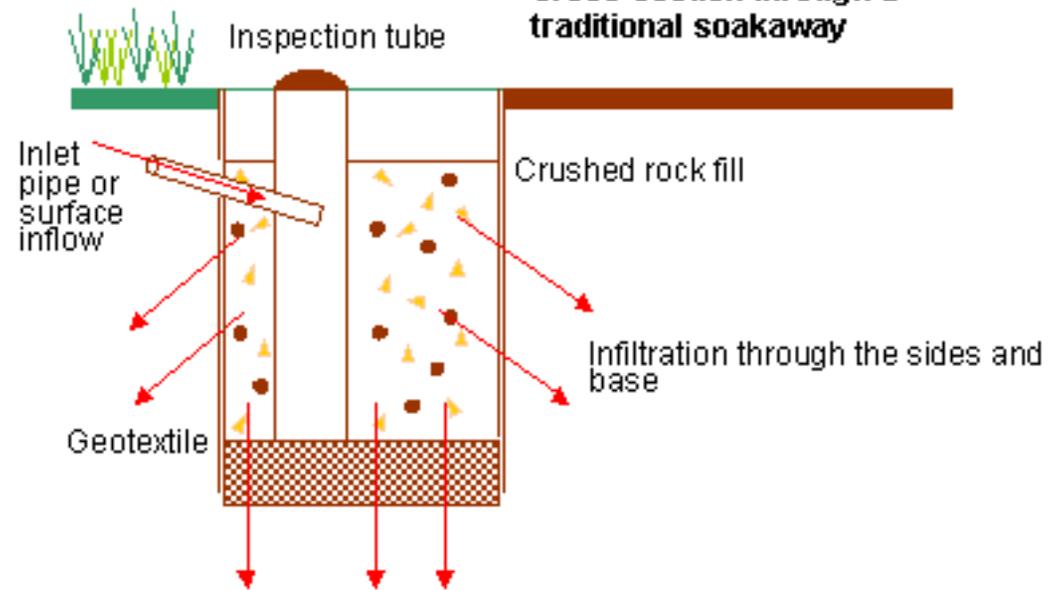
Location, Location, Location...

- Locate rain garden near source of run-off.
- Avoid locating near building areas, well heads, and septic systems.
- Locate away from heavy traffic areas to avoid compaction.

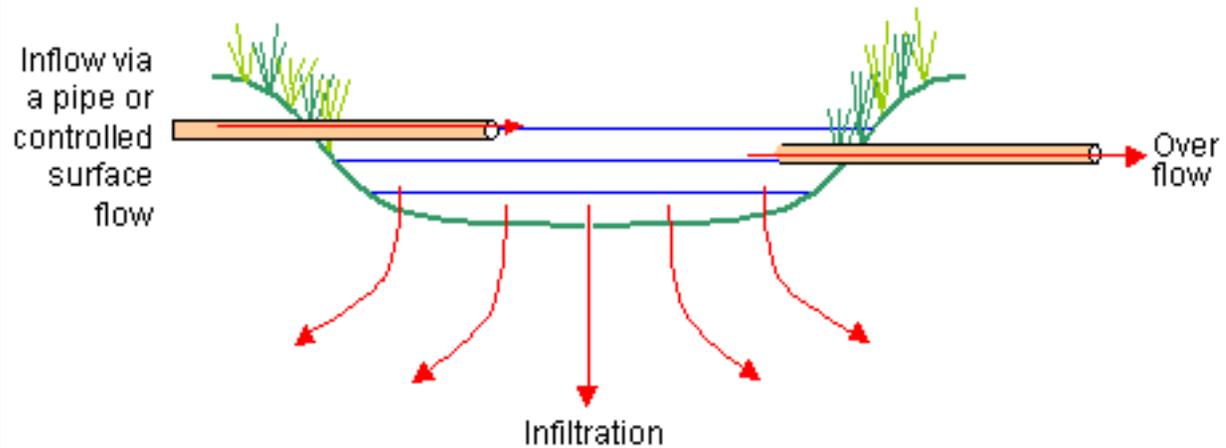
Infiltration

- Infiltration devices drain water directly into the ground, providing opportunity for groundwater recharge.
- Infiltration facilities are below ground, and water should not appear on the surface after 24-48 hours following rainfall.

Cross-section through a traditional soakaway



Cross-section through an infiltration basin



Infiltration Testing

- Prior to installation of any infiltration facility, a permeability test should be performed to determine infiltration capabilities.
- Infiltration rates between 0.52"/hour and 8.27"/hour are generally acceptable.

Healthy Riparian Buffer



Photo: NRCS PLANTS database

Planting for Water Quality

Benefits of Riparian Forest Buffers

Leaf Food

Leaves fall into a stream and are trapped on woody debris (fallen trees and limbs) and rocks where they provide food and habitat for small bottom dwelling creatures (such as insects, amphibians, crustaceans and small fish) which are critical to the aquatic food chain.

Canopy and Shade

The leaf canopy provides shade that keeps the water cool, retains more dissolved oxygen and encourages the growth of diatoms, beneficial algae and aquatic insects. The canopy improves air quality by filtering dust from wind erosion, construction or farm machinery.

Filtering Runoff

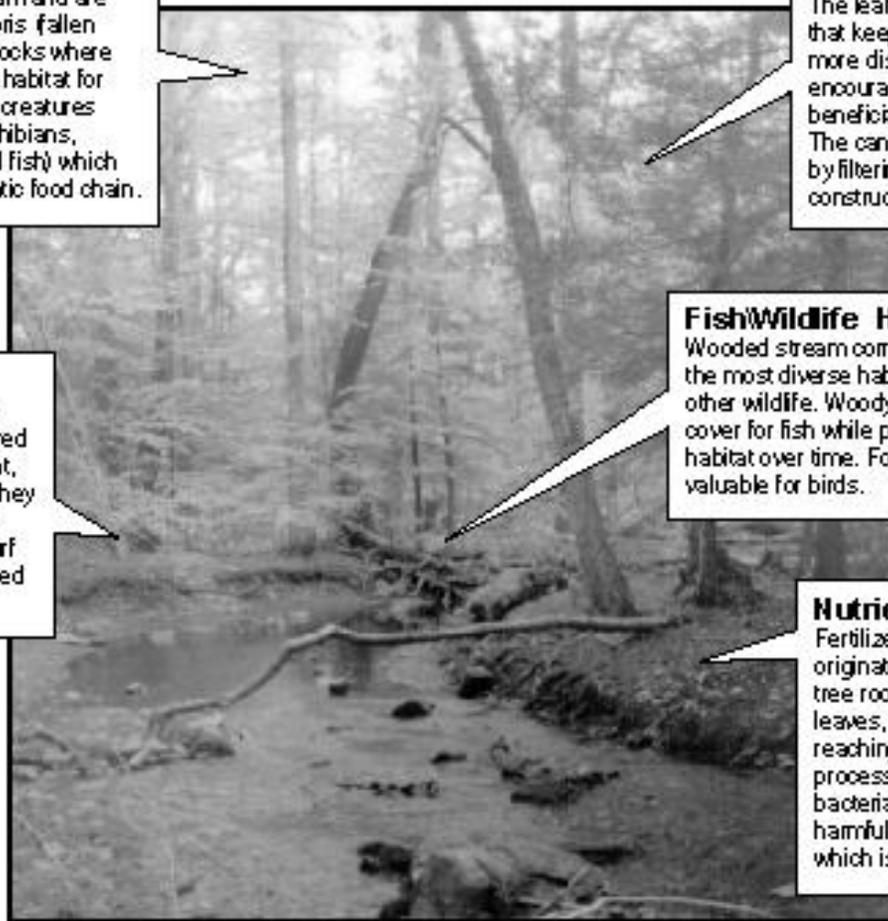
Rain and sediment that runs off the land can be slowed and filtered in the forest settling out sediment, nutrients and pesticides before they reach streams. Infiltration rates 10-15 times higher than grass turf and 40 times higher than a plowed field are common.

Fish/Wildlife Habitat

Wooded stream corridors provide the most diverse habitats for fish and other wildlife. Woody debris provides cover for fish while preserving stream habitat over time. Forest diversity is valuable for birds.

Nutrient Uptake

Fertilizers and other pollutants that originate on land are taken up by tree roots. Nutrients are stored in leaves, limbs and roots instead of reaching the stream. Through a process called 'denitrification', bacteria in the forest floor convert harmful nitrate to nitrogen gas, which is released into the air.



Plants can reduce flooding downstream.

- Planting or not mowing along the streambank can intercept the floodwaters, slowing them down and reducing the extent of flooding downstream.
- Deeper rooted species help to utilize some of the surface runoff and stabilize surface.

Plants are an important component of wildlife habitat.

- Planting a diversity of native plants ensures that the needs of a variety of creatures will be met. Such plantings help to supplement the natural habitat.

Enhanced property values

- Landscaping that enhances the beauty of your property while contributing to improvements in water quality is a sound investment.

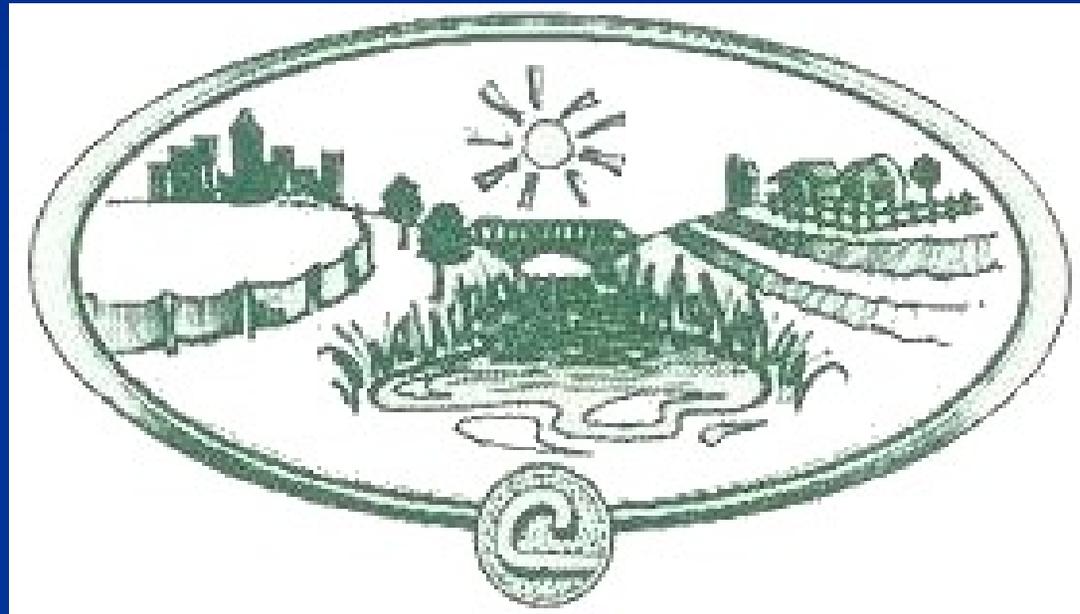
Tree Vitalize

- Initiative in Southeast Pennsylvania to restore canopy cover.
- Tree Vitalize Watersheds program:
 - Open to all municipalities in Montgomery, Philadelphia, Chester, Bucks, and Delaware Counties.
 - Funding is available for planting riparian buffers.
 - In 2005, over 6000 trees were planted in Montgomery County through Tree Vitalize Watersheds.

In Conclusion....

- Limit the amount of impervious surfaces in your landscape.
- Where possible, direct runoff from impervious surfaces across vegetated areas, such as rain gardens.
- Allow "thick" vegetation or "buffer strips" to grow alongside waterways to filter and slow runoff and soak up pollutants.
- Plant trees, shrubs, and groundcover. They will absorb up to fourteen times more rainwater than a grass lawn and they don't require fertilizer.
- Collect and reuse rainwater!

Montgomery County Conservation District



www.MontgomeryConservation.org