

Storm Water Solutions for your HOA

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VCE - Prince William

Neighborhood Conference

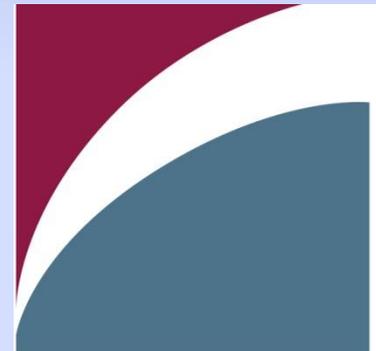
Prince William County

February 2014



Partners for Water Quality

- Landscaping and turf management
- Stormwater pond management
- Wildlife concerns
- Recommendations for maintaining your landscape to save time and \$\$
- Protecting water quality, pollution prevention, and housekeeping tips



**Virginia
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Understanding and Managing Stormwater

Rain

- Rain fills our lakes and rivers, recharges the underground aquifers, and provides water to plants and animals.
- VA receives an average of 42 inches per year



What happens to the Rain?

Depends on many factors:

- Rate of rainfall
- Soil conditions (Dry, Damp, Soggy)
- Density and coverage of vegetation
- Amount of urbanization
- Topography

During A One Inch Rainstorm:



- 25,800 gallons of water runs off a one-acre parking lot.
- 1,361 gallons of water runs off a one-acre wooded area.

What is Stormwater?



- Water that washes over land through the drainage system, and into our waterways.
 - Rain/Sleet
 - Melting Snow / Ice
 - Irrigation

How does stormwater reach our waterways?

Though our drainage systems

- Storm drains
- Drainage ditches
- Underground pipes
- Retention ponds
- Culverts
- Creeks and streams
- Wetlands

Stormwater is not typically an issue in undisturbed areas

- Leaves of trees and plants break up the raindrops
- Roots of plants and healthy soil absorb water
- Because of plant cover, fewer soil particles are carried along as it travels down the watershed to a body of water.

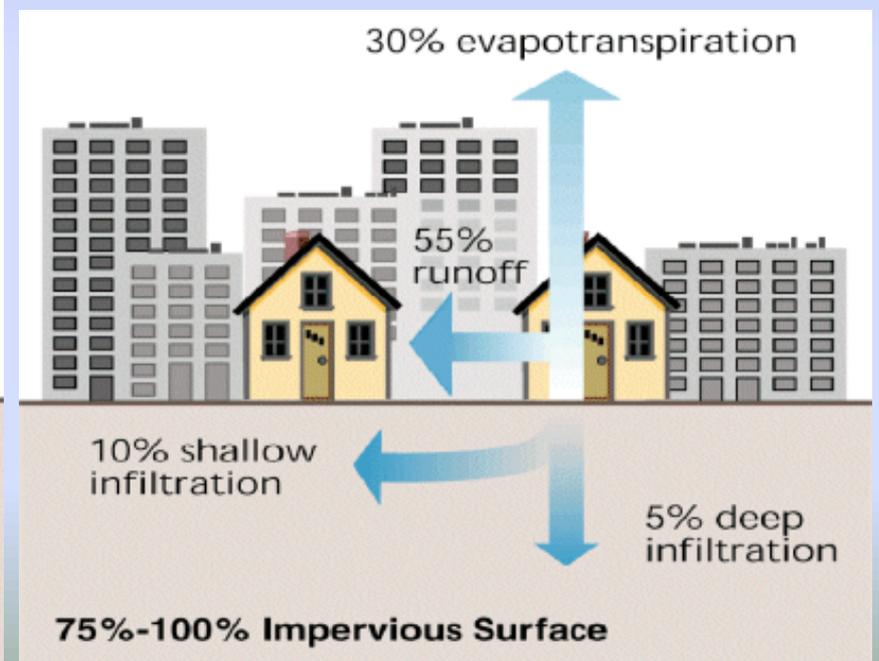
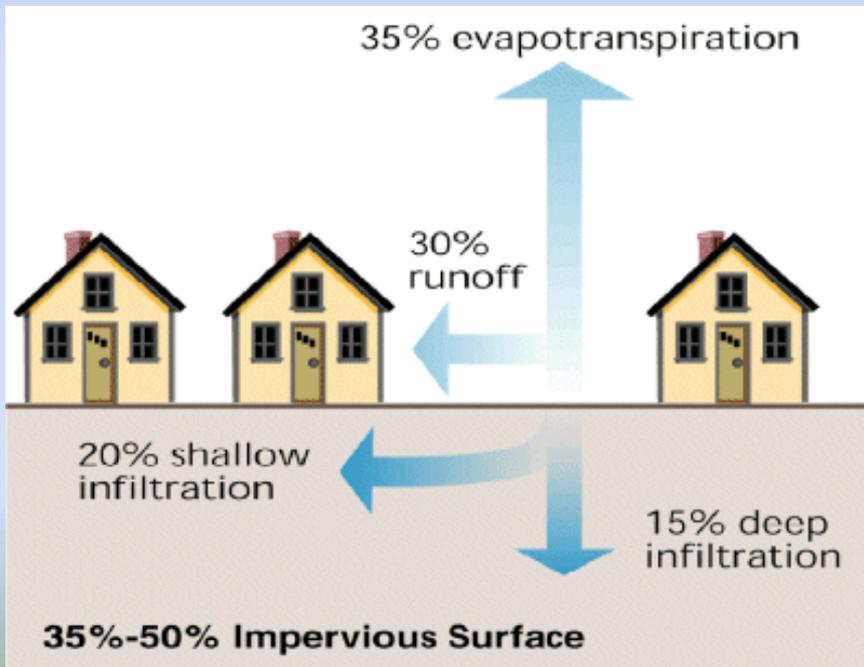
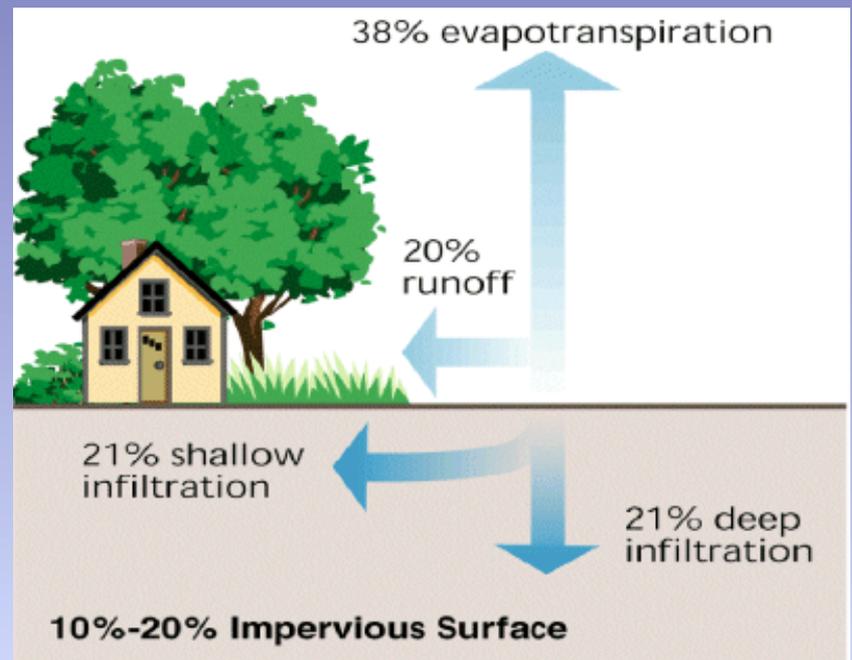
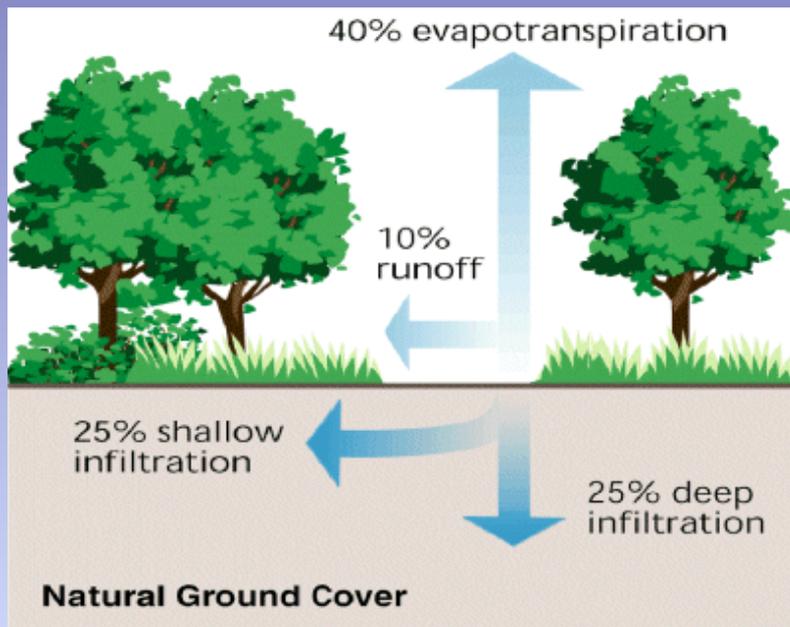


What is an impervious surface?

A hard surface that water doesn't soak into

- Paved Surfaces
- Buildings (rooftops)
- Parking areas
- Driveways
- Sidewalks
- Patios
- Roads

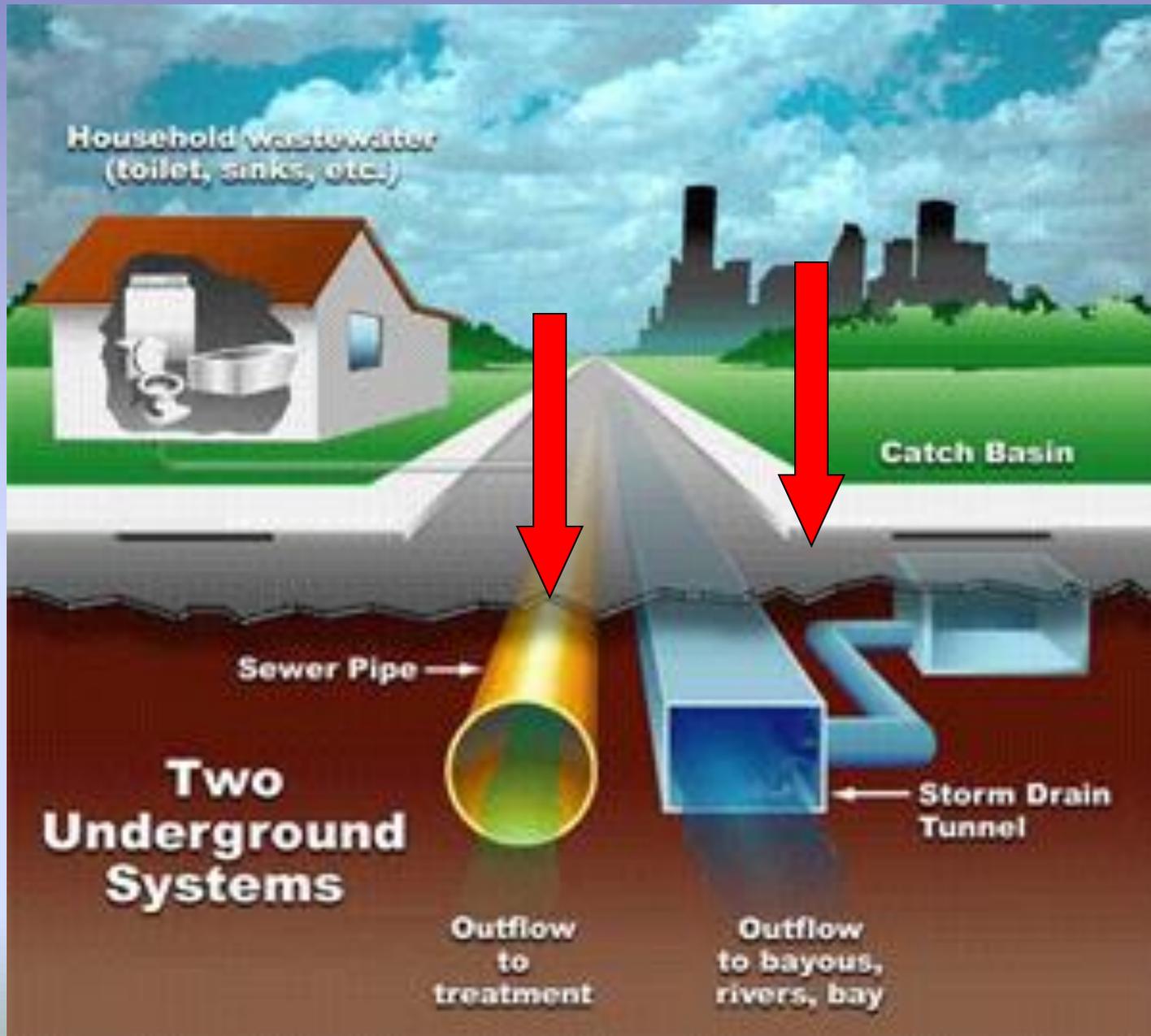




What's the connection between development and stormwater runoff?

- Prince William county has over 831 residents per square mile.
- More development and more impervious surfaces = more polluted runoff

What's the difference between our drainage system and our sanitary sewer system?



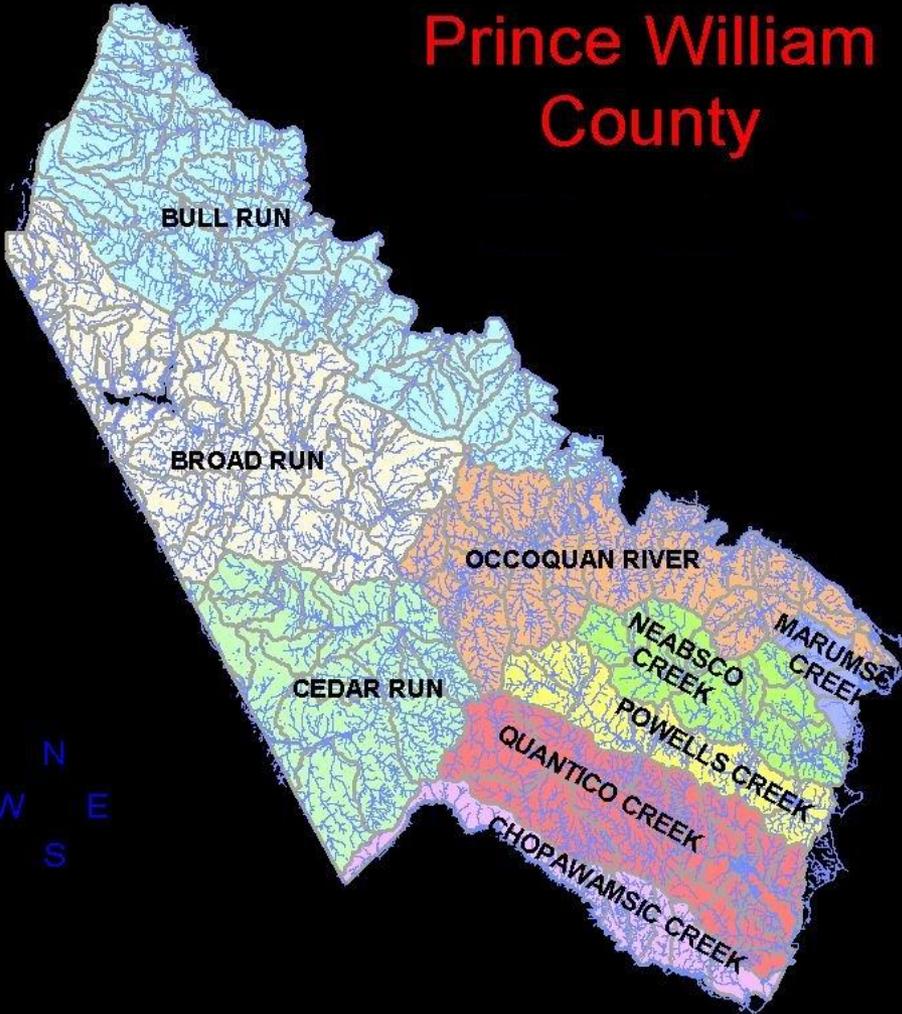
What is a Watershed?

- The land that water flows across on its way to a stream, river, or lake
- No political boundaries
- Determined by topography and slope

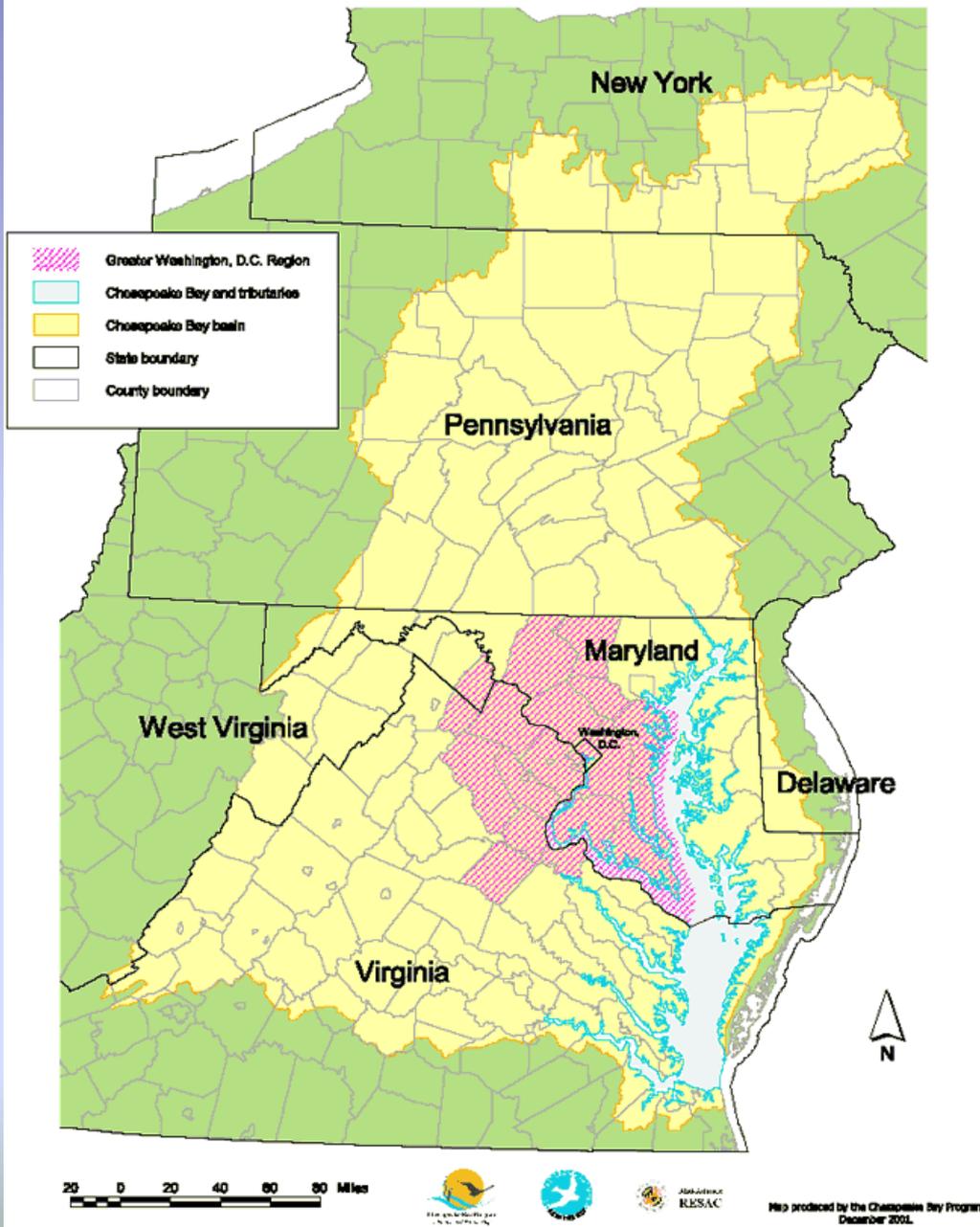


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Prince William County



The Chesapeake Bay Watershed



The Problem with Stormwater

Flooding

caused by litter
and yard waste
clogging drains



Polluted runoff
doesn't go to a
treatment plant

The Problem with Stormwater

- Pollution caused by:
 - Sediment
 - Pet waste
 - Salts
 - Pesticides
 - Fertilizer
 - Vehicles
 - Litter
 - Yard debris
 - Heat

How does polluted runoff impact our waterways?

- Fish kills
- Algal blooms
- Foul odors
- Habitat destruction
- Unsightly appearance
- Aquatic weeds
- Contaminated drinking water
- Recreation and economic impacts



Stormwater runoff pollution affects ALL of our waterways

- Several local waterways do not meet water quality standards and are impaired by pollution
- 62 stream segments impaired for various pollutants
 - Neabsco Creek
 - Cedar Run
 - Kettle Run
 - Broad Run
 - Bull Run

The Problem with Stormwater

Flooding -
Caused by litter
and yard waste
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Polluted runoff
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Nitrogen and Phosphorus Fertilizer

Improperly applying fertilizer or applying too much causes

- Algae blooms
- Aquatic weed growth

Depletes oxygen for aquatic organisms



FILAMENTOUS ALGAE

Pesticides

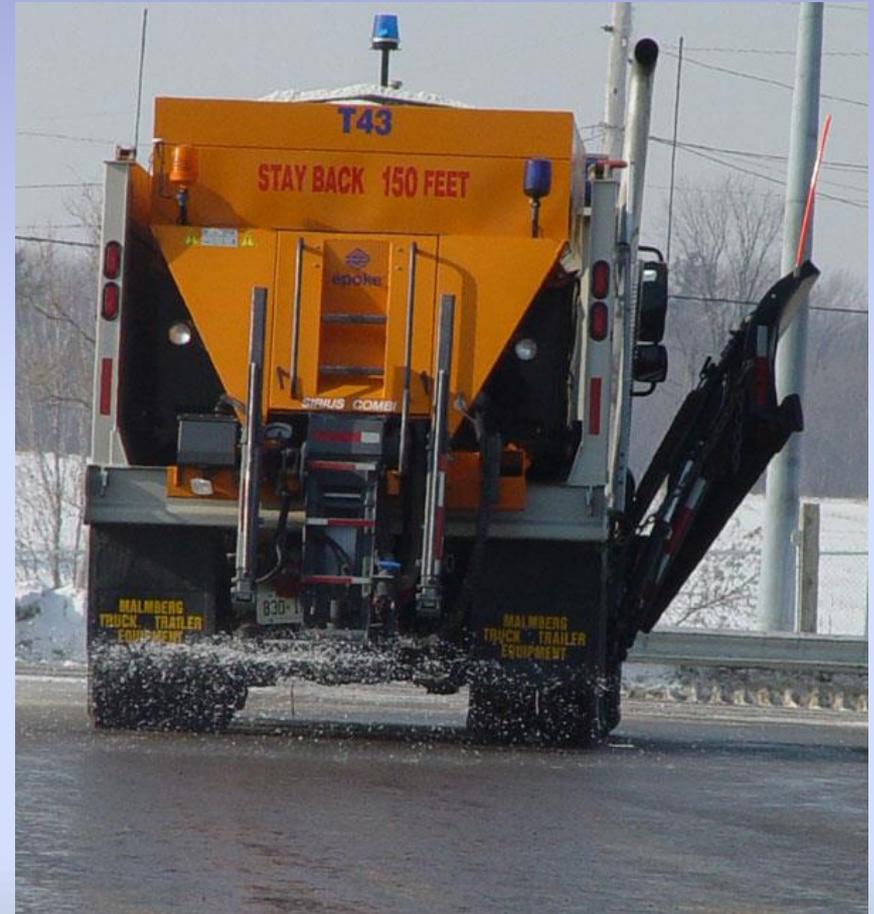
Insecticides, herbicides & fungicides are washed into waterways

These pose a threat to humans, animals, birds, plants & beneficial insects



Salts

- Toxic to freshwater organisms and plants
- Corrosive to water pumps and pipes
- Increases the cost of water treatment
- Plant growth and yield are reduced



Pet Waste

- Contains high concentrations of pathogens & nutrients
- Pose a human health hazard for recreational and drinking water
- Nutrients that cause algal blooms



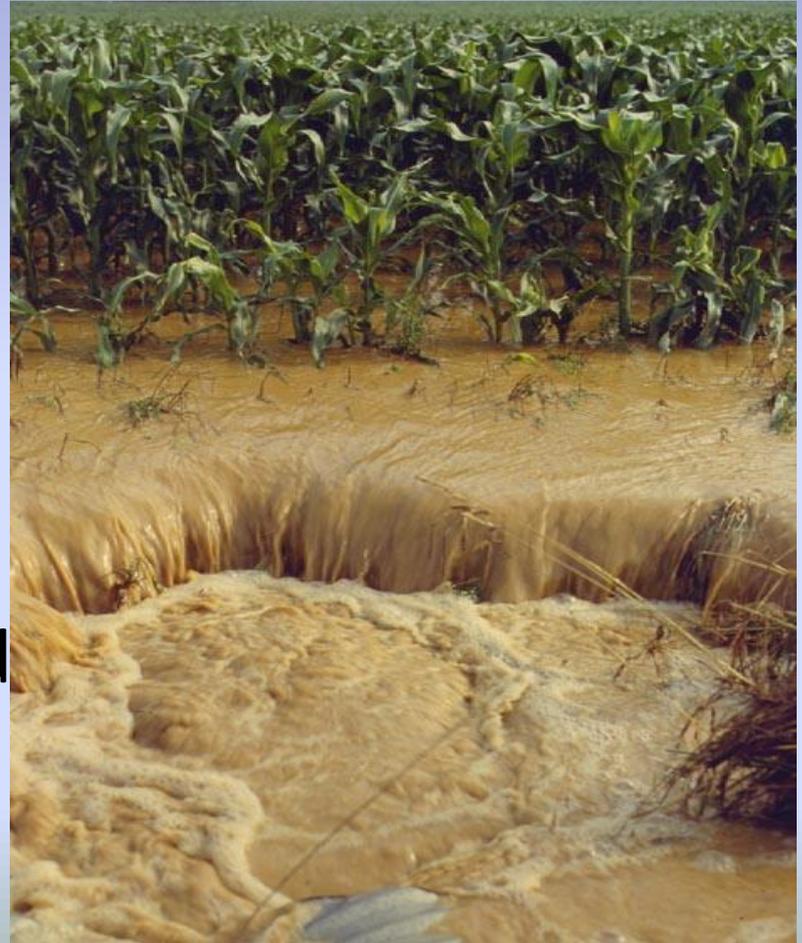
Yard debris

- Leaves, grass, branches clog drains
- As organic matter decomposes, it depletes oxygen in streams
- Nutrients cause algal blooms and aquatic weed growth that lead to fish kills and habitat destruction



Sediments

- Clogs storm drains causing flooding
- Requires dredging of navigation channels
- Clogs fish gills, smothers fish eggs
- Destroys habitat by covering bottom-dwelling animals and submerged aquatic vegetation



Nitrogen and Phosphorus Fertilizer

Improperly applying fertilizer or applying too much causes

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FILAMENTOUS ALGAE

Vehicles



- Oil, antifreeze, gas, brake dust, tire bits, car wash soap are washed into the drain system
- Soaps (surfactants) threaten aquatic habitat
- The used oil from one oil change can contaminate 1 million gallons of fresh water

Other 'housekeeping' tasks

- litter
- disposing of pet-waste
- chemicals – lawn and garden, de-icers
- washing cars,
- changing motor-oil on impervious driveways
- disposal of leftover paint and household chemicals

Litter

- Clogs drains and cause flooding
- Ugly and costly to clean up
- Wildlife mistake litter for food or get entangled in it.



Heat – Thermal Pollution

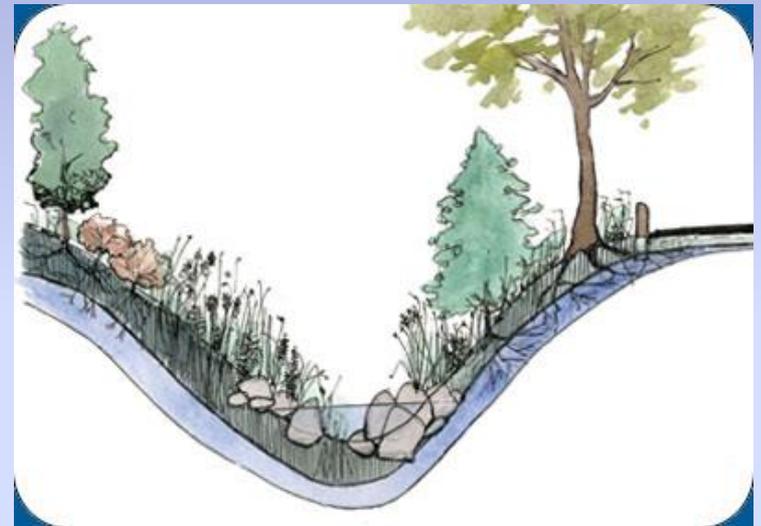


- As water travels over hot pavements, roads, sidewalks it becomes heated
- Lowers dissolved oxygen
- Increases the solubility of salts, herbicides, and pesticides
- Decreases species diversity

So what can we do?

Prevent sedimentation

- Plant vegetative buffers that hold soil in place, prevent erosion, filter pollutants, and provide habitat
- Plant groundcovers and native plants
- Re-seed bare spots or mulch



Properly Dispose of Pet Waste

- Always pick up after your pet and dispose of the waste properly
- Seal it in a plastic bag and throw it away
- Don't flush waste down the toilet



In the landscape---



Fertilize in the fall not the spring.

- Use the correct amount of fertilizer
- Measure your lawn
- Join BEST Lawns

In the landscape---

Test soil in lawn areas every three years.

A soil test is included in BEST Lawns enrollment



In the landscape---

- Do not apply fertilizers or pesticides near bodies of water, or before a rain.
- Sweep up any residue from hard surfaces and dispose of properly.



In the landscape---



- Use pesticides as a last resort
- Weed by hand or use natural predators
- Spot treat with pesticides
- Never apply before it rains
- Follow any pesticide label-it's the law!

In the landscape---



- Use native, hardy plants suited for our climate.
- They resist drought better and require less pesticides.

In the Landscape--

- Start a compost pile
- Grasscycle- Use a mulching mower and return your grass clippings to the lawn=Free fertilizer
- Sweep up and collect all yard waste off the street and sidewalks



Vehicles

- Wash your car on the grass
- Use phosphate-free car soaps
- Go to a commercial car wash
- Maintain your vehicle to prevent leaks
- Use kitty litter or saw dust to clean up leaks and spills
 - Dispose in trash
- Collect and recycle hazardous waste oils, solvents etc. and Properly dispose of auto fluids



So what can we do about Litter

- Put litter in trash
- Recycle
- Use ashtray or receptacle for cigarette butts



So what can we do?



- Clean parking lots and paved areas of leaves, trash and sediment.
- Sweep pavements-
 - And pick up the dirt- don't sweep dirt into the gutter.

So what do we do?

Limit the exposure of potential pollutants to rainfall or runoff.....

- Store materials inside, cover or remove materials
- Minimize the amount of material stored by implementing “just in time” purchasing

So what can we do?

Educate employees and volunteers on proper storage, handling and disposal of potentially hazardous wastes



So what can we do?



- Clear snow to the lower end of paved areas.
- Clear snow from drains to allow for better drainage
- Use ice melt, sand, kitty litter, cinders ashes or other alternatives—Not fertilizer!

Keep it closed!



Check drain plug to prevent leaks

Other things you can do:

- Rain Barrels
- Pervious pavers
- Swales
- Rain Gardens



Remember—
You are the solution
to stormwater pollution!



Storm water Site Visit Case Studies for discussion



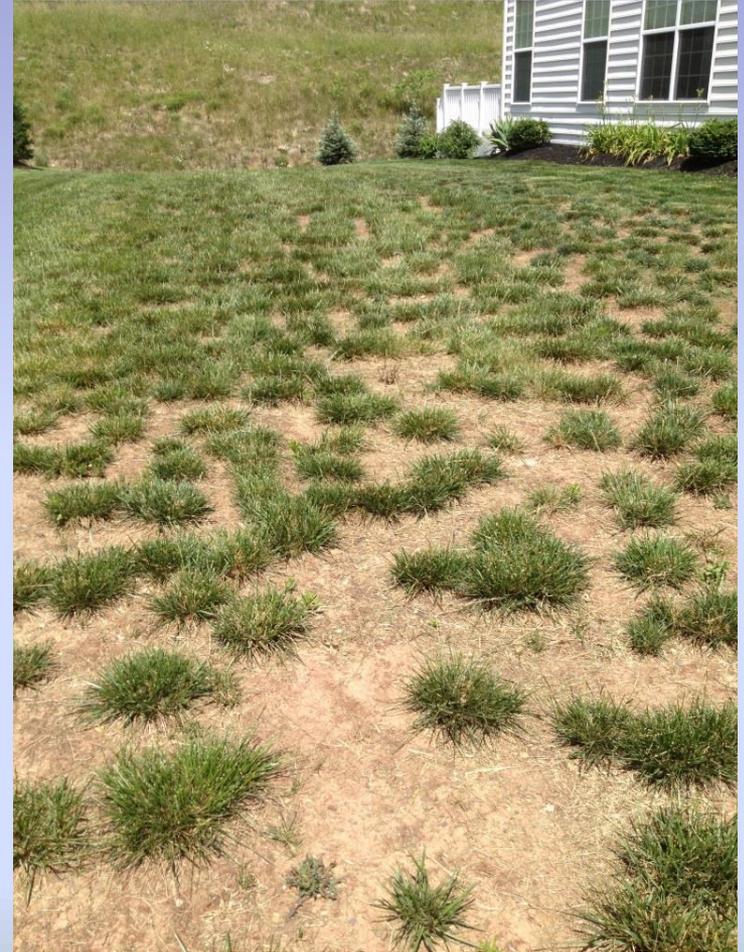
Do these look familiar?



Algal bloom and erosion



How about these?



More trouble areas....



Resource Protection Areas



Thank You For Being a Partner For Water Quality!

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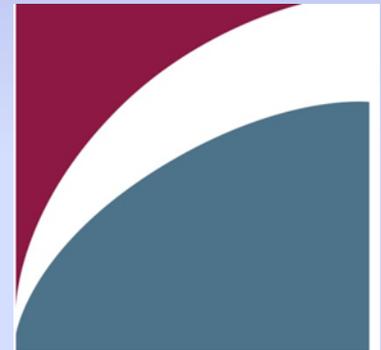
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