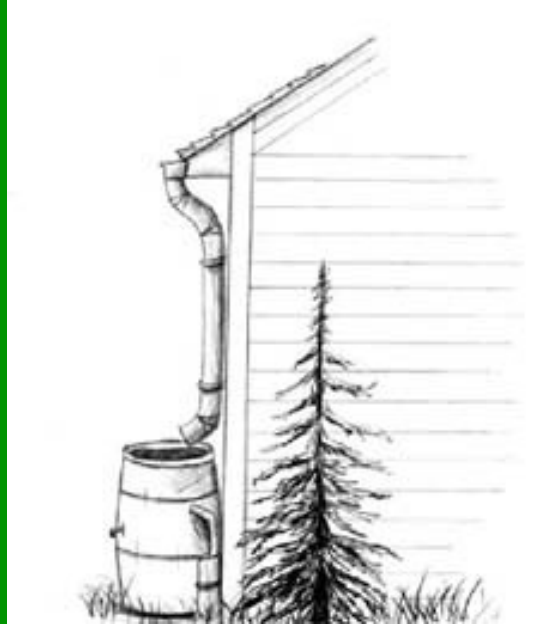


Watershed Awareness/Rain Barrel Workshop



**Pennsylvania
Resources
Council, Inc.**

"Working to protect the environment since 1939."

**DON'T BE A
LITTERBUG**



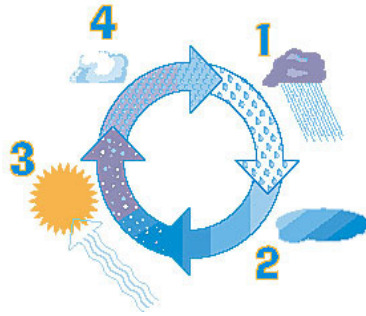
**PENNSYLVANIA
ROADSIDE COUNCIL**



Pennsylvania
Resources
Council, Inc.

"Working to protect the environment since 1939."





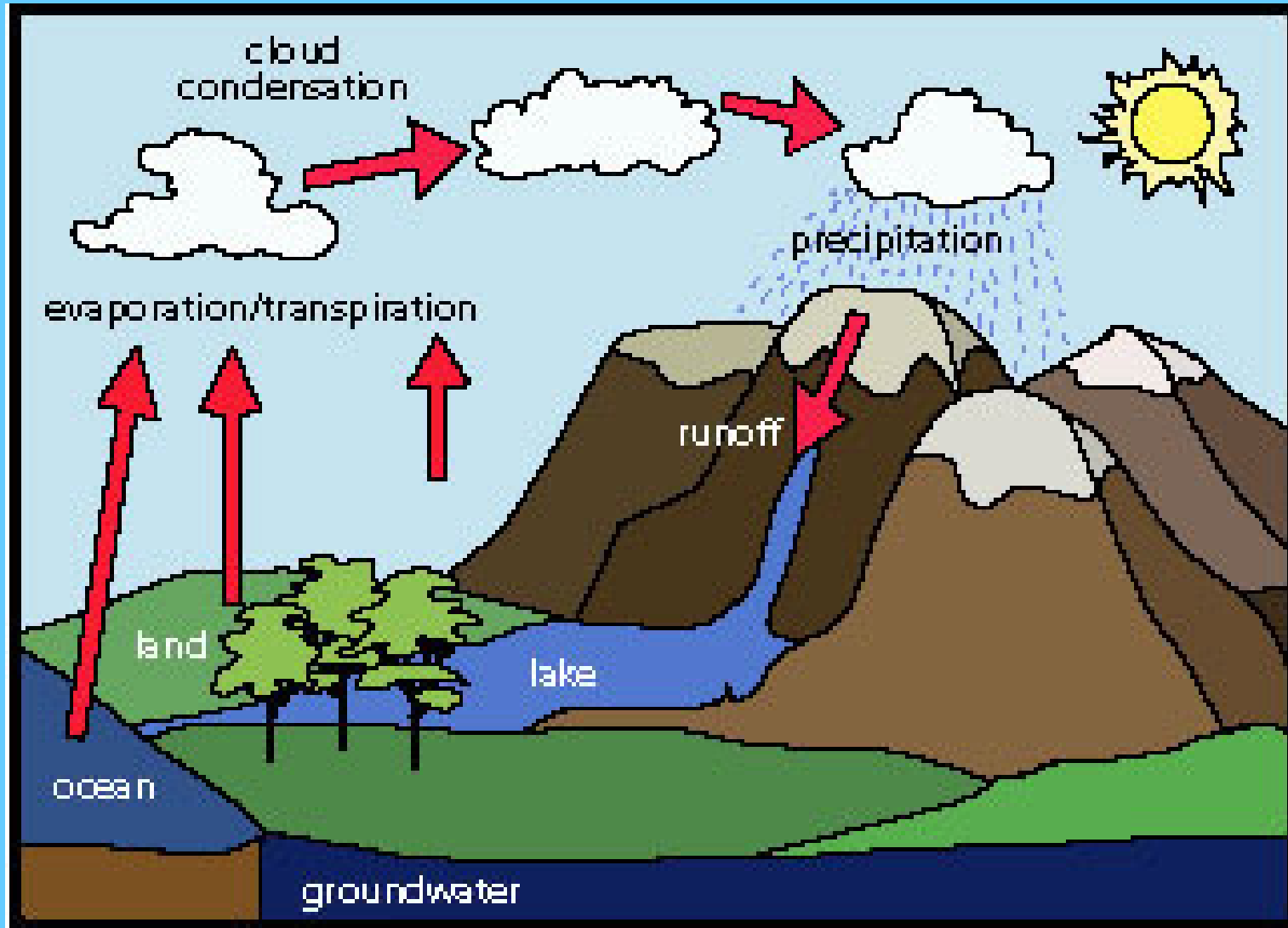
Between Earth and Earth's atmosphere, the amount of water remains constant; there is never a drop more, never a drop less. This is a story of circular infinity, of a planet birthing itself.

LINDA HOGAN, Northern Lights, Autumn 1990

WATER is LIFE



Water Cycle



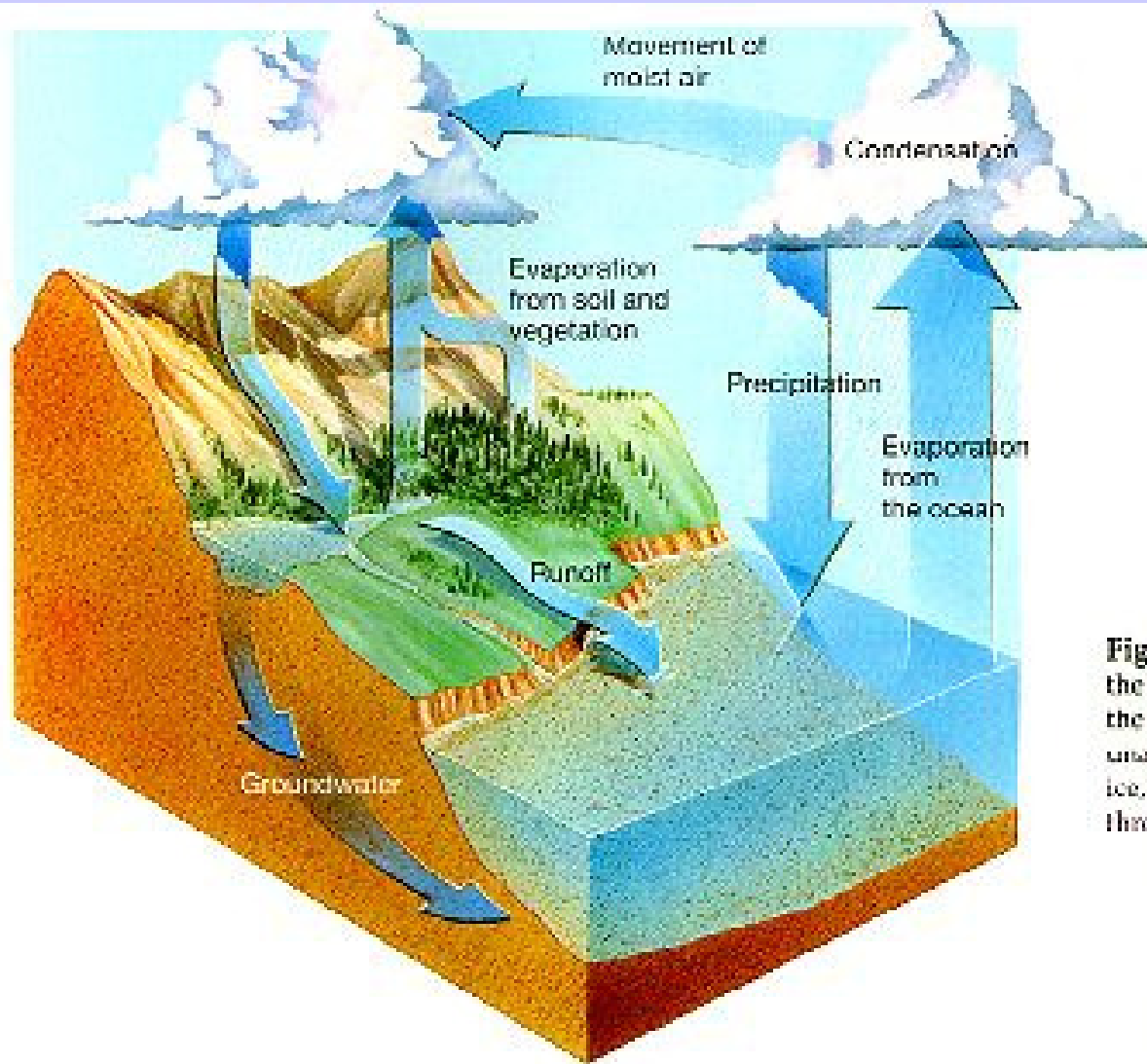
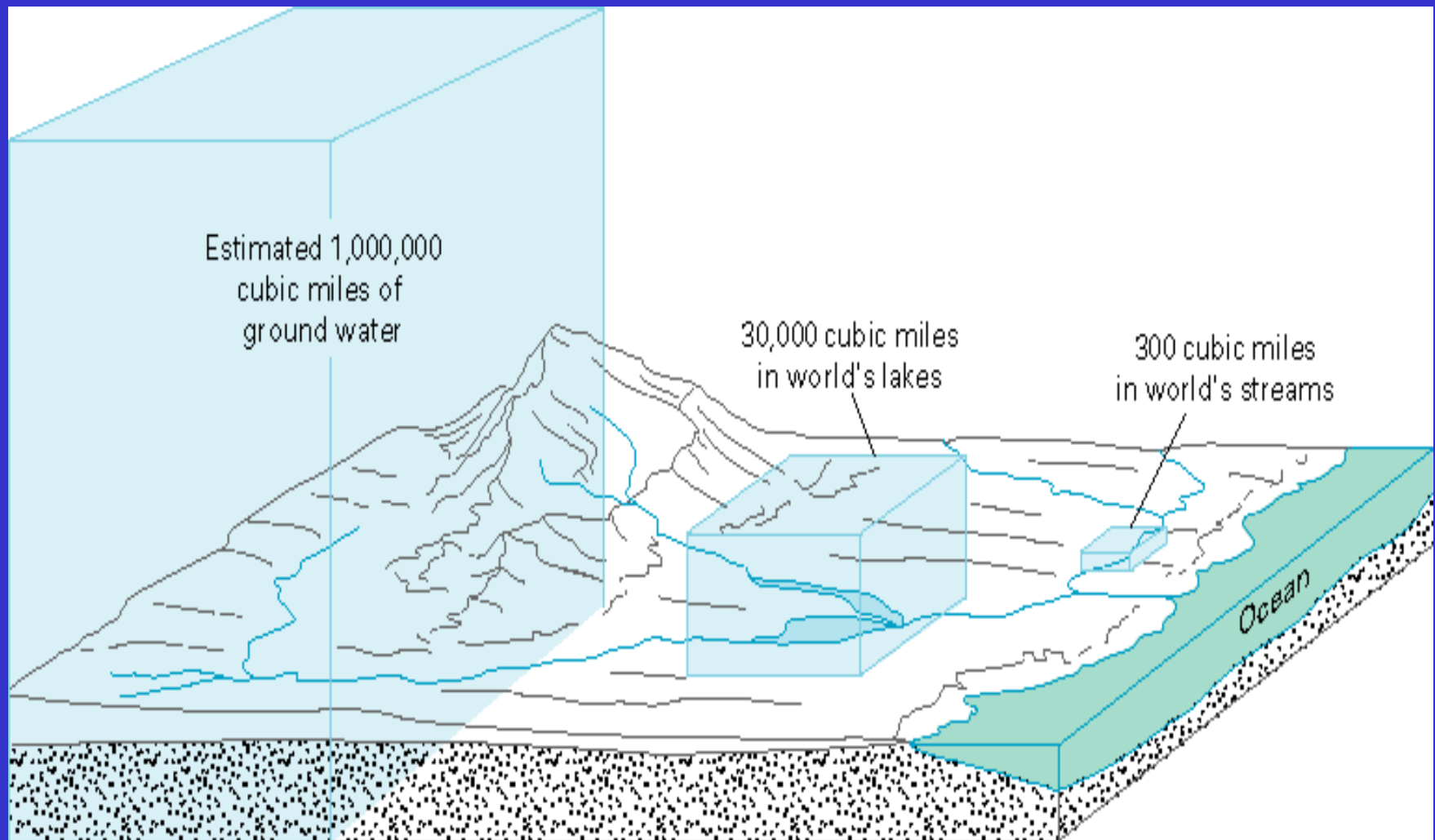


Figure 54-6 The hydrologic cycle. Water cycles from the oceans to the atmosphere to the land and back to the oceans. Although some water molecules are unavailable for thousands of years (locked up in polar ice, for example), all water molecules eventually cycle through the hydrologic cycle.

Fresh Water in Storage



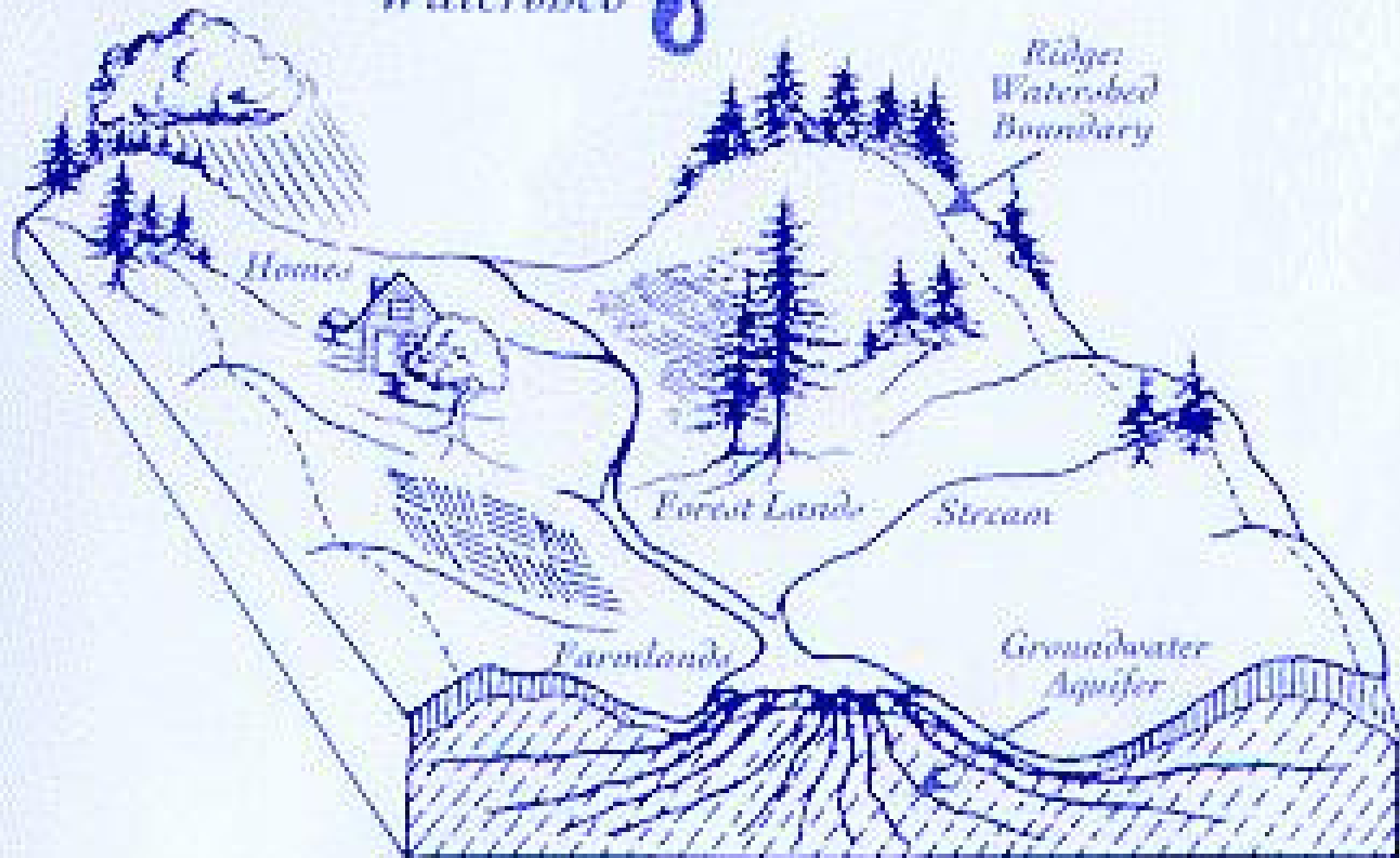
What exactly is a “Watershed”?



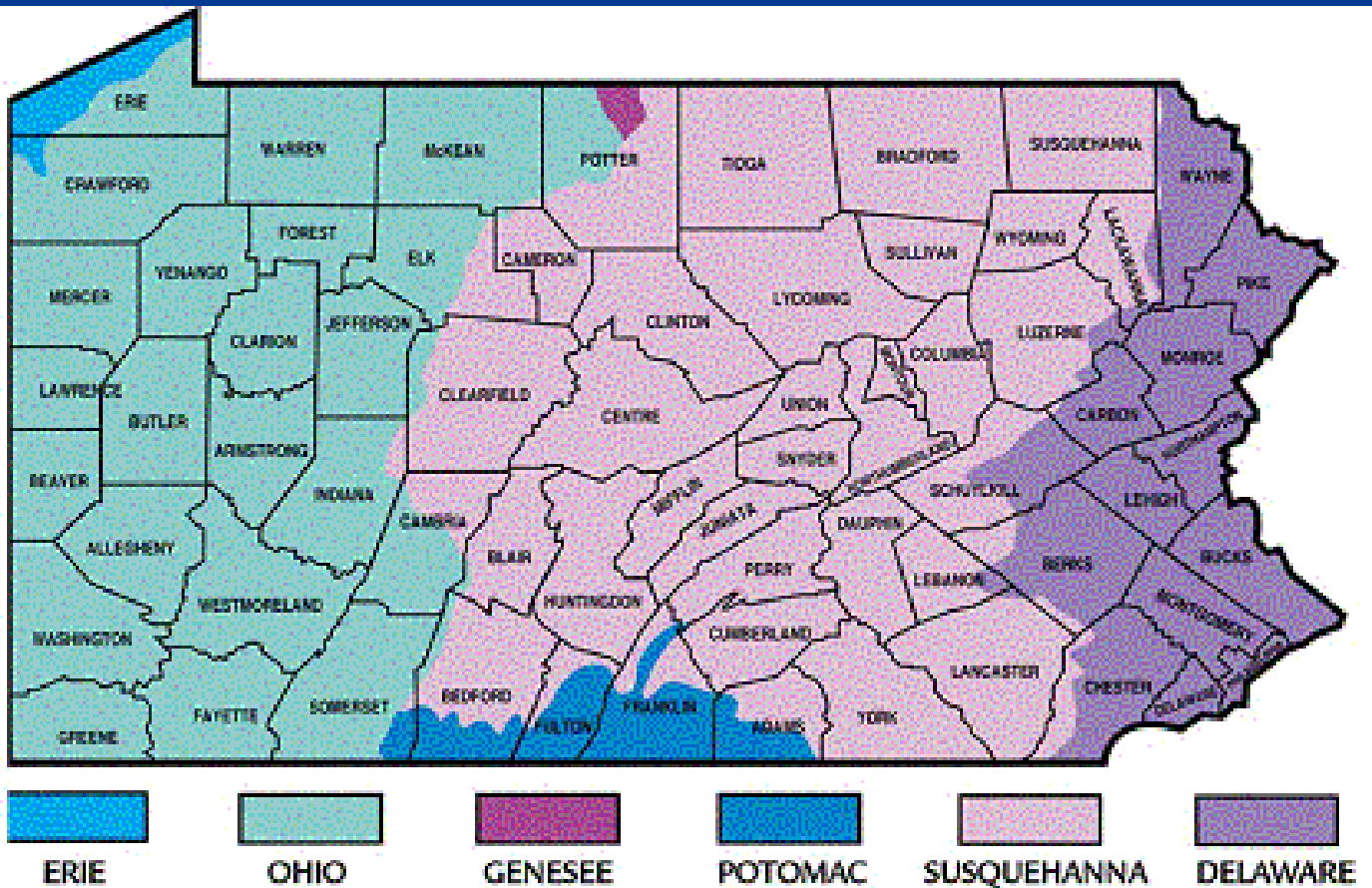
Watershed: the land area from which surface runoff drains into a stream, channel, lake, reservoir or other body of water (collection site)



Watershed



PA's 6 Major Watersheds



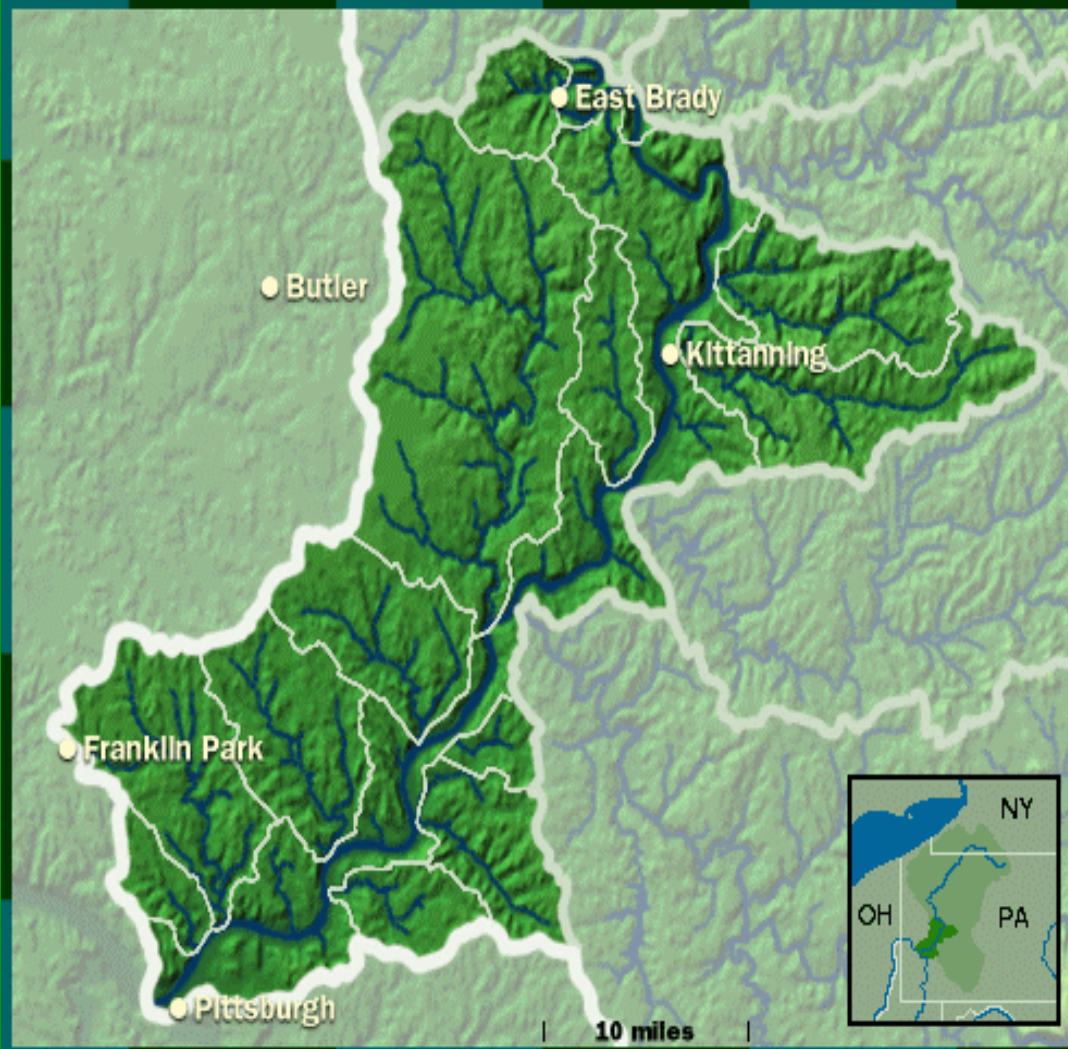




Lower Allegheny



Watershed Units



Human Impact on the Watershed

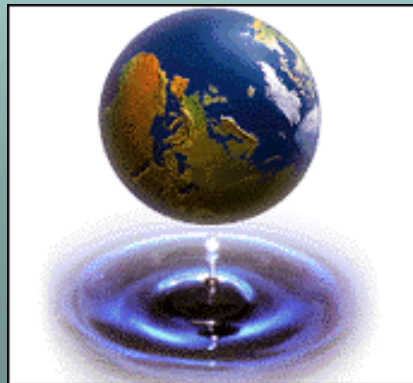
- **Point Source**
- **Nonpoint Source Pollution (NPS)**

Sources of Human Impact

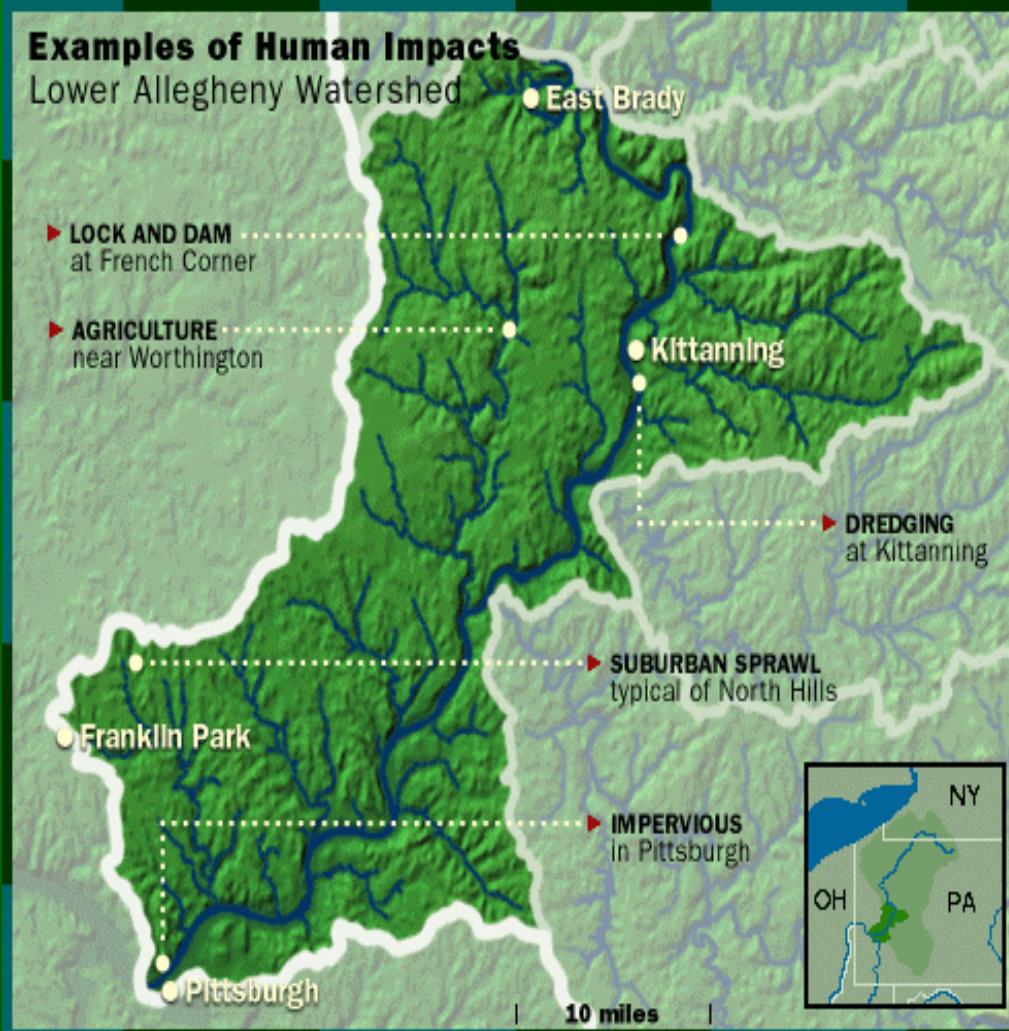


Human Impact on the Watershed

- **Homes/Yards**
- **Schools**
- **Businesses**
- **Development**
- **Agriculture**
- **Mining**
- **Construction**
- **Sprawl**



Human Impacts on Watersheds

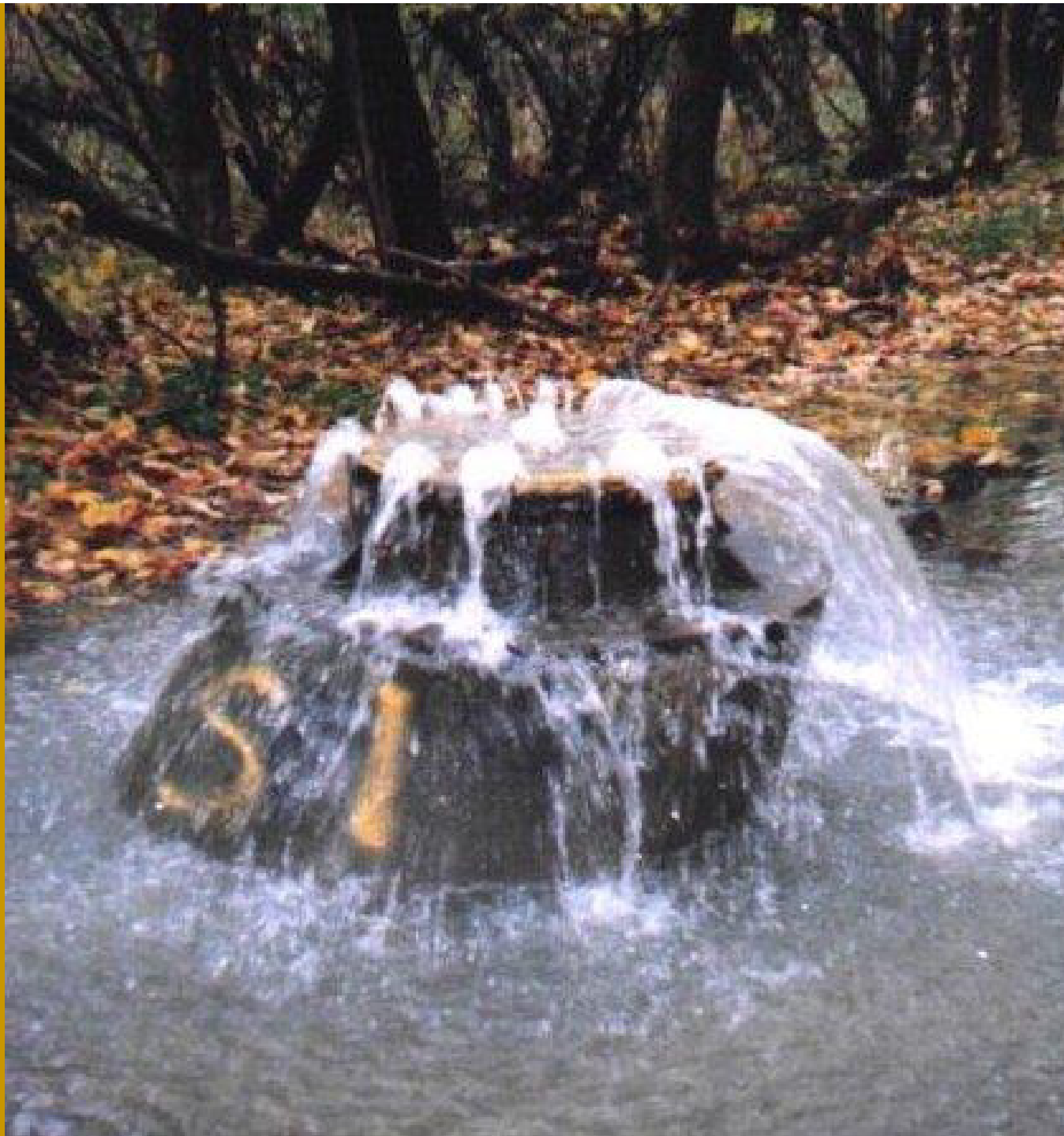


Combined Sewer Overflow (CSO)



Sewer Overflow







GO "GREEN" AND
CLEAN !!

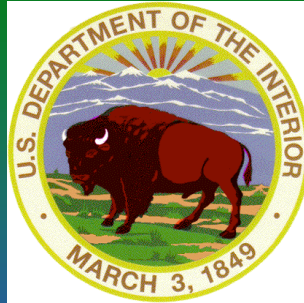


What is “Green” Cleaning?



What is "ENVIRONMENTALLY PREFERABLE" ?

- "...products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose..."



- MUST BE BIO-BASED (NO PETROCHEMICALS)
- NO PETRO-DYES IN PRODUCTS (NO BLUES, GREENS, YELLOWS, OR ANY OTHER COLOR unless provided by natural means)
- NO ARTIFICIAL PETRO-PERFUMES (NO...PINES , MINTS , CHERRIES , VANILLAS , LEMONS ... - unless provided through natural means).

"GREEN" -or- Environmentally-Preferable Standards

- **Must Not Contain Any Carcinogens, Mutagens, or Teratogens Designated by Federal Law**
- **MUST BE BIODEGRADABLE**
- **Must Not Contain Chlorinated Solvents**
- **Must Not Contain Any Ozone-depleting Compounds, Greenhouse Gases**
- **Must Not Contain Any Substances That Contribute to Photochemical Smog and Poor Indoor Air Quality**
- **Must Not Be Delivered in Aerosol Cans.**

- **Must Not Contain Ingredients Included on the "Chesapeake Bay Program's Toxics of Concern List" .**
- **Must Not Be Toxic to Humans or Aquatic Life**
- **Must Not Contain Endocrine Modifiers, Alkyl Phenyl Ethoxylates, Dibutyl Phthalate, or Heavy Metals**
- **Must Not Contain More than 0.5 Percent by Weight of Phosphorous**
- **Must Not Contain Persistent or Bioaccumulative Substances**

NEW YORK STATE MANDATES "GREEN CLEANING"

On January 10th, 2005, New York State Governor George Pataki announced in his 2005

State-of-the-State Address that he signed an Executive Order mandating state agencies and authorities to use **ONLY** non-toxic cleaning supplies, and that legislation is currently being created for a similar mandate concerning **ALL** New York State schools.

Homemade Non-toxic Cleaners

- Basic ingredients include:
 - Water
 - Baking soda
 - White distilled vinegar
 - Liquid soap
- All purpose cleaners, glass cleaners, stain removers, oven cleaner, drain cleaner, floors, polishes, toilet bowl cleaner, etc, etc.



Lawn and Garden



American Lawns...

- Cover more than **30 Million Acres**
- Use up to **10 X more chemical pesticides** per acre than farmers use on crops
- **2001 EPA figures estimate**
 - **US homeowners bought 102,000,000 .lbs** of the active ingredients used in lawn and garden pesticides at a **cost of over \$2 billion**

Chemical pesticides and fertilizers contaminate surface and groundwater.

- Lawn pesticides and fertilizers can contaminate surface and groundwater.**
- This diminishes the quality of our drinking water as well as the quality of aquatic habitats and health of aquatic life forms.**
- Many fish and aquatic insect species are highly sensitive to fertilizers and pesticides.**

Household pesticides are poisoning city creeks

- **Pyrethroids is a class of insecticides found in household sprays and lawn care products. These findings have caught the attention of EPA, which is now in the process of reregistering these insecticides.**

Researchers suspect that pyrethroids bind to small bits of dirt that wash off lawns and into nearby streams.



Wisconsin researcher says frog deformities increase with use of fertilizers



In the Garden/On the Lawn

- **Use natural, non-toxic pesticides and fertilizers in the lawn and garden**
- **NEVER use pesticides if it looks like rain**
- **Use mulch in the garden to keep moisture in and weeds out**
- **Control soil erosion by planting a ground cover and/or native**
- **Compost grass clippings and leaves. Never allow them to wash into roadways where they will reach storm drains.**

Car Care



Car Care

- Clean up spilled brake fluid, oil, grease and antifreeze immediately . You can use kitty litter to absorb it
- Wash your car on the lawn or in a grass or gravel area so that the water can percolate into the soil. The ground filters it before it reaches the river or stream.

CAR CARE

- **Fact: One quart of motor oil can pollute 250,000 gallons of water in our rivers and lakes.**
- **Take used motor oil to a service station that recycles it**
- **Anti-freeze can be recycled. Take it to a service station that does so.**

CAR CARE

- **Take used batteries and oil filters to participating service stations for recycling.**
- **Check your car every couple of months for leaks in the oil, fuel, brake and cooling systems**

What is HHW or Household Hazardous Waste?



HHW is...



HHW is...

- Six categories: cleaning products, auto maintenance, hobby products, personal care, lawn and garden care
- Found in the kitchen, basement, garage, and workshop
- Look for precautionary words like Poison, Danger, Warning, Caution, Toxic, etc.

Latex Paint

- **NOT a hazardous waste**
- **As long as paint is completely dry, it can be thrown out in regular garbage**
- **Using kitty litter or paint hardener**

HHW and the Environment

Improper disposal of HHW can:

- Kill living organisms in a lake or river
- Destroy wildlife and vegetation
- Cause major reproductive complications in wildlife
- Limit the overall ability of an ecosystem to survive



What can you do?

- **Buy only what you need**
- **Use less toxic alternatives**
- **Give away unused portions to friends**
- **Bring HHW to an HHW collection event**
- **Take responsibility for what you buy**

How Do You Dispose of the Polluting Materials Used in Your Home?

The way you dispose of products you and your family use at home can contaminate your community's ground water

Motor oil, pesticides, left-over paints or paint cans, mothballs, flea collars, weedkillers, household cleaners, and medicines can be harmful to ground water and to the environment in general.

The average American disposes of approximately one pound of this type of waste each year. Multiply that by the number of people in your community. It adds up to a lot of toxic material going in to the groundwater.

Don't Pour It Down the Drain!

Anything you pour down your drain or flush down your toilet will enter your community's sewer system.

Don't Put It in the Trash!

As rain and snow pass through the landfill, the water can become contaminated by hazardous products and eventually carry them into the ground water and surface water.

Don't Dump It on the Ground!

Hazardous wastes dumped on or buried in the ground can contaminate the soil and leach down into the ground water or be carried into a nearby river or stream by runoff during rainstorms.

What You Should NOT Do

- **Never leave products within reach of children and animals**
- **Never allow children to handle or dispose of HHW**
- **Never dump HHW down storm sewers or in the backyard**
- **Never burn or bury HHW**
- **Never place HHW in the trash**
- **Never reuse containers for other purposes**
- **Never mix products unless instructed to do so by the label directions**

Do Use and Dispose of Harmful Materials Properly!

Use less of such products. Whenever possible, substitute a nonhazardous product. Buy only as much as you need.

Use non-phosphate laundry detergents and non-toxic cleaning products

Instead of fabric softener use baking soda in the final rinse

Use latex paint instead of oil-based paint whenever possible

RECYCLE!

Making cans from recycled aluminum products produces 96% less air and water pollution than making them from raw materials(bauxite).

Manufacturing recycled paper produces 55% less air and water pollution than manufacturing paper from virgin wood(trees).

Recycling just one aluminum can saves enough energy to run a television for three hours.

Each ton of recycled paper can save 17 trees, 380 gallons of oil, three cubic yards of landfill space, 4,000 kilowatts of energy and 7,000 gallons of water!

Don't be a litterbug!

Litter gets washed into the storm sewer and ends up in the lakes, streams, rivers and wetlands.



Impervious Surface



Forested Wetland



Impervious Surface



The pervious pavement at the Chicago Center for Green Technology lets water seep into the ground instead of heading into the sewer drain. (Photo by Shawn Allee)







Replacing impervious surfaces like sidewalks and driveways with permeable areas allows more water to infiltrate into the ground.

Permeable Paving Systems

What is a rain barrel?



- **A rain barrel is a system that collects and stores rain water from your roof that would otherwise be lost to runoff and diverted to storm drains, streams and rivers.**
- **A rain barrel is relatively simple and inexpensive to construct and can sit conveniently under any residential gutter down spout.**

Elevating the Rain Barrel

The rain barrel is designed to take advantage of gravity. Water will flow from the vinyl hose when the hose is below the barrel. Therefore, place the barrel on cinder blocks or a sturdy wooden crate at least 15 inches from the ground.



55-Gal. Drum Rain Barrel



Rain Barrel Camouflage



**To construct your rain
barrel you will need:**

One 55-gallon food-grade drum (these can be purchased or obtained for free from a beverage plant or dairy)

- **3 1/2ft vinyl hose (3/4" DD x 5/8" ID)**
- **One 4" diameter atrium grate/screen**
- **One 1/2" PVC male adapter (will be attached to bottom of rain barrel)**
- **One 3" vinyl gutter elbow**
- **Waterproof sealant (i.e. plumbers goop, silicone sealant, or PVC cement)**
- **One 3/4" x 1/2" PVC male adapter (will be attached to end of hose and readily adapted to fit standard garden hose)**
- **Teflon tape**

You will need the following tools:

- Drill with 3/4" bit (or use hole saw to cut 3/4" hole)**
- Router, jig saw, or coping saw**
- Measuring tape**
- Other items as needed**

1/2 Inch Male Adapter





Attaching adapter to bottom of barrel

Measure about 1 inch above the bottom of the barrel where the curvature along the bottom rim ends and the barrel side begins to rise toward the top. Using a 3/4" bit (or hole saw), drill a hole through the barrel.

- 2. Screw the 1/2" PVC male adapter into this newly drilled hole. The hard PVC threads cut matching grooves into the soft plastic of the barrel.**
- 3. Un-screw the 1/2" PVC male adapter from the hole. Wrap threads w/teflon tape tightly. Coat the threads of the coupler with waterproof sealant. Screw the coated adapter back into the hole and let it sit and dry for 24 hours.**
- 4. Attach 3 1/2 foot vinyl hose to the PVC male adapter.**

Atrium Grate or Screening Device



- **Using the atrium grate as a template for size, mark a circle at the center of the top of the drum (Locating the rainwater inlet in the center of the barrel allows the barrel to be pivoted without changing the position of the down spout).**

- Drill a ½" hole in the inside of the marked circle. Use a router, jig or coping saw to further cut within the marked circle until the hole is large enough to accommodate the atrium grate (the atrium grate is used to filter out large debris). Make sure not to make the hole too big—you want the flange of the atrium grate to fit securely on the top of the barrel without falling in. Placing a scrap piece of fine mesh window screen inside or outside of the grate will provide filtering of finer debris and mosquito control.

Cutting out a notch at top of barrel to hold adapter and hose

Using a 1/2" bit or saw, cut out a notch at the top of the barrel rim (aligned so that it is above the outlet at the bottom of barrel). The notch should be large enough so that the coupler will firmly snap into place.



**By using your rain barrel
you'll be :**

- » conserving water**
- » reducing the chlorine
you put on your garden**
- » saving money with
every barrel you catch**
- » helping to reduce
CSOs**

OTHER OPTIONS

- **Creating a Rain Garden**
- **Above-Ground Cisterns**

Rain Gardens



Choosing a Rain Garden Site



Preparing the Site









Above-Ground Cisterns





**Thank You
for
helping to conserve and
protect our watersheds!**

