

# WATER!

Every Drop Counts



[kyfb.com](http://kyfb.com)



[conservation.ky.gov](http://conservation.ky.gov)

# It's up to us...

On Earth, where there is water, there is life.

People, plants and animals thrive. Some plants and animals have learned to adapt in some places with very little water, but if we had no water at all, our planet would be as barren as the moon. But no new water is being made. We keep using the same water over and over. Imagine, that bath you took could have been the same water a dinosaur once drank. Those little droplets have been around! Though there are many ways water can become polluted and unhealthy to use, if we all learn how to protect it and do our part, we should always have enough.

From space, Earth looks blue because of its massive oceans.

The oceans hold about 97% of Earth's water. It's saltwater that humans can't drink. Another 2% of water is frozen in polar ice caps and glaciers. So that leaves only about 1% of Earth's water as fresh water we can use.

How much water is there on Earth?

It's a mind-boggling amount. Here's some ways to get a mental picture of it: If all the Earth's water were poured on the United States, it would be 90 miles deep! Imagine a gallon jug to represent all the water on Earth. Then pour out one tablespoon. That tablespoon shows how much of the Earth's water we can use for drinking.

## How water is used...

By Humans:

Humans are 66% water.

Humans need about two quarts of water a day to help digest food, cool our bodies, lubricate our joints, remove bodily wastes and clean our eyes.

The human brain is 75% water; bone is 25% water.

Humans can survive about 40 days without food, but only five to 10 days without water. Humans lose about 8 ounces of water a day by just breathing.

By Plants:

Plants can absorb a lot of water; however, they lose most of it by sweating out impurities through pores in their trunks, stems and leaves, a process called transpiration.

An acre of corn gives off 3,000-4,000 gallons of water each day. A large oak tree can transpire 40,000 gallons a year.



# The Water Cycle

You can't keep a good water droplet down! It stays on the move, shape shifting from liquid to vapor to solid (ice). Sometimes it's on the Earth's surface, sometimes it's in the ground and sometimes it's in the clouds.

## Condensation

After water evaporates, it cools until it becomes a liquid. Tiny water droplets join together in the sky to form clouds. The vapor can also form fog or mist.

## Transpiration

Plants take up water from the Earth through their roots, then lose some through pores in their leaves. As warm air passes over the leaves, it warms the water which evaporates into the air. Animals, including humans, give off tiny droplets of water vapor when they breathe.

## Precipitation

Water droplets merge in the clouds and fall to the Earth as rain, snow, sleet or hail. Some fall directly into lakes and streams but some fall on land. That water may seep into the soil (see infiltration), or it runs off into streams, lakes and other low places. This is called runoff.

## Evaporation

The sun warms water, turning it from a liquid into a gas called vapor (like the word evaporate). Water rises from oceans, lakes and rivers into the atmosphere.

## Kentucky Farm Bureau FUN FACT

Without gravity, rain would fall to Earth as perfect balls. However, raindrops aren't shaped like teardrops either. Scientists with supersensitive cameras have determined that falling raindrops are shaped more like slightly flattened hamburgers.

Find out more:

[www.fluidmech.net/tutorials/raindrops/raindrop.htm](http://www.fluidmech.net/tutorials/raindrops/raindrop.htm)

## Infiltration

Some precipitation enters the soil where it helps plants grow. Some seep farther down through the soil and rock and joins other water in springs, underground streams and aquifers. The layers of rock and soil act as a filter to clean the water.

# We All Live In A Watershed

Water runs across or under land on its way to a stream, river or lake. The area it runs over, from the highest points to the lowest, is called a watershed or river basin. The rain falling in your backyards soaks into the ground or runs along the surface until it reaches a stream. As water moves through each watershed, it picks up pollutants and carries them on. Pollutants upstream from your neighborhood affect your streams, and pollutants in your neighborhood get carried on to someone else's stream.

Each smaller watershed joins others until they reach major rivers, eventually reaching the Mississippi, one of the largest watersheds in the world, then on to the Gulf of Mexico. Our backyards, neighborhoods, towns and counties are part of interconnecting watersheds, and the way we take care of water here affects everyone downstream.

1. Locate the nearest creek where your runoff goes. Find your location on a mapping website such as Mapquest ([www.mapquest.com](http://www.mapquest.com)) or Kentucky Watershed Viewer ([eppcmaps.ky.gov/website/watershed/viewer.htm](http://eppcmaps.ky.gov/website/watershed/viewer.htm)) and it might show the nearby creek's name.
2. Trace your local stream to a larger stream or river, then to a larger one.
3. Most Kentucky watersheds empty into the Ohio River, but a few pour directly into the Mississippi River. The Mississippi River takes the Ohio River water to the Gulf of Mexico.



## Kentucky Farm Bureau karst in kentucky

Fifty-five percent of Kentucky's land has karst beneath it. Karst topography is formed when water dissolves certain rocks such as limestone, creating swiss cheese-like holes underground that can contain aquifers (underground streams) with lots of water. Some examples are the sinkhole plains and caves of Central Kentucky. The trouble with karst is that anything that gets into a sinkhole enters the groundwater virtually unfiltered, so the danger of pollution is greater.

## Watershed Game

So you think you'd like to be the boss managing a national park, farm or city park system? The Watershed Game offers the chance for you to make vital decisions affecting your water's health:

[www.bellmuseum.org/distance/learning/watershed/watershed2.html](http://www.bellmuseum.org/distance/learning/watershed/watershed2.html)

## On The Farm

Poor agricultural practices and years of sustained drought taught harsh lessons about wind and soil erosion during the 1930s with what is called the Dust Bowl days. As a result of the agricultural devastation, counties formed local conservation districts to help farmers find better ways to raise crops and livestock while protecting the land and water. By the mid 1950s, each Kentucky county had a local board working to help growing communities protect their natural resources.

The Kentucky Agriculture Water Quality Act passed in 1994 requires each farmer with 10 or more acres to develop a plan to protect ground and surface water from pollution caused by activities on their farms. Pollution can come from fertilizers and pesticides spread on fields, erosion of plowed soil, runoff from livestock waste and many other farming procedures.

These protection plans include Best Management Practices (BMPs), which can help reduce the amount of pollutants that reach the water. Examples of BMPs include no-till planting and strip cropping; careful use of fertilizers and pesticides; and protecting plants around streams. These and many other BMPs are identified in the Kentucky Agriculture Water Quality Plan.

The conservation districts help farmers come up with the plans and provide financial and technical assistance to implement the plans. One way they help is by offering low cost equipment to handle animal waste, apply herbicides (weed killers) and pesticides or to plant crops. Some districts provide funds to groups that want to do projects to improve their lakes and streams. They may buy water-test kits or sponsor water-watch groups or may help with riverbank erosion projects, recycling or cleaning up illegal dumps.

## WHAT CAN YOU DO?

- Get involved with projects sponsored by your local conservation district.
- Recycle household goods.
- Use herbicides and pesticides sparingly and carefully.
- Pick up litter to keep it from polluting the waterways.
- Fence animals away from streams. Livestock may trample plants that limit erosion along stream banks and animal waste fouls the water.

## Kentucky Farm Bureau WAT-ER YOU HAVING

How much water does it take to make a serving of your favorite foods?

Almonds: 12 gallons  
French Fries: 6 gallons  
Milk: 65 gallons  
Tomato: 3 gallons  
Watermelon: 100 gallons  
One Egg: 120 gallons  
Rice: 35 gallons  
Orange: 14 gallons

## TOO WET, TOO DRY

Floods occur when water from rainfall or melting snow causes streams to become so full they spread beyond their banks, resulting in a flash flood—the number one severe weather related killer in the United States. Flash floods can roll boulders, tear out trees, destroy buildings and bridges and scour out new stream channels. It only takes six inches of fast water to knock a person off his or her feet and only two feet of water to float a car. Pay close attention to the news during heavy rains. Never try to walk, swim or drive through floodwaters. A flash flood watch means conditions are right for a flood to occur. Plan to move to higher ground. A flash flood warning means it's happening – like RIGHT NOW! Leave the area!

A drought is a period of abnormally dry weather that affects the available water. Cities may ban washing cars or watering lawns if the water supply gets low. Droughts can affect us in many ways:

### Economically

When crops shrivel from lack of rain, farmers lose the money they would have made selling them. They also have to buy feed for animals that would have grazed on pastures. Since there may be less food available, costs are up for everyone.

### Socially

During the Dust Bowl years of the 1930s drought, many farm families lost their crops and livestock. They left their homes and moved, usually to cities, where more people put strains on supplies there.

### Environmentally

The prolonged drought of 2001 created the state's worst fire season in more than a decade. More than 160,000 acres of forests burned. Wildfires damage soil, water and wildlife as well as timber. Fallen trees, forest litter and other materials on the ground burn and expose the bare earth to erosion, which can clog streams with sediment.

# In The City

Anything that goes on the land or into the air will eventually wind up in the water. When it rains, whatever is on the ground will be washed off. It may go to a storm drain that eventually goes to a river or stream, go directly to a river or stream, or it may soak into the ground and become part of the groundwater that wells tap into. Urban runoff is one of the leading sources of pollution in the United States. This nonpoint source pollution is hard to stop with laws, but the federal government has enacted several to cut pollution in cities:

Chemicals at industrial sites are often stored out in the rain or snow. This runoff can carry pollutants to storm sewers, rivers and lakes. These businesses must have a plan showing how they will prevent this. Techniques include lining underneath the storage area or storing the materials under a roof.

Construction sites of one acre or more must have a permit showing a plan has been developed to prevent pollution in runoff and the plan is being followed. For instance, you might see black material fencing or bales of hay around construction sites to keep dirt from washing away.

## PREVENT NONPOINT SOURCE POLLUTION

- Plant grasses, trees and other plants to slow and absorb runoff and filter water seeping into the ground.
- Minimize use of fertilizers and pesticides. Read labels on how to properly dispose of containers or take them to a hazardous waste dropoff center.
- Use fewer paved surfaces for patios and driveways. Water can't filter through concrete or asphalt. Try pavers, crushed rock, mulch or grass instead.
- Collect pet waste in your yard for proper disposal.
- Wash your car in your yard instead of in the driveway so runoff stays out of the storm drain.
- Collect yard waste and compost instead of allowing it to be washed into the storm drain.
- Decrease runoff from your property by using a rain barrel or rain garden.
- Don't pour oil or grease on the ground or down the drain.

Some city storm sewer systems must have a program to prevent pollutants from storm water being washed into sewers, which then empties into local bodies of water. This may include local programs like labeling the storm drains, street sweeping, tree planting, rain gardens or rain barrels.

## The Safe Drinking Water Act

Passed in 1974, the law requires drinking water plants to test and treat for 91 contaminants.

Drinking water systems produce a consumer confidence report each year to let customers know how their water measures up. Find out more and check for your water system's report at:

[www.epa.gov/safewater/ccr1.html](http://www.epa.gov/safewater/ccr1.html)

Kentucky Farm Bureau  
**manage the city  
of dryville**

[ga.water.usgs.gov/edu/dryville.htm](http://ga.water.usgs.gov/edu/dryville.htm)

# In The Home

It's easy to take clean water for granted, just turn on the faucet and voila! Our population is growing, and we're all using more water than ever before. Kentucky's population nearly doubled from 2.15 million in 1900 to 4.04 million in 2000. In 1900, the average person used 5 gallons of water a day. Today, the average is 80 gallons per person a day! That means we all have to be more careful about keeping water clean and using it wisely.

## TOILETS: 26.3%

A toilet that leaks for six months can waste 45,000 gallons of water! To check for leaks, put about a dozen drops of red food coloring (do not use any dye) into the toilet tank (the upright part at the back). Wait 10 to 15 minutes. If no coloring shows up in the bowl, you have a leak-free toilet. Color in the bowl means you need to check the flushing mechanism. If the flushing assembly needs to be replaced, consider getting a more efficient model.

## LAUNDRY: 24.8%

Wash full loads of laundry so you don't waste water.

## SHOWERS & BATHS: 19.7%

Take shorter showers. A 10 minute shower uses 50-90 gallons of water. For tub baths, fill the tub only one-fourth full. Install a water-saving showerhead and faucets.

## MISCELLANEOUS: 14.7%

Whether washing dishes or brushing your teeth, don't let the water run! Fill a sink or cup for rinsing. This "gray water" can be used to water plants.

## LEAKS: 11.4%

Check for leaks. A faucet that drips 100 drops a minute will waste 300 gallons of water in a month. Most faucet leaks are caused by worn out washers, parts that are inexpensive and usually easy to repair. If you aren't familiar with a particular faucet, borrow a how-to plumbing book or call your plumber.

## WASHING DISHES: 3%

For cold drinks, keep a bottle of drinking water in the fridge rather than running water until it gets cold. Run the dishwasher only with a full load.

## Kentucky Farm Bureau WATER IN YOUR FAUCET

In Kentucky, about 90% of the residents get their water from the 572 public water systems. Some of the systems draw water from rivers or lakes. Groundwater-wells or springs-provides water to 226 public water systems. About 10% of people get their water from private wells or springs. Tap water costs about \$2 per 1,000 gallons for public water systems to produce. Meters at each house keep track and people are billed according to how much water their family has used. Use less water and you'll save money!

# Outside The Home

Use a broom rather than a hose to clean the driveway, patio, sidewalks and garage floor.

Follow label directions for throwing away chemicals. These products can include oven cleaners, mothballs, weed killers, pesticides, paint thinners and many more substances commonly used at home.

Never dump chemicals, gasoline or oil on the ground, into a storm sewer, at roadside dumps or in your garbage. Take them to a recycling center.

If a product label warns against getting the substance on your skin, wrap the container in newspaper before placing it in the trash.

Do not flush medicines down the toilet. Traces of antibiotics are being found in streams, which means they could show up in drinking water. Wrap medicine containers in newspaper and place them in the trash.



# In Lakes and Streams

Kentucky is rich in natural beauty and keeping it beautiful means we have to think about the actions we take each day that could foul out water.

When the Clean Water Act became law in 1972, many of Kentucky's waterways had been affected by pollution. Some streams were not safe to be used for swimming or fishing. Others could not support aquatic life, like macroinvertebrates or fish.

Thirty years after the Act, many miles of streams are cleaner and water quality in our state has improved, although some places are still impaired. Now there are more stringent laws to protect our water quality. The Clean Water Act requires anyone who discharges into streams or lakes (point source pollution) to have a permit with limits on any contaminant that would be allowed. Wastewater from homes and businesses must go to treatment plants to be cleaned before it goes into streams. In areas without sewer systems, homes have septic systems to clean the wastewater.

Unfortunately, at the 30-year anniversary of the Clean Water Act, nonpoint source pollution was the biggest problem for Kentucky's waters. Pathogens and sediment were the top contaminants. They came from construction, mining, agriculture, failing septic systems, urban runoff and many other activities. Pollutants also filter down into the groundwater and from there can contaminate lakes and streams.

## BIO-INDICATOR SPECIES

Scientists study small aquatic creatures to determine how healthy water is. Some can live in polluted water, but others must have a purer environment. Because some streams are unhealthy, let your "net" be the Internet. Do keyword searches on the creatures below to create an illustrated guidebook of stream bio-indicators.

Good-quality water bio-indicators  
stonefly, caddisfly, riffle beetle, water penny, mayfly and dobsonfly

Good to fair-quality water bio-indicators  
beetle larva, dragonfly, damselfly, fishfly larva, clam and crayfish

Poor-quality water bio-indicators  
aquatic worm, blackfly larva, leech and pond snail

## What Can You Do?

- Dispose of trash properly.
- Participate in local beach, river or stream bank cleanups.
- Use a funnel to fill a boat's gas tank and avoid overfilling.
- Repair leaky tanks.
- Dispose of oil at oil collection facilities.
- Use environmentally safe cleaning products on boats.

Kentucky Farm Bureau

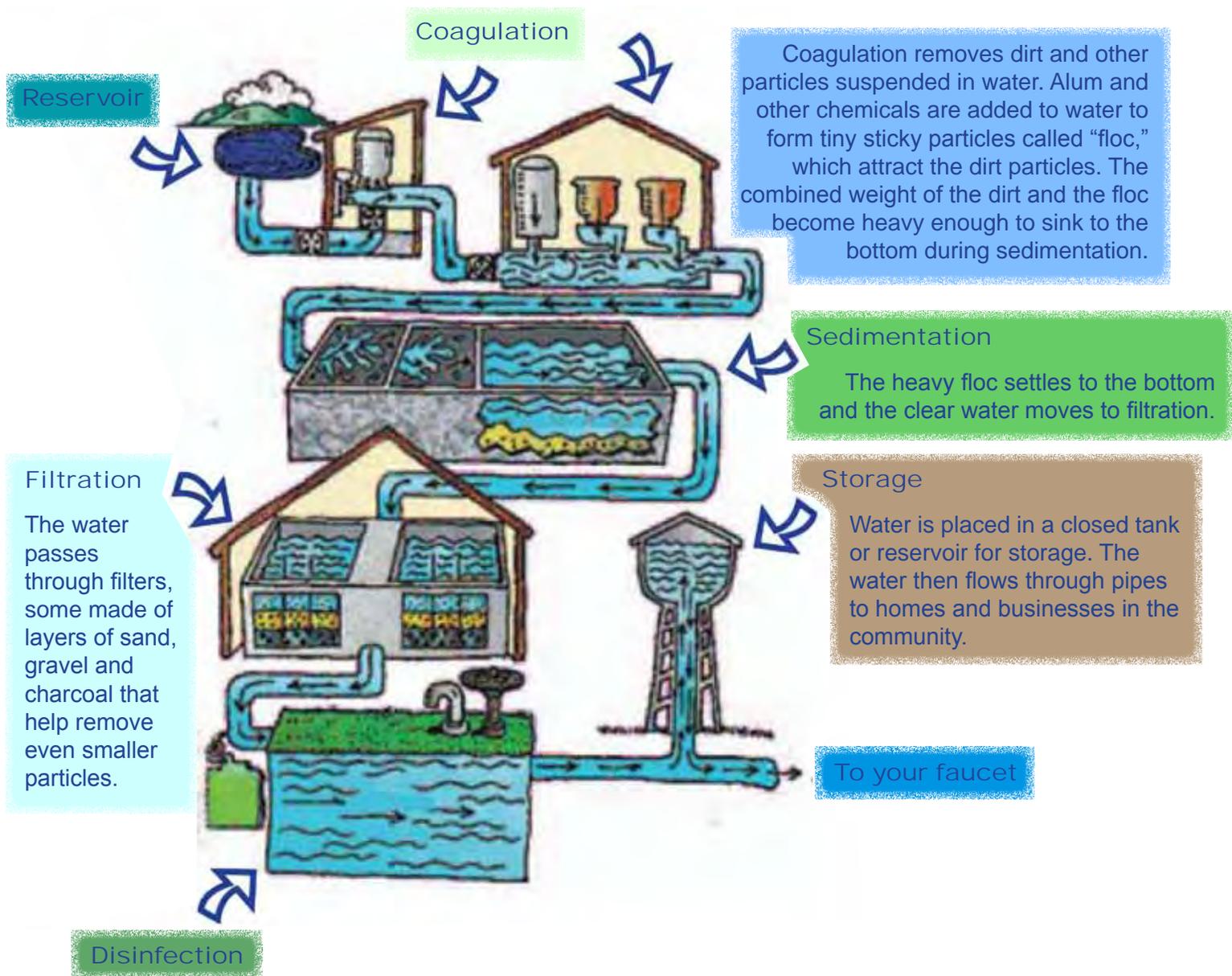
## AQUATIC CRITTER game

Here's a game that's just crawling with possibilities! The Aquatic Critter Game lets you choose a pond critter and see whether you can identify it:

[www.dnr.state.wi.us/org/caer/ce/eek/critter/watercritter/aquatict.htm](http://www.dnr.state.wi.us/org/caer/ce/eek/critter/watercritter/aquatict.htm)

Kentucky has 89,431 miles of rivers and streams. That's more than 3.5 times the distance around the Earth! Kentucky's reservoirs cover 228,385 acres, roughly one-third the area of Rhode Island. It's home to 230 native species of fish. Only Alabama and Tennessee waters have more. Kentucky also has one of the most diverse freshwater mussel populations in the world.

# Treating Water



## Key Words

**Influent** - Incoming, untreated wastewater

Screening - Removes large debris (cans, bottles, paper products, rocks, wood, leaves, etc.)

Grit Removal - Removes sand and other small debris too fine for screening to remove

Pre-aeration - Freshens the wastewater and helps remove oils

Sedimentation & Flotation - Removes settleable and floatable materials not removed in preliminary treatment

Solids Processing - Treats solids removed by other processes

Chemical, Biological & Physical Processes - Removes suspended and dissolved solids

Disinfection - Eliminates pathogenic organisms

**Effluent** - Outgoing, fully treated water

# Trees and Water - a shaded affair

Did you know that about 70% of your body is water? Water also covers about 70% of the Earth's surface and makes up about 70% of all trees. Water is a necessity for life so it's important that we keep it clean. Forests and trees play major roles in maintaining and improving water quality.

## How Much Water Does a Tree Drink?

A healthy 100-foot-tall tree has about 200,000 leaves. A tree this size can take 11,000 gallons of water from the soil and release it into the air again, as oxygen and water vapor, in a single growing season.

## How Do Roots Help Clean Water?

The roots of a tree grip the ground and act like thousands of "fingers" to anchor the tree as it keeps soil from washing away. The amazingly complex root network (often an area underground larger than the tree's branches) also filters harmful substances out of water as it soaks downward to the water table.

## What is a Streamside Buffer and Why is it Important?

A streamside buffer is made up of a layer of trees, shrubs, wildflowers, mosses and ferns that grow along a creek, stream or river and vary from just a few feet in depth to several hundred feet. The purpose of the buffer is to prevent soil erosion and filter out pollutants from stormwater runoff from nearby industrial, residential or agricultural sites before it reaches the stream.

## How Do Trees Drink?

Trees drink when water in the soil passes into tiny hair-like roots. It enters the roots loaded with minerals from the soil and is carried up the tree's trunk all the way to the leaves.

## Why is it Important to Shade Streams?

Many different animals live in forests near water: beavers, deer, frogs, herons, salamanders, snakes, and turtles. These and many other creatures depend on forest lakes and streams for food, water, homes and protection. In some streams, the shade of trees plays an important role in the lives of certain fish and invertebrates. Trout, crayfish, clams, mussels and aquatic insects are sensitive to changes in water temperatures. These species only reproduce in cool, shaded water, and if there are no trees or other plants along stream banks, direct sunlight will heat the water so they won't reproduce. These aquatic species serve as indicators of water quality and any disruption in these sensitive areas can have serious impact.

At present, one of the most significant threats to these sensitive areas is the Hemlock Woolly Adelgid. This insect attacks our native eastern hemlocks by feeding on the tree's sap, eventually causing death. Eastern hemlocks are a critically-important tree species because they are evergreen trees and provide the necessary shade 24/7, 365 days per year. What will happen to these areas when the eastern hemlocks are gone?

Now that you know more about the role trees play in improving water quality, find out what you can do to help!

# Water and Wildlife

There's no doubt about it, living things need water and because they all tolerate the quality of water differently, certain plants and animals are used by biologists as bioindicators. A bioindicator is a living thing that tells us by its presence or absence something about the quality of the environment. For instance, a dominance of tubifex worms and leeches indicates poor water quality, thus they are classified as pollution tolerant. Upstream, there may be fewer tubifex worms and lots of mayfly nymphs, caddisfly larvae, water pennies and dobsonfly larvae (hellgrammites) that are pollution intolerant. Their presence indicates good to excellent water quality. Farther downstream where the pollution becomes diluted, you may find crayfish, clams and dragonfly larvae. These organisms can exist in a wide range of water conditions. Carp, catfish, and gars are more tolerant than trout, perch and sculpins.

Why should we care about what lives in the water? Just like us, wildlife needs healthy aquatic ecosystems in order to survive. Aquatic insects, crustaceans, worms, mollusks and aquatic plants provide a significant portion of the food chain for fish, amphibians, reptiles, birds and mammals that we value.



*Kentucky Department of Fish & Wildlife biologists sample streams to determine the health of the stream and its watershed. Above is a biologist testing Sugar Creek in the Red Bird River Drainage.*

## Kentucky Farm Bureau **TONGUE TWISTERS**

It's soggy! Surely we're set to get some sunshine soon!

Weary Willie walked warily wearing whistling water wings.

Winsome Wendy Wasserman watched wonderful Waileah waterfalls while waltzing with wary Wiley Wetzel.

## Rain Gardens

Rain gardens are becoming increasingly popular as a natural way to reduce storm water runoff in home landscape. A rain garden is a natural or dug shallow depression designed to capture and soak up runoff from roofs or other impervious (nonporous) urban areas like driveways, parking lots, streets and lawns. This reduces runoff by allowing storm water to soak into and filter through the ground instead of flowing into storm drains and surface water, which cause erosion, water pollution and flooding.

Studies have shown that up to 70 percent of the pollution in our streams, rivers and lakes is carried in by storm water. Rain gardens can cut down on harmful substances reaching creeks and streams by 30%.

Native plants are the best choice for a rain garden since they generally do not require fertilizer and are more tolerant of the local climate, soil and water conditions. Water filters through soil layers before entering the groundwater system and the root systems enhance infiltration and moisture redistribution. The plants also return oxygen and water vapor into the atmosphere through transpiration.

Rain gardens provide other benefits as well. They can provide valuable habitat for birds, butterflies and many beneficial insects while enhancing the beauty of the landscape. Rain gardens also help reduce flooding and drainage problems while increasing the amount of water that filters into the ground, which recharges local and regional aquifers.

Plant your own rain garden and help protect Kentucky's streams and lakes from pollutants carried by urban storm water.

# Green Infrastructure Improves Quality of Water and Life

Green infrastructure is associated with a variety of environmental, economic and human health benefits, many of which are interconnected. Green infrastructure techniques typically involve natural or engineered systems that mimic natural landscapes in order to capture, cleanse and reduce stormwater runoff. Green infrastructure can include parks and nature preserves, rain gardens, rain barrels, green roofs, wetlands, permeable (porous) pavement and other methods intended to significantly reduce the amount of stormwater runoff entering the sewer system and our waterways.

**Fewer Sewer Overflows, Reduced Flooding** – Green infrastructure reduces stormwater runoff by capturing and absorbing water. This can result in fewer sewer overflows, cleaner water and reduced flooding or wet basements.

**Reduced Water Pollution** – Stormwater runoff is a major source of water pollution in the United States. In urban areas, rain water runs off of

buildings and pavement, picking up chemicals and a variety of other pollutants. Green infrastructure techniques help prevent pollutants from entering nearby storm drains and sewers, which then flow into our waterways.

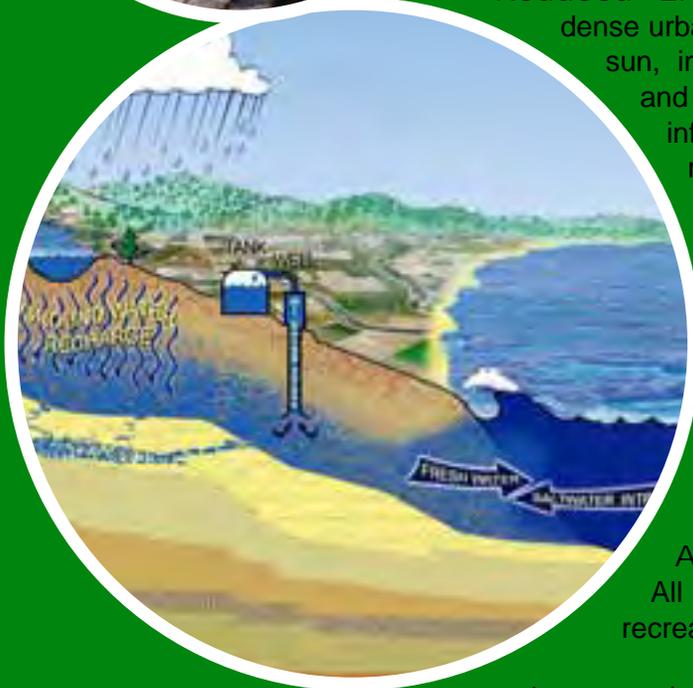
**Improved Air Quality** – The plants and soils included in green infrastructure are not only attractive, but they also help improve the surrounding air quality by removing carbon dioxide and other pollutants from the air.

**Reduced Energy Demands** – Cities and dense urban environments trap heat from the sun, increasing average air temperature and leading to heat related deaths. Green infrastructure techniques, especially green roofs, can help alleviate this heat build-up and reduce the need for air conditioning in buildings. This saves money and reduces global warming pollution.

**Enhanced Groundwater Recharge** – The natural infiltration capabilities of green infrastructure technologies can improve the rate at which groundwater aquifers are 'recharged' or replenished. Enhanced groundwater recharge can also boost the supply of drinking water for private and public uses.

**Additional Wildlife Habitat and Recreational Space** – All forms of green infrastructure can provide increased access to recreational space and create new wildlife habitat.

**Improved Human Health** – An increasing number of studies suggest that vegetation and green space - two key components of green infrastructure - can have a positive impact on human health. Recent research has linked the presence of trees, plants and green space to reduced levels of inner-city crime and violence, a stronger sense of community, improved academic performance, and even reductions in the symptoms associated with attention deficit and hyperactivity disorders.



# Go green – help reduce littering in Kentucky

At a time when everyone is thinking of ways to be more environmentally friendly, ordinary citizens everywhere are taking steps to 'green' their homes, businesses and communities. From starting recycling programs to using energy-efficient light bulbs, environmentally friendly habits are all the rage. But in a time when new green tricks and gadgets are being invented and marketed on an almost daily basis, the fundamental methods for protecting our precious resources are too often cast aside and forgotten.



Each day all of us encounter a problem that poses a serious threat to our natural resources – litter. Too many people carelessly and irresponsibly dispose of trash on roadways, believing that one fast food wrapper or one cigarette butt isn't enough to cause lasting harm. They are wrong. Consider the following statistics:

- Plastic coated paper, such as fast food cups, takes five years to decompose. (California Waste Management)
- Cigarette filters contain toxic chemicals that can seep into waterways, tainting community water supplies and destroying aquatic life, which often confuse them for food.

It's not only wrappers and cigarettes that have the power to threaten. No matter what type or where it starts, litter moves, whether through stormwater systems or in the wind, creating the potential for serious environmental harm. According to Keep America Beautiful, research has shown that 18% of all litter finds its way into streams and waterways as pollution, an astounding figure when you consider how many tons of litter are scattered across the United States each year.

Not only does litter have the power to deplete natural resources but financial resources as well. Each year, workers from the Kentucky Transportation Cabinet spend about 200,000 hours removing litter from the state's roadways, costing the Commonwealth an astounding sum of \$4-5 million annually.

We can all play a part in addressing this problem and protecting our land, water, wildlife and state funds, starting

in our own communities. We can take a positive step toward becoming greener and protecting our resources by placing increased attention on the littering epidemic that has plagued our communities for too many years to count. By joining forces with other citizens throughout the region and reporting litterbugs or volunteering for a community cleanup, you can help to ensure that Kentucky and its resources stay clean and unspoiled for generations to come.

## Kentucky Farm Bureau **BUILD A FILTER**

You'll Need:

A 2-liter bottle cut in half  
Water  
Pitcher  
Rubberbands  
Measuring Cups

Filter Choices:

Sand	Net
Cotton Balls	Gauze
Sponges	Coffee Filters
Paper Towels	
Clear Cups	
Potting Soil	
Small & Large Rocks	
Newspaper	

Find out which materials can remove the most mud from water. Each filter can have three filtering items. Layer them inside the bottle. If you choose sand or pebbles, use a small piece of paper towel attached to the outside of the opening with a rubberband.

Pour one cup of water through each filter. Watch it come out. Is there mud or does it look clean? Catch the water in clear glass and measure it. A good filter design does not have mud at the bottom.

# Envirothon Lets Students Dig In

If you and your friends want to get involved in environmental issues, check out Envirothon. It allows high school students to team up on a series of hands-on outdoor contests to solve environmental problems. Teams of five are sponsored by their local conservation districts to study forests, soils, water and wildlife along with an environmental issue that changes every year. The 2010 issue will be "protection of groundwater through urban, agricultural and environmental planning." The competition involves teamwork, problem solving and critical thinking. At the regional and state competitions, students might be asked to identify an aquatic bug or name trees by their bark.

The winners of the state competition travel to the international competition to compete against teams from across North America. The 2009 state winners, Model Laboratory in Richmond, will be competing in North Carolina in Asheville, NC. The 2010 international competition will be held at the University of California, Merced.

Teams must be registered by February 28 to compete in the 2010 Kentucky Envirothon.

## Contact Information

your local conservation district  
([www.conservation.ky.gov/condistricts/](http://www.conservation.ky.gov/condistricts/))

Division of Conservation  
([www.conservation.ky.gov](http://www.conservation.ky.gov))

Kim Richardson (502-573-3080 or  
[kimberly.richardson@ky.gov](mailto:kimberly.richardson@ky.gov)).

## Kentucky Dams

The Commonwealth of Kentucky is lucky to have had assistance from the Natural Resources Conservation Service since 1954. Why you ask? They have assisted in the planning and installation of the 199 dams that protect our state (The 200th dam is currently being constructed in McKee, KY). These structures provide nearly \$11 million in annual benefits to Kentucky. The dams have benefited approximately 2 million acres in Kentucky by preventing floods, reducing soil erosion, retaining sediment, conserving water, creating wildlife habitat and reducing property damage. Most importantly dams have benefited the lives and infrastructures located below the impoundments.

Watershed Conservancy Boards are made up of local sponsors who inspect, maintain and operate the dams. Through dam inspections, sponsors help identify deficiencies and changing conditions that may accrue. Potential problems include: deterioration, movement or instability, animal burrows, erosion or ATVs. The Conservancy Board volunteers also assist with project planning.

To find out if you have a dam in your community, contact your local conservation district. Conservation districts are located in every county across the Commonwealth and are there to help you out. The districts also provide educational programs to teach schools and community groups about soil and water conservation.