



STORMWATER steward

A Stormwater SMART publication

Volume 7, Issue 2

Spring, 2015

*at a
glance*

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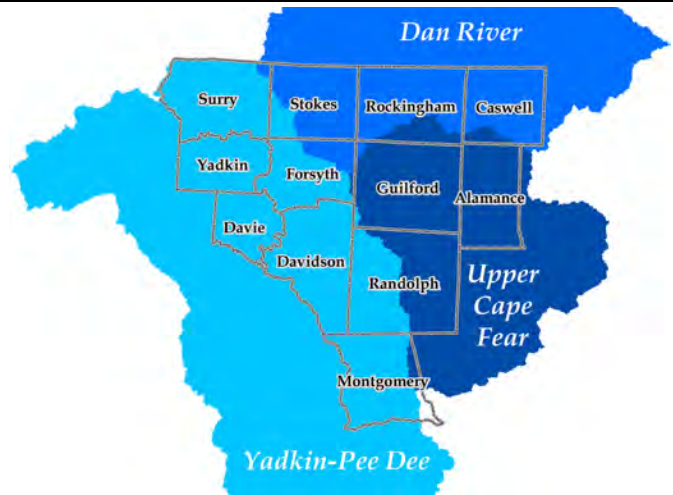
FINDING YOUR WATERSHED!

What's a Watershed?

A watershed is an area of land that drains to a specific site. Think of it as a line connecting the highest points in a region, rain that falls within the line travels across land and through small streams to get to the larger river in the watershed. Everything that happens in a watershed affects water quality for all downstream communities.

What is My Watershed?

As you drive down the road you may see a sign that says "Entering the Cape Fear River Basin".



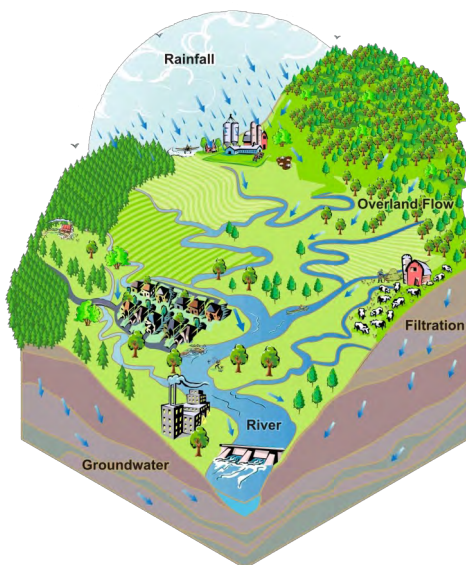
A river basin such as the Cape Fear River Basin is a very large watershed containing many large rivers and small tributaries. Because the Cape Fear River Basin is such a large watershed it is often referred to as the Upper Cape

the dam at Jordan Lake. Below the lake the large river is known as the Cape Fear River and flows to the ocean near Wilmington NC.

Stormwater Pollution Enters a Watershed:

As rain falls on parking lots, streets and lawns, rainfall runoff picks up pollutants such as oil, trash and dog waste and carries it downhill into the closest river, stream, or lake. Once the pollution enters the water if flows through downstream sections of the watershed before entering the ocean.

For more information contact Joy Fields with Stormwater SMART at: jfields@ptrc.org or 336-904-0300.



Did you Know?

Mushrooms produce many antibiotics.



Mycelium holds soil together and help reduce soil erosion.



Fungi can use radiation as a source of energy like plants use sunlight.



Mycelium can break down oil.



Non-sporing mycelium can be used to deter or kill insects such as ants and termites. The insects eat the mycelium and become mummified by the fungi.



Mycelium can hold up to 30,000 times its mass.

RUNOFF RUNDOWN: THE POWER OF MUSHROOMS

Mycofiltration:

Most of a mushroom's biomass, or body, is made of thin white strands of tissue called mycelium. Mycelium creates networks underground and may occasionally create a fruit which is called a mushroom. Fungi, aka mushrooms, have been used for years to clean chemicals out of the ground and reclaim land that has been too polluted for normal uses. Now fungi are being explored for

treating stormwater. Mycofiltration is the process of using structures intentionally colonized by fungi mycelium to filter water.

Filtration of Stormwater:

Stormwater or rainfall runoff picks up pollution as it runs across yards, sidewalks, streets and parking lots. One of the pollutants of concern that can be found in this rainfall runoff is *E. coli* bacteria.



Mycofiltration using burlap bags: Paul Stamets

The fungal mycelium can strain, absorb and digest bacteria as a food source. Therefore, mycofiltration is low-cost, and low tech way to filter bacteria out of water. However not much is known about the ideal types of fungi or what the



Mushrooms Clean Stream: Jesse Skoubo

fungi should grow on to filter the water effectively. The EPA recently funded a partnership between Fungi Perfecti, a corporation specializing in growing and selling mushrooms and the Washington State University to research the suitability of using mushrooms to filter stormwater. The initial research showed that fungal mycelium can remove *E. coli* from flowing water and led the corporation to create the MycoFilter™.

To view the report check out fungi.com.

OCEAN BLUE PROJECT



Mushrooms Clean Stream: Jesse Skoubo

The Ocean Blue Project (OBP) was started by a father in response to his son's concern for plastic pollution in the ocean. Now OBP is promoting environmental education, organizing litter clean-ups, and trying out mycofiltration to achieve ecological restoration. Volunteers with OBP placed mushroom spawn in a mixture of coffee grounds and straw in a burlap bag and positioned them in a storm drain. The goal is to encourage the mycelium in the bag to filter the water that shoots through the storm drain and clean the runoff before it enters a local creek.

CITIZEN SCIENCE: CAROLINA HERP ATLAS



Herps is short for herpetology, which is the study of amphibians (frogs and salamanders) and reptiles (turtles, snakes, lizards and alligators). Herps are an important part of southern ecosystems. Many species of reptiles and amphibians are sensitive to changes in the quality of their habitat, which makes them potentially important indicators of overall environmental health.

Amphibians and reptiles spend a portion of their life cycle in the water and therefore, clean and healthy water is often vital for them to grow. Several species of reptiles and amphibians in North Carolina are affected by water-related issues. The southern leopard frog is abundant throughout the state, but water pollution and destruction of wetland habitats is causing a decline in some local populations. The bog turtle, found in only a small

part of the Piedmont, is disappearing from its North Carolina range. One reason behind its decline is that the turtle's wetland habitats have been drained over the years in order to grow crops and construct roads, buildings and golf courses.

While these species are experiencing a decline due to human impact, there is plenty we can do to help them recover. By properly disposing of trash and recyclables, we can make sure the water stays clear of litter and pollution. Another great way to help the herps is by reducing runoff and preventing polluted or contaminated runoff. One way to do this is by picking up your pet waste and disposing of it properly.

If you want to learn more about North Carolina's herps visit www.carolinaherpatlas.org.

HERP UPCLOSE: MARBLED SALAMANDER



Marbled salamanders are found throughout NC and are one of the salamanders that can play an important role in riparian ecosystems. The adult marbled salamander feeds primarily on worms, spiders, snails, centipedes and a variety of insects found on land and in the vegetation growing near streams rivers and lakes. Salamanders require water including vernal pools (small seasonal wetlands), creeks, or other flooded areas to lay their eggs and support the growth of larvae into adulthood. Because vernal pools and floodplain wet-

lands are cut off from the stream, fish cannot survive in these wetlands so they are really important for salamanders, frogs and other critters who's eggs are a favorite snack for fish.

Many salamanders are bio-indicators and tell us if there is a pollution problem in the water and in their habitat because they breathe through a thin, porous skin and must remain moist even when on land. To remain moist on land, salamanders hide in the leaves and vegetation that create moist, humid environments by releasing water into the air during transpiration. Therefore, vegetation growing along water provides important habitat for salamanders and other animals, while also filtering out pollutants such as dirt, nutrients and trash that can get washed by the runoff from uphill human activity such as cattle grazing, farming, or development. Keeping the water clean and buffered by vegetation will keep this important insect feeder alive and well.

GET INVOLVED: STREAM MONITORING

Davidson County
Randolph County
Rockingham County
Archdale
Asheboro
Burlington
Elon
Gibsonville
Graham
Green Level
Haw River
Lexington
Mebane
Oak Ridge
Summerfield
Randleman
Reidsville
Thomasville
Trinity

Become a Stream Team and Adopt-a-Stream:

Many residents in the Piedmont Triad have told Stormwater SMART staff that they no longer hear the frog calls in the spring or see the crawdads in the stream. These are stories that suggest that the stream that used to support that life is now too polluted to effectively provide habitat for the frogs and crawdads. Whether called Adopt-a-stream, Stream-Watch, River Watch or Volunteer Monitoring it all boils down to collecting information on the health of your neighborhood stream. Adults and youth can become a Stream Team and adopt a stream by sampling the benthic macroinvertebrates.

The macroinvertebrates can be used to determine the health because they have different levels of tolerance to pollution so identifying them provides you with a water quality index. Mayflies, stoneflies and caddisfly larva are used as bate during fly fishing and are critters that are sensitive to pollution. Crawdads, clams and dragonflies can tolerate some pollution



Kids identifying the macroinvertebrates during camp: [City of Burlington](#)

while leaches, worms and some snails can tolerate more pollution. If you find no critters, or only find leaches and worms you know there is a problem.

Residents in many communities in NC are going out and monitoring water quality to identify and report sources of pollution. Once these data are collected local towns and communities can address the pollution and have cleaner waters.

To create a stream team contact Joy Fields at 336-904-0300.

LOOK FOR STORMWATER SMART AT A EVENT NEAR YOU.

4/25/2015	Dogwood Festival - Mebane
4/25/2015	High Rock Lake Event - Lexington
5/2/2015	Multicultural Festival - Lexington
5/2/2015	Electronic Recycling – Randleman
5/9/2015	Little Alamance Creek Exploration - Burlington
5/16/2015	Summerfield Founders Day
6/18/2015	Project WET - Kernersville
Summer	Local Summer Camps



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PIEDMONT TRIAD
REGIONAL COUNCIL

Stormwater SMART was created by the Piedmont Triad Regional Council (formerly Piedmont Triad Council of Governments) to help Phase II communities comply with National Pollution Discharge Elimination System (NPDES) and Jordan Lake Public Education and Outreach requirements. Stormwater SMART is supported through dues paid by member governments.