

## North Carolina's Educational State Forests (ESF) and State Forests [www.ncesf.org](http://www.ncesf.org)

- Bladen Lakes State Forest, Bladen Co.  
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- Clemmons ESF, Johnston & Wake Co.  
(919) 553-5651
- Dupont State Recreational Forest,  
Henderson & Transylvania Co.  
(828) 877-6527
- Headwaters State Forest, Transylvania Co.  
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- Holmes ESF, Henderson Co.  
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- Jordan Lake ESF, Chatham Co.  
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- Mountain Island ESF, Gaston & Lincoln Co.  
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N.C. Department of Agriculture and Consumer Services  
Steven Troxler, Commissioner  
[www.ncagr.gov](http://www.ncagr.gov) [www.gottobenc.com](http://www.gottobenc.com)



U.S. Environmental Protection Agency  
Forestry Nonpoint Source Pollution Prevention Program  
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## From Forests... ...to Faucets

Do you drink tree-water?

North Carolina has approximately 18.8 million acres of forestland. That's nearly 55% of the land in the state! And of that total forestland, approximately 60% is owned by individuals.

In the mountains and piedmont areas of our state, millions of people get their drinking water from lakes or rivers that are surrounded by forests.

Research and studies done in North Carolina and elsewhere have shown:

- Forests offer the cleanest and most reliable supply of water than other types of land cover, because forests naturally filter out some pollution and provide water flows year-round.
- In a case study in North Carolina, it was observed that the cost to treat drinking water was lower in watersheds where forests covered at least 70% of the upstream land area.
- Across the South, it is estimated that nearly 50 million people receive drinking water that comes from or flows through forests before reaching a water treatment facility.

# Water's Journey Through the Forest



The rain that falls on your yard can travel many miles. Learn how forests play a role in managing water runoff and protecting our rivers, lakes, sounds and estuaries.

**HEALTHY FORESTS = CLEAN WATER**  
Use Best Management Practices

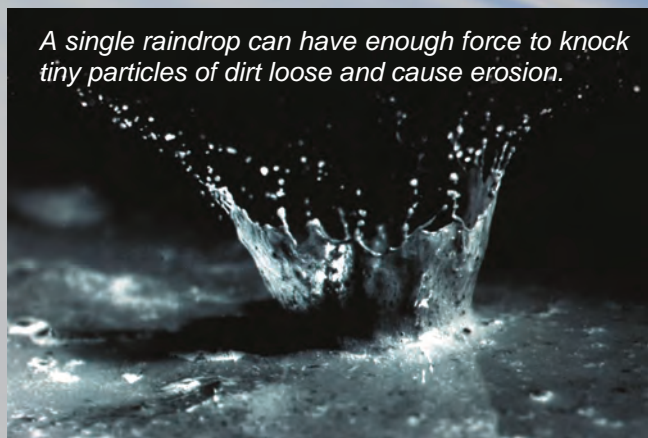
Web: [ncforestservice.gov](http://ncforestservice.gov)

## Forest Soils are Nature's Sponge

The ground may seem hard and solid, but actually it is more like a sponge. Almost half of the volume of forest soil is empty pore space that contains water, air, nutrients, and insects.

If the soil gets compacted, then those empty spaces collapse and water cannot soak into the ground, which causes more runoff.

*A single raindrop can have enough force to knock tiny particles of dirt loose and cause erosion.*



Forests help to protect soil and store water. Tree roots maintain the soil's structure and create new pore spaces. Also, when it rains, the treetops catch water. The rain is slowed down so it can infiltrate into the soil. Then it slowly trickles underground, filtering out pollution and finally reaching groundwater or a stream.

### Take it Outside

When you walk in the woods, do you see streaks on the ground where water has washed away the leaves? What could be done to repair those areas, and get the rain to soak into the soil, instead of running off? Learn more from the Center for Watershed Protection, [www.cwp.org](http://www.cwp.org)

## Forests in the City

Trees in your neighborhood, at your school, or in parks are pretty to look at. But they can also help prevent excess runoff after it rains. This runoff is often called stormwater.

By protecting trees, or placing new trees in the right locations, forests in the city -- called "urban forests" -- can act like a natural umbrella. But don't stand under a tree during a thunderstorm!

Urban forests can be a component of 'green infrastructure'. This concept is the name given to how natural plants and vegetation can be incorporated into city planning and development to manage stormwater.



### Take it Outside

The next time it starts to rain, look outside and notice how the ground underneath a large tree stays dry, right after the rain starts. The tree is catching the rain, and reducing the stormwater runoff. Learn more from the Green Infrastructure Center, [www.gicinc.org](http://www.gicinc.org)

## Managing Forests for Water Quality



*Stream protected on a timber harvest with a buffer.*

Forests are vital to produce timber, wood, and paper products that are needed around the world. Timber harvesting can be done in a way that is sustainable and protects water quality.

In North Carolina, logging operations are required to achieve several water quality standards, known as the Forest Practice Guidelines Related to Water Quality (abbreviated as FPGs).

One of these requirements is to leave a protective Streamside Management Zone (SMZ) alongside designated streams to keep sediment pollution from entering the waterway.

In addition, there are industry-adopted Best Management Practices (BMPs) that guide how forest management activities should occur, to maintain water quality and conserve soil.

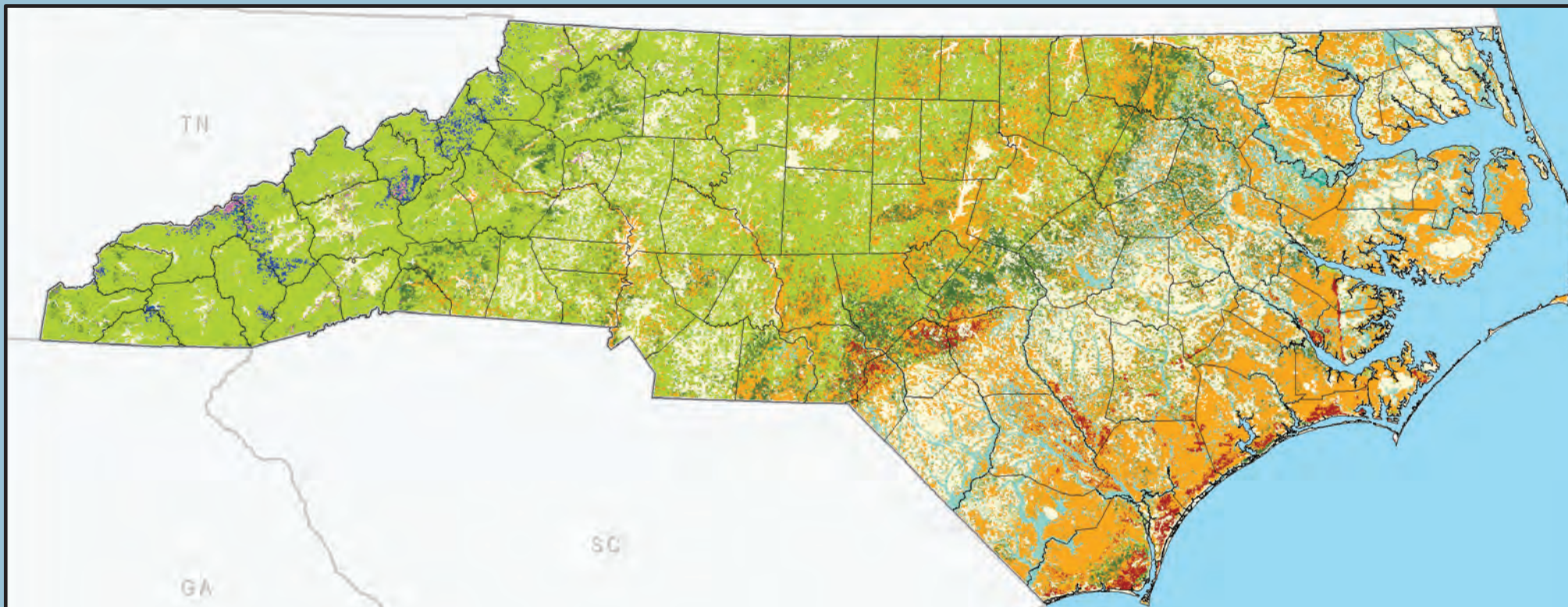
### Take it Outside

Walk along a stream in the woods, and imagine if you were going to harvest the timber, how wide of a SMZ would you keep along the stream? What factors did you consider when making your decision? (Hint: look in the North Carolina Forestry BMP Field Guide, at [www.ncforestservice.gov](http://www.ncforestservice.gov)).

There are 17 major river basins in North Carolina.  
Be sure to protect the quality of water for your downstream neighbors!

Five of those rivers that begin in North Carolina eventually flow into the Gulf of Mexico.  
Can you name them?(\*)

Where does the water go from your home-town?  
Learn more about our river basins at:  
[www.eenorthcarolina.org/riverbasins.html](http://www.eenorthcarolina.org/riverbasins.html)



There are more than 40 native forest tree species that grow in North Carolina!

This includes some species that you normally see up north in colder climates such as spruce, fir, and hemlock.

The forests of North Carolina are comprised of approximately 65% hardwood species and 35% pine/conifer (softwood) species.

Hardwoods		Softwoods	
	Elm/Ash/Cottonwood Group		Loblolly/Shortleaf Pine Group
	Maple/Beech/Birch Group		Longleaf/Slash Pine Group
	Oak/Gum/Cypress Group		Eastern White Pine Group
	Oak/Hickory Group		Non-Forest
	Oak/Pine Group		

There are 8 pine tree species native to North Carolina. Can you name them?(\*\*)

Area of North Carolina River Basins in Square Miles, and Percent of Each Basin that is Covered in Forest.

Broad	1,514	59%
Cape Fear	9,164	49%
Catawba	3,285	52%
Chowan	1,298	47%
French Broad	2,829	75%
Hiwassee	644	83%
Little Tennessee	1,797	88%
Lumber	3,329	47%
Neuse	6,062	42%
New	754	66%
Pasquotank	3,366	48%
Roanoke	3,493	56%
Savannah	171	90%
Tar-Pamlico	6,148	44%
Watauga	205	77%
White Oak	1,382	47%
Yadkin-Pee Dee	7,221	53%

River Basin Reference: North Carolina's River Basins Poster, Version 10/2013. [www.eenorthcarolina.org](http://www.eenorthcarolina.org).  
Forest Cover Reference: 2011 National Land Cover Dataset, USGS.

\*\* Answers: Eastern White pine, Loblolly pine, Longleaf pine, Pitch pine, Pond pine, Shortleaf pine, Table Mountain pine, and Virginia Pine.