



North Carolina Forest Service

An agency of the N.C. Department of Agriculture & Consumer Services

BMP Newsletter

Best Management Practices for Water Quality & Soil Conservation



This issue's cover photo was taken along a forest road cut slope in the Piedmont. It depicts small erosion pedestals created by the power of water erosion. When easily eroded soil is protected from splash erosion, isolated pedestals capped by resistant material (in this case by rock) can be left standing. Provide cover to protect soil!

Water quality refresher workshop tour success

Over the course of this past year, the N.C. Forest Service held six water quality refresher workshops across the state. Collectively, we had nearly 275 attendees! These workshops were attended by N.C. Forest Service, N.C. Division of Water Resources, N.C. Department of Environmental Quality, N.C. Wildlife Resources Commission, N.C. State Parks, National Resources Conservation Service, U.S. Forest Service, and U.S. Army Corps of Engineer employees. Other attendees included folks from forest industry, forestry consultants, timber buyers, private landowners, and other non-profit organizations. Thank you to those who attended and contributed to our refresher workshops. We hope the workshops were informative and useful. We plan to continue to offer forestry and water quality workshops where loggers, industry, state, and federal employees can come together to understand the rules, science, and monitoring of forestry and water. If you would like to see the presentation materials from this workshop series, please visit ncforestservice.gov. We welcome comments/questions/concerns; please direct them to NCFS.Water@ncagr.gov.

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Highly anticipated events



The 150th anniversary of the [N.C. State Fair](#) is set to take place October 12-22 this year. Come on out and enjoy the festivities. Stop by the NCFS exhibit and visit Smokey Bear.

Come learn about and experience bottomland forest science in Wilmington, NC.

go.ncsu.edu/bottomland-symposium

BOTTOMLAND and SWAMP FORESTS SYMPOSIUM
October 31 - November 2, 2017
Hilton Riverside Hotel - Wilmington, NC



Is Modeling A Step Towards Quantifying BMP Effectiveness?

The forestry community is well aware of the benefits working forests provide. However, relaying this message can be challenging. One facet of communicating water quality benefits is through BMP monitoring, yet the question of “How much sediment are these practices preventing” is commonly asked. One approach to answer this question may be through modeling. Scientists have models for just about everything, so what model is currently best suited for BMP inspections?

First off, what is a model?

A model is a representation of some aspect of reality. Scientists develop, modify, and use them to help understand, describe, or predict how things work in the real world by exploring a simplified representation of a particular phenomenon. In the case of forestry BMPs, we are interested in how much soil has or will reach streams. There are several models used in research to estimate sediment delivery from forestry sites but many of them are too time intensive and not practical for most forest managers.

Is there a practical solution?

The **Universal Soil Loss Equation (USLE)** is one of the most widely used models to estimate erosion rates around the world. Originally developed for agriculture, the USLE was adapted by [Dissmeyer and Foster \(1984\)](#) for forestlands. Researchers have shown the model to be useful in ranking erosion rates for a wide variety of sites and management conditions. The model is relatively simple to learn and apply, with a small learning curve.

What should you know about the USLE?

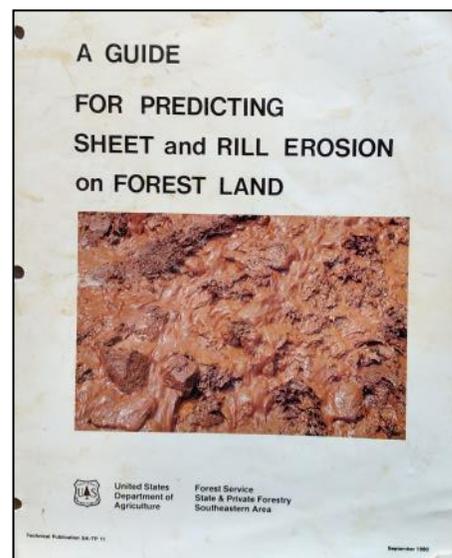
- Comprised of six components (rainfall index, soil erodibility, slope, length, plant cover, and erosion control practices) that are multiplied together to estimate the amount of soil displacement to the bottom of a slope (outputs units are ‘tons per acre per year’)
- Does not predict sediment loading into streams

How might USLE estimates augment harvest inspections?

The USLE can estimate soil loss values for a specific area, which can in turn be used to compare different tract areas or combined to calculate a weighted estimate for the whole tract (see [Christopher and Visser, 2007](#)). These estimates can be used to evaluate the performance of an operation in a quantitative manner.

That’s all great, but give me the bottom line...

Modeling soil erosion may help provide the necessary transparency of forest management. As stewards of forestland, we should be proactive in educating interested parties about our efforts to conserve forest soils and demonstrate the effectiveness of forestry BMPs.



Western Region Focus

BMP Focus: Hurricane & large rain event prep & rehab

Hurricanes and large rain events are part of the natural ecosystem. These natural forces frequently shape the landscape of North Carolina. However, land disturbing activities including forest access roads have the potential to amplify these impacts when appropriate BMPs are not implemented.

In some cases such as Hurricane Irma, there is a period of time to prepare current forestry operations. Recognizing and taking quick actions can greatly minimize accelerated erosion and other issues that stem from above average rainfall events. While the N.C. Forest Service recognizes the challenges of such events, the [*Forest Practice Guidelines Related to Water Quality still apply!*](#)

Some suggested preparatory actions include:

- Removing temporary stream & ditch crossings;
- For pipes and crossings that will remain during the storm, assure they are cleared to allow maximum flows;
- Install additional waterbars, turnouts and other methods for removing water off of travel surfaces, especially near sensitive areas (i.e., stream crossings and road areas near streams);
- Remove petroleum products from the site and locate equipment on high, stable ground.

After the storm, inspect current forest operations and those completed within the past year. Be cautious of washed out roads and don't drive through standing water. If sedimentation in streams occurred from your logging job sites during the storm, take prompt action to install BMPs to prevent additional erosion and sedimentation after the storm.



Photo credit: NCFS water quality forester, Chris Sharpton. There are other options aside from traditional seed and straw. Consider using erosion control matting as an alternative. The NCDOT has successfully used these type of items for years.

Upcoming Events

Oct. 11-12 Marion
[ProLogger Base Course](#)

Oct. 24-27 Charlotte
[NCAFP 12th Annual Fall Floodplain Institute Conference](#)

Nov. 1 @ 1 p.m. WEBINAR
[Hardwood Forest Management for Health and Productivity](#)

Piedmont Region Focus

BMP Focus: Beaver swamps

Beavers are nature’s engineers and they play an important ecological role, but their objectives don’t always align well with landowner objectives. Beavers impede the flow of streams, resulting in extensive flood plains. These wet areas create riparian habitat, enhance stream complexity, capture sediment, and provide temporary water storage. However, beavers also down valued timber.

Legally, a streamside management zone is not required around a beaver pond. However, the responsible party must still prevent visible sediment from getting into the beaver pond. The Division of Water Resources ‘Riparian Buffer’ must be established around the edge of beaver impoundments, if the stream leading into or out of it appears on either the most recent topographic or soils

map and is located in an area with these specialized rules.

Although repopulating beavers is not suggested, restoration of riparian floodplain and wetland storage should become important objectives of stream restoration that can lead to reductions in flood damage. Visit: [Beaver Management Assistance Program \(BMAP\)](#).



Example of a beaver impoundment adjacent to a timber harvest (above and right from the same tract). This was a violation of the Tar-Pamlico Riparian Buffer Rule.



Upcoming Events

Oct. 12-13 @ Raleigh,
[Defense Coastal/Estuarine Research Program Symposium](#)

Oct. 14 @ Pittsboro,
[Clean Jordan Lake Annual Fall Trash Cleanup](#)

Nov. 1 @ Raleigh,
[2017 APNEP Ecosystem Symposium](#)

Nov. 1 @ 1 p.m. WEBINAR
[Hardwood Forest Management for Health and Productivity](#)

Nov. 9 @ Fayetteville,
[Sustainably Funding Your Watershed Efforts Workshop](#)

Eastern Region Focus

BMP Focus: Nutrients, algal blooms, and forestry

Over the past year there has been growing concern over algal blooms along some eastern North Carolina streams. Excessive algal blooms occurred in these waters back in the 1970's and resurgence has been limited until recently. Some are quick to blame bottomland forest management, but how much of this problem is actually coming from logging operations?

Bottomland forest systems are found at low elevations close to bodies of water. Vegetation composition and growth is driven by water (hydrology). Flooding in these forests occur irregularly with varying periods of inundation. Flood waters flowing into bottomlands deposit sediment and nutrients from upstream sources. Some of the excessive nutrients are cycled as the forest grows, and it is known that larger trees process more nutrients than smaller trees. A common progression of thought may lead some to believe timber harvesting causes algal blooms.

However, most of the scientific studies have been limited in their ability to demonstrate and quantify nutrient inputs from timber harvests. Research in this area is warranted prior to changes in management recommendations. The N.C. Forest Service provides forest management options based on scientific information rather than conjecture or speculation.

In spite of uncertain cause and effect relationships, the forestry community proactively developed BMPs for bottomlands, recommending practices that minimize soil impacts and sediment delivery (e.g., shovel logging).

Upcoming Events

Oct. 19 @ Wallace,
[Log A Load Golf Tournament](#)

Oct. 23 @ New Bern,
[Sustainably Funding Your Watershed Efforts Workshop](#)

Oct. 24-25 Wilmington,
[2017 Eastern Forest Insight Conference](#)

Oct. 31-Nov. 2 Wilmington,
[Bottomland & Swamp Forest Symposium](#)

Nov. 1 @ 1 p.m. WEBINAR
[Hardwood Forest Management for Health and Productivity](#)



Photo of an active shovel logging job adjacent to the Perquimans River. A streamside management zone was established and no apparent algal bloom was found within the river. Photo taken during NCFs flight inspection in Aug. 2016. Photo credit: NCFs Assistant District Forester, Jamie Dunbar.

North Carolina Forest Service

WATER RESOURCES BRANCH
1616 Mail Service Center, Raleigh, NC. 27699-1600



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NCDA&CS Agricultural Services

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www.ncfirewise.org

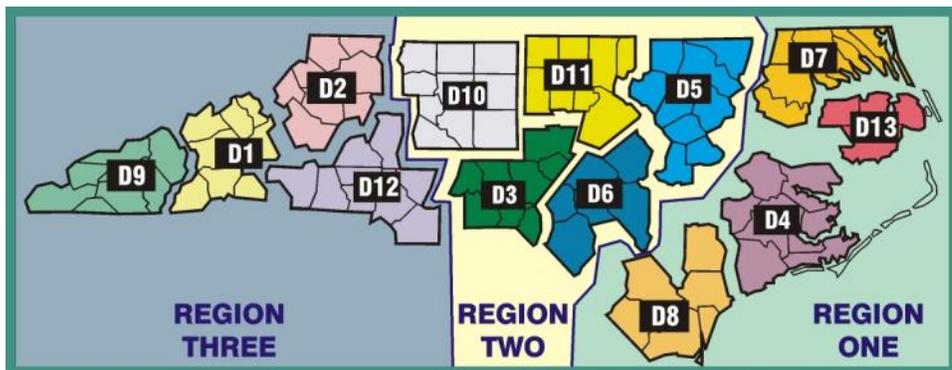
Go Out and Learn in the Forest

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Western Region

Western Mountains (D9, D1):
Chris Sharpton: 828-774-8602

Foothills (D2, D12):
Richard Cockerham: 704-616-0747

Piedmont Region

Northern Piedmont (D5, D10, D11 [North of I-40])
Nancy Blackwood: 336-500-3661

Southern Piedmont (D3, D6, D10 [South of I-40])
Matt Vincett: 910-334-0025

Eastern Region

Northern Coastal Plain
(D7, D13, +Beaufort and Pitt):
Cathy Gilkeson: 252-286-0881

Southern Coastal Plain
(D4 [-Beaufort and Pitt], D8):
Paul Mowrey: 252-286-0862



NC STATE EXTENSION

BOTTOMLAND and SWAMP FORESTS SYMPOSIUM

October 31 - November 2, 2017

Hilton Riverside Hotel - Wilmington, NC



This symposium is the outcome of three years of research by key members of the N.C. Forest Service, N.C. State University Department of Forestry and Environmental Resources, and the USDA Forest Service. It is recommended for anyone with either ecological or economic interest in bottomland hardwood and swamp forest silviculture. Attendees will hear from researchers and practitioners from throughout the Southeastern US who have the latest data and experience in these lowland forest types. Their research considerations included overall assessment of the existing forest types in the region, best management practices for harvesting and water quality, and the potential for restoration efforts for natural and human influenced sites.

Exhibitors and poster presenters will round out the overall symposium content during planned networking breaks, meals and receptions planned for October 31 and November 1. A comprehensive field tour is planned for November 2, which will cover major types of bottomland forest systems. Visit go.ncsu.edu/bottomland-symposium for the agenda & registration.