

**North Carolina
Forest Service**



NC Forestry BMP Effectiveness Monitoring Watershed Study

*Virginia – North Carolina – Southern Research Station Meeting
Haw River State Park
February 17, 2012*

Who?

Forestry BMP Effectiveness Study

Outside Funding Sources:



Data / Information Users:



Policy Makers



Agency Personnel



Forestry Community



Watershed Planners



Academia

Significant in-kind contributions

Landowners:



RESEARCH STATIONS DIVISION



Primary Study Researchers:



Forestry BMP Effectiveness Study

Why?

-  The Clean Water Act mandates states to develop a protection program for non-point source pollution (Section 208), including forestry.
-  Forestry Best Management Practices (BMPs) are considered to be an effective tool for minimizing the impact of forestry operations on water quality. However, the effectiveness of BMPs are constantly under scrutiny.
-  While previous studies have shown properly installed BMPs are effective to protect water quality during forestry activities, more research is needed to quantify BMP effectiveness at varying scales with different site conditions, within different ecological regions, and for specific BMPs.
-  Neuse River Riparian Buffer Rules as they relate to forestry have not been quantitatively evaluated.
-  Little quantitative data on stream crossings in the Piedmont region, particularly with respect to effectiveness of different crossing alternatives.

Forestry BMP Effectiveness Study

What?

1) Before-After Control-Impact (BACI) Paired Watershed Study

- Quantify the effectiveness of forestry BMPs on a small headwater watershed scale at preventing erosion and sedimentation.
- Evaluate the Neuse River Basin Riparian Buffer Rule as it relates to forestry operations.

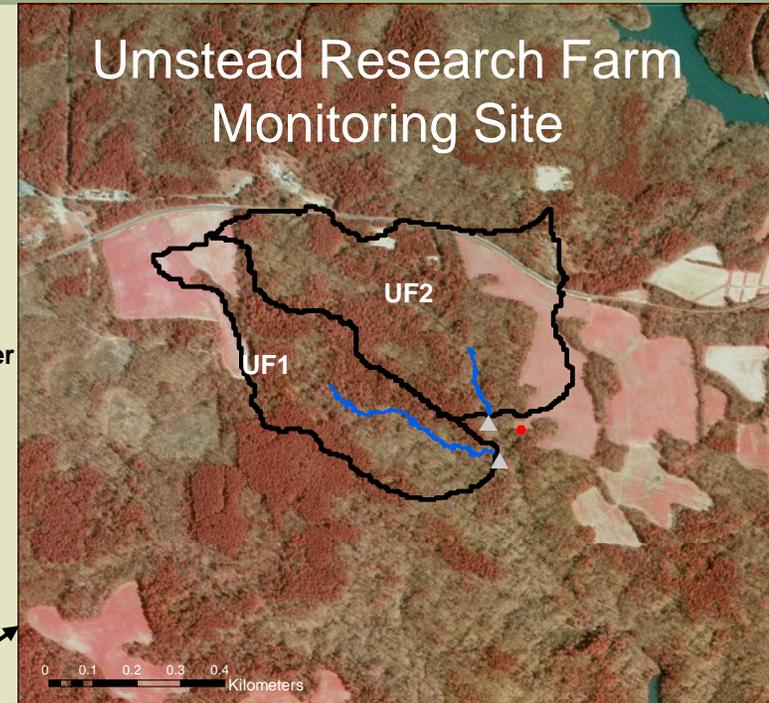
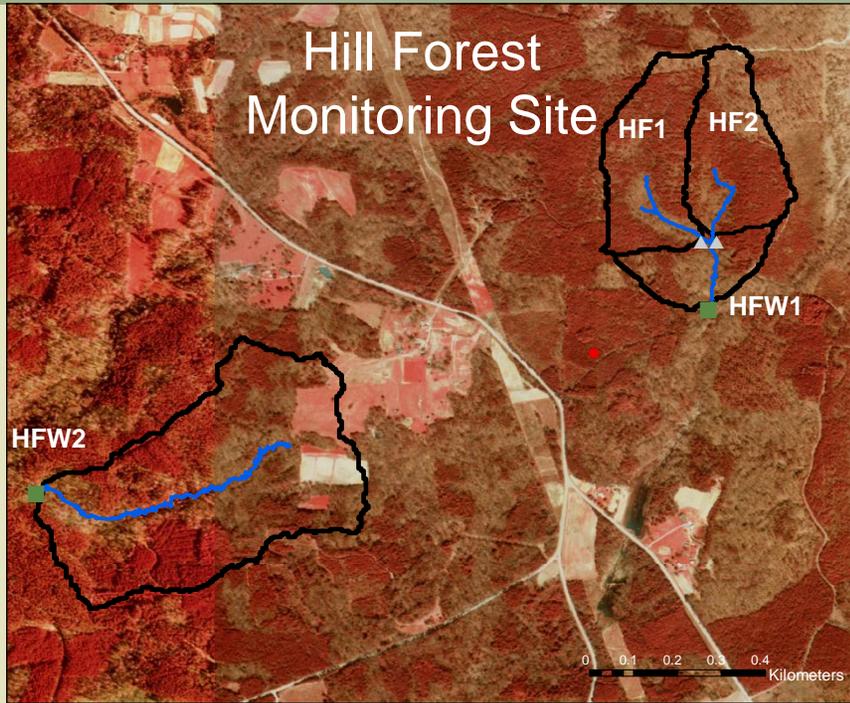
2) Upstream / Downstream – Before / After

- Quantify the benefits of bridgemat stream crossings as compared to other crossing alternatives.



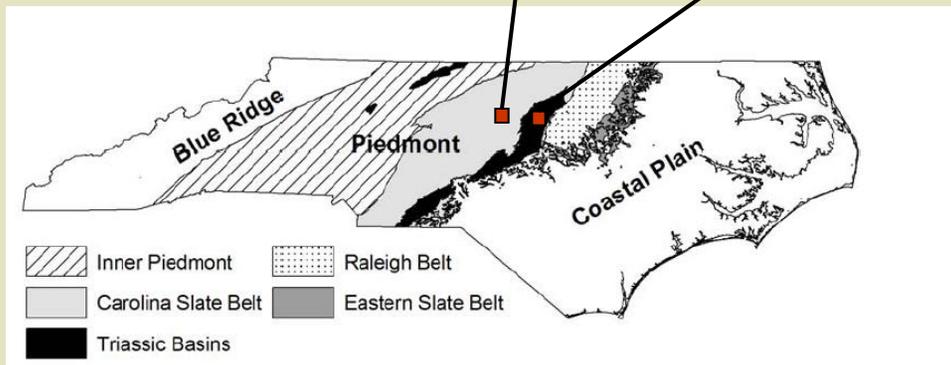
Where?

Forestry BMP Effectiveness Study



- ▲ Flume
- Weir
- ◆ Weather

**** Stream crossing studies conducted throughout the Piedmont of North Carolina. ****



Watershed Characteristics.

	HF1	HF2	UF1	UF2	HFW1	HFW2
Size (ha)	12	12	19	29	29	40
(acres)	30	28	47	70	73	100
Aspect	South	South	Southeast	Southeast	South	Southwest
Geologic regions	Carolina Slate Belt	Carolina Slate Belt	Triassic Basin	Triassic Basin	Carolina Slate Belt	Carolina Slate Belt

Carolina Slate Belt is more of a rocky region.

Triassic Basins is more of a sandy region where the soil is easily erodible.

- 🌲 **Five year study, 2007/2008 – 2013.**
- 🌲 **Pre-treatment monitoring, 2008 – 2010.**
- 🌲 **Treatment, Fall / Winter 2010 / 2011.**
- 🌲 **Post-treatment monitoring 2010 – 2013.**
- 🌲 **Stream crossing studies conducted opportunistically from 2010 – 2013**
 - 💧 Ideally 2–3+ weeks in advance of installation to capture several baseline storm events, continue monitoring during use, and 3–5+ weeks after use / deconstruction

Questions?

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ncforestservice.gov/water_quality/water_quality.htm

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North Carolina Forest Service



WebGIS Preharvest Planning Tool

*Virginia – North Carolina – Southern Research Station Meeting
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Who?

WebGIS Preharvest Planning Tool

Funding Provided By:



WebGIS Users:



Logging Professionals



Agency Personnel



Landowners



Educators



Forestry Practitioners



Students

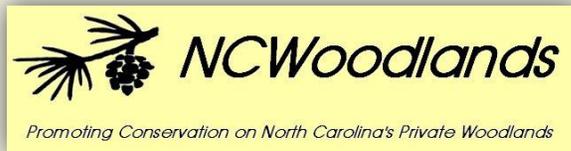
Stakeholder Partners:



Water Resources
Committee



GIS
Task Force



-  Preharvest planning notably increases forestry BMP implementation and reduces risk to water quality on forestry sites.
-  GIS technology is often underutilized, particularly by *Nonindustrial Private Forest landowners* and *logging professionals*.
-  GIS education and information transfer is challenging given the speed at which technology advances and the frequency at which new data is created and old data is updated.
-  A WebGIS system that consolidates up-to-date GIS and information resources (e.g., BMP manual) will improve decision making on the ground.

- 🌲 **Create a WebGIS tool that expands on and utilizes informational resources (e.g., BMP Manual) and GIS data (e.g., NRCS SSURGO soils, hydrology, topography, watersheds, etc.) and is capable of generating a detailed "forest engineering" plan.**
 - 💧 Maps from templates as well as custom maps
 - 💧 Generate brief reports summarizing harvest site characteristics (i.e., steep slopes, erodible soils, log deck suitability, rutting hazards, streams, wetlands, areas of special concern, etc.)
 - 💧 Offer BMP recommendations based on site attributes

 **Statewide in North Carolina**

 **Project being conducted in collaboration with SGSF Water Resources Committee and GIS Task Force in an effort to create a tool that can be “plugged-into” other state information systems for use.**

Spring 2012

- 💧 Inventory of southern region state IT and GIS resources
- 💧 Convene forestry advisory group to inform WebGIS system development

Summer 2012 – Spring 2013

- 💧 System requirements and prototype proof of concept
- 💧 Application development
- 💧 Alpha and beta testing / application adjustments

Summer 2013

- 💧 Application rollout to the public
- 💧 Trainings and workshops

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