



Lessons Learned from the Neuse River Basin Education Program

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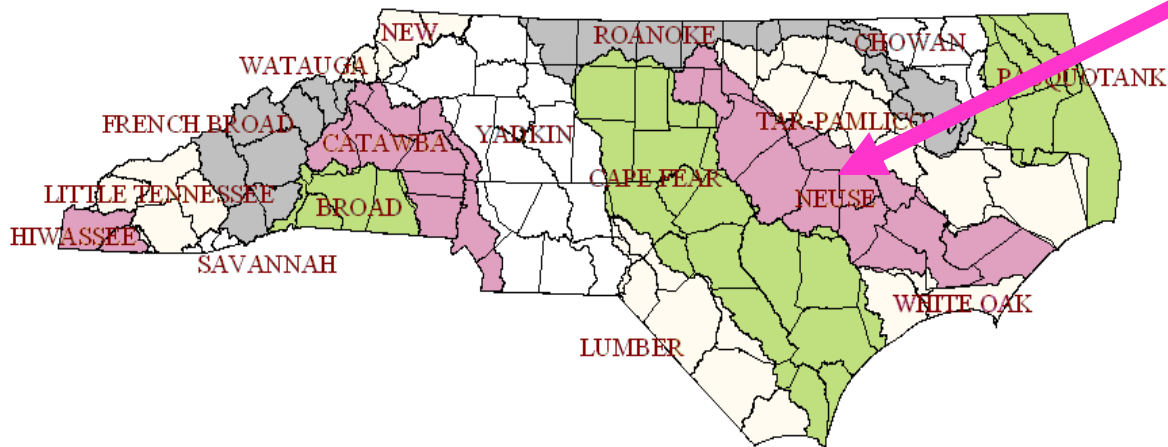
Dwane Jones, Area Extension Agent



Presentation Outline

- The Problem
- The Strategy
- The Outcomes
- Lessons Learned

North Carolina's River Basins



The Neuse River – It doesn't stink!



The Problem (mid-1990s)

- Fish kills in the Neuse Estuary
- Algae blooms
- Pfiesteria outbreaks
- Excessive nutrient loading
- Public outcries for help

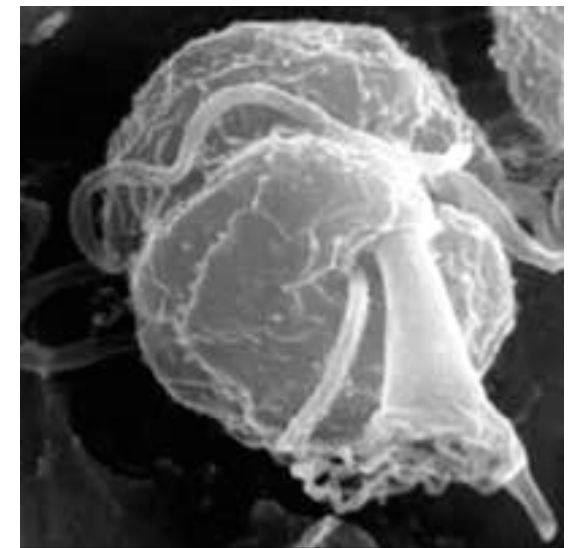
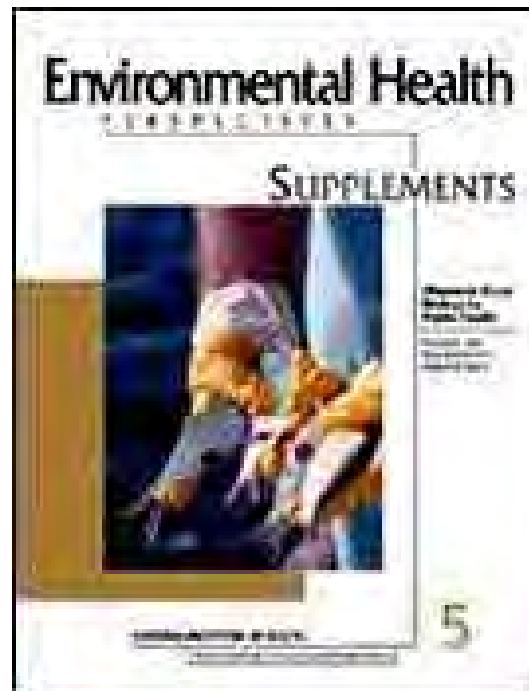


Lower Neuse River Basin



Lower Neuse River Basin

- Recreation and commercial fishing
- Fish kills and toxic algae scares in late 1990s



Middle Neuse River Basin



Raleigh News and Observer, 1995

Middle Neuse River Basin

- Coastal Plain
- Intensive agriculture
- Sandy soils



The Triangle connection

Click on map to see wastewater discharger sites



Source: N.C. Division of Environmental Management, Neuse River Basinwide Management Plan

Raleigh News and Observer, 1995

Upper Neuse River Basin

- Piedmont
- Rapid development
- Conversion of forest & agricultural land to urban



The Strategy – Focus on N Loading

- Research
- Education
- Financial Assistance
- Technical Assistance
- Laws & Regulations



Research

- Estuary monitoring and modeling
- Identifying sources of pollution
- Evaluating BMP effectiveness
- Targeting resources



Neuse Education Team

- Initiated in 1996 with \$500K from Legislature
- NC Cooperative Extension Service
- 4 Area Agents + NCSU Specialists in Soil Science, Engineering, & Communications
- Field Demonstrations & Research
- www.neuse.ncsu.edu



Financial & Technical Assistance

- Focus on agricultural BMPs
- Cost-Share & Grants: \$12M
- Mitigation (Buffers, Urban Nutrient Offset)
- USDA-NRCS, Soil & Water Conservation Districts



Laws & Regulations

- State law requiring 30% N reduction
- TMDL approved by EPA requiring 30% reduction
- Regulations (Neuse NSW Management Strategy)
 - Point sources
 - Riparian buffer protection
 - Agriculture
 - Urban stormwater
 - Nutrient management training



Point Sources

- 30% N loading reduction based on 1995 discharges
- Permit limits cannot exceed 3.5 mg/L of N
- New & expanded discharges must meet load limits or purchase discharge credits
- Neuse River Compliance Association formed in 1992
 - 18 members with 22 WWTPs
 - Association permit governs N discharges collectively

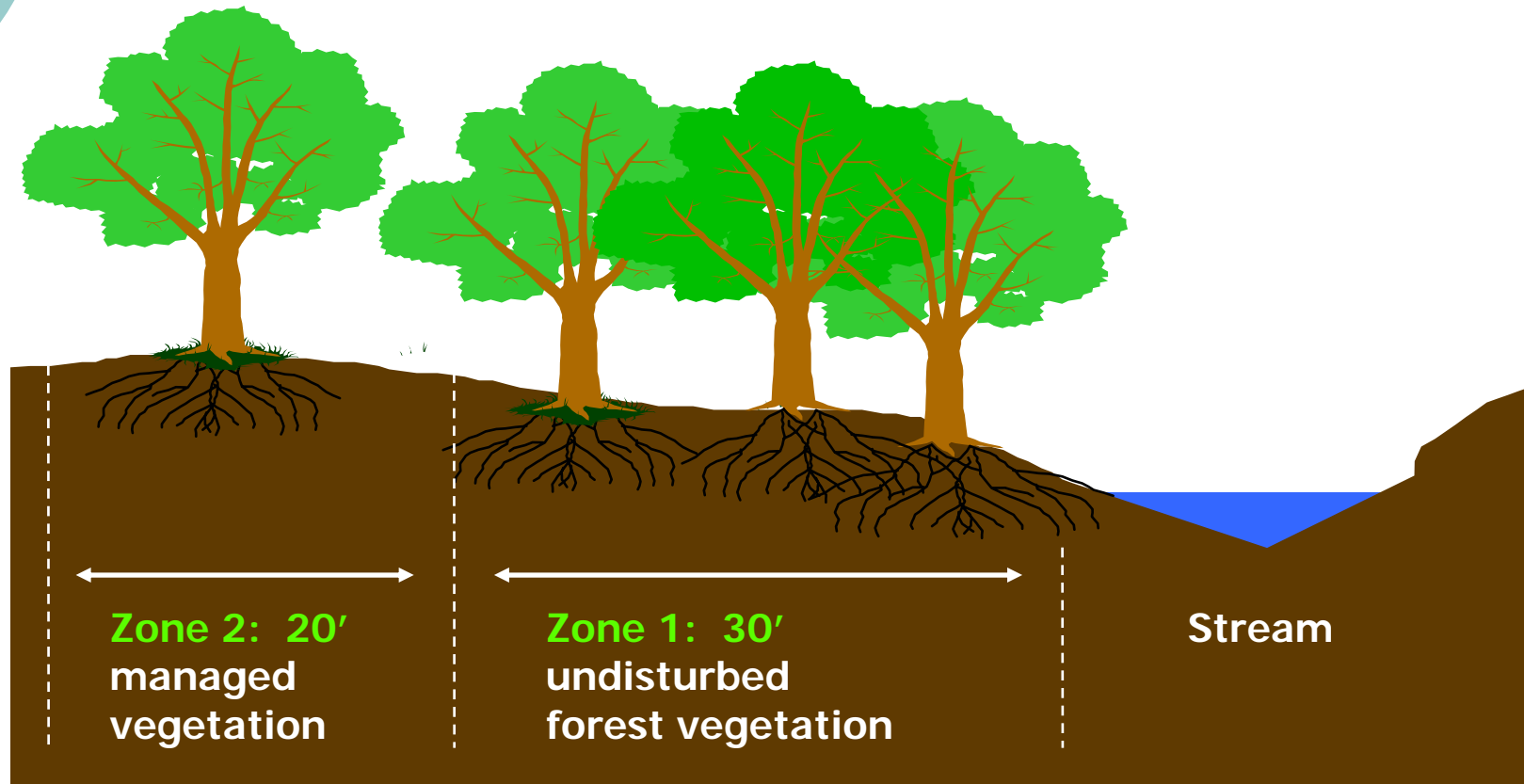


Riparian Buffer Protection



Riparian Buffer Protection

- Existing buffers must be protected
- Mitigation payments if impacts cannot be avoided



Agriculture

- 4,000 farmers on 1 million acres
- 30% N reduction target (collective)
- BMPs tailored to local needs
 - Nutrient management
 - Buffers
 - Controlled drainage



Nutrient Management

- Realistic Yield Estimates based on soils and crops
- Precision fertilizer application
- Scavenger crops
- Changes in cropping patterns (corn to cotton)



Parrott Farm, Lenoir County, NC



Buffers



Controlled Drainage



Core Creek Watershed





Nutrient Reductions on Farms

Change	% Contribution
BMP Installation	29
Fertilizer Management	33
Crop Shift	10
Cropland to Grass or Trees	2
Cropland to Idle	17
Cropland to Urban	10

Nutrient Management Training

- Provided by NC Cooperative Extension Service
- Required if applying fertilizer to 50 or more acres
 - 1500 Farmers
 - 500 Landscape & lawn care workers



“I liked it, it was very educational. I got an idea of how easy nitrogen runoff can be into the river.”



“It made me more aware of the need to watch what we are doing, not to over fertilize due to the environment and the economics, especially as I have land near the river.”

Urban Stormwater

- New development must install BMPs to control N loading to 3.6 lb/ac per year
- Nutrient offset payments allowed
- Remove illegal discharges
- Education



Stormwater BMPs for N Reduction

- Wet ponds and wetlands
- Bioretention (rain gardens)
- Level spreaders
- Permeable pavement
- Green roofs

