

DRAFT

Strategy for Implementing a Wetlands Monitoring and Reporting Program in NC

April 25, 2013

Introduction

The 2003 EPA document entitled “Elements of a State Water Monitoring and Assessment Program for Wetlands” specifies that states should implement a wetlands component into their overall surface water monitoring strategy by 2014. One of the primary program goals in developing a comprehensive wetlands monitoring program is to establish a baseline of wetland condition and report changes in condition in the State’s Clean Water Act (CWA) Section 305(b) Report (or Integrated Report). The activities of the wetland monitoring program described herein along with the interpreted results will be reported biannually in North Carolina’s Integrated Report for the ultimate goal of supporting basinwide water quality planning in North Carolina.

The wetlands monitoring program in NC has been primarily supported by EPA Wetland Program Development Grants since 2004, when the wetland monitoring program first began. Each grant had specific wetland monitoring goals, focusing on a particular wetland type or wetlands within a specific watershed. The wetlands monitoring work in NC has monitored over 10 wetland types and collected extensive data including GIS/land use analysis, rapid assessments, water quality, soils, hydrology, and biological surveys of vegetation, amphibians, and macroinvertebrates. As a result of this work, a consistent scientific methodology for monitoring wetlands in the southeastern United States was established. This wetland monitoring methodology influenced the EPA’s National Wetland Condition Assessment (NWCA) procedures and NC was a major participant in the EPA’s national wetland survey, assessing 47 wetlands in 2011. In all, over 175 wetlands have been monitored by the NC wetlands monitoring program as is shown in Figure 1 on page 5.

In the past few years, the NC wetlands monitoring program has begun to have an influence on multiple state regulatory programs. For example, the methodology for monitoring wetlands has been used in the 401 Water Quality Certification process where monitoring impacts to the affected wetland was needed on a long term basis. The Aquifer Protection regulatory program has also used the wetland monitoring methodology to develop monitoring requirements for wetlands adjacent to large wastewater land application systems. In the future, NC DWQ hopes to utilize the monitoring data to inform guidelines for successful wetland mitigation projects and to develop monitoring protocols for wetlands adjacent to mining operations and/or wastewater disposal facilities. We anticipate that this type of regulatory influence by the wetlands monitoring program will continue to grow. In order to fully utilize this resource, wetland monitoring data needs to be readily accessible through a selectable map that will provide monitoring data for sites of interest in addition to providing data that would be characteristic of a specific wetland type. In addition, development of a long term sustainable implementation plan for the wetlands monitoring program in NC will allow for integration of wetlands monitoring into other existing monitoring programs within the state. Further integration with these monitoring programs means building partnerships in order to share data and experience that will further common goals such as restoring and protecting wetlands and improving stream condition.

Strategy and Objectives

Wetlands provide critical functions such as storage of water, filtration, transformation of nutrients, and provision of wildlife habitat, all of which serve to protect and improve water quality in surface waters and groundwater. An effective and consistent wetlands monitoring program working with other regulatory and resource agencies will result in better management decisions and overall improvements in water quality and reduced impairments. A major emphasis of the wetland monitoring program will be reporting on wetland quantity and quality and determining how the data can be used in watershed planning and to help restore the quality of impaired streams through restoration of adjacent wetlands. The wetlands monitoring program needs to be implemented as an integral part of NC DWQ's existing planning programs much like the existing ambient monitoring program for streams, lakes, and rivers within NC DWQ's Environmental Sciences Section by providing information on wetland condition that in the future could be used for planning purposes. Results will continue to be used to support regulatory decisions and develop monitoring protocols for DWQ's regulatory programs as needed (i.e., 401 Water Quality Certification, Isolated Wetlands, Stormwater, NPDES, Non-discharge Wastewater, etc.).

Into the future, the formal implementation of the wetlands monitoring program should concentrate on the following types of monitoring (phased in over time):

- Ambient Monitoring: Sites monitored on a regular long term basis using a rotating basin approach;
- Basinwide/Watershed Monitoring: Sites monitored on a special needs basis such as in conjunction with the needs of basinwide or watershed permitting, monitoring, and restoration;
- Random Monitoring: Sites monitored for specific purposes for varying time periods across the state using a probabilistic sampling process (would be largely supported by Wetland Program Development Grants);
- National Wetland Condition Assessment: New random sites (as determined by the EPA's probabilistic sampling procedure) monitored for a one day intensive survey every five years;
- Formal establishment of a Wetland Monitoring Reference Network: Approximately 16 additional wetlands should be added to the 14 current long term monitoring sites to provide a continuous set of reference data for various wetland types and various ecoregions, and could be used to help correlate changing wetland quantity and quality to wetland and stream condition.

These wetland monitoring activities will be used to accomplish the following objectives:

- Show trends in the ambient condition of riparian wetlands and report them in the NC 305(b) report (Integrated Report);
- Provide data to establish a relationship between changing wetland quantity (no net loss) and quality to changing stream condition;
- Produce information that could be used to integrate wetland protection and restoration into Basinwide Plans;
- Use the data to guide mitigation planning with the particular goal of improving impaired streams;
- Determine trends such as degradation due to current human influences or longer term influences such as climate change or specific stressors;
- Create wetland profiles of specific wetland types for use as reference wetlands by NC DWQ's Biological Assessment Program and for informing success criteria for wetland restoration and mitigation;
- Establish wetland profiles and expand knowledge of wetland function, leading to better management decisions;
- Develop a Southeast Regional Wetlands Monitoring Network to build upon current work with

South Carolina, Alabama, and Georgia under the Southeast Wetlands Monitoring Intensification Grant; and

- Use data to assist EPA with development of a national wetland reference network.

Success with these objectives will require wetland monitoring data that is accessible from a selectable map that provides data for sites of interest. Further queries would allow users to access data on what constitutes a reference wetland for specific wetland types in terms of vegetation, amphibians or hydrology; to access the condition of wetlands in the Albemarle Pamlico National Estuary Program (APNEP) area; and to access wetlands along a disturbance gradient. Data needs further analysis to develop predictive models that will use long term monitoring data to predict wetland condition and to classify wetlands in condition categories. Models or decision frameworks need to be developed that will allow problem wetlands to be identified, to determine when improvement in wetland condition is occurring that may improve water quality in impaired streams, and to allow possible impacts from climate change to be identified. Integration with NC DWQ's planning database is needed so that wetlands near impaired streams can be identified and prioritized for restoration purposes.

Methodology and Design

The technical design of NC's wetland monitoring program will feature both probability-based sampling and targeted sampling on reference and non-reference wetland sites as well as selected wetland restoration sites. The targeted wetland sampling sites will be chosen based on basinwide needs such as planning updates, permitting requirements, and restoration opportunities for stream improvement. The methodology for collecting non-biotic and biotic resources data will be the same as that used by the Southeast Wetland Monitoring Intensification grant (which is based on the protocol used by the NWCA). The wetland monitoring program will continue to use the EPA's 3-level assessment framework, which includes GIS analysis to establish land development index (LDI) scores (level 1), rapid assessment methods using NC Wetland Assessment Method (NCWAM) and others (level 2), and collection of water quality samples, soil samples, hydrology, and extensive surveys of vegetation, amphibian, and macroinvertebrate populations (level 3). Past and future data collected will be used to create profiles for reference wetlands of specific types as defined by NCWAM.

Figure 1 on page 5 shows all of the wetland sites that have been monitored by the NC wetlands monitoring program since 2004. The wetlands monitoring network will include the current 14 long term monitoring sites (six headwater forests, four basin wetlands, two riverine swamp forests, and two bottomland hardwood forests). To complete the wetland monitoring network, more wetlands will need to be added. The additional wetlands would include 4-5 Riverine Swamp Forests, 2-3 Bottomland Hardwood Forests, 4-5 Salt/Brackish Marshes, 2-4 Isolated Wetlands, and 2 Pocosins. An important partnership has been established with the APNEP in terms of the monitoring network. In Figure 1 on page 5, the bold black line in the northeast part of the state delineates the APNEP area where approximately 88 wetlands have been monitored thus far. NC DWQ's wetlands monitoring network could be critical to the APNEP overall monitoring effort since the monitoring data could help answer questions about the condition of wetlands in the APNEP area. The NC Wetlands Monitoring is working with APNEP to further identify areas of cooperation.

Reporting

The activities of the wetland monitoring program along with the interpreted results will be reported to EPA annually in DWQ's overall Monitoring Strategy and biannually in the Section 305(b) Report (or Integrated Report). The goal of reporting on wetland monitoring activity is to:

- Evaluate wetland condition in terms of a categorical scale;
- Identify wetlands that can be restored to help improve impaired waterbodies;
- Document the condition of wetlands that have been restored and what improvements have occurred to impaired streams;
- Report results of the wetlands monitoring network in terms of change in wetland condition over time; and
- Report on long term wetland monitoring data that might be reflective of climate change.

General support and resource planning

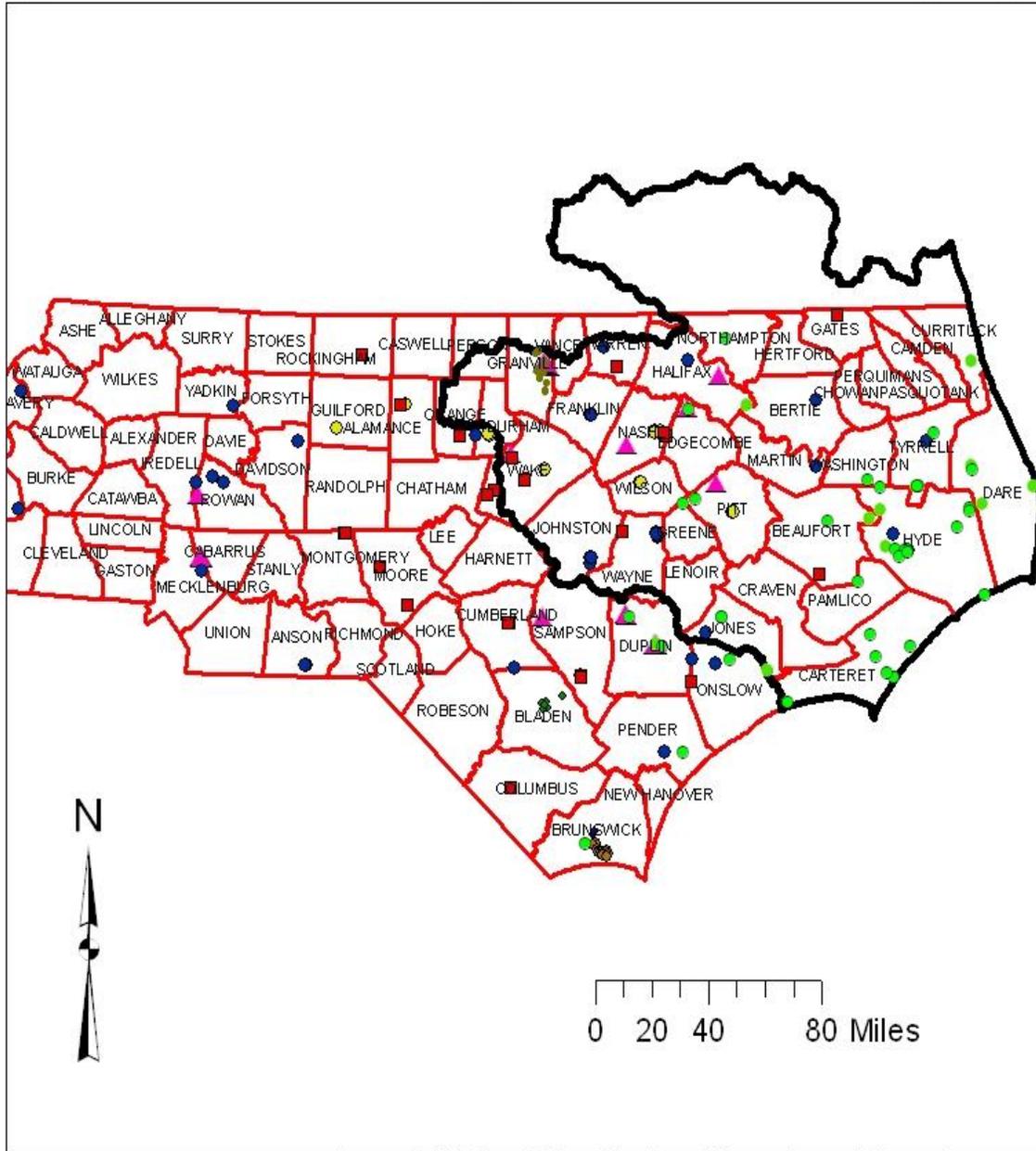
In order to report on wetland condition and improve water quality, we cannot continue to rely only on the funding sources of the past. The next phase of implementing NC's wetland monitoring and reporting program will require new partnerships with water monitoring agencies and new sources of funding. To accomplish the monitoring objectives discussed above, additional supplemental Clean Water Act Section 106 funds will be needed for wetlands monitoring. Supplemental funding can be leveraged with CWA Section 104(b)(3) funds and work can be supported by existing staff resources. The additional funding needed is based on the following:

- Salary for two full time wetland scientists (environmental senior specialists) and two part time seasonal employees to assist with field data collection;
- Monitoring and analysis costs for water quality and soil samples, hydrology data, and biological surveys of vegetation, amphibians, and macroinvertebrates for the ambient monitoring of basinwide wetlands;
- Data analysis and evaluation costs to assess wetland condition and function; and
- Costs to report results through various technical reports and conference presentations.

Summary

This proposed strategy will fully integrate NC's wetlands monitoring program as a part of the overall state water monitoring strategy as specified in the EPA's Elements of a State Water Monitoring and Assessment Program (March 14, 2003), which requires such plans to be in place by 2014. Partnerships with other state and federal agencies will allow the results of the wetland monitoring activities to be used in a larger and more beneficial capacity to help improve impaired streams and to restore and preserve more wetlands. Future activities will include the development of the NC Wetland Program Plan which will build upon this proposed strategy. As more long term wetland monitoring data is collected from the wetlands monitoring reference network, techniques will be established to allow for the detection of changes in wetland condition over time and lead to better management decisions. Developing a consistent long term wetlands monitoring program will provide a scientific basis for management and regulatory decisions by NC DWQ and other regulatory and resource agencies as well as emphasize restoring and preserving wetlands as a method to improve impaired waters. Our goal is that implementation of these wetland monitoring activities will eventually lead to development of wetlands component within NC DWQ's 106 work plan as additional supplemental funding is critical to ensure that the wetlands monitoring groundwork constructed over the past 8 years can be sustained for full integration into DWQ's water quality programs.

Figure 1: Wetlands Monitored by the NC Wetland Monitoring Program



Legend: Wetland Sites Monitored by various EPA grants

- ◆ brunswick_hydro_IW
- ◆ bladen_hydro_IW
- NWCA_BaseSites_Sampled-2011
- NWCA_OversampleSites_Surveyed2011
- Site_Locations_HeadwaterWetlands_Grant1
- New Headwater_Boundary
- Eli_Mitigation_Sites_AApoints_8-31-12
- ▭ GranvilleBoundryPoly
- ▲ Intensification_Grant_SWMG_JG