

# **Building Strong Collaborative Relationships for a Sustainable Water Resources Future:**

**STATE OF NORTH CAROLINA**  
SUMMARY OF STATE WATER PLANNING

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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

# STATE OF NORTH CAROLINA

## 1. STATE/REGIONAL WATER PLANNING STATUS

North Carolina maintains separate planning programs for water supply and water quality. North Carolina currently has a “bottom-up” approach to water supply planning, which is established by law in the state’s General Statutes (G.S.). Each local government or large community water system that provides public water services must individually or with other local governments and community water systems prepare a local water supply plan (LWSP) and submit it to the Department of Environment and Natural Resources (DENR) (§143-355(l), G.S.). DENR then uses the LWSPs to develop the State Water Supply Plan (SWSP) (§143-355(m), G.S.). The SWSP describes LWSPs as, “basically an assessment of a system’s water supply needs for a 20 to 25-year period and that system’s ability to meet those needs.” Since the drafting of the North Carolina Water Supply Plan the planning horizon for the local plans has been extended to 50 years to coincide with the State’s river basin water supply planning program.

By law, the LWSPs must document the present and projected population, industrial development, and water use within the service area; current and future water supplies; and current and future water conservation and water reuse programs. LWSPs must also describe the level of technical assistance required to address projected water needs. As part of the LWSP, a Water Shortage Response Plan (WSRP) must be developed that describes how the local government and community water system will respond to drought and other water shortage emergencies. LWSPs must be updated every 5 years. Revised plans must include descriptions of the current and anticipated surface water withdrawals and reliance on transfers of surface water between basins as defined by §132-215.22G, G.S.

The SWSP is intended to be a summarizing document (§143-355(m), G.S.). It summarizes the information, projections, major water supply issues, water conservation and water reuse programs, and technical assistance needs of the individual LWSPs. Potential conflicts among the various LWSPs are identified in the SWSP as well as ways that LWSPs could be better coordinated. Since LWSPs and the SWSP were mandated in 1989, only one SWSP has been developed. This first and current version was released in 2001, and is based on over 500 LWSPs developed in 1998 to 1999.

Since the release of the SWSP in 2001, DENR’s Division of Water Resources (DWR) has adopted a new water supply planning strategy. In the 2007 session, the General Assembly passed House Bill 2499, “An Act to Improve Drought Preparedness and Response in North Carolina, as Recommended by the Environmental Review Commission,” creating Session Law 2008-143. This bill created or revised several sections in the General Statutes including addition of §143.355.2, pertaining to local water shortage response plans, and revision of §143.355, describing the duties and powers of the DENR.

DWR’s new strategy focuses on developing river basin water supply plans (BWSPs) for each of the state’s 17 major river basins: Broad, Cape Fear, Catawba, Chowan, French Broad, Hiwassee, Little Tennessee, Lumber, Neuse, New, Pasquotank (Albermarle Sound), Roanoke, Savannah, Tar-Pamlico, Watauga, White Oak, and Yadkin-Pee Dee. The BWSPs are currently the top water

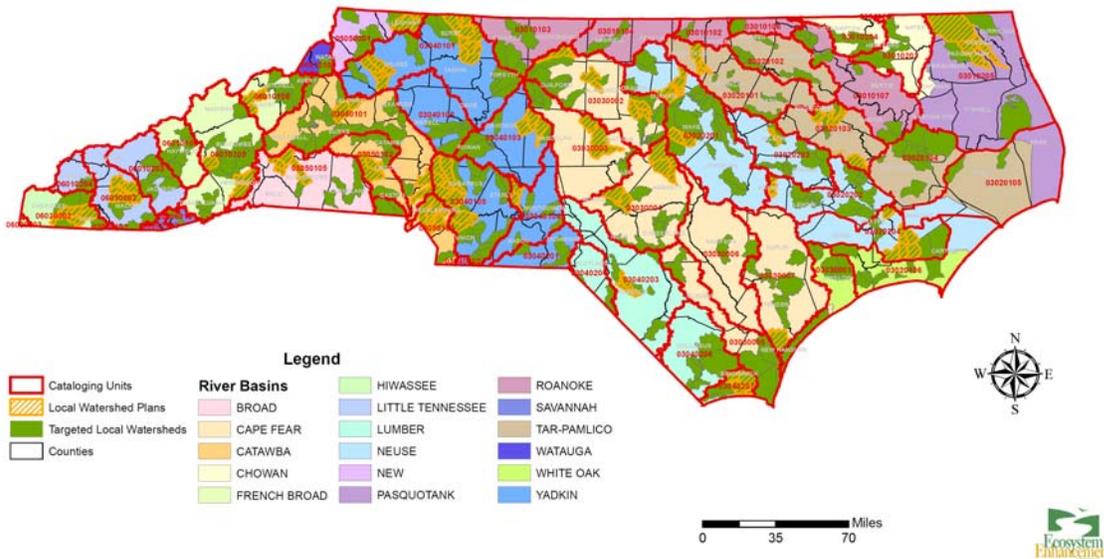
resource planning priority of the DWR. The BWSPs will cover 50-year water supply projections made by incorporating information from the most recent LWSPs into a computer-based hydrologic model, the Operational Analysis and Simulation of Integrated Systems (OASIS). The OASIS model is used to indicate where to expect water supply problems 30 to 50 years into the future. A pilot BWSP was developed for the Cape Fear basin, which encompasses the metropolitan areas of Raleigh and Durham. Model results for Cape Fear include water supply scenarios for the years 1998, 2030 and 2050. As BWSPs are completed, the SWSP will be updated to incorporate those changes. Each river basin has a DWR maintained webpage listing pertinent information for those involved in the BWSP development process including OASIS modeling results, draft BWSPs, active interbasin transfer certifications, news on upcoming public meetings, and links to related websites. DENR staff credit the LWSP process, effective outreach and education, quality data, and the OASIS model with positively contributing to the development of a statewide water plan.

Water quality planning in North Carolina is covered in the BWQPs developed by the Division of Water Quality (DWQ). The BWQPs represents a non-regulatory, watershed-based approach to restoring and protecting surface water quality. Preparation of a BWQP is a 5-year process consisting of three phases:

1. Water quality data collection and identification of goals and issues
2. Data analysis and public workshops
3. Preparation of a draft basinwide plan, public review, approval of plan, issuance of NPDES permits, and plan implementation

Initiation of each BWQP cycle is staggered in time with the first cycle of BWQPs completed in 1998. Each of the state's 17 major river basins has a BWQP. After completion of each phase in the cycle, a river basin's BWQP is updated and posted on DWQ's Basinwide Planning Program website.

Once the BWSPs are completed the DENR plans to develop a process of water planning and management whereby the DWR and the DWQ share information to develop a statewide integrated water resources plan. It is estimated that full integration will occur in the next 3 to 5 years.



**Figure 1. Delineation of Major River Basins of North Carolina, Targeted Local Watersheds and Local Watershed Plans (EEP, Nov. 17, 2008)**

Specific areas of concern regarding water resources in North Carolina have been identified as drivers in developing planning and management strategies. These issues are being addressed in state water resources initiatives including both the BWSP and the Beach and Inlet Management Plan both in the development process.

Recent periods of drought and low flow in North Carolina have made groundwater withdrawal and water allocation increasingly important issues. The Capacity Use Area program (CUA) is the only legal tactic available to regulate and monitor groundwater withdrawals outside of a vague legal requirement to “be reasonable” (Water Allocation Study, 2008). Currently the program is in effect in the Central Coastal Plain (CCP) of North Carolina, a primarily rural region in the eastern third of the state located on top the Cretaceous aquifers which supply the majority of the region’s water. Under this program groundwater withdrawals in excess of 100,000 gallons per day require a withdrawal permit. Central Coast Plain Capacity Use Area (CCPCUA) rules taken into effect in August of 2002 are designed to institute a phased reduction of groundwater withdrawals. Under the rules users will be required to reduce withdrawals from 30 percent in areas of a declining water level to 75 percent in areas of dewatering or salt water intrusion by 2018 (Water Allocation Study, 2008).

Other issues of concern in North Carolina focus on the state’s coastal areas. Beach nourishment, dredging, harbor restoration, sea level rise, and increases in storm surges are a few examples of issues affecting coasts. A primary concern in addressing coastal issues is availability of monetary resources. The DENR plans to release a Beach and Inlet Management Plan in May of 2009 addressing the overall strategy for managing coastal resources.

Climate change is another issue facing North Carolina water resources planning and management. The DWR is developing models for the BWSPs that address climate change

factors. The models help to identify geographic areas where there is potential for water shortages due to population growth, reduced precipitation, and future drought scenarios.

## 2. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

DENR's DWQ and DWR are the state's lead agencies on water resources management and planning. Tom Reeder has been the designated POC for this assessment.

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In 2003, DENR partnered with the N.C. Department of Transportation and the U.S. Army Corps of Engineers (USACE) to form the Ecosystem Enhancement Program (EEP). The EEP's responsibilities include the mitigation of the impact on wetlands and surface waters resulting from N.C. Department of Transportation projects and impaired wetland restoration. The EEP creates plans to best determine where to focus mitigation and restoration efforts. EEP prepares local watershed plans (LWPs) for targeted local watersheds (TLWs).

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### 3. WATER MANAGEMENT VISION AND GOALS

DENR's mission is "To conserve and protect North Carolina's natural resources and to maintain an environment of high quality, for the health, well-being and benefit of all," and its vision is, "North Carolina: Green and Growing!"

In DENR's Strategic Plan 2008 to 2009 (DENR, 2008), one of the department's strategic directions is called "Water for the future." Goals and objectives under "Water for the future" are:

- a. Enactment and implementation of Governor Easley's three part drought legislation proposals
  - i. Modernize public water systems
  - ii. Promote water conservation and efficiency
  - iii. Improve our ability to respond to water emergencies
  
- b. Protecting our waters
  - i. Coastal stormwater rules
  - ii. Jordan Lake watershed rules
  - iii. ERC's Water Allocation Study
  - iv. CAMA issues, including enforcement of rules requiring removal of sandbags for erosion control after 2 to 5 years
  - v. Plan for sustainable water use by river basin

DENR's DWQ maintains specific goals and objectives for BWQPs (DENR-DWQ, 2008):

#### Goals

- Identify water quality problems and restore full use to impaired waters.
- Identify and protect high values resource waters.
- Protect unimpaired waters yet allow for reasonable economic growth.

#### Objectives

- Collaborate with other agencies to develop appropriate management strategies.
- Assure equitable distribution of waste assimilative capacity.
- Better evaluate cumulative effects of pollution.
- Improve public awareness and involvement.

Finally, EEP's mission is defined in its Memorandum of Agreement (EEP, 2003) as, "to restore, enhance, preserve and protect the functions associated with wetlands, streams, and riparian areas, including but not limited to those necessary for the restoration, maintenance and protection of water quality and riparian habitats throughout North Carolina."

#### 4. SCOPE OF WATER RESOURCES PLANNING AND MANAGEMENT

Development of BWQPs is a 5-year process consisting of three phases (the BWQP schedule is given in Table 1):

1. Water quality data collection and identification of goals and issues
  - Identify sampling needs
  - Conduct biological monitoring activities
  - Conduct special studies and other water quality sampling activities
  - Coordinate with local stakeholders and other agencies to continue to implement goals within current basinwide plan
  
2. Data analysis and public workshops
  - Gather and analyze data from sampling activities
  - Develop use support ratings
  - Conduct special studies and other water quality sampling activities
  - Develop preliminary pollution control strategies
  - Coordinate with local stakeholders and other agencies
  
3. Preparation of draft basinwide plan, public review, approval of plan, issue NPDES permits, begin implementation of plan
  - Develop draft basinwide plan based on water quality data, use support ratings and recommended pollution control strategies
  - Circulate draft basinwide plan for review
  - Revise plan after public review period
  - Submit plan to Environmental Management Commission (EMC) for approval
  - Issue NPDES permits
  - Coordinate with other agencies and local interest groups to prioritize implementation actions
  - Conduct special studies and other water quality sampling activities

**Table 1. Basinwide Water Quality Plan Planning Schedule for 2005 to 2012 (DENR-DWQ, Nov. 17, 2008)**

Basin	DWQ Biological Data Collection	Draft Out For Public Review	Final Plan Receives EMC Approval	Begin NPDES Permit Issuance
<b>Chowan</b>	Summer 2010	05/2012	07/2012	11/2012
<b>Pasquotank</b>	Summer 2005	05/2012	07/2012	12/2012
<b>Neuse</b>	Summer 2010	07/2012	03/2008	01/2008
<b>Broad</b>	Summer 2005	03/2008	05/2008	07/2008
<b>Yadkin-Pee Dee</b>	Summer 2006	03/2008	05/2008	09/2008
<b>Lumber</b>	Summer 2006	01/2009	03/2009	07/2009
<b>Tar-Pamlico</b>	Summer 2007	05/2009	07/2009	09/2009
<b>Catawba</b>	Summer 2007	07/2009	09/2009	12/2010

<b>French Broad</b>	Summer 2007	03/2010	05/2010	09/2010
<b>New</b>	Summer 2008	10/2010	11/2010	03/2011
<b>Cape Fear</b>	Summer 2008	09/2010	11/2010	04/2011
<b>Roanoke</b>	Summer 2009	07/2011	09/2011	01/2012
<b>White Oak</b>	Summer 2009	01/2012	03/2012	06/2012
<b>Savannah</b>	Summer 2009	01/2012	03/2012	07/2012
<b>Watauga</b>	Summer 2008	01/2012	03/2012	09/2012
<b>Hiwassee</b>	Summer 2009	01/2012	03/2012	08/2012
<b>Little Tennessee</b>	Summer 2009	01/2012	03/2012	10/2012

Each BWQP is divided into four major sections:

1. Basinwide information
  - Introduces the basinwide planning approach used by the state
  - Provides an overview of the river basin including: hydrology, land use, local government jurisdictions, population and growth trends, natural resources, wastewater discharges, animal operations and water usage
  - Presents general water quality information including summaries of water quality monitoring programs and use support ratings in the basin
2. Basin (watershed) information
  - Summarizes recommendations from previous basin plan, achievements made, what wasn't achieved and why, current priority issues and concerns, Impaired waters, and goals and recommendations for the next five years by subbasin
3. Current and future initiatives
  - Presents current and future water quality initiatives and success stories by federal, state and local agencies, and corporate, citizen and academic efforts
4. Appendices
  - List NPDES dischargers and individual stormwater permits
  - Describes water quality data collected by DWQ, use support methodology and 303(d) listing methodology
  - Provides workshop summaries, points of contact, and a glossary of terms and acronyms

In a few of the BWQPs (e.g., White Oak, Chowan), management strategies are incorporated into the plan in addition to simply listing water quality initiatives. This is an area where the flexibility of the BWQP framework allows for inconsistencies between plans.

DWR will use the same river basin delineations to develop the BWSPs. Their website on river basin planning lists this as the generic BWSP development process (DENR-DWR, Nov. 17, 2008(b)):

1. Develop an initial list of stakeholder group participants.
2. Develop generic planning framework based on the Cape Fear River Basin Water Supply Plan.
3. Convene the first stakeholder group meeting.
4. Develop summary of information needs.
5. Develop the River Basin Water Supply Plan framework.
6. Work on the plan and model with stakeholder input.
7. Develop the River Basin Water Supply Plan, Draft(s) and revise based on stakeholder feedback.
8. Complete and distribute final River Basin Water Supply Plan.

EEP develops RBRPs for each of the major river basins. In the RBRPs, EEP evaluates GIS data and other resource and planning documents on water quality and habitat conditions to select TLWs using information from following categories:

- Water quality problems—watersheds have existing and potential water quality problems resulting from non-point source pollution.
- Resource values—values beyond water quality? (public water supply, shellfish areas, outstanding or high quality resource waters, aquatic natural heritage elements and significant natural heritage areas).
- Watershed approach—existing watershed planning or protection initiatives already underway.
- Land cover—indicator of restoration need.
- Local resource comments/recommendations.

For TLWs identified by the RBRPs, LWPs are developed using the following three step process:

1. Watershed assessment—*A technical watershed assessment is developed to inventory and validate information regarding historical and current watershed conditions, including problem areas within the watershed where functional improvements could be realized or protection measures should be applied.*
2. Local stakeholder involvement—*Local representation is critical to the process for the purposes of providing input and feedback on watershed assessment products and watershed restoration goals.*
3. Project implementation—*A comprehensive suite of specific watershed improvement projects will be identified through the planning process. Projects including wetlands, stream and riparian buffer restoration, enhancement and protection will be pursued by the EEP or other state, federal, local or nonprofit resources. Other recommendations such as Stormwater Best Management Practices and policy recommendations may be pursued through partnerships with state, federal and local programs for the long-term improvement and protection of watershed functions.*

## 5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

Again, North Carolina uses a “bottom-up” approach to water resources management planning. In developing the Cape Fear BWSP, the DENR has brought together stakeholders from large sectors of water use including the agricultural, industrial, and commercial sectors for technical input regarding future growth plans and future needs which were incorporated into the modeling process. Public forums assist local governments in the development and implementation of LWSPs and BWQPs. Each BWQP includes an appendix summarizing the public meetings and workshops held during the development of the BWQP. These summaries include the location, issues/problem areas identified, any DWQ comments/responses, and where in the BWQP those issues/problems are addressed. In general, public workshops identified the following as the major water quality issues facing their respective river basin: habitat degradation, urban runoff, biological monitoring issues (e.g., criteria for aquatic habitat assessments), sedimentation, hurricane and/or drought related issues, protecting headwaters, and fish consumption. Several river basin workshops identified lack of public outreach and education programs, lack of coordinated planning, lack of enforcement of existing regulations, and lack of adequate monitoring as the greatest hindrances to the planning and implementation process.

Unlike the DWQ, which operates within the strict guidelines of the Clean Water Act, the federal government plays a negligible role in the day to day operations of the DWR. The DWR’s primary government partnerships are with the U.S. Geological Survey which provides data and the U.S. Army Corps of Engineers which is involved in coastal projects, permitting, and providing financial assistance. During discussions, a representative from the DWR indicated that they believe the federal government could enhance the water resource planning effort by working to improve interstate interaction regarding water resources planning and management and to by promoting greater standardization to facilitate more efficient collaboration between states.

## 6. PLAN IMPLEMENTATION STRATEGY

Most of the “plans” are summary documents—detailed descriptions of the hydrology, climate, population, economy, natural resources etc. In general, they do not contain specific goals and/or benchmarks since their primary intent is to identify potential water resources problems. The state implements actions through the development of the various regional plans. In general, responsibility for specific implementation actions (e.g., developing water conservation ordinances) is held by local governments or regional entities (e.g., utilities).

In addition to the plans, there are numerous water resources-related regulations established by state legislation. The recently passed Session Law 2008-143, amended the North Carolina General Statutes to improve drought preparedness and response by adding or rewriting sections. A few new sections are:

- § 143-355.3. Water shortage emergency powers
- Authorizes Governor to declare a water shortage emergency and grants Secretary of DENR with powers and duties during those periods
- § 143-355.4. Water system efficiency

- Requires local governments and large community water systems to have separate meters for new in-ground irrigation systems
- Sets up eligibility requirements for state water infrastructure funds for system expansions to ensure that applicant:
  - Has a water rate structure adequate to support operation and maintenance of the system
  - Has implemented a leak detection and repair program
  - Has an approved water supply plan
  - Meters all water use (except for use that is impractical to meter)
  - Has evaluated the extent to which reclaimed water can be used to meet future needs
  - Has implemented a consumer education program to emphasize water conservation
- § 143-355.6. Enforcement

Authorizes Secretary to enforce 143-355.2 and 143.355.3, pertaining to drought and water conservation, with civil penalties (fines)

Rewritten sections, include:

- § 143-215.22H. Registration of water withdrawals and transfers required
- § 106-24. Collection and publication of information relating to agriculture; cooperation
- § 143-350. Definitions
- § 143-354. Ordinary powers and duties of the Commission
- § 143-355. Powers and duties of the Department
- § 143-355.1. Drought Management Advisory Council; drought advisories

## **7. OUTCOMES ASSESSMENT PROCESS**

The success of the state planning process has not been formally assessed by DENR since the development of the SWSP in 2001. Both DWR and DWQ do not have established performance measures to assess the effectiveness of the planning process. The development of the 17 BWSPs is still in its infancy. The first plan (Cape Fear River Basin) is scheduled to be completed at the end of January 2009 and will serve as a template for other BWSPs. During the process of developing the Cape Fear BWSP a technical team of stakeholders have been involved in identifying measures of levels of performance in addition to the models themselves identifying areas of concern.

## **8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS**

The key water resources issues/needs in the State of North Carolina are:

- Need for comprehensive water supply planning in the 17 major North Carolina river basins to identify areas of critical importance and where to place planning and management emphasis in the future.
- Possible establishment of a statewide water withdrawal permitting program to better understand and manage water use. This issue is most important in the Central Coastal Plain region of the state where ground water is being overdrawn leading to saltwater intrusion

affecting water quality. (However, there is a ground water withdrawal permitting program already in place in the Central Coastal Plain under the CUA Rules.)

- Coastal issues including but not limited to beach nourishment, dredging, harbor restoration, sea level rise, and increases in storm surges. The Beach and Inlet Management Plan scheduled to be released in April 2009 will serve as a guide for managing coastal resources.
- Restoration of impaired watersheds, especially those susceptible to future human impacts as a result of increasing urbanization.
- Integrating water supply and water quality plans.

North Carolina is in the process of comprehensively analyzing its statewide water supply needs through its “bottom up” approach to a statewide plan. The Basin Water Supply Plans will be the primary indicators of the water supply needs in the state. Although the BWSP process is in its infancy it has already proven to be a beneficial tool for fostering stakeholder input that can be integrated into the plans.

In order to address its water resources needs, North Carolina will need to work in cooperation with surrounding states. The points of contact participating in the interview portion of formulating this summary stated that they would like to see more opportunities for interstate collaboration in water resources planning and management and proposed that the federal government work to promote relationships among states with greater standardization in order to facilitate efficient interactions.

Effectively meeting statewide water resources challenges will require resources beyond those currently expended in North Carolina. Additional money is needed to acquire the necessary staff and technology to develop basin-wide plans and to model complex future scenarios to promote sound decision making. Addressing coastal issues will also require large financial investments in technology and capital improvements.

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